Don’t miss TowerXchange Meetups for Europe (12-13 April) and Americas (16 -17 June)!

Small cells, big opportunity

Cellnex, WIG and Indus Towers interviews

TowerXchange Europe:
- Who’s who: an A-Z of European tower stakeholders
- Interviews with Deutsche Functurm and CETIN
- Special features on Ireland, Italy and CEE towers

TowerXchange CALA:
- Andean Tower Partners: Digital Bridge goes West!
- GTS’s Eisenstein and Varela on Brazil
- Guatemala case study including SBA and IFC

TowerXchange Africa and the Middle East:
- The new Nigerian tower market + HTN Towers
- Tower deal updates: KSA, Kuwait and South Africa
- TowerXchange Meetup Africa roundtable reports

TowerXchange Asia:
- edotco, AMT, Bharti Infratel keynote report
- Matrix of Asian MNO tower strategies
- Malaysia, Cambodia, India and China reports
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TowerXchange Meetup calendar

- TowerXchange Meetup Europe, April 12-13, 2016
- TowerXchange Meetup Americas, June 16-17, 2016
- TowerXchange Meetup Africa, October 19-20, 2016
- TowerXchange Meetup Asia, December 13-14, 2016
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About TowerXchange

Founded in 2012, TowerXchange is your independent community for operators, towercos, investors and suppliers interested in EMEA, CALA and Asian towers. We’re a community of practitioners formed to promote and accelerate infrastructure sharing. TowerXchange don’t build, operate or invest in towers; we’re a neutral community host and commentator on telecoms infrastructure.

The TowerXchange Journal is free to qualifying recipients. We also provide webinars and regular meetups. TowerXchange monetises this community through hosting annual Meetups and the sale of advertising, without compromising editorial integrity.

TowerXchange was founded by Kieron Osmotherly, a TMT community host and events organiser with 18 years’ experience, and is governed with the support and advice of the TowerXchange “Inner Circle” – an informal network of advisors.

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TowerXchange’s analysis of the independent tower market in Europe

The past couple of months have seen big news in the European market indicating a major shift is underway in attitudes toward tower ownership. Of Europe’s 600,000 towers (including Russia and the CIS), currently 29% sit in the hands of independent towercos, operator-captive towercos and JV infracos but with the recent pipeline of activity, TowerXchange expect this to increase to 35% in 2016 with the figure having the potential to exceed 40% in the next two years if momentum continues apace. If such forecasts came to pass, towercos would have the same level of penetration in Europe as they currently do in Sub-Saharan Africa, where four towercos rapidly rolled up the most investible assets ostensibly over a five year period.

The most recent European news come from Spanish giant, Telefónica. After months of speculation surrounding a potential divestment of towers, January saw the carve out of their 11,500 Spanish sites into a newly formed infrastructure business – Wireless Towers. Whilst still unclear whether this will lead to an IPO or sale (although a two stage approach involving both seems likely) – the move will either result in the introduction of significant sized operator-owned competitor, or will provide a highly attractive acquisition for either a European or an international towercos to achieve scale rapidly. Speculation is already mounting that Telefónica’s Wireless Towers footprint could be extended to absorb their German and remaining CALA towers, although the MNO has not confirmed this.

In Russia, the sale of Vimpelcom’s 10,400 towers is well underway, with three shortlisted bidders – Russian Towers, Vertical and the Russian Direct Investment Fund in the running for the portfolio. The deal is expected to close in Q1-2 2016, marking Russia’s first major tower transaction. Following the completion of the sale it is widely expected that Vimpelcom will then turn their attention to potential divestitures across their CIS markets, in a bid to further reduce their current debt.

Keeping our focus on the east, Russia’s MTS and Megafon are also rumoured to be re-evaluating their tower strategies – with Megafon looking into a potential carve out with a view to IPO. In Turkey it has recently been reported that Turkcell have re-opened discussions with bankers regarding a
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potential tower sale, and in Poland, Orange are also rumoured to be looking into a tower sale.

The other major piece of news is the imminent closure of the sale of a 45% stake in Telecom Italia’s infrastructure unit – Inwit. Following a successful IPO of 40% of the business in 2015, the sale of the 45% stake is expected to close mid-March. Three offers have been received – from American Tower (AMT), EI Towers and Cellnex in conjunction with infrastructure fund F2i (the latter consortium reportedly being the front runner). EI Towers favors acquiring a smaller stake – it remains to be seen whether the AMT or Cellnex bid would trigger the acquisition of the whole company.

TowerXchange are currently tracking 67 towercos, broadcast companies and JV infracos with tower portfolios in Europe. With the exception of Cellnex (active in Spain and Italy), Wireless Infrastructure Group (with assets in the UK, Ireland and the Netherlands), Shere Group (with towers in the UK and Netherlands) and Britannia/Hibernian (with assets in both the UK and Ireland), all other companies have a presence in just one country.

Major tower transactions on the cards represent an opportunity for Europe’s towercos to expand into new geographies and also represent an opportunity for major international players to gain a footprint in Europe. With European MNOs accustomed to infrastructure sharing, and urban infill to meet growing data demand sitting as a top priority, with an appetite for smaller portfolios, from BTS startups to 100-2,000 towers. But the question remains: does anyone have the appetite and digestive capacity to compete with Cellnex for Europe’s largest sale and leasebacks?

Moving away from macro-structures, an increasing number of European towercos are tapping opportunities in the small cell and DAS markets. With European MNOs accustomed to infrastructure sharing, and urban infill to meet growing data demand sitting as a top priority,
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## European tower deals since 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Tower count</th>
<th>Deal value €</th>
<th>Cost per tower €</th>
<th>Deal structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Ireland</td>
<td>Coillte</td>
<td>Cignal</td>
<td>113</td>
<td>17,000,000</td>
<td>150,000</td>
<td>Portfolio acquisition</td>
</tr>
<tr>
<td>2015</td>
<td>Germany</td>
<td>Telefónica</td>
<td>Deutsche Telecom/ Omega Towers</td>
<td>7700</td>
<td>94,600,000</td>
<td>12,000</td>
<td>Portfolio acquisition</td>
</tr>
<tr>
<td>2015</td>
<td>Italy</td>
<td>Tecnorad</td>
<td>EI Towers</td>
<td>134</td>
<td>693,000,000</td>
<td>5,170</td>
<td>SLB with 10% equity</td>
</tr>
<tr>
<td>2015</td>
<td>Italy</td>
<td>Wind (Vimpelcom)</td>
<td>Cellnex</td>
<td>7377</td>
<td>94,600,000</td>
<td>12,700</td>
<td>SLB</td>
</tr>
<tr>
<td>2015</td>
<td>Italy</td>
<td>TowerCo</td>
<td>Cellnex</td>
<td>212</td>
<td>94,600,000</td>
<td>446,226</td>
<td>SLB</td>
</tr>
<tr>
<td>2014</td>
<td>Spain</td>
<td>Telefonica/Yoigo</td>
<td>Cellnex</td>
<td>4277</td>
<td>385,000,000</td>
<td>90,016</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>France</td>
<td>Bouygues Telecom</td>
<td>FPS Towers</td>
<td>2166</td>
<td>185,000,000</td>
<td>85,637</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>Germany</td>
<td>KPN</td>
<td>American Tower</td>
<td>2031</td>
<td>393,000,000</td>
<td>193,501</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Protelindo</td>
<td>261</td>
<td>75,000,000</td>
<td>287,356</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Shere Group</td>
<td>460</td>
<td>115,000,000</td>
<td>250,000</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>Spain</td>
<td>Telefonica</td>
<td>Cellnex</td>
<td>500</td>
<td>45,000,000</td>
<td>90,000</td>
<td>SLB</td>
</tr>
<tr>
<td>2010</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Open Tower Company</td>
<td>500</td>
<td>500,000,000</td>
<td>1000</td>
<td>SLB</td>
</tr>
<tr>
<td>2008</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Open Tower Company</td>
<td>101</td>
<td>25,832</td>
<td>250,000,000</td>
<td>SLB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Totals / average</strong></td>
<td>25,832</td>
<td>2,002,600,000</td>
<td>114,973</td>
</tr>
</tbody>
</table>

Source: TowerXchange

There exists significant potential for a third party infrastructure provider to deliver more cost effective, neutral host heterogeneous networks. The uptake of venue-DAS is growing significantly and a number of city-wide outdoor small cell projects are being rolled out, with observers believing that 2016/2017 will be the time when small cells and DAS start to achieve scale. Cellnex and Wireless Infrastructure Group offer exclusive interviews on this topic in our small cells special feature later in this edition.

Further focus for Europe’s towercos resides in decommissioning as the impact of MNO consolidation (such as that of 3's acquisition of O2 in Ireland and the proposed merger of 3 and O2 in the UK) starts to filter through to their infrastructure.

At such a pivotal time for the European tower industry, TowerXchange is excited to be launching the first **TowerXchange Meetup Europe in London, taking place on 12-13 April.**

For further detail on the European tower market, checkout TowerXchange's Who's Who in European towers.
European tower activity - the headlines

**Azerbaijan:** Infraco Azerconnect active in the country.

**CIS:** Logycom forms first independent towerco in Kazakhstan, with an order to build just under 100 towers. Meanwhile, Vimpelcom’s towers could come to market across several CIS states.

**Czech Republic:** CETIN, infrastructure business carved out of O2 has 5,300 towers and 750 micro sites. Also in infrasharing venture with T-Mobile.

**Denmark:** Infrasharing mandated by the state - TT-Network formed by Telia and Telenor. MNO divestments expected in 2-4 years.

**Finland:** Digita sold to First State Investments in 2012.

**France:** Towerco FPS active after acquiring towers from Bouygues Telecom and 20,000 rooftop sites from Loxel. TDF lead the market, ITAS TIM and Towercast also active. Free Mobile’s entry disrupting the market, SFR-Numericable forced into merger; Bouygues Telecom looking to exit? Could more towers become available for sale and leaseback?

**Germany:** Towercos Deutsche Funkturm and American Tower active in the market, ATC’s towers bought from KPN. Potential for carve out and sale/IPO of Telefonica’s 10-12,000 towers.

**Greece:** Infraco VICTUS Networks run by Vodafone Greece and Wind Hellas. Initial rumors of potential sale and leasebacks emerging.

**Hungary:** Antenna Hungaria acquired by the state from TDF in 2014.

**Ireland:** Towercom, ESB Telecoms, WIG, Hibernian, Cellcom and Highpoint active. Together with three state-owned entities, they own 40% of Ireland’s 4,000 towers. 3’s acquisition of O2 disrupted network sharing agreements and is leading to consolidation. Coillte sold 298 sites including 113 towers to InfraVia Capital Partners creating new towerco Cignal.

**Italy:** 45% stake in Inwit being sold following an IPO of 40% of the business. Cellnex/F2i, American Tower and EI Towers in the running. EI Towers acquisition of fellow broadcast towerco Rai Way initially halted. EI Towers continue to roll-up smaller towercos. Cellnex closed landmark sale and leaseback with Wind in 2015.

**Latvia:** Bite Group brought towers to market in 2013 but no agreement reached.

**Netherlands:** Protelindo, Shere Group and Open Tower Company acquired a total of 1,322 towers from KPN. Rumours that T-Mobile may be looking to sell its business.

**Poland:** Emitel (towerco) and NetWorkS! (infraco) active in the market. Rumours surrounding a potential tower sale by Orange.

**Portugal:** Portugal Telecom sold to Altice – tower sale rumour has gone quiet.

**Romania:** Orange and Vodafone sharing networks since 2013.

**Russia:** 10,400 Vimpelcom towers up for sale and rumoured divestments from MTS and Megafon. Active towercos include Russian Towers, Vertical, Link Development and Service Telecom.

**Serbia:** Managed service provider Konsing Group owns a portfolio of 47 sites.

**Spain:** Telefonica carved out 11,500 towers into new infrastructure business, Wireless Towers, with a view to sell or IPO. Towerco Cellnex active after acquiring towers from Telefonica/Yoigo. Axion towers rumoured to be on the market.

**Sweden:** Several infracos including Net4Mobility, 3GiS and SUNAB

**Turkey:** Turkcell’s Global Tower manages over 16,000 sites including 7,870 macro towers. Turkcell in talks with bankers regarding a potential tower sale.

**UK:** Towercos active in the market include Arqiva, WIG and Shere Group, MBNL and CTIL sizable infracos. Sale of O2 to Hutchison still under review; implications for joint venture infracos unclear.

**Ukraine:** Towerco UKRTower active in the market.
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TowerXchange research has not revealed any infracos or towercos to date.

Towercos or infracos active in the market. No recent transactions have taken place and none rumoured to take place soon.

Towercos or infracos active in the market. No current transactions taking place but an attempted tower sale has taken place in the last 3 years or there are unconfirmed rumours of a deal in this market.

Towercos or infracos active in the market. Rumours of deals confirmed in the market.

Towercos or infracos active in the market. Deals of significant size have taken place in the last 5 years.

Towercos or infracos active in the market. Deals have taken place in the last year and more imminent deals rumoured.

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**Legend**

- □ TowerXchange research has not revealed any infracos or towercos to date
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- □ Towercos or infracos active in the market. Deals of significant size have taken place in the last 5 years.
- □ Towercos or infracos active in the market. Deals have taken place in the last year and more imminent deals rumoured

**Source**: TowerXchange

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Note: For the purposes of our European coverage, ‘Towerco’ describes an independent company which owns and operates passive infrastructure for commercial profit. ‘Infraco’ incorporates MNO joint venture organisations and carve outs which serve more than one entity or market their towers commercially.
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Poland: Orange rumoured to be evaluating tower sales Poland

Rumours are circulating surrounding a potential sale of Orange towers in Poland with a review of its other European assets also underway. As one of Orange’s largest markets on the continent, they own an estimated 4,892 towers in the country, but having failed to acquire any 4G spectrum in the last auction, Orange are thought to be reconsidering the ownership of their own infrastructure. Although no formal announcement has yet been made regarding a sale, Orange is said to be working with Lazard, their preferred advisors, to investigate such a transaction.

Russia: Russian Towers, Vertical and Russian Direct Investment Fund shortlisted in sale of Vimpelcom’s 10,400 towers

Following the receipt of eight offers in December, Vimpelcom have shortlisted three bidders - Russian Towers, Vertical and the Russian Direct Investment Fund (RDIF) - in the sale of its 10,400 ground-based towers in Russia. Initial bids were reported in the order of US$500mn with the highest bid submitted at around US$800mn (US$48,047-US$76,923 per tower). An optional 19,500 rooftop sites could be included in the offering, taking the site count up to nearly 30,000. The transaction is expected to close in March of this year, helping to alleviate Vimpelcom of some of its US$25bn in debt. Vimpelcom are also believed to have released a teaser, a potential prelude to the sale of infrastructure assets in the CIS region.

Italy: Telecom Italia receives three offers for the sale of a 45% stake in Inwit

American Tower Corporation is the latest company revealed to have placed an offer to acquire a 45% stake in Telecom Italia’s infrastructure business, Inwit. The other two named bidders are Spanish towerco, Cellnex, in conjunction with Italian infrastructure fund F2i (the consortium reportedly being the front runner in the process) and Italian broadcast towerco, EI Towers. Telecom Italia, who earlier in 2015 sold a 40% stake through a listing on the Milan Stock Exchange, hopes to complete the transaction by June of this year.

Italy: Inwit acquires 76 towers in Lombardy

Inwit are not standing still whilst negotiating the sale of 45% equity. Instead they recently announced the acquisition of 76 sites, primarily in Brescia, through the acquisition of Gestione Due, Gestione Immobili and Revi Immobili for a total of €7.9mn.

Czech Republic: Shares of CETIN cease trading on the Prague Stock Exchange

Since 4th January 2016, trading of CETIN shares on the unregulated market of the Prague Stock Exchange has been terminated following a squeeze out of minority shareholders at the General Meeting in December 2015. The company was listed by independent parties in June of last year with it never being an intention of PPF to list the company. As of 4th January, CETIN is now wholly owned by PPF, the Czech investment company who bought O2 Czech Republic from Telefonica. CETIN is a carve-out infraco with over 5,000 towers.

Ireland: Ireland launches its National Broadband Plan

Ireland have launched their long anticipated National Broadband Plan to upgrade minimum download speeds in rural areas from 1.2MB to 30MB - creating a real step change in broadband provision to rural areas. Details of the plan, which will cover 750,000 premises, are still to be finalised however both a fibre and wireless component are expected to play a significant role.
eSite hybrid power for shared sites

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- Industry leading OPEX reduction
- Full remote power management

Flexenclosure’s eSite™ is a diesel-battery hybrid power system for telecom sites that delivers 24/7 network uptime and cuts diesel costs, CO2 emissions and energy related OPEX by up to 90%. eSite delivers the best sustained performance over time versus any competing hybrid power system. Contact us today to see what eSite can do for your network.

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**Russia:** Russian Towers generate over a third of its revenues from Tele2

Russian Towers, which owns a portfolio of 1,500 towers in the Russia, reported in Q3 2015 that 37.6% of its revenues came from MNO Tele2. Vimpelcom (trading as Beeline) accounted for 19% of revenues, MTS 17.7% and Megafon 13.1%.

**Spain:** Telefónica carve out 11,500 Spanish towers into a new infrastructure unit, Wireless Towers

Following speculation in December surrounding a sale of 60,000 Telefónica assets the company has confirmed that it will carve out its 11,500 Spanish towers into a separate infrastructure business, Wireless Towers. Their subsea cable infrastructure has also been carved out into a separate entity – Submarine Telecom. The company is exploring a potential listing or sale of the business.

**Turkey:** Turkcell opens discussions with bankers regarding a potential tower divestiture

Having previously decided against a sale of towers in the Turkish market, Turkcell have re-opened discussions with bankers to investigate a potential sale of their towers held by subsidiary, Global Tower. Turkcell are working with advisors on a valuation of Global Tower (which owns a portfolio of 7,500 towers) and are looking into a potential IPO. Discussions are in the early stages and observers have commented that regulatory challenges in the country may present a barrier.

**UK:** The Competition and Markets Authority approves the sale of Orange and Deutsche Telecom shares in EE to BT

The British Competition and Markets Authority (CMA) has approved the sale of 100% of Orange and Deutsche Telecom's shares in EE to BT. The sale positions BT as the leading integrated communications provider in the UK market and raises £3.4bn in cash for Orange.

**UK:** Consolidation amongst UK MNOs could force a tower sale

Anti competitive concerns from Brussels could force Hutch to divest O2’s towers if they are successful in their bid to acquire Telefonica’s UK business. This could force a realignment of partnerships within the UK’s two joint venture infrastructure sharing firms, CTIL (O2 and Vodafone) and MBNL (Three and EE, which BT is attempting to acquire, recently approved by the UK CMA).

**UK:** Arqiva to work with Rothschild on strategic review

Arqiva, the UK telecoms and broadcast towerco, has confirmed they will be working with Rothschild to look at options to either restructure its debt or sell the business. The company whose shareholders include Canada Pension Plan Investment Board and Macquarie Group’s European Infrastructure Fund has been looking at ways to improve its earnings following increasing competition in the UK market. A sale of the business could fetch around £2bn.

---

**Meetup Europe 2016**

**12-13 April, Business Design Centre, London**

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www.towerxchange.com/meetups/meetup-europe
The formation of Telefónica’s - Wireless Towers, and what it means for the global tower industry

Motivations behind the carve out of Telefónica’s Spanish towers and what their transaction history suggests about future activities

Speculation surrounding an IPO or sale of Telefónica towers has been rife since CFO, Angel Vila hinted at the strategy in his Q3 2015 investor presentation, with media outlets rushing to suggest a sale of 60,000 assets could be imminent. All eyes have been on the Spanish giant as the industry anticipated one of the most significant tower transactions that Europe has seen to date. Last week Telefónica confirmed the wheels are now in motion to carve out their 11,500 Spanish towers into a newly created entity – Wireless Towers, signifying a major game changer for the European tower market.

What is Telefonica’s official stance on the news?

In a call with TowerXchange, Telefónica confirmed the creation of two new entities in Spain – Submarine Telecom (which will incorporate their subsea cable infrastructure) and Wireless Towers - which will incorporate the 11,500 telecom towers the company owns in Spain.

Whilst speculation surrounding a valuation of their newly created Spanish infrastructure businesses varies widely from €5bn to €13bn, Telefónica have cited Telecom Italia’s carve out of Inwit in Italy and America Movil’s carve out of Telesites in Mexico as key benchmarks. As to whether the carve out at Telefónica will result in an IPO or sale, the company is keeping an open mind and we will have to wait and see how this plays out.

Why would Telefonica consider a sale or IPO of their Spanish assets?

With revenues continuing to decline in Spain and currency devaluations hitting its Latin American businesses hard, Telefónica needs to raise cash and reduce leverage. Currently €50bn in debt, the sale of Telefónica’s O2 business in the UK to Hutchison Group for £10.3bn (€13.5bn) was hoped to go some of the way to tackling this, but with the deal being held up by the regulator and growing concerns that the transaction may not be approved, monetisation of its infrastructure assets

Keywords: Acquisition, America Movil, Americas, Argentina, Asset Register, Brazil, Capex, Carve Out, Chile, Cellnex, Central America, Colombia, Deal Structure, Deutsche Funkturm, Deutsche Telecom, Europe, Europe News, Germany, Infrastructure Funds, Infrastructure Sharing, Insights, Inwit, Investors, Lease Rates, MarketWatch, Masts & Towers, Mexico, News, O2, Peru, Regulation, Rooftop, Sale & Leaseback, Spain, South America, Submarine Telecom, Telecom Italia, Telefonica, Telesites, Tower Count, Transfer Assets, UK, Valuation, Venezuela, Wireless Towers

Read this article to learn:

- Details on the creation of Wireless Towers - Telefónica’s newly formed Spanish infrastructure business
- The history of Telefónica tower transactions in Europe and CALA
- Estimations on a potential valuation of Telefónica’s 11,500 Spanish towers
- Current thinking on whether a sale or IPO would be the most likely outcome
- The potential for a carve out and sale or listing Telefónica towers in other markets
represents an alternative strategy that is now being pursued in parallel.

What history do Telefónica have of selling their towers?

In Europe, Telefónica have sold towers in both Spain and Germany. In Germany this was in the form of an asset transfer of 7,700 sites (mostly rooftops and sites at overlapping locations to their E-Plus acquisition) to Deutsche Funkturm for an undisclosed amount in 2015; In Spain it was two sale and leaseback deals to Cellnex, the first in 2012 selling 500 towers for just over US$49mn the second in 2014 selling 4,277 towers (including a tranche from TeliaSonera subsidiary Yoigo) for US$419.6mn, both times at an average of just over US$98k per tower. In Central and Latin America, Telefónica have completed a further 11 sale and leaseback deals divesting 9,076 towers in Brazil, Chile, Mexico and Colombia (see table one).

**What does this tell us about the potential valuation of their 11,500 towers?**

Taking Telefónica’s average price per tower achieved in their two Spanish transactions of US$98,115 would value their 11,500 towers at US$1.13bn. Industry insiders however have commented that Telefónica are unlikely to be happy at the price they got from their two Spanish tower sales to Cellnex and so would likely be looking for a much higher valuation. Taking the average value a European tower has sold at to date of US$125,504 would produce a valuation of US$1.44bn.

**Would an IPO or sale be more likely?**

Telefónica have publically stated that they are remaining open minded about the monetisation of their carved out towers. Their referencing of the IPOs of Inwit, Cellnex and Telesites as key motivators in carving out their towers does however suggest an IPO is very much at the forefront of executives’ minds. The two stage process adopted by Inwit whereby they first publically list to obtain an initial tranche of capital and boost valuations and then subsequently release further equity through a sale to a towerco could well be an attractive model for Telefónica to
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837
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3278
SITES UNDER
MANAGEMENT

Telecommunications and Power Services
- Design, Engineering & Construction
- Power Supply
- Mast & Tower Solutions
- Site Planning, Acquisition & Property Services
- Procurement, Logistics & Warehouse Management
- Operations & Maintenance
- Testing & Commissioning
- Network Equipment Installation Commissioning & Swap-out
follow and could become a standard in European MNO tower divestitures.

**What do previous carve outs and IPOs of towercos tell us about the market?**

Whilst there are too many variables and unknowns to speculate as to the valuation that Telefónica’s newly created Wireless Towers could achieve at IPO, there are several key factors that one must take into account when drawing upon lessons from previous public listings in the market.

The listing of a 66% stake in Cellnex, Abertis Telecom’s infrastructure business, saw shares surge 12% on the first day of trading, valuing it at €3.5bn (US$3.8mn). The IPO of a 40% stake in Inwit (Telecom Italia’s infrastructure unit) the following month, saw shares rise more than 9% on its trading debut on the Milan stock exchange, giving the company a market cap of around €2.4bn, and raising a gross €875.3mn (US$956.7mn) for Telecom Italia in the process. Inwit has 11,519 towers on the balance sheet, whilst Cellnex have 15,140, yet differences in their market cap at their trading debuts is largely be attributed to (amongst other factors) Cellnex’ proven track record in the acquisition and management of third party towers. Similar to Inwit, the newly created Wireless Towers does not come with this experience and whilst multiple tenants do exist on Telefónica’s towers, it is likely in many cases to be the result of swaps rather than commercial leases, and it is not clear whether internal chargebacks are charged at cost plus or at commercial lease rates.

Looking across the Atlantic to Mexico, the recent carve out of America Movil’s 12,555 towers into new infrastructure business Telesites may serve as a cautionary tale considering the fall of its stock (from Mex$13.38 to approximately Mex$11.00 during the third week of January) since its listing on 21 December. Its target price and overall financial goals for 2016 have been considered bold by analysts, especially if compared with its listed competitors such as SBA Communications and American Tower. However, it is definitely too early to comment on Telesites’ performance and Telefónica might still use the carve-out and following IPO as a benchmark to avoid pitfalls.

Carving out a Spanish ‘Wireless Towers’ gives Telefónica a couple of quarters to novate leases, tidy up asset registers, and establish the trading performance of a stand alone tower business based on which investors can make a sound judgment on the economic value of any proposed sale or IPO.

**What impact does the creation of Wireless Towers have on the European towerco landscape?**

With 107,994 of Europe’s 600,000 towers (or 18%) sitting in the hands of independent or operator led towercos, Telefónica’s deal in Spain alone would shift this two percentage points, but it is rather the tone that it sets for the rest of the industry that will have the biggest impact. Adding to Vimpelcom’s move to sell 10,400 towers in Russia (along with rumours circulating of further divestments in the CIS) plus rumours gathering momentum from Orange, Turkcell, MTS, Megafon and even potentially Vodafone looking at tower transactions we are starting to see a marked shift in MNO attitudes towards ownership of their passive infrastructure. Acting as a catalyst for future tower transactions, Telefónica’s carve out has major implications for European towercos.

The formation of a new operator-led towerco would create sizeable competition in a European market where the fledgling tower industry is yet to reach scale. A potential sale of assets could entice some of the major American towercos to make a move in the European market; American Tower who are sitting on 2,031 towers in Germany have expressed an interest in the upcoming Inwit transaction but have otherwise been relatively conservative about supplementing their European footprint. Such a sizeable transaction, coupled with further divestments on the cards could entice American Tower and their competitors to look more seriously at the European market. A potential sale could also pose an opportunity for a mid-tier European towerco (with the right financial backing) to make the next step up and break into a new market; with Cellnex currently the only towerco with a sizeable portfolio in more than just one country such competition is viewed positively by those seeking a healthy and dynamic market (although Cellnex are sure to be near the front of the queue when it comes to submitting a bid for Telefónica’s Spanish towers).
Could we see Telefónica following this strategy in other markets?

Regarding the carve out of infrastructure assets in other markets, the company is keeping closed lips but industry widely expects the Spanish market to just be a starting point. Sources close to Telefónica in Germany suggest they have 10,000-12,000 towers remaining following the transfer of 7,700 sites to Deutsche Telecom in 2015 making this the next most exciting market for a potential Telefónica carve out.

Having sold 9,076 towers to date in CALA, few have been retained in the critical markets of Brazil, Mexico and Chile, with an estimated 5-10,000 towers remaining across the three countries. Estimations suggest tower counts around 4,000 per country in Peru, Argentina, Colombia and Venezuela with a further 5,000 in Central America. Whilst the portfolios do not reach the scale of those in Spain and Germany, the tower market is better established in CALA and valuations are generally higher than in Europe, so they still present significant opportunities to raise capital and reduce Telefónica’s debt.

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16-17 June, Florida

Meetup Africa 2016
19-20 October, Johannesburg

Meetup Asia 2016
13-14 December, Singapore

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Vimpelcom's sale and leaseback process in Russia could be nearing conclusion, with 10,400 of the country’s ~37,000 ground based towers coming to market. The transaction could be swelled by the inclusion of up to a further 19,000 rooftop sites – Russia has 80-95,000 sites including rooftops. While forex and trade sanctions may limit the appetite of Western investors, demand for co-location created by the expansion of Tele2, Antares and by the incumbent MNOs’ 4G rollouts makes Russia’s towers highly sought after.

Keywords: 4G, Antares, Armenia, Asset Register, Bid, CIS, Divestment, ESN, Forex, Risk, Georgia, India, IPO, Kazakhstan, Kyrgyzstan, Link Development, Megafon, Merrill Lynch, MNO, MTS, Mubadala, Network Expansion, Quippo Telecom, Rooftop, Rouble, Russia, Russian Direct Investment Fund, Russian Towers Sale & Leaseback, Service Telecom, Tajikistan, Tele2, Ukraine, Uzbekistan, Vertical, Vimpelcom, VIOM Networks, Wind

Read this article to learn:
- Details of assets for sale in Vimpelcom’s Russian tower transaction
- Who the prospective bidders in the sale & leaseback process are
- What opportunities exist in the Russian market for co-location
- Challenges and complications exit in the Russian tower market
- Expected future tower carve outs and sales across Russia and the CIS

By Laura Dinnewell, Head of EMEA, TowerXchange

Russian MNOs have traditionally been reluctant to look at infrastructure divestment with previous tower sales processes having amounted to nothing. Yet as Merrill Lynch, Vimpelcom’s nominated advisors for a potential tower divestment, closed the process for new bids this December with seven proposals received and an eighth asking for an extended deadline, 2015 has seen a major step forward when it comes to the opening up of the tower market.

Vimpelcom, headquartered in Amsterdam, is Russia’s number three mobile network operator behind MTS and Megafon. Along with Russia’s other MNOs their revenues have been hit as a result of Russia’s ongoing economic crisis linked to lower oil prices and Western sanctions over Russia’s role in the Ukraine. Globally the company is believed to be US$25bn in the red with a pressing need to restructure debt.

No stranger when it comes to the sale of their tower assets, Vimpelcom’s Italian subsidiary WIND sold 7,377 towers to Cellnex in 2015 freeing up €693 million in capital (realising €93,941 per tower). In September at an investor summit, Vimpelcom’s CEO of the Russian Business Unit, Mikhail Slobodin called a sale of their towers a “mere opportunity to get more money” referring to them as a “non-core asset”.

What is known about the proposed sale of Vimpelcom’s towers in Russia?

Back in August of this year, Vimpelcom appointed
Merrill Lynch as advisors to oversee a potential sale of 10,400 ground based towers (GBTs). The first week of December it was reported that seven bids had been received, each in the order of US$500mn with the highest bid submitted at around US$800mn (US$48,047-US$76,923 per tower). There have further been rumours that the number of sites for sale may increase (an optional 19,500 rooftop sites could take the count to nearly 30,000) and investors have also been asked about their interest in Vimpelcom’s CIS towers.

Which companies are believed to have participated?

Whist details of all the proposed bidders have not been released, Russian newspaper, Vedomosti reported bids from Russian towercos Russian Towers, Vertical and from the Russian Direct Investment Fund in conjunction with UAE Mubadala.

Sources close to two other domestic towercos – Link Development and Service Telecom, have also revealed that they too have bid in the process. Whilst tower counts for these two are in the order of 100-200 (rather than 1700 of Russian Towers and Vertical), with a big financial partner such companies are interesting platforms. Furthermore rumours of a local Russian tower builder looking to move up the value chain could represent another prospective bidder.

ESN, one of Russia’s largest private companies, established in the early 90s by Grigori Briozkin, is widely thought to have an interest in the Vimpelcom towers. Active in multiple sectors from energy to media through to high tech, ESN have stayed away from the build to suit market, waiting for a big transaction to mark their entry into the tower sector. 10,400 towers for sale could well mark that major transaction.

Whilst current trade sanctions make it very difficult to invest European and US money in Russia at present, Indian, Far Eastern and Arabic investors with fewer restrictions may well have had an appetite to participate in the bidding process. The UAE’s Mubadala represents one such company whilst Quippo Telecom, fresh from the successful exit from Viom Networks in India, could represent another.

Why does now represent a good time to be getting involved in the Russian tower market?

The Russian mobile market is fiercely competitive,
with five MNOs including the long established Megafon, MTS and Vimpelcom, newer market entrant Tele2 and Antares, A Russian company yet to enter commercial operation but focused solely on data services. Both Tele2 and Antares are aggressively expanding their networks opening up strong potential for co-location, while 4G expansion rollout capex opens up further requirements for infrastructure expansion for Megafon, MTS and Vimpelcom.

With decent lease rates and a good potential for a Russian towerco to increase their tenancy ratio rapidly, the Russian market represents a very attractive proposition for an acquisitive towerco.

What potential complexities does the market face?

The devaluation of the Ruble and a projected 15% inflation rate in 2016 represents one of the biggest challenges to the market (see figure one). With lease rates being paid in Rubles questions arise surrounding the appetite of international investors in owning towers in the Russian market. Simultaneously the cost of imported technologies will continue to rise affecting the economics of sites. As to whether this is prohibitive, attitudes are split. Whilst some view the market with scepticism others comment that the asset class is seen as stable and with long term contracts available and the right deal structure, investments in Russian towers can present an attractive opportunity, in spite of forex risk.

<table>
<thead>
<tr>
<th>Table One: Prospective bidders in the Vimpelcom transaction</th>
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<tbody>
<tr>
<td><strong>Russian Towers</strong></td>
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<td><strong>Vertical</strong></td>
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<td><strong>Russian Direct Investment Fund, Mubadala and Baring Vostock Capital</strong></td>
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<td><strong>ESN</strong></td>
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<td><strong>Link Development</strong></td>
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<td><strong>Service Telecom</strong></td>
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<td><strong>Quippo Telecom</strong></td>
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<tr>
<td><strong>Russian tower builder</strong></td>
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<td><strong>Middle or Far Eastern investors</strong></td>
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Trade sanctions on Russia following their involvement in the Ukraine represents a second challenge that creates a barrier for Western investors.

Further concerns exist around Russian MNOs willingness to relinquish control of their sites with some observers believing management clauses may be stipulated in contracts to provide the MNO with some degree of control over prospective tenants. Any limitations on co-locations and tenancy ratio are sure to have an adverse effect on investor appetite.

Finally, the asset registers of Russia’s MNOs are reportedly poorly maintained, with particular concern over acquiring towercos’ ability to determine clear land title. The headstart Vimpelcom has over their competitive MNOs in tidying their asset register ready for sale could see the #3 operator realise a premium on their tower valuations.

**Could we see further deals?**

The sale of Vimpelcom’s Russian towers may not be the end of the story, there are strong hints that the company may be interested in divesting towers in their CIS footprint too, with Bloomberg having reported back in October that Vimpelcom were eyeing up a potential divestment of 50,000 towers across Kazakhstan, Armenia, Kyrgyzstan, Uzbekistan, Tajikstan, Georgia and Ukraine as well as Russia.

Within Russia, both MTS and Megafon have made noises surrounding potential tower carve outs or divestments, with Megafon looking at a potential carve out with a view to IPO. The appetite however of a towerco for both Vimpelcom and either MTS or Megfon assets may be seriously reduced with considerable overlap in networks particularly in well-served urban areas. There may be a marked advantage for the first MNO to bring their tower sale to fruition, creating healthy competition that should favour towercos in the market.

Whatever the outcome, the Russian tower market represents one of the hottest in Europe and 2016 looks sure to be an exciting year.

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**Figure 1: USD to RUB exchange rate 2011 – 2016**

- The USD to RUB exchange rate has fluctuated significantly between 2011 and 2016, with the highest rate observed in 2014 and the lowest in 2013.
- The trend shows an upward trend in 2015, indicating a weakening of the Ruble against the US Dollar.
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# TowerXchange Meetup Europe – Draft Agenda

## London | April 12-13, 2016

### Day One | Tuesday 12 April

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<tr>
<td>8.00</td>
<td>Coffee and registration</td>
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<td>8.45</td>
<td><strong>Opening presentation and TowerXchange analysis</strong></td>
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<td></td>
<td>Kieron Osmotherly, CEO, TowerXchange</td>
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<td>Laura Dinnewell, Head of EMEA, TowerXchange</td>
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<td>9.30</td>
<td><strong>European CXO panel - the big picture</strong></td>
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<td></td>
<td>- Scott Coates, CEO, Wireless Infrastructure Group</td>
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<td>- Frédéric Zimer, CEO, FPS Towers</td>
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<td>- Peter Owen Edmunds, Chairman, Russian Towers</td>
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<td>10.15</td>
<td><strong>Broadcast assets &amp; JV infracos in the telecoms mix</strong></td>
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<td>- Stefano Ciccotti, CEO, Rai Way</td>
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<td>- Malcolm Collins, CEO, CTIL</td>
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<td>- Nikos Babalis, CEO, Victus Networks</td>
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<td>11.00</td>
<td><strong>Introducing the leading managed service providers in Europe</strong></td>
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<td>11.20</td>
<td>Coffee &amp; networking</td>
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<td>11.50</td>
<td><strong>Roundtables session 1</strong></td>
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<td>12.50</td>
<td>Networking lunch</td>
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<td>14.10</td>
<td><strong>Roundtable session 2</strong></td>
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<td>15.10</td>
<td>Coffee and networking</td>
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<tr>
<td>15.40</td>
<td><strong>Towerco investment, growth &amp; exit strategies</strong></td>
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<td></td>
<td>- Moderator: Gaurav Bath, Global Communications Group, Citi</td>
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<tr>
<td>16.40</td>
<td><strong>The role of remote monitoring in European networks</strong></td>
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<td>17.00</td>
<td>End of day one &amp; drinks</td>
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<td>19.30</td>
<td>TowerXchange Dinner</td>
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### Day Two | Wednesday 13 April

<table>
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<th>Time</th>
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<tr>
<td>8.30</td>
<td>Welcome coffee</td>
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<tr>
<td>9.00</td>
<td><strong>Keynote interview with Europe’s most acquisitive towerco</strong></td>
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<td>- Tobias Martinez, CEO, Cellnex</td>
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<td>9.20</td>
<td><strong>Tower divestments, carve outs and M&amp;A</strong></td>
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<td>- Alexander Chub, President, Russian Towers</td>
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<td>- Colin Cunningham, Managing Director, Cignal</td>
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<td>- Petr Slováček, CEO, CETIN</td>
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<td>- Bill Bates, International Business Development, SBA Communications</td>
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<td>10.00</td>
<td><strong>Introducing the leading OEMs in Europe</strong></td>
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<td>Coffee and networking</td>
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<td>10.50</td>
<td><strong>Emerging European markets</strong></td>
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<td></td>
<td>- Temel Oktem, Head of Telecom, Media &amp; Technology, Europe, Middle East and North Africa, IFC</td>
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<td>- Sergey Plissak, Commercial Director, Logycom Group</td>
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<td>- Sachit Ahuja, Vice President, Business Development, Tillman Global Holdings</td>
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<td>- Arthur Akopyan, Managing Director &amp; Partner, UFG Asset Management</td>
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<td>11.30</td>
<td><strong>Roundtable session 3</strong></td>
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<td>12.30</td>
<td>Networking lunch</td>
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<td><strong>Roundtable session 4</strong></td>
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<td>14.40</td>
<td>Coffee and networking</td>
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<tr>
<td>15.40</td>
<td><strong>Small cells, DAS &amp; heterogenous networks</strong></td>
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<tr>
<td></td>
<td>- Scott Coates, CEO, Wireless Infrastructure Group</td>
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<td></td>
<td>- Alexandre Mestre, International Business &amp; Marketing Director, Cellnex</td>
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<td>- Nicolas Ott, Managing Director, Telecoms, Arqiva</td>
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<tr>
<td>16.20</td>
<td><strong>Introducing the leading small cells service providers in Europe</strong></td>
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<td>16.40</td>
<td>End of Meetup</td>
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**Roundtable session 1: 11:50-12:50, 12 April**

**Country Focus: Russia**
- Alexander Chub, President, Russian Towers
- Peter Owen Edmunds, Chairman, Russian Towers

**Country Focus: Netherlands**
- Frank van Kuppefeld, Commercial Director, Novec
- Randolf Nijssé, Open Tower Company

**Country Focus: Greece**
- Nikos Babalis, CEO, Victus Networks

**Country Focus: France**
- Cedric Lepolard, CFO, FPS Towers

**Decommissioning: Can it create value within an acceptable timeframe?**
- David Bernal Cantero, Director of Business Development, Cellnex

**European MNO consolidation: rumours, deals & drivers**
- Andrew Doyle, Managing Consultant, PA Consulting

**Growing and scaling a towerco**
- Justin Speake, President & CEO, EuroTower

**How to ensure a successful IPO**
- Julian Plumstead, Managing Director, Rothschild

**Supply chain management to reduce site maintenance costs**
- Solange Karwera, Head of Passive Network Sites Infrastructure, Vodafone Procurement Company

**Roundtable session 2: 13:40-14:40, 13 April**

**Country Focus Ireland**
- Morag Pollack, GM, Towercom

**What do you need to know about ground lease aggregation?**
- Bill Bates, International Business Development, SBA Communications

**RAN sharing - threats and opportunities**
- Cedric Lepolard, CFO, FPS Towers
- Pierre Cassier, Commercial Director, FPS Towers

**Towerco valuations in Europe**
- Host TBC

**Making the most of synergies between broadcast and telecoms**
- Nicolas Ott, Managing Director, Telecoms, Arqiva

**Benchmarking tower efficiencies against best practice**
- Host TBC

**Subcontractor performance management**
- Egor Bykov, Head of Strategy, Vertical

**Roundtable session 3: 11:30-12:30, 13 April**

**Country Focus: Spain**
- Jorge Alberto Jimenez, President, Axion

**Regional focus: CIS**
- Temel Oktem, Head of Telecom, Media & Technology, Europe, Middle East and North Africa, IFC

**Country Focus: Poland**
- Host TBC

**Regional Focus: Scandinavia**
- Henrik Kamstrup, Partner, KPR Consult

**How to carve out infrastructure assets from an MNO**
- Petr Slováček, CEO, CETIN

**Opportunities for towercos in small cells & DAS**
- Host TBC

**Roundtable session 4: 13:40-14:40, 13 April**

**Country Focus: Italy**
- Carlo Ramella, Chairman, EI Towers

**Country focus UK**
- Malcolm Collins, CEO, CTIL

**Country Focus Turkey**
- Host TBC

**Country Focus: Czech Republic**
- Host TBC

**Tower transaction deal structures & terms**
- Daniel Lee, Managing Director, Intrepid Advisory Partners

**Minimising costs in the strengthening of towers for additional operator equipment**
- Host TBC

**A comparison of neutral host DAS and multi-tenant small cell vendors and how to design a heterogeneous network attractive to multiple tenants**
- Host TBC, Vodafone Procurement Company

**How to monetize a JV infra-sharing firm**
- Host TBC
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Acsys is the global leader in cell site access control solutions. Our patented, military-grade technology is utilised by leading tower companies, telecom operators, and vendors throughout the globe to better manage their O&M and eliminate unauthorised access.

Acsys designs simple, yet powerful solutions, with a focus on power-independent locking systems and workforce management software and applications. These technologies are combined to reduce theft, better manage vendors, create fairer and stronger SLAs, and simplify operational workflows. Our solutions equate to increased uptime.

European-rooted with the benefits of China-based production and a highly-specialised and diverse team from around the world, Acsys pushes the boundaries of how technology can be embraced within complex industrial environments for better security and staff management. With a customer-centric, customised approach Acsys follows the belief to think ‘outside the box’ to deliver easy-to-deploy, highly durable and cost effective solutions for the most challenging scenarios.

Invendis

Invendis Technologies India Pvt. Ltd. was started in 2007 by people with more than 100 man years of experience in Telematics. Today, we are a global leader in the business of Remote Monitoring of Telecom Towers.

Invendis designs and delivers technology-enabled business solutions that help Telcos & Towercos to offer uninterrupted services to their clients. Invendis also provides a complete range of Remote Monitoring & Energy Optimization services by leveraging our domain and business expertise.

Our offerings span front end equipments, sensors, transducers, business applications, systems integration, product engineering, Installation, maintenance, 24X7 Global Monitoring & IT infrastructure services.

Invendis pioneered customizable Front End Monitoring & controlling equipments, which helped Towercos to roll out Monitoring & Energy optimization solutions in shortest possible time.

Invendis has a global footprint with over 25,000 installations spread across Asia, Africa & Europe.

www.invendis.com

Heliocentris

Heliocentris engineers and operates integrated power systems and hybrid power solutions for mobile and professional radio networks. Its fuel cell based backup systems provide carefree emergency power to grid-connected stations. The hybrid power solutions are designed around its leading Energy Management System and Remote Management Software, comprising various technologies reaching from conventional batteries and gensets to its proprietary self-refuelling fuel cells. Headquartered in Germany, with operations in Middle East, Africa and South East Asia, the company offers turnkey solutions including O&M services and vendor-financed long-term energy services. So customers worldwide can select to purchase on CAPEX or OPEX basis.

www.heliocentris.com

NorthStar

NorthStar is an industry leader in designing and manufacturing high performance lead-acid batteries and high efficiency telecom cabinets. The company has state-of-the-art facilities in the USA and Sweden, and their products are used in more than 120 countries worldwide. NorthStar premium thin plate AGM batteries deliver long life at elevated temperatures, with faster recharge and superior PSOC cyclic performance. NSB Blue Batteries are today reducing 85% of diesel generator run time in offgrid telecom
applications. The newly launched NorthStar Academy program will help customers to prolong their battery life and save energy in their telecom network.

www.northstarbattery.com/1/2/3.php

Exhibitor:

Abloy Oy

Abloy Oy in Finland is one of the leading manufacturers of complete high security solutions. ABLOY secures business operations on land, at sea, and in the air – in all circumstances. Abloy has a proven history of telecommunication business for decades. Along with the new technology in telecom business Abloy has introduced new methods and systems to create value and fast pay-back time to telecom customers. Abloy provides a complete solution including project management.

Combining mechanical and electromechanical features PROTEC2 CLIQ offers double security with wide internationally tested and approved product range. Remotely controlled PROTEC2 CLIQ system enables to control sub-contractors activities on sites reducing management costs and providing traceability. New CLIQ Connect key together with mobile application makes the key update even more easy and flexible and enhances high security by minimizing the potential risk of a lost key. Several telecom customers have chosen ABLOY solutions to be leaders in fast developing telecommunication world.

www.abloy.com

To discuss your participation, contact Annabelle on +44 7423 512588 or email amayhew@towerxchange.com
**Middle market matures**

TowerXchange just completed our bi-annual update of CALA tower counts and, wow, the independent developers are growing fast! Scale and geographical footprints are growing quickly: in Brazil alone the number of middle market towerco towers (i.e. not owned by carriers, AMT, SBA or GTS) increased 55% from 2,600 a year ago to 4,030 in Q3 2015. But the phenomenon of middle market tower growth is not restricted to Brazil – consider the examples of dramatic CALA portfolio growth shown in the table on the page after next.

Other tower companies such as Torrecom, NMS and Innovattel / TORRESEC have grown by similar magnitudes. While TowerXchange’s tower counts should only be treated as estimates, there is no doubt that the stock of independent developer towers in CALA is growing healthily.

Growth is not limited to volume, but also geographical extensions. 2015 has seen a rush of middle market towercos into Peru and Mexico, attracted by the BTS investments of Entel and AT&T respectively, and the amplifying effect their investments are having on competitive carriers’ capex budgets. We’ve also seen two virgin territories opened up by middle market towercos: TORRESEC will be the first towerco to build in Argentina, while some “under the radar” activity in Ecuador has become more visible with SBA Communications’ acquisition of 130 towers in the country, again from TORRESEC. The last year has also seen PTI make their debut in Costa...
Accelerate your sales cycle and close your next major deal in telecom towers

Advertise in the TowerXchange Journal, circulated to a highly targeted community of the 15,000 most influential tower decision makers

To book your advertisement, contact: Annabelle Mayhew | amayhew@towerxchange.com | M. +44 (0) 7423 512588
## Major tower transactions in Latin America 2011/2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Seller</th>
<th>Buyer</th>
<th>Deal structure</th>
<th>Cost per tower US$</th>
<th>Deal value US$</th>
<th>Tower count</th>
<th>Country</th>
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<tr>
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<tr>
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<td>GTP**</td>
<td>American Tower</td>
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<td>Brazil</td>
<td>Telefonia</td>
<td>American Tower</td>
<td></td>
<td></td>
<td>666</td>
<td></td>
</tr>
</tbody>
</table>

**Totals / average**

- **Cost per tower US$**: $200,130
- **Deal value US$**: $8,288,000,000

*American Tower acquisition of 4,630 BR Towers includes 2,530 towers plus 2,100 exclusive rights

**Totals and average exclude the GTP / American Tower deal as it was US-centric

Special thanks to Jonathan Atkin, Managing Director at RBC Capital Markets for his contribution
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**Dramatic CALA portfolio growth**

<table>
<thead>
<tr>
<th>Towerco</th>
<th>Q3 2014 count</th>
<th>Q3 2015 count</th>
<th>Growth</th>
</tr>
</thead>
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<tr>
<td>Phoenix Tower International*</td>
<td>58</td>
<td>1096</td>
<td>17.05x</td>
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<tr>
<td>CSS</td>
<td>341</td>
<td>1203</td>
<td>3.53x</td>
</tr>
<tr>
<td>Brazil Tower Company</td>
<td>300</td>
<td>753</td>
<td>2.51x</td>
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<td>Mexico Tower Partners</td>
<td>600</td>
<td>1278</td>
<td>2.13x</td>
</tr>
<tr>
<td>QMC Telecom</td>
<td>550</td>
<td>901</td>
<td>1.64x</td>
</tr>
<tr>
<td>Torres Unidas</td>
<td>750</td>
<td>1080</td>
<td>1.44x</td>
</tr>
</tbody>
</table>

*PTI’s growth is not all organic; they have acquired towers from T4U in Brazil, TOCSA in Costa Rica and Teletower Dominicana / Amzak in the Dominican Republic, but organic growth has also been substantial.

Some of these independent developer portfolios are destined to be retained, but most are ‘built to flip’, with a sale to one of the U.S. publicly listed towercos the most likely exit, although Phoenix Tower International (PTI) are certainly stirring up the status quo in that regard, as will the various Digital Bridge entities including MTP and ATP. Whereas Grupo TorreSur had previously been a buyer, rumor continues to suggest their Brazilian portfolio could be acquired for the right price.

With many of CALA’s middle market towercos maturing rapidly toward exit, the TowerXchange Meetup Americas 2016 – taking place in Boca Raton, 16-17 June 2016 – will certainly be an interesting gathering! Note that the TowerXchange Meetup Americas won’t be hosted in co-location with the PCIA. Texas is not a suitable location for a CALA-focused gathering, besides which we feel the CALA tower industry is sufficiently mature to merit its own stand-alone event.

**Pace of sale and leasebacks slows**

There hasn’t been a large scale sale and leaseback deal (SLB) in CALA since American Tower announced the acquisition of an estimated 6,480 towers from TIM in 2014. Rumors or a potential SLB with Entel in Peru have not yet crystalised into a formal process. With Brazil and Mexico approaching saturation, in terms of sale and

**Selected estimated CALA tower counts**

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated Tower Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>8,400</td>
</tr>
<tr>
<td>Peru</td>
<td>9,450</td>
</tr>
<tr>
<td>Caribbean</td>
<td>10,550</td>
</tr>
<tr>
<td>Central America</td>
<td>11,520</td>
</tr>
<tr>
<td>Colombia</td>
<td>15,240</td>
</tr>
<tr>
<td>Argentina</td>
<td>16,000</td>
</tr>
<tr>
<td>Mexico</td>
<td>25,334</td>
</tr>
<tr>
<td>Brazil</td>
<td>50,139</td>
</tr>
</tbody>
</table>

Estimated total towers in rest of South America: 17,400 (Venezuela, Ecuador, Bolivia, Paraguay, Uruguay, Surinam, French Guiana and Guyana)
LatAm towerco breakdown by country

<table>
<thead>
<tr>
<th>AMT</th>
<th>Andinas</th>
<th>Continental</th>
<th>Innovatte</th>
<th>QMC</th>
<th>SBA</th>
<th>Torrecom</th>
<th>Torres Unidas</th>
<th>Phoenix Tower Int.</th>
<th>Centennial</th>
<th>NMS</th>
<th>ATP</th>
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<tr>
<td>Brazil</td>
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<td></td>
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<td>Dominican Republic</td>
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</tbody>
</table>

leaseback (SLB) opportunities, TowerXchange expect the tower ‘land grab’ to move the West Coast countries Colombia, Chile and Peru, which are less penetrated by towercos but highly attractive and which each feature significant potential growth.

Let’s take a closer look at each of CALA’s tower markets.

**Argentina**

Doubtless attracted by the recent 4G auctions, the associated 98% population coverage obligations, and the network investment that has inspired on the part of Claro, Telecom Personal and Movistar, TORRESEC’s maiden BTS contract win in Argentina marks the breaking of ground in Argentina for the first time by an independent towerco. It’s a bold move and one which could pay dividends if a culture of infrastructure sharing can be fostered in Argentina’s growing 16,000 tower market, but the specter of country risk and challenges repatriating funds seem likely to keep the U.S. publics out of Argentina for the foreseeable future.

**Brazil**

Towercos continue to drive significant organic growth in Brazil, where 73% of the country’s 50,139 investible towers are now owned by independent towercos. With Claro’s and only a handful of other towers remaining on carrier balance sheets (Oi reportedly has around 1,000 remaining towers which could still be monetised), Brazil is otherwise ‘sold out’ in terms of SLBs, so the next transactions

**Towercos focusing on a single country**

**Brazil**: GTS, Highline, CSS, Sky sites, Telecom Torres, Torre Online, Grupo Alfa

**Mexico**: MTP, IIMT, Intelli Site Solutions, Telesites

**Panama**: Torres de Panama

**Uruguay**: Uruguay Torres

**Costa Rica**: Catalina Inc., Tocsa
Who owns Brazil’s 50,139 towers?

<table>
<thead>
<tr>
<th>Company</th>
<th>Towers</th>
</tr>
</thead>
<tbody>
<tr>
<td>América Móvil (Claro, Net and Embratel)</td>
<td>18,851</td>
</tr>
<tr>
<td>Vivo</td>
<td>7,000</td>
</tr>
<tr>
<td>TIM</td>
<td>6,300</td>
</tr>
<tr>
<td>Oi</td>
<td>4,353</td>
</tr>
<tr>
<td>Nextel</td>
<td>1,750</td>
</tr>
<tr>
<td>Other small and non-traditional operators, including Sky Brasil, Algar Telecom, Sercomtel and ON Telecom</td>
<td>1,720</td>
</tr>
<tr>
<td>SBA</td>
<td>8,500</td>
</tr>
<tr>
<td>GTS</td>
<td>6,300</td>
</tr>
<tr>
<td>Independent developers</td>
<td>1,000</td>
</tr>
<tr>
<td>AMT</td>
<td>300</td>
</tr>
</tbody>
</table>

Source: TowerXchange

we see could be further middle market towerco acquisitions. These would follow previous consolidation of companies like BR Towers, Z-Sites and Sitesharing by American Tower, and T4U by PTI. Even Highline do Brasil has been getting in on the acquisition act recently, acquiring 60+ rooftop sites from ON Telecom and a further 125 towers from Algar Telecom for 18 BRL and 64 BRL respectively (around US$4.5mn and US$16mn).

Central America

If you consider it one market which, with shared operational resources it effectively is, with 1,520 towers Central America is CALA’s fifth largest and third most penetrated tower market (34%).

SBA Communications is the market leader in Central America, with over 2,000 towers, Continental Towers has just under 700 towers in the region, American Tower is now present only in Costa Rica, having sold their Panamanian towers to Phoenix Tower International, who also recently acquired some assets from TOCSA in Costa Rica. Torrecom, NMS, Torres de Panama and startup Catalina round off Central America’s towercos.

The majority of operator captive towers are retained by Millicom-Tigo and Claro although for different reasons we don’t think many are likely to come to market under SLBs. Whilst inorganic growth opportunities are finite, the rollout of 4G across Central America (most advanced in Costa Rica) is generating excellent organic growth and amendment revenue opportunities for towercos. SBA reports achieving similar Tower Cash Flow, with a similar spread between ground rent and tenant rent, in Central America as in Brazil.

Caribbean

More than half of the Caribbean’s 10,550 towers serving the Caribbean’s 28mn population are in the Dominican Republic and Haiti. TowerXchange has identified only one towerco in the Caribbean; 189 towers formerly owned by Amzak’s Teletower Dominicana, but recently acquired by Phoenix Tower International. There is the possibility to roll up a Caribbean tower play either with a substantial acquisition, such as of Viva’s towers in the Dominican Republic, or for example by rolling up a portfolio across the holdings of LIME or Digicel, but of course the challenge will be achieving economies of scale across 700 islands.

The jewel in the crown of a Caribbean tower portfolio five years from now could be Cuba. With just 23% mobile penetration in a population of 11.3mn and ETECSA remaining the sole operator, there would be no shortage of carriers and towercos keen to enter Cuba should U.S.-Cuban relations continue on their current trajectory toward normalisation, and should the telecom market liberalise. Reports suggest all four U.S. carriers
would be interested to launch in Cuba, attracted both by tremendous untapped domestic market growth potential, and significant Cuba to U.S. international call volume.

**Chile**

Chile is a notably more mature mobile market than Peru and Colombia, boasting 147% SIM penetration and 51% mobile broadband (GSMA Intelligence, Q4 2014), and a nicely balanced carrier market split between Movistar (39.5%), Entel (37.3%) and Claro (21.4%). Entel look the most likely tower seller, Movistar having sold towers to American Tower and Torres Unidas, towercos who remain the leaders in a relatively small tower market which operates just 22% of Chile’s towers. Torres Andinas also has around 200 Chilean towers in the air or in the pipeline.

Law No. 20.599, also known as the Towers Law, has suppressed Chile’s BTS market with its onerous restrictions on building in saturated or sensitive areas, its somewhat heavy handed attempt to mandate infrastructure sharing, and its requirements to invest in camouflage, at times to compensating local communities. While this has stifled tower build in the short term, strict zoning rules tend to have an aggregate positive impact on the tower industry as they force network planners to share more structures as it becomes almost impossible to build.

Recently auctioned but not yet allocated 700MHz spectrum for 4G came with extra coverage obligations including connecting 1,281 remote regions, leading BMI to project that Chile’s carriers would need three to four times as many towers.

**Colombia**

There’s a good runway for tower market growth in Colombia, with 4G on the AWS band already being deployed and a 700MHz auction imminent. But TowerXchange don’t see why Colombia seems to be as attractive if not more attractive to towercos as it’s Western CALA neighbours. The lack of a strong regulator means there isn’t the same pressure on América Móvil to share towers as we’ve seen in Mexico, despite their market share in both markets being significantly North of 50%, and the carrier still sees their towers as a competitive differentiator.

A National Law designed to ease permitting in Colombia reportedly has not prevented local government from closing sites. And Tigo, Movistar and ETB are sharing their 4G rollout, with roaming agreements in place, which will dampen tenancy

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![Estimated breakdown of tower ownership in Mexico](https://example.com/chart.png)

Source: TowerXchange
demand. However Avantel and DirecTV, with the potential of AT&T investment represent significant upside to tenancy ratio models.

The sheer size and doubtless potential of Colombian market has attracted substantial investment by American Tower, which acquired 656 towers from Movistar between 2010 and 2012 and a further 2,126 from Tigo in 2011. American Tower currently has 3,626 towers in Colombia, where other active towercos with low triple and double digit tower counts include Continental, Innovattel, Centennial, NMS, Torres Unidas, Phoenix Tower International and Torres Andinas.

**Mexico**

While América Móvil’s Telesites is still a ‘black box’ when it comes to hard data, TowerXchange have seen some pretty aggressive organic growth targets just under 1,000 per year in Mexico alone – although noises coming out of América Móvil continue to suggest Telesites will be used to build new towers in most of their other tower markets. Similarly aggressive Telesites tenancy ratio growth targets will be difficult to achieve if the aforementioned volume of new builds are added. AT&T and Telefónica are negotiating to co-locate on Telesites’ towers, and it seems increasingly likely that Telesites will charge a market lease rate in Mexico – pricing the towers to sell co-locations, not to protect the assets from competitors. However, the fact remains that entire Telesites venture is still pending regulatory approval.

Today’s Mexican tower market isn’t just a duopoly between American Tower and Telesites; Mexico Tower Partners (MTP), which was GTP’s footprint in Mexico which was retained when the rest of the assets were sold, is growing fast thanks in no small part to a symbiotic relationship between MTP and a local tower builder who build and flip towers to the MTP balance sheet on a regular basis. Meanwhile Centennial, IIMT, Torrecom, NMS and Conex (QMC’s Mexican towerco) will all vie for the frenzy of BTS opportunities triggered by AT&T’s market entry, compounded by the deployment of a new government-sponsored 700 MHz wholesale LTE network expected to need ~8,000 sites, with initial tenders expected in the second half of 2015.

The Mexican telecommunications regulator the IFT says 80,000 PoS are needed in Mexico, almost 4x the country’s current inventory, a need which could, for example, be served by a healthy tower market of 40,000 towers with a tenancy ratio of 2.0.

**Peru**

Peru was a comfortable, relatively slow growth duopoly between Movistar and Claro with Nextel only active in the big cities, but Entel’s acquisition of Nextel and nationwide vision has stimulated network investment. Indeed, Entel could conceivably raise capital for network investment by monetising their Peruvian towers. There’s
plenty of room for tower market growth in Peru with one of CALA’s lowest SIM penetration rates (101% according to GSMA Intelligence, Q4 2014) and a fledgling 4G market, although all three market leaders have launched LTE and more spectrum is coming. Peru’s Ministry of Transport and Communications has called for an increase from their current 9,000 to 22,000 cell sites over the next three years, an increase of almost 2.5x in tower stock. Peru’s previously notoriously complex permitting regime should be eased by new legislation which has just come into law which creates a uniform administration process, although at least one towerco is pushing back against the regulator's apparent right to intercede in pricing.

While there are five towercos in Peru, they hold only 14% of the country’s towers. Torres Unidas claim to have 600 towers in Peru, American Tower has 581 and there are smaller portfolios owned by NMS, Torres Andinas and Innovattel.

**The rest of CALA**

TowerXchange have yet to study the new towerco markets of Ecuador, where SBA Communications recently acquired 130 towers from TORRESEC, and where a couple of other middle market towercos are rumored to be commencing operations. Similarly, there are a couple of local towercos in Uruguay, a finite but potentially attractive tower market.

Bolivia, Venezuela, Guyana, Suriname and French Guiana have seldom come up on our radar, at

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**Latin America Heatmap**

![Latin America Heatmap](image-url)

**Legend**

- **Towercos have acquired the majority of towers from carriers**
- **Towercos have acquired a significant proportion of towers from carriers, but the majority remain carrier-owned. Significant BTS towerco activity also present**
- **Less SLB activity, but plenty of BTS towerco activity**
- **Early stage market for BTS and/or SLB**
- **Negligible towerco activity**

Source: TowerXchange
least not since a conversation with Frontier Tower Solutions a couple of years ago. Paraguay has been similarly quiet in terms of towerco activity.

**Conclusion: Towerco penetration approaching 50% in CALA, could approach 75% by 2020**

Towercos currently own 44% of CALA’s ~160,000 towers, assuming one counts Telesites as a bona fide towerco. With a significant proportion of new towers being built by towercos, and with a significant proportion of Claro’s BTS looking increasingly likely to be destined for Telesites’ balance sheet, the penetration of the towerco model into CALA will pass 50% in 2016 even if the SLB market remains in stasis.

CALA’s towercos don’t want all the towers: a lot of parallel infrastructure built during the carriers’ land grab is destined to be stranded on carriers’ balance sheets where a competitor monetises their towers first. TowerXchange would estimate the addressable market in CALA as may be 65% of the region’s current towers.

Of course, CALA needs more towers. Organic growth will largely reside on towerco balance sheets, which could see the region’s tower count double in the next six to seven years, pushing towerco penetration in CALA to almost 75% by 2020. This impressive absorption of the macro network could be supplemented (eventually) by a heterogeneous network layer in which the region’s carriers and towercos have hitherto been reluctant to engage.
Mexico: Telesites’ share price drops 15% since launch

Telesites started trading on December 21 on the Bolsa Mexicana de Valores (BMV) and registered a price drop of approximately 15% during its first week of trade. As of January 4, its share price was MXN$11.24 but it touched lows of MXN$11.03 on December 28. For the next twelve months, analysts estimate target prices ranging between MXN$7 and MXN$16.65.

Mexico: American Tower MLA with AT&T, which represents more than half Mexican revenues

In their Q3 2015 webcast, American Tower revealed that they had signed a long term MLA with AT&T in Mexico which extends the old Iusacell and Nextel agreements to 14 years and guarantees minimum levels of new business from the AT&T rollout. “AT&T is our biggest customer not only in the U.S., globally, and now also in Mexico,” said Chairman Jim Taiclet during their Q3 2015 results webcast. AT&T represents 60% of AMT’s Mexico revenues, with Telefónica on 20-21%.

Meanwhile, AMT built 230 new sites in Brazil in Q3 2015.

Mexico: IFT approves spectrum swap between AT&T and Movistar

The national telecom regulator IFT has given the green light to the spectrum swap deal between AT&T and Movistar. The deal includes Personal Communications Service (PCS) spectrum in the 1900MHz band and Advanced Wireless Services (AWS) spectrum in the 1700MHz/2100MHz. Movistar will also lease 1900MHz spectrum blocks back to AT&T.

Mexico: AT&T and Telcel apply for spectrum auction

AT&T and Telcel are the only two operators bidding for the upcoming Advanced Wireless Services (AWS) spectrum auction. According to Telegeography, the auction will include 80MHz worth of 4G-suitable spectrum and will commence on 15 February.

Costa Rica: Sutel to organise new spectrum auction

Telecom regulator Sutel has been instructed by the Minister of Telecommunications Emilio Arias to set up an auction to sell 40MHz in the 1800MHz band and 30MHz in the 1900/2100MHz band that weren’t sold during the 2011 auction. According to El Financiero, only Movistar and Claro will compete in the auction.

Ecuador: New telecom law come into effect

The General Regulation of the Organic Telecommunications Law, issued this past December, came into effect thanks to the executive decree issued by President Rafael Correa. As defined by the law, the Ministry of Telecommunications & Information Society (Mintel) remains the main body in charge of regulatory issues while regulatory body Arcotel monitors their implementation.

Venezuela: Opposition to amend Chavez’s telecom laws

The parliamentary opposition has recently announced their intention to amend the current Telecommunications Law as well as the Law on Communication and Information. The opposition has gained the majority in the National Assembly and is planning to review the laws originally approved by Hugo Chavez in 2010 as “they allow
the executive power to extort the private media by planting fear of suspending licenses” as stated by local media Globovision quoting the elected representative, Henry Ramos Allup.

**Brazil: Telefónica’s value goes up in 2015**

Telefónica’s share price increased by 18.7% in 2015 and Vivo was the only carrier in Brazil to raise its market value last year. The growth is mainly due to its strong infrastructure and high proportion of post-paid customers, according to Brazilian newspaper Valor Econômico.

**Brazil: CADE approves infrasharing among carriers**

This past December, the Brazilian Conselho Administrativo de Defesa Econômica (CADE) approved the infrasharing project presented by TIM Brasil, Vivo, HI Mobile and Claro. The project plans to offer indoor mobile services in malls, airports and other high density areas.

**Brazil: TIM appoints Nokia for network upgrade and small cells**

TIM Brasil appointed Nokia Networks to upgrade and expand its 3G and 4G networks in various Brazilian states. Nokia Networks has also been selected to provide small cells to the carrier.

**Brazil: TIM completes second tranche of tower sale to American Tower**

TIM Participações announced it has completed the sale of 1,125 telecom towers to American Tower for US$128.8mn. This is the second batch of towers sold by TIM to American Tower (AMT) after the sale of 4,176 towers for US$473.5mn. TIM will release the final 1,180 towers to AMT over the next few months.

**Brazil: Anatel announces winners of spectrum auction**

Anatel received around US$190.33mn in bids for its multi-band spectrum auction which assigned remaining frequencies in the 1800MHz, 1900MHz and 2500MHz bands. Among the bidders, Nextel made the largest contribution (approximately US$114mn) for 4G-suitable spectrum in the São Paulo area. Other winning bidders include Vivo, Claro, TIM, TPA Telecomunicações, Lig Telecomunicações, Sercomtel and Clivo Participações. Sky Brazil was the only bidder who apparently didn’t win any spectrum.

**Brazil: Telecom Italia opens up to TIM Brasil-Oi merger**

Telecom Italia reportedly is ready to discuss with investment firm LetterOne Holding, who has an exclusivity agreement in place with Oi, the potential merger between TIM Brasil and Oi. According to Bloomberg, Telecom Italia initially rejected the deal and is now requesting to retain control of the merged entity as a condition to start the negotiation.

A merger would create the largest carrier in Brazil in terms of subscribers, with around 42% market share.

**Chile: WOM achieves 4G coverage targets**

WOM has announced the completion of its 4G network, now serving twenty-one towns and cities including Arica, Iquique, Calama, Antofagasta, Copiapó, La Serena, Coquimbo, Ovalle, Valparaíso, Santiago, Rancagua, San Fernando, Curico, Talca, Linares, Concepción, Temuco, Osorno, Puerto Montt, Valdivia and Punta Arenas.

**Chile: Tenders to be issued for the Patagonian fibre project**

According to business daily Pulso, telecom regulator Subtel is planning to issue a tender to develop a fibre-optic network in Patagonia. Over US$100mn have already been approved by the Chilean budget office for the public-private initiative.

**Argentina: Federal court intervenes in AFTIC-Nextel dispute**

The Argentinian telecom regulator, AFTIC, has officially rejected the purchase by Grupo Clarin of a 49% stake in Nextel due to the lack of regulatory approval. In recent news, the Federal Administrative Court N. 9 was reported to have intervened in the dispute by imposing a six-month injunction on the case. Therefore, the case will be reviewed later in 2016 by the new Government led by Mauricio Macri who was elected President in November.
Telesites approved but declared dominant player
América Móvil’s towerco to start trading on December 21

Since the creation of Telesites back in 2014, TowerXchange have been looking closely at the evolution of América Móvil’s tower venture, from the carve-out of the carrier’s 10,000+ towers to the towerco’s recent registration on the Mexican Stock Exchange. In this article, we take a closer look at the implications of Telesites business in Mexico and beyond and whether the towerco is proving to be a fair competitor to the likes of American Tower and Mexico Tower Partners.

At the beginning of December, the Comisión Nacional Bancaria y de Valores (CNBV) - the Mexican banking and securities regulator - approved the registration of Telesites which will start trading on the Mexican Stock Exchange (BMV) on December 21.

In spite of this move, Gabriel Contreras, President of IFT, stated that not only América Móvil but also Telesites is considered a dominant player and as such, needs to comply with the existing regulation on the matter.

In Contreras’ words, the 2014 decision to declare the operator a dominant player “extended to all companies in the group and it was established that in the event of spinoffs, mergers or other corporate moves, the affiliates and subsidiaries would have the same obligations as the dominant company.”

Practically speaking, there hasn’t been any practical consequence for Telesites whose business has been recently approved and whose negotiations with the likes of AT&T and Telefónica had started even before the CNBV’s go-ahead.

Keywords: AT&T, American Tower, América Móvil, CNBV, Carve Out, Comisión Nacional Bancaria y de Valores, EBITDA, Federal Telecommunications Institute, IFT, Lease Rates, Market Entry, Market Overview, Mexico, North America, Regulation, Telefónica, Telesites, Transfer Assets

Contact Arianna Neri, Head of Americas at aneri@towerxchange.com for more information

Read this article to learn:
- The approval of Telesites and its trading launch
- IFT’s views on Telesites and América Móvil’s dominant position in the Mexican market
- Telesites current strategy and future plans in Mexico and beyond
- Is Telesites a fair competitor?
When created, Telesites acquired 10,800 towers from América Móvil and its count is already up by over 1,700 towers to 12,555 (as of Q3 2015), representing 48% of Mexico’s 26,010 towers. Telesites is targeting a count of 16,600 Mexican towers by 2020.

Exclusively used by América Móvil in the past, Telesites’ portfolio is now available to all Mexican carriers, with MLAs already agreed with Telefónica and AT&T. For the time being, TowerXchange has reached out to the towerco for comments and looks forward to new developments on the always exciting Mexican industry.

“ When created, Telesites acquired 10,800 towers from América Móvil and its count is already up by over 1,700 towers to 12,555 (as of Q3 2015), representing 48% of Mexico’s 26,010 towers. Telesites is targeting a count of 16,600 Mexican towers by 2020. ”
The approval and inauguration of Telesites marks a new chapter in CALA towers - an operator-captive towerco with a potential pan-regional footprint and a scale that by the end of this decade could surpass even American Tower’s LatAm operation.

To date Telesites’ operations have only commenced in Mexico and Costa Rica, but many other Claro opcos are saying that new sites will be built through Telesites - it remains to be seen whether all Claro’s legacy towers, which would total in excess of 30,000, could all be transferred to the new entity.

**KPI objectives**

Telesites has already agreed MLAs with Telcel (of course), AT&T and Telefónica, charging a lease rate comparable to Mexico’s other towercos of around US$1,150.

With a tenancy ratio very close to one currently, bullish estimates suggest Telesites is targeting a tenancy ratio of 1.6 by 2020, driven by pent up demand from Telefónica and AT&T which could see 2,000 co-locations added very quickly in 2016. However, 1.6 remains an ambitious target given the 900+ new towers (most with a single tenant) which Telesites intends to build per annum in Mexico.

Through subsidiary Opsimex, Telesites has already raised substantial debt, initially as high as 9x EBITDA, which they plan to deliver over the coming years.

In conclusion, TowerXchange see Telesites as the primary change agent in what has otherwise been a quiet year for the CALA tower industry. The creation of Telesites may have implications even beyond CALA, creating a playbook for the carve out and management of operator-captive towercos which could be replicated by the likes of Telefónica (primarily in Europe), and drawing comparisons with Axiata and its six-country edotco venture.

An exhaustive analysis of the Mexican telecom tower industry will be a crucial component of the 2016 edition of the TowerXchange Meetup Americas. Now in its third edition, TowerXchange will gather key executives from the Mexican, Central and South American tower industry in **Boca Raton, 16-17 June 2016**, at the exclusive Boca Raton Resort & Club. Contact Arianna Neri at aneri@towerxchange.com for more information.
Meetup Americas 2016

A unique networking opportunity with 250 leaders of the CALA telecom tower industry

Thursday 16 and Friday 17 June, Boca Raton Resort and Club, Boca Raton

To discuss your participation, contact Annabelle on +44 7423 512588 or email amayhew@towerxchange.com
## TowerXchange Meetup Americas – Draft Agenda

**Boca Raton | 16-17 June 2016**

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<tr>
<th>Day One</th>
<th>Thursday 16 June</th>
<th>Day Two</th>
<th>Friday 17 June</th>
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<tr>
<td>8:00</td>
<td>Registration and coffee</td>
<td>8:30</td>
<td>Registration and coffee</td>
<td>Zaid Alsikafi, Managing Director, Madison Dearborn Partners</td>
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<tr>
<td>9:00</td>
<td>TowerXchange’s analysis of the CALA telecom tower industry</td>
<td>9:00</td>
<td>CXO panel part III: the Andean States</td>
<td>Jonathan Atkin, Managing Director, RBC Capital Markets</td>
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<td>9:40</td>
<td>CXO panel part I: Brazil</td>
<td>10:00</td>
<td>Strategic partners panel: access control and site management platforms</td>
<td>Manuel Aviles, President and Founder, Innovatel/Torresec</td>
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<td>10:40</td>
<td>Strategic partners panel: remote monitoring solutions</td>
<td>10:20</td>
<td>Networking coffee break</td>
<td>Bill Bates, Vice President, Business Development, SBA Communications</td>
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<td>11:00</td>
<td>Networking coffee break</td>
<td>10:50</td>
<td>Roundtable session III</td>
<td>Peter Bendall, Senior Vice President, Macquarie Group</td>
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<td>11:30</td>
<td>Roundtable session I</td>
<td>12:15</td>
<td>CXO panel part IV: Mexico</td>
<td>Marco Cordoni, Senior Partner, Analysys Mason</td>
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<td>12:50</td>
<td>Networking lunch</td>
<td>13:15</td>
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<td>Eric Crabtree, Chief Investment Officer, IFC</td>
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<td>14:00</td>
<td>CXO panel part II: Central America</td>
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<td>Roundtable session IV</td>
<td>Juan Cueria, Vice President and COO, Innovatel Torresec</td>
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<td>15:00</td>
<td>Strategic partners panel: energy solution providers</td>
<td>16:00</td>
<td>Networking coffee break</td>
<td>Felipe de Antuñano, Co-CEO, Intelli Site Solutions</td>
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<td>15:20</td>
<td>Networking coffee break</td>
<td>16:30</td>
<td>A look at the rest of CALA: from Cuba to Argentina</td>
<td>Jim Eisenstein, Chairman and CEO, Grupo TorreSur</td>
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<td>Roundtable session II</td>
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<td>Eric Ensor, COO, Torres Andinas</td>
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<td>17:00</td>
<td>End of day one followed by drinks reception</td>
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<td>End of Meetup</td>
<td>José F. Escobar, Director, Catalina Site Management</td>
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<td>Fernando García Álvarez, Construction and Network Infrastructure Manager, Entel Peru</td>
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<td>Mariano Gomez, Vice President, NMS</td>
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<td>Dagan Kasavana, CEO, Phoenix Tower International</td>
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<td>Andre T. Laloni, Managing Director, Head of Brazil and Southern Cone, UBS</td>
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<td>Senior representative, Telefónica</td>
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<td>Maria Scotti, CEO, Torrecom</td>
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<td>Jose Augusto Varela, VP Operations LatAm, Grupo TorreSur</td>
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<td>Estrella Zaharia, CEO, Andean Tower Partners</td>
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<td>Chahram Zolfaghari, CEO, Brazil Tower Company</td>
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Country and regional focus:
- Brazil (open)
- Brazil (VIP only*)
- Mexico (open)
- Mexico (VIP only*)
- Colombia (open)
- Colombia (VIP only*)
- Peru
- Chile
- Argentina
- Ecuador
- Cuba
- Costa Rica
- Panama, Honduras & El Salvador
- Guatemala and Nicaragua
- USA
- Canada
- Puerto Rico
- Caribbean

Operational focus:
- Opportunities for renewables and ESCOs in CALA
- Microcells, small cells and DAS
- Accelerating build-to-suit construction and colocation
- How to build towers with maximum future sale value
- How to minimise the total cost of evaluating and strengthening towers
- How towercos and their subcontractors can ensure adherence with challenging SLAs
- Low cost sites deployment
- Beyond passive infrastructure: end to end models
- Reducing opex through workforce and vendor performance management
- Redefining the way we manage SLAs and KPIs: managing system performance rather than site performance
- Subcontractor performance management
- Impact of spectrum regulation and technology policy on towerco tenancies

Financial focus:
- The investibility of the telecom tower sector
- How towercos should be licensed, regulated and taxed
- New towerco business models: developing new opex and capex structures
- How do ratings agencies look at towercos?
- Master lease agreements best practices
- MNO consolidation: implications for the tower industry
- Listed towercos: what do equity investors focus on?
- How to mitigate forex exposure
- How to raise local and international debt for towercos and their suppliers
- Best practices for mature towercos (VIP only*)
- Optimising the capital structure of CALA towercos
- What are telecom towers worth?
SBA Communications

SBA Communications Corporation is a first choice provider and leading owner and operator of wireless communications infrastructure in North, Central and South America. By “Building Better Wireless,” SBA generates revenue from two primary businesses - site leasing and site development services.

In our site leasing business, SBA leases antenna space on our multi-tenant towers to a variety of wireless service providers under long-term lease contracts. SBA owns and operates over 24,000 towers across North, Central and South America. We build our towers at the request of wireless carriers, leveraging our in-house experience in site acquisition, zoning and construction. Our ability to offer carriers a comprehensive portfolio of communication sites is complementary to our tower ownership business. Currently, SBA manages approximately 5,000 communication site locations on behalf of third-party landlords.

Through our site development services, SBA offers wireless service providers assistance in developing their own networks. Our services include site identification and acquisition as well as obtaining zoning approvals and permitting for networks representing all technologies. SBA also provides a broad range of cell site equipment installation, optimization and integration services. Our extensive site development experience includes participation in the development of more than 45,000 communication sites.

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Acsys

Acsys is the global leader in cell site access control solutions. Our patented, military-grade technology is utilised by leading tower companies, telecom operators, and vendors throughout the globe to better manage their O&M and eliminate unauthorised access.

Acsys designs simple, yet powerful solutions, with a focus on power-independent locking systems and workforce management software and applications. These technologies are combined to reduce theft, better manage vendors, create fairer and stronger SLAs, and simplify operational workflows. Our solutions equate to increased uptime.

European-rooted with the benefits of China-based production and a highly-specialised and diverse team from around the world, Acsys pushes the boundaries of how technology can be embraced within complex industrial environments for better security and staff management. With a customer-centric, customised approach Acsys follows the belief to think ‘outside the box’ to deliver easy-to-deploy, highly durable and cost effective solutions for the most challenging scenarios.

www.acsys.com

Invendis

Invendis Technologies India Pvt. Ltd. was started in 2007 by people with more than 100 man years of experience in Telematics. Today, we are a global leader in the business of Remote Monitoring of Telecom Towers.

Invendis designs and delivers technology-enabled business solutions that help Telcos & Towercos to offer uninterrupted services to their clients. Invendis also provides a complete range of Remote Monitoring & Energy Optimization services by leveraging our domain and business expertise.

Our offerings span front end equipments, sensors, transducers, business applications, systems integration, product engineering, Installation, maintenance, 24X7 Global Monitoring & IT infrastructure services.

Invendis pioneered customizable Front End Monitoring & controlling equipments, which helped Towercos to roll out Monitoring & Energy optimization solutions in shortest possible time.

Invendis has a global footprint with over 25,000 installations spread across Asia, Africa & Europe.

www.invendis.com

AUSONIA

AUSONIA provides specific power solutions for any typical telecom application (STANDBY GENSETS, OFF GRID BTS POWER UNITS, HYBRID SOLUTIONS, MOBILE POWER STATIONS, NO-BREAK POWER SYSTEMS, etc.), successfully certified by 12 YEARS on FULL OPEX model.

Thanks to its unique technology, based on VARIABLE SPEED DC GENSETS with mechanical efficiency, AUSONIA offers a wide portfolio of modular HIGH EFFICIENCY ENERGY SOLUTIONS, specifically designed to power off-grid / bad-grid BTS sites and totally monitored and controlled by remote through a dedicated web-based system. Such power solutions are designed to significantly reduce the OPEX and TCO of the Telecom Operators and Tower Companies

www.ausonia.net

nexsysone

Nexsysone is your one-stop solution that harnesses the power of its advance software modules through a single unified interface to address the needs of operators and...
Our sponsors and exhibitors

tower owners in planning, efficiently maintaining and effectively sharing their infrastructure, thereby saving huge operational costs and enhancing ROI on their CAPEX.

Nexsysone’s all-encompassing software platform is used by some of the largest technology upgrade roll-outs in the USA, as well as some of the largest greenfield deployments in Asia such as in Myanmar where operators and tower companies use nexsysone to enable the sharing of network infrastructure.

The nexsysone’s advance software module ‘towerone’ is specifically tailored to make easy the tower sharing process that tackles the typical technical, contractual and commercial complications that ultimately stop the common objective of reducing operational costs via site sharing.

www.nexsysone.com

Bronze Sponsor:

Vinson & Elkins LLP

Vinson & Elkins LLP is one of the oldest and largest international law firms, with approximately 700 lawyers located in 15 offices around the world.

Our global telecommunications team has extensive experience advising on international telecoms and telecoms infrastructure transactions. We have significant industry experience, advising on telecoms transactions in numerous countries. Our telecommunications advice includes acquisitions and disposals, debt and equity financing, infrastructure development, operational arrangements, regulatory matters and dispute resolution.

We also have significant experience in the negotiation and drafting of sale and purchase, debt and equity financing, master lease, build-to-suit, site management and service level arrangements; and have played a prominent role in complex fibre transactions.

www.velaw.com

Exhibitor:

GS Yuasa

GS Yuasa is a Japanese company formed in 2004 by the merger of two large 100 year old battery manufacturers, Japan Storage Battery and Yuasa. At US$3.2B in sales, GS Yuasa is one of the worlds largest battery manufacturers.

GS Yuasa manufactures a full line of technologies including lithium, lead acid, nickel metal hydride, and nickel cadmium for the automotive, industrial, and specialty battery markets. Especially for Telecom market, we have developed a 48V lithium ion battery module that has outstanding cyclic life and charge acceptance that can reduce the runtime of generators and the total cost of ownership of telecom base stations. With 36 affiliates in 16 countries, GS Yuasa has a worldwide presence operating under the GS Yuasa, GS, and Yuasa brands.

www.gs-yuasa.com (GS YUASA)

Exhibitor:

Nanhua

For more than 24 years, Shanghai NANHUA Electronics has been focused on the designing, manufacturing and marketing of industrial application products. NANHUA has begun the promotion and application of Aviation obstruction light system for telecom towers in the year 2007. NANHUA has full experience in manufacturing of the complete line of cost-effective obstruction lighting and control solutions for the telecom towers, chimneys, high buildings, port machinery and any other high structures that could threaten the aircrafts. NANHUA products have been proven to be professionally designed and highly reliable.

NANHUA Electronics is located in Shanghai, China, with a factory of 6000 square meters, 310 staffs till June of 2014, including 37 members in R&D center and ISO 9001 quality authentication certification.

www.nanhua.com

Exhibitor:

Zamil Infra

Zamil Infra is one of the leading EPC players in the Telecom Infrastructure & Power projects which offers Total Solution Provider, Full turnkey services, Managed Services, and Energy & Power solutions to telecom operators and service provider companies. Zamil Infra has successfully executed telecom passive infrastructure works at 10,000 plus sites in Middle East, Africa and Asia. With global factories in Bahrain, UAE, Egypt, Vietnam, India and China, we specialize in design and fabrication of varied kind of telecom towers. Our leading...
Our exhibitors

Our exhibitors clientele includes major telecom players like TeliaSonera, Globe telecom, Etisalat, MTN, Vodafone, Bharti Airtel, Aircel and Network Equipment Providers such as ZTE, Ericsson, Huawei.

http://www.zamilinfra.com

Exhibitor:

Abloy

ABLOY secures business operations on land, at sea, and in the air – in all circumstances. Abloy has a proven history of telecommunication business for decades. Along with the new technology in telecom business Abloy has introduced new methods and systems to create value and fast pay-back time to telecom customers. Abloy provides a complete solution including project management. Combining mechanical and electromechanical features ABLOY PROTEC2 CLIQ offers double security with wide internationally tested and approved product range. Remotely controlled PROTEC2 CLIQ system enables to control sub-contractors activities on sites reducing management costs and providing traceability. Several telecom customers have chosen ABLOY solutions to be leaders in fast developing telecommunication world.

www.abloy.sg

Exhibitor:

NorthStar

NorthStar is an industry leader in designing and manufacturing high performance lead-acid batteries and high efficiency telecom cabinets. The company has state-of-the-art facilities in the USA and Sweden, and their products are used in more than 120 countries worldwide. NorthStar premium thin plate AGM batteries deliver long life at elevated temperatures, with faster recharge and superior PSOC cyclic performance. NSB Blue Batteries are today reducing 85% of diesel generator run time in offgrid telecom applications. The newly launched NorthStar Academy program will help customers to prolong their battery life and save energy in their telecom network.

www.northstarbattery.com/1/2/3.php

Exhibitor:

Metalogalva

TELECOM TOWERS MANUFACTURER

Quality products at fair prices. Company with 42 years experience. Young and flexible team. 400 employees; 30 engineers. 100 000 tons galvanizing capacity (year). 14 welding and plasma robots. 6.6M€ Investment on new equipments.

Qualifications:
- QUALITY MANAGEMENT SYSTEM ISO 9001
- RDI MANAGEMENT SYSTEM CERTIFICATE NP 4457
- ENVIRONMENTAL MANAGEMENT SYSTEM ISO 14001
- MANAGEMENT SYSTEM CERTIFICATE
- OCCUPATIONAL HEALTH AND SAFETY OHSAS 18001
- SPECIAL CERTIFICATION FOR GALVANIZATION for German
- Norm DASI – GUIDELINE 022

Verification:
- QUALIFICATION OF MANUFACTURES TO WELD STEEL STRUCTURES according to DIN 18800-7 Level “E” <EC CERTIFICATE FACTORY PRODUCTION CONTROL (FPC) EN 1090 – 1/2 – EXC3

http://www.metalogalva.pt/pt/

Exhibitor:

Cotech Tower Services

COTECH was incorporated in 2006. We specialize in the provision of ROPE ACCESS Inspection Repair and Maintenance Services. Skills ideally suited to the vertical tower industry. Our qualified, trained and highly skilled work force can address your next project with safety, practicality and speed to market. IRATA Industrial Rope Access * SPRAT-Rope Access Approved * Comtrain Approved.

*Rope Access- For Safety, Speed and Cost Effectiveness

http://www.cotechtowerservices.com

Exhibitor:

Does your company provide products and services to the CALA telecom tower industry

Now in its third year, the TowerXchange Meetup Americas will gather an audience of 200+ CALA tower industry leaders. Leading turnkey infrastructure service providers, tower manufacturers, RMS and site management platform developers and energy equipment providers have selected the TowerXchange Meetup Americas as their preferred platform to showcase their solutions and expertise. If you'd like to find out more and request a bespoke proposal, please contact Annabelle on +44 7423 512588 or email amayhew@towerxchange.com.
TowerXchange’s analysis of the independent tower market in Africa and the Middle East

Integration in SSA, transactions in MENA

Figure 1: Estimated number of towers owned or managed by towercos in MEA

Source: TowerXchange

2016: The year of integration for towercos in SSA

We’ve said it before: the land grab is almost over in SSA towers. Most of the continent’s investible towers, 49,149 in total, have been transferred from MNO to towerco balance sheets or have been built by towercos. The majority of SSA’s new towers will be built by towercos. We have seen towerco penetration in SSA rise from less than 1% at the beginning of this decade to 40% today, and forecast to rise to 54% by the end of 2016.

There are a few important sale and leasebacks still to close: the cancelled Airtel transactions in Tanzania and DRC (Chad, Malawi and Gabon may follow) are back on the block – Helios Towers Africa and Eaton Towers again seem the most interested parties. MTN’s on-off sale of South African towers may have to be back on as the continent’s leading operator seeks to raise funds to resolve the US$3.9bn fine imposed by the NCC, a fine MTN is challenging legally. Towers could also come to market this year in Senegal and Mozambique.

But the prevailing theme for SSA towercos will remain integration. IHS, Eaton Towers and Helios Towers Africa could be 18-24 months away from their next major capital event – more likely an IPO in IHS’s case, a trade sale more likely for the others. HTN Towers’ next major liquidity event had appeared imminent, but their IPO was cancelled two weeks after it was announced. With major liquidity events on the horizon, Africa’s privately owned towercos will be focusing on integrating newly acquired assets, leasing up towers, reducing opex and improving EBITDA margins and ultimately valuations.

A last flurry of tower transactions may be concluded before SSA’s towercos’ focus narrows to efficiency and the drive to profitability and exit. The feeling is that IHS may seek some lower country risk ballast to counterbalance their portfolio, perhaps in Saudi Arabia or South Africa, while Helios Towers Africa and Eaton will battle for the last portfolios from Airtel’s passive infrastructure monetisation programme.

Priorities in 2016 will be contractor performance, energy efficiency, and above all co-location sales. With the global economic slowdown and with
Figure 2: MEA’s middle market and prospective new entrant towercos

Source: TowerXchange

Africa’s leading MNO hit by a swingeing fine, 2016 may not be a great year for organic growth in SSA. But whilst oil prices are low, there is a natural hedge to the several markets in which currency devaluation is adversely affecting margins.

2016: The migration to a towercos business model starts in earnest in MENA

Sale and leaseback processes in KSA and Kuwait are almost past the point of no return: the final round of Mobily and Zain processes commences at the end of January. After years of stalled processes and speculation, 2016 will see a MENA tower market inaugurated in earnest. Etisalat’s Mobily is selling 9,600 towers in KSA, where Zain is also selling 5,700 towers as well as seeking buyers for 1,600 towers in Kuwait. Efforts to attract a buyer for towers in Sudan and Iraq have to date yielded little interest.

Meanwhile, Vimpelcom’s passive infrastructure monetisation strategy could soon extend to Algeria, where 6,000 Djezzy towers could soon be available to a buyer willing to accept a 49% FDI limit. Algeria is not the only North African country in which towers may be coming to market: we’ll say no more than to forecast that the current penetration of towercos into MENA of 1.4% will rise to 12.5% by the end of 2016, and to 24% by the end of 2017. Expect a dedicated Towercos Meetup for MENA in Dubai in the first half of 2017 if we’re right!

Country overviews

Algeria: TowerXchange are tracking the possibility
Figure 3: MEA’s biggest tower transactions to date

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Tower count</th>
<th>Deal value US$</th>
<th>Cost per tower US$</th>
<th>Deal structure</th>
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<tbody>
<tr>
<td>2015</td>
<td>Nigeria</td>
<td>Etisalat</td>
<td>IHS</td>
<td>555</td>
<td></td>
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<td>SLB</td>
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<td>MobiNil</td>
<td>Eaton</td>
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<td>$131,150,000</td>
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<td>American Tower</td>
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<td>2014</td>
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<td>Eaton</td>
<td>2,500</td>
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<td>MTN</td>
<td>IHS</td>
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<td>Joint venture (IHS 49%, MTN 51%)</td>
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<td>Airtel</td>
<td>HTA</td>
<td>394</td>
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<td></td>
<td>SLB</td>
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<tr>
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<td>MTN</td>
<td>IHS</td>
<td>1,269</td>
<td></td>
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<td>SLB</td>
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<td>HTA</td>
<td>1,149</td>
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<td>$87,616</td>
<td>SLB with direct investment in HTT*****</td>
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<td>Eaton</td>
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<td>MLL (Contract since cancelled)</td>
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<td>Orange</td>
<td>IHS</td>
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<td></td>
<td>MLL</td>
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<td>IHS</td>
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<td>IHS</td>
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<td>Eaton</td>
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<td>Eaton</td>
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<td>MTN</td>
<td>American Tower</td>
<td>1,000</td>
<td>$89,000,000</td>
<td>$174,510</td>
<td>Joint venture (AMT 51%, MTN 49%)</td>
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<td>Tanzania **</td>
<td>Millicom/Tigo</td>
<td>HTA</td>
<td>1,020</td>
<td>$80,000,000</td>
<td>$130,719</td>
<td>Joint venture (HTA 60%, Millicom 40%)</td>
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<td>Millicom/Tigo</td>
<td>HTA</td>
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<td>Joint venture (HTA 60%, Millicom 40%)</td>
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<td>MTN</td>
<td>Cell C</td>
<td>American Tower</td>
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<td>South Africa *</td>
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<td></td>
<td>American Tower</td>
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<td>$200,000,000</td>
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<td>Starcomms</td>
<td>SWAP</td>
<td>407</td>
<td>$81,000,000</td>
<td>$199,017</td>
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<td>2010</td>
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<td>Vodafone</td>
<td>Eaton</td>
<td>750</td>
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<td>HTA</td>
<td>750</td>
<td>$54,000,000</td>
<td>$120,000</td>
<td>Joint venture (HTA 60%, Millicom 40%)</td>
</tr>
</tbody>
</table>

| Totals / average | 39,256 | $3,766,000,000 | $126,853 |

* Cell C deal included 1,400 existing towers plus the option to acquire up to 1,800 more to be constructed. Cost of original 1,400 towers only included here  ** Millicom/Tigo’s stake in Helios Towers Tanzania reduced to 24.5% after Helios acquired towers from Vodacom Tanzania in 2013  *** Telkom Kenya-Eaton deal subsequently cancelled  *****Vodacom sold 100% of equity in towers but subscribed to acquire a 24.5% interest in HTT

Source: TowerXchange
of ~6,000 Djezzy towers coming to market. Algeria is one of several countries which currently limits foreign direct investment (FDI) to 49%. Under such circumstances, an international investor or towerco considering putting capital into an Algerian tower play, whether BTS or more likely sale and leaseback, is limited to a minority stake and must source a local partner in a market with no pre-existing independent tower industry. The formula is further complicated in the case of Djezzy, recently reorganised so that the government owns a controlling stake.

**Burkina Faso:** Congratulations to Eaton Towers on closing their deal to acquire Airtel’s towers in Burkina Faso, where Telemob (Onatel) and Airtel vie for market leadership, with Telecel (Planor Afrique) not far behind. It hasn’t been an easy period for Burkina Faso – within days of Eaton announcing the deal to acquire Airtel’s towers, a coup had toppled the government, and there is now the looming threat of terrorist action spilling over into the State. If that weren’t enough to contend with, Airtel recently agreed to sell their opco in Burkina Faso to Orange. 3G was launched in 2013 but mobile broadband penetration remains just 4%*. SIM penetration is just 79%* in Burkina Faso, a country of some 18.4mn.

**Cameroon:** New entrants Viettel’s Nexxtel launched in September 2014 and claimed to have 2mn subscribers by Q2 2015, although their window of 3G exclusivity expired at the end of 2014. MTN has launched 4G in four cities and committed to hang 3G and 4G equipment on 700 sites during 2016. State-owned CamTel has commenced rollout of their GSM
network, completing Cameroon’s transition from a two to a four MNO market. YooMee are one of several non-traditional MNO tenants on Cameroon’s towers. Prior to Nexxtel and CamTel’s rollouts, IHS owned and operated 90% of Cameroon’s towers, having acquired 1,000 towers from MTN and secured an MLL (Manage with License to Lease) deal with Orange for a further 900 towers. IHS eventually persuaded Nexxtel to co-locate on a limited basis, but Viettel have also built hundreds if not thousands of their increasingly familiar guyed-mast towers. CamTel may leverage co-location more substantially, and have engaged Huawei to deploy their GSM network.

The GSMA Green Power for Mobile “Best Practices for Energy Provision in Telecoms: Francophone Africa” report, released in April 2014, suggested there were 2,090 towers in Cameroon at that time, of which 533 were off-grid, 34% of which were using solar power (plus two on-grid grid-DG-solar hybrids). According to Orange, fuel represents 52% and the grid 48% of the total energy cost in Cameroon. IHS provides a full service tower+power service in Cameroon, and thus is the principle buyer of telecom energy equipment and services.

SIM penetration stood at 93%* and mobile broadband penetration at 5%* in Cameroon in Q4 2015, up from 72% and 1% respectively a year earlier.

Chad: Airtel cancelled their sale of passive infrastructure in Chad to Helios Towers Africa, who had until that points seemed poised to become the first towerco in a country with less than 2,000 towers. One of the reasons for the collapse of the HTA transaction was subsequently revealed as Chad was identified as one of four countries for which Airtel had entered exclusive negotiations to sell their opco to Orange, but the deadline for that transaction has since lapsed. SOTEL is Chad’s third MNO, with YooMee heading a list of prospective non-traditional tower tenants.

Although it is a relatively small market, TowerXchange don’t think we’ve heard the last of potential tower deals in Chad – whoever owns the opco, Airtel or Orange may be motivated to re-open dialogue (presumably with Helios Towers Africa) and resume the process of transferring assets.

At the 2015 TowerXchange Meetup Africa, Millicom hinted at having an appetite to partner with an ESCO in Chad.

Congo Brazzaville: Helios Towers Africa is the sole towerco in Congo Brazzaville, having closed a deal to acquire Airtel’s 394 towers, representing around 44% of the country’s towers. Negotiations to sell Airtel’s Congolese opco to Orange recently lapsed, but MNO consolidation is not a new phenomenon in Congo, Airtel having acquired Warid’s operation in the country in 2014 vaulting them over MTN to become market leaders. BinTel’s Azur are ranked a distant third.

SIM penetration climbed just 2% to 102%* and mobile broadband penetration grew by the same percentage to 9%* in Congo between Q4 2014 and Q4 2015.
Cote d’Ivoire: While SWAP operates a handful of towers in the country, IHS holds a dominant position in the Cote d’Ivoire tower market having acquired a total of ~2,000 towers from market leaders MTN (under SLB) and Orange (MLL) in 2014. IHS owns more than two in three of the towers in Cote d’Ivoire, and provides a full tower+power service. According to Orange, fuel represents 36% and the grid 64% of the total energy cost in Cote d’Ivoire.

Number three MNO Moov was part of a package of assets transferred from Etisalat to Maroc Telecom. Fourth and fifth ranked MNOs Comium and GreenN have been threatened by nationalisation due to mounting debts.

YooMee launched a TD-LTE network in Cote d’Ivoire in 2014, prompting CEO Dov Bar-Gera to tell TowerXchange “We entered Cote d’Ivoire after IHS had secured the rights to market MTN and Orange’s towers for co-location, and that has had a huge impact in terms of shortening our to time to market. Whereas previously we needed to negotiate with landlords, secure permits and engineer power solutions in order to get new sites up and running, leveraging the independent towerco’s sites reduced our lead time significantly.”

There are 26.1mn* SIM cards among Cote d’Ivoire’s 23mn* citizens, with mobile broadband penetration at 35%*. 

DRC: Airtel's tower portfolio, reportedly the most widespread in the country, is reportedly back on the block after the unceremonious cancellation of the operator’s sale to Helios Towers Africa. HTA and Eaton Towers are believed to be interested in the renewed process. HTA is the sole towerco and has been delivering reliable service and strong tenancy ratio growth in the DRC since entering the market on the back of a US$45mn deal to acquire 729 towers from Millicom Tigo back in 2010 (Millicom retained 40% equity in Helios Towers DRC). Helios Towers DRC provides full service tower+power. Grid power is reasonably reliable in Kinshasa, but less reliable in Lubumbashi and Goma. Almost all sites outside these three cities are off-grid and fuel costs can be 2.5x more expensive in rural areas.

Infratel claims to have built over 800 rural sites for Vodacom DRC.

With around 4,250 towers serving 48.75mn connections, DRC has one of the highest number of SIMs per tower in the world at 11,470, illustrating the DRC’s huge growth potential.

That growth potential has attracted four leading MNOs: Airtel, Orange, Tigo and Vodacom, while aggressive cut-price operator Africell claimed to have 7mn subscribers in DRC by the end of 2014. Africell leveraged co-locations on over 200 Helios Towers DRC sites to accelerate time to market, and the operator is launching 3G. Smile plans to launch LTE in DRC in 2016. Raga Sat has launched broadband services leveraging O3b’s “fibre from the sky” MEO satellite service.

SIM penetration was just 62%* and although 3G was launched in 2012, mobile broadband penetration remained at 11%* in DRC in Q4 2015.

*Source: TowerXchange
DRC is covered in the TowerXchange Meetup Africa roundtable reports.

**Egypt:** Eaton announced a US$131mn deal to acquire 100% of the equity in 2,000 towers from Mobinil in April 2015, representing a third of the MNO’s towers and 10% of the ~20,000 towers in the country. The towers Eaton will acquire are concentrated in the Delta, Upper Egypt and Red Sea regions, but notably do not include assets in the rooftop-centric Cairo market.

Participants at the two Egypt roundtables at the TowerXchange Meetup Africa 2015 were keen to emphasise that, despite perceptions to the contrary, there are few security challenges in Egypt outside of Sinai.

A raft of mega-projects, including the construction of a new capital East of Cairo, the discovery of offshore gas, and the enlargement of the Suez canal, could drive economic prosperity and demand for towers.

With SIM penetration of 102%* and mobile broadband penetration of 42%*, plus an established culture of infrastructure sharing in the country, the potential for towerco profitability is good in Egypt. While 3G coverage is currently fairly extensive, with most operators focusing on capacity upgrades ahead of a potential 4G auction once the political situation is more stable, Egypt still has more SIMs per tower than any other country in MENA (4,690 versus the regional average of around 2,500), illustrating potential for new tower builds.

Vodafone Egypt leads the market followed by MobiNil (over 90% owned by Orange) with Etisalat Nisr, the third operator, making three credit worthy prospective tenants, each of which could potentially divest further towers in Egypt. Telkom Egypt’s long mooted mobile launch may finally happen in 2016.

Grid connections for Egyptian tower sites are slow and expensive, so DGs are widely used – the business case for renewables may be boosted if fuel subsidies, which currently mean diesel is around a fifth the cost of other African markets, are reduced.

Local tower manufacturer / service provider HOI-MEA also operates a network of around 40 towers in Egypt, with a vision to scale to 300 by 2018. HOI-MEA’s tenancy ratio is already approaching 1.5.

Egypt is covered in the TowerXchange Meetup Africa roundtable reports.

**Gabon:** The future of Airtel’s towers in Gabon is uncertain. The operator had originally set out to divest towers in all 17 African countries, but Gabon seldom seemed to mentioned on the grapevine. For now, we assume the towers will remain on Airtel / Africa Towers’ balance sheets, meaning there will be no independent towercos in Gabon.

Airtel is deploying LTE, but mobile penetration was still negligible in Gabon at the end of 2014. Etisalat’s Moov subsidiary in Gabon was acquired by Maroc Telecom. Libertis (Gabon Telecom) and Azur (BinTel) make up the rest of the MNO market.

Oil and Gas wealth partly accounts for Gabon’s soaring 164%* SIM penetration rate.

**Ghana:** Eaton are adding Airtel’s Ghanaian towers to the 750 Vodafone towers they are managing with...
license to lease. There are three major towercos active in Ghana, which have been snapping up tenancies for over three years. Back in 2010, Helios Towers Africa setup a joint venture towerco with Millicom Tigo as minority partners, to which 750 towers were transferred. Shortly afterward Eaton Towers closed their deal with Vodafone Ghana, then American Tower set up another joint venture with MTN to which 1,876 towers were transferred (ATC Ghana now markets 2,098 Ghanaian towers, representing around a third of the country’s tower stock). All of Ghana’s towercos now provide a full service tower+power. With strict permitting and environmental policies in Ghana, it’s tough to get new towers built and towercos expect less than 100 new structures to go up in 2016. However, this amplifies appetites for co-location: tenancy ratios in Ghana are already around two.

MTN leads a crowded market for operators, followed by Vodafone, Tigo, Airtel and Glo, with Expresso struggling to establish a foothold.

The devaluation of the Ghanaian Cedi, compounded by deregulation of fuel prices, led to spiralling opex costs and crippling fuel shortages in 2015. Every industry was affected, and towercos struggled to achieve SLAs, while EBITDA margins suffered. However, Ghana’s towercos have developed dynamic processes able to get ahead of fuel shortages: at the last TowerXchange Meetup Africa (October 2015), one of Ghana’s towercos had achieved nine consecutive weeks of positive SLA performance.

SIM penetration rose from at 113% to 121%* and mobile broadband penetration from 24% to 30%* in Ghana between Q4 2014 and Q4 2015.

Ghana is covered in the TowerXchange Meetup Africa roundtable reports.

**Kenya:** Eaton Towers are integrating several hundred towers recently acquired from Airtel Kenya into their portfolio. Eaton is the sole towerco in Kenya and has long coveted the market, having secured an MLL deal with Orange that was soon cancelled after a change in strategic direction by the operator, which culminated in the announcement of the sale of Orange’s 70% stake in Telkom Kenya to Helios Investment Partners. Eaton’s number one issue: how to engage with Safaricom as a tenant and as a de facto competitor – Safaricom selectively leases their own towers to other MNOs at attractive rates. Safaricom has a dominant position in Kenya with 66.3% market share. Airtel has 19.1%, Telkom Kenya 11.8% and new entrant Equitel 2.9%, according to CAK statistics for Q3 2015.

Kenya has ~6,600 towers, grossly insufficient for a country of 46mn people and with a land area of 570,000 sq km. SIM penetration is just 80%* with plenty of room for mobile broadband growth, at 18%* penetration at Q4 2015. Safaricom launched LTE at the end of 2014.

**Kingdom of Saudi Arabia:** Zain is divesting ~5,700 towers, while Etisalat (Mobily) is divesting ~9,200 towers in KSA. American Tower, Digital Bridge, IHS, Providence Equity, Quippo, TASC Towers, Towershare and a number of local investors have all been linked with the opportunity, but the shortlist has narrowed and final bids are due at the end of January. The consensus seems to be that it would be advantageous for one bidder so secure both the Zain and Mobily portfolios, given STC’s mobile market leadership and ownership of over half the country’s towers (~16,400). The KSA tower market offers a good volume of potential BTS opportunites, and a surprisingly large amount of off-grid towers for a country with a reliable grid.

KSA’s 3G network is mature and the rollout of LTE is well under way. SIM penetration was at 181%* with mobile broadband penetration at 71%* in Q4 2015.

Don’t miss the Mott MacDonald Share Square: Saudi Arabia in the news section!

**Kuwait:** Market leaders Zain are divesting 1,600 towers in Kuwait, representing around a third of the country’s ~5,100 towers. Ooredoo and STC’s Viva are Zain’s competitors. With population coverage at 100%, any organic growth for towercos entering Kuwait must be driven by network densification rather than extension. SIM penetration was at 192%* with mobile broadband penetration at 81%* in Q4 2015.

**Madagascar:** TowerCo of Madagascar (ToM), initially spun out of TELMA but now an independent towerco in it’s own right, operates around 700 towers on the island of Madagascar. The operational challenge of operating a distributed tower network, particularly during rainy season, is not for the faint hearted, while the success of ToM has deterred other towercos...
from bidding for Airtel’s Madagascan towers, which seem set to be returned to the local Africa Towers subsidiary. Orange is also active in Madagascar. SIM penetration was just 31%* and mobile broadband penetration 19%* in Q4 2015.

**Malawi**: Eaton’s deal to acquire Airtel’s towers in Malawi was cancelled in late 2015, but the assets may be brought back to market. Mobile services are among the most expensive in Africa in Malawi, contributing to SIM penetration of just 38%, and mobile broadband penetration of 15%. Airtel lead a duopoly with TNM. Efforts to inaugurate a third operator have flopped with Expresso and Celcom failing to launch – the regulator’s latest pony to back is Lacell, who were licensed in October 2015. Xinwei has announced plans to rollout a low cost rural network. Athonet is deploying an LTE service. There are around 800 towers in Malawi.

**Mozambique**: TowerXchange has heard rumors of towers coming to market in Mozambique from multiple sources, but we have not yet been able to verify their veracity. A potential driver may be the government’s drafting of a bill mandating the sharing of telecoms infrastructure. We understand there are around 5,000 towers in Mozambique, including 1,500-1,800 guyed mast towers erected by low cost new market entrant operator Viettel. Indeed it is the turbulence caused by Viettel’s entry that may have precipitated passive infrastructure monetisation, both on the part of incumbent MCel, which has seen market share eroded by both Viettel and Vodacom, and indeed potentially by Viettel themselves. Viettel’s Mozambique subsidiary Movitel is co-owned by Viettel and a holding company run by FRELIMO (Frente de Libertação de Moçambique – the main political party in the country).

**Niger**: When Eaton Towers opens up the first towerco in Niger when their deal with Airtel finally closes, they’ll need to be ready to engage with a challenging energy logistics scenario, low population density, and sub US$5 ARPU. Airtel has recently secured a 3G license in Niger where it competes with Orange, SahelCom and Moov (recently sold by Etisalat to Maroc Telecom). SIM penetration is just 34%* in Niger, and mobile broadband penetration 2%*.

**Nigeria**: Nigeria is a benchmark tower market for many reasons. It’s the largest towers and largest mobile market in SSA, with 154.3mn* connections among a population of 184.6mn*. It’s the oldest growth independent towerco market in Africa; towercos have been building towers in Nigeria since 2006. Almost half (24,746) of SSA’s towerco-owned towers (49,149) are in Nigeria, and over US$2.5bn has been spent by towercos to acquire 79% of Nigeria’s towers. Towercos have proved their ability to deliver 99.9% uptime in challenging grid conditions in Nigeria. Nigeria is not just a benchmark for African towers, it’s proof of the efficacy of the independent towerco model in any emerging market.

Competition for BTS opportunities is increasing among Nigeria’s three major and many middle market towercos. While most commentators agree Nigeria needs to double the country’s current stock
of towers, uncertainty created by the NCC’s US$3.9bn fine on market leader MTN (the legal challenge of which has been adjourned until mid-March) makes predicting capex budgets a fool’s errand.

Nigerian cell site energy efficiency programmes are also becoming a benchmark for the rest of Africa, with battery hybrids widely deployed and solar being added, particularly in the north of the country.

Nigeria is covered in the TowerXchange Meetup Africa roundtable reports. There are also special features on “How the new Nigerian tower market will work” and “What we learned about HTN Towers” in the Africa and Middle East features section.

**Rwanda:** IHS has closed the acquisition of Airtel’s 184 Rwandan towers, to be added to their acquisition of 550 towers from MTN Rwanda in 2013. IHS Rwanda’s managing director Kunle Iluyemi was quoted in The New Times as saying IHS erected 34 towers across the country in 2014, with plans to build further 50 towers in 2015. TowerXchange estimate there are around 1,300 towers in Rwanda, of which IHS owns more than three in four.

Rwanda is home to three tier one MNOs, so has no shortage of credit worthy tenants. MTN leads the market, followed by Tigo and Airtel. Korea Telecom secured a joint venture with the Rwandan Ministry of Youth and ICT to build a nationwide LTE network. SIM penetration in Rwanda rose from 61% to 75%* with mobile broadband rising from 28% to 35%* between Q4 2014 and Q4 2015. Rwanda is covered in the TowerXchange Meetup Africa roundtable reports.

**Senegal:** Sonatel, in which Orange is a controlling stakeholder, had been investigating the potential sale and leaseback of their 1,800 structures in Senegal, but the challenges aligning all stakeholders, including powerful unions and government shareholders, now suggest Sonatel will instead seek a managed services provider. Sonatel is the market leader with 55.7% market share, followed by Millicom-Tigo on 22.8% and Expresso on 21.3% (according to statistics from ARTP for September 2015). Expresso are seeking a towerco partner in Senegal (and beyond) – they are seeking to add 250-350 towers to their existing network of 450. It remains to be seen whether Tigo, with around 1,100 towers in Senegal, might also be interested in partnering with a towerco.

There are around 3,350 towers in Senegal serving a population of just over 15mn with SIM penetration of 96%* and mobile broadband penetration having increased 63% YOY to 14%*.

Senegal is covered in the TowerXchange Meetup Africa roundtable reports.

**South Africa:** If MTN’s current legal challenge fails to significantly reduce the US$3.9bn fine imposed by the NCC, most commentators expect the MNO to divest their most valuable remaining tower assets to raise capital – and MTN’s South African towers would be top of many towercos’ shopping lists! The South African tower market is up for grabs: only 8.7% of South Africa’s estimated 25,000 towers are currently in towerco hands. American Tower’s landmark acquisition of 1,400 towers from Cell C back in 2011 has since been supplemented with BTS activity, giving ATC South Africa 1,917 towers in their portfolio by Q3 2015. Eaton Towers has built around 200 towers in South Africa. American Tower’s tenancy ratio is South Africa is 1.9, while Eaton’s has passed two. Atlas Towers are now building a tower per week in South Africa and positioning themselves to compete for any sale and leaseback opportunities. Infratel, Eagle Towers and Pro High Site Communications complete the map of South African towerco. A major sale and leaseback in South Africa could precipitate the rollup of one or more of South Africa’s middle market towerco.

Recent reports in Bloomberg suggest that MTN has 19,000 sites to sell in South Africa; that total may be inflated by counting sites instead of towers – with a prevailing tenancy ratio as high as 1.8 in South Africa, and reducing the total to exclude rooftops, TowerXchange reckon MTN’s South African tower count is nearer 10,000. Should MTN bring their South African Towers to market, TowerXchange counts at least five prospective strategic buyers, supplemented by the usual array of infrastructure fund bidders.

Most commentators rate IHS as the favourite to secure MTN’s South African towers. Africa’s largest towerco has a track record of acquiring MTN towers, are amenable to flexing deal structures to meet MTN requirements, and the two parties hold each other in high esteem. While IHS would benefit from
adding some lower risk ‘ballast’ to their West Africa-centric portfolio, it remains to be seen whether they would have the appetite to acquire assets in KSA and SA, should they emerge successful in bidding for Mobily and Zain’s towers in Saudi.

Meanwhile, Telkom’s stop-start tower monetisation programme has stopped again. Telkom asked for expressions of interest in a portfolio of around 6,000 shareable structures in South Africa, but that process was discontinued. Whether MTN’s towers coming to market could restart that process remains to be seen.

Vodacom South Africa, which operates their ~10,000 tower network as an internal towerco, and leases space to third parties, would seem less inclined to monetise their towers.

BMI share their perspective on the South African tower market in the news section.

**Tanzania:** Helios Towers Tanzania (HTT) owns around 3,100 of Tanzania’s ~5,500 towers, acquired in a US$75mn deal with Vodacom in 2013 and a US$80mn deal with Millicom-Tigo in 2010 for 1,149 and 1,020 towers respectively. Millicom recently restructured their equity stakes in HTA’s local towercos to acquire a 24% stake in HTA’s parent company. It is not clear whether Vodacom exited their shareholding in HTT in the process.

The recent cancellation of Airtel’s sales of Tanzanian towers enables HTT to re-channel capital into build to suit programmes: both Vodacom and Tigo are supplementing their network in anticipation of aggressive competition from new market entrants Viettel, which launched on October 15 2015 under the Halotel brand. Viettel has 1,500 new towers in the air or under construction, and has begun co-locating. Zantel (acquired by Millicom from Etisalat), Smart, Smile and TTCL complete the MNO landscape in Tanzania, which lends itself to co-location as each of Tanzania’s four main MNOs is dominant in a different region of the country, providing a strong incentive for co-location to accelerate nationwide coverage. The sheer scale of Tanzania amplifies maintenance costs, which can be as high as US$7,000 per annum – ten times the cost in the US.

Tanzania is covered in the TowerXchange Meetup Africa roundtable reports.

**Uganda:** Eaton Towers will be adding Airtel’s Ugandan towers to the 700 towers they acquired from Orange and Warid back in 2012. Airtel since acquired Warid, while Orange sold out to Africell. Uganda remains ripe for further in-market consolidation, with seven licensed MNOs. American Tower is also active in Uganda, where they have a joint venture with MTN and currently market 1,388 towers. TowerXchange estimate there are a little over 4,000 tenancies on 3,485 towers in Uganda, suggesting an average tenancy ratio just under 1.2. Expect this number to rise driven by the enthusiasm of new entrant MNO Africell, which operates an asset-light model and prefers to co-locate rather than build thus accelerating time to market. Organised crime compounds the effect of administrative fuel theft in Uganda, making site hardening a priority for towercos.

SIM penetration is just 72%* in Uganda, with multi-SIMing meaning actual penetration is under 50%, with mobile broadband penetration at 16%*.

Uganda is covered in the TowerXchange Meetup Africa roundtable reports.

**Zambia:** IHS have acquired the towers of market leaders Airtel Zambia to supplement their 2014 acquisition of MTN’s Zambian 719 towers, giving them approximately 85% of the towers in this ~2,000 tower market. Capital constrained Zamtel is the third of three MNOs, although the government is a fourth player in Zambia’s tower market through towers built by the Universal Service Fund.

SIM penetration is 72%* in Zambia, and mobile broadband penetration 16%. ARPU is low: in the US$2-3 range.

Zambia is covered in the TowerXchange Meetup Africa roundtable reports.

*Statistics courtesy of GSMA Intelligence, Q4 2015.

TowerXchange are looking forward to once again hosting the top 250 decision makers in African towers at the 2016 TowerXchange Meetup Africa, hosted in the prestigious ballroom at the Sandton Convention Centre on October 19 and 20 2016! Visit: www.towerxchange.com/meetup/meetup-africa/
Africa and Middle East News
A roundup of tower news across SSA and MENA

Sierra Leone and Burkina Faso: Orange acquires 100% of Airtel shares in Sierra Leone and Burkina Faso

Orange is set to acquire 100% of Airtel Sierra Leone and Airtel Burkina Faso’s share capital in a bid to strengthen the operator’s presence in Africa. The deals will add close to 5.5mn customers to Orange’s customer base and extend the company’s African footprint to cover 20 countries. This is further to the initial agreement signed between Airtel and Orange in July 2015 regarding the potential acquisition of Airtel’s operations in Burkina Faso, Sierra Leone, Chad and Congo Brazzaville to fund its operations in Nigeria. The completion of the transactions in Sierra Leone and Burkina Faso (implemented in partnership with Orange’s subsidiaries in the Côte d’Ivoire and Senegal) are still subject to approval by the relevant authorities whilst the agreements in Chad and Congo Brazzaville have lapsed.

Tunisia: Tunisia Telecom and Orange launch RAN sharing agreement

Tunisia Telecom and Orange have launched a RAN sharing programme in Tunisia to reduce rollout and maintenance costs. 78 villages in Zaghouan followed by the governate of Jedouba will be covered by the project which is estimated to cost in the region of US$100-150,000, less than half the amount had the two MNOs followed independent strategies.

Nigeria: MTN Nigeria disputes US$3.9bn fine

MTN Group has announced that it will be challenging the fine it received from the Nigerian Communications Commission (NCC) last year for failing to disconnect 5.1mn unregistered subscribers before the deadline given. The initial fine of NGN1.04tn (US$5.2bn) issued in October was reduced by 25% by the NCC in December. MTN have instructed lawyers to commence with proceedings however the group has stated that it will continue to work with Nigerian authorities to try and find a more amicable solution.

Zambia: Zambia to spend US$272mn to build 469 mobile towers

The Zambian government have announced plans to build 469 towers which will be owned and operated by state owned telecommunications company, Zamtel. The towers will be built in all ten provinces in a move to increase access to mobile communications in both urban and rural areas. As Zambia’s third largest operator (behind MTN and Airtel), the move is expected to help Zamtel grow its market share, competing with its rivals that have already expanded their networks.

Cote d’Ivoire: ARCTI opens expressions of interest for a new telecoms concession

Amidst hikes in license fees for existing MNOs Orange, MTN and Telecel, the Autorite de Regulation des Telecommunications de Cote d’Ivoire (ARTCI) opened Expressions of Interest for a new telecoms concession in a bid to “revitalise” the market. The government aims to reduce the number of licenses to four global concession holders, opening up the potential for one new operator in the market.

Tanzania; DRC: Airtel renegotiating cancelled tower sales in Tanzania and the DRC

TowerXchange understand that Airtel has resumed and substantially progressed tower sales for at
Deal nearing completion for 15,000+ towers in KSA and Kuwait

Saudi Arabia and Kuwait: Digital Bridge, Providence Equity and IHS in the running for Mobily and Zain towers

Final bids are due in early February for Mobily and Zain’s towers in Saudi Arabia after delays to the Mobily transaction at the end of 2015 due to the appointment of a new management team. Those believed to have submitted offers include Digital Bridge Holdings, Providence Equity and IHS, although Towershare, Quippo, Inwit, TASC Towers and at least one local investor are all also believed to be interested. It is thought that bidders are keen to secure both portfolios to maximise synergies and economies of scale. Over 15,000 KSA towers could be included in the transactions with 20% of these reliant on non-grid power. With currently just 1.4% of towers in the hands of independent towercos in the Middle East, the transactions in Saudi Arabia and neighbouring Kuwait will push this up to 11-12%. Efforts to divest towers in Sudan and Iraq have apparently attracted less interest.

Ethiopia: Ethio Telecom to launch expansion tender in early 2016

Ethio Telecom, Ethiopia’s state owned MNO is set to launch a tender in early 2016 to expand and upgrade its network coverage by 72%. Whilst the project details and costs are still being finalised, it is thought that the works will focus on upgrading software technology, including the potential addition of 5G technology. It is not thought that further towers will be constructed as part of the expansion plan, with Ethio Telecom believing it already possesses an adequate portfolio of towers for the plans.

Nigeria: HTN Towers postpones IPO

Nigerian towerco HTN towers announced that it had shelved plans to list the company on the London Stock Exchange following the receipt of expressions of interest from potential buyers. In a statement to the press, Pierre Danon, HTN Towers Chairman stated “The shareholders of the Company have received expressions of interest from potential buyers. Consequently, the board of the directors of the Company has decided not to proceed with the IPO at this time. Notwithstanding, we were very pleased with the high level of investor engagement in the IPO process.”

least two of the four countries where transactions were cancelled. Helios Towers Africa remains firm favourites to re-confirm the acquisition of Airtel’s Tanzanian towers, while multiple parties are believed to be interested in Airtel’s towers in DRC, believed to be the country’s most pervasive network. The status of tower transactions in Chad, where Airtel may have been in negotiations to sell their opco to Orange, and Malawi, where the deal was recently cancelled with Eaton, remain less clear.

Tanzania: Millicom to acquire 85% stake in Zantel

Millicom International Cellular has confirmed that it will acquire an 85% stake in Zanzibar Telecom (Zantel) from Etisalat Group, with the remaining 15% continuing to be state-owned. The move will strengthen Millicom’s position in its biggest African market whilst paying only a nominal cash amount of US$1 for the stake, Millicom will assume Zantel’s US$74mn of debt obligations. The transaction is still subject to regulatory approval by both the Tanzanian Communications Regulatory Authority (TCRA) and the Fair Competition Commission.

Ghana, DRC, Tanzania: Millicom reshuffles shares for a 24% stake in Helios Towers Africa

Millicom will exchange their shares in Helios Towers Africa’s tower companies in Ghana, DRC and Tanzania for a 24% stake in HTA’s parent company. The rationale behind the reshuffle is to simplify the HTA’s share ownership structure. HTA acquired a portfolio of 2,450 Millicom towers in the three countries through a sale and leaseback deal in 2010.
Mobile market overview

The Kingdom of Saudi Arabia (KSA) is the largest country in the Middle East and 12th largest in the world by land area. The economy is largely oil based, with oil providing 45% of GDP and 90% of export earnings; KSA holds 16% of the world’s proven petroleum reserves. Recent reductions in the oil price are therefore limiting economic growth and hence potentially constraining growth for mobile operators. Efforts to diversify the economy in areas such as downstream petrochemicals and mining are in progress and may help to offset this to some extent.

The population of KSA has grown annually at an average of 2.4% over the past five years to the current estimate of 30.9m people of whom 57% are under 30 years old. KSA has the joint lowest population density in the Middle East region with 14 people per km² compared to the regional average of 136 people per km².

Three Mobile Network Operators (MNOs) serve KSA – STC, Mobily and Zain. STC the original incumbent has the highest market share by subscriber numbers with 45%, while Mobily and Zain have 38% and 17% respectively. The three MNOs supply 59.2mn mobile connections within KSA giving a market penetration of 181% as of Q4 2015, up from 53.9mn at the end of 2014. In addition two virtual operators commenced operations on the STC and Mobily networks late in 2014.

The mobile user population in KSA is polarised between Saudi nationals who tend to be high value users, and guest workers / expatriates who are more interested in low cost 2G voice and text services. As 2G legacy handsets are gradually being replaced with 3G and 4G capable handsets there will be a progressive reduction in the 2G user base. This will drive a longer term transition of former 2G users to 3G and is likely to increase use of VoIP services, particularly to limit the cost.
of international calls. The need for 2G services is however expected to persist for some time to come.

**Key mobile developments**

The mobile market in KSA, like many in the Middle East, is highly competitive. It has a sizable proportion of users that are amongst the World’s largest consumers of data and usage continues to grow. The user base is also fluid, with changes as expatriates come and go as well as pilgrims visiting the holy cities. To achieve further growth the MNOs are competing to expand the proportion of their user base that consume high volumes of data. This in turn is driving a process of technology and capacity upgrades.

**4G rollout**

KSA was one of the first countries in the world to rollout 4G. All three MNOs launched their 4G services in 2011 with Mobily reaching the market first. Although Mobily initially established a narrow lead in 4G subscriptions, STC now holds the dominant share. 4G coverage across KSA reaches 90% of the population as of Q4 2015, a relatively high figure even amongst the technologically developed nations of the Middle East.

The availability of these technologies has enabled KSA to maintain one of the highest data traffic volumes per user in the world. Cultural factors have contributed to these high data traffic volumes. In particular a rise in popularity of video games and a lack of cinemas have stimulated a thriving online video streaming culture. KSA has the highest per capita use of YouTube in the world and about half of this use is from mobile devices. This aligns with the fact that over 90% of KSA broadband connections are mobile.

The number of 4G/LTE subscribers is expected to continue to increase placing additional demand on the KSA networks. Subscriber forecasts suggest that, by 2020, the number of 4G subscriptions will reach 26.5mn from the current level of 10.6mn; with subscribers to 2G services falling to 7.1mn from 14.4mn in the same time period.

**Operator activity**

Although STC remains the dominant operator, Zain has been the leader in terms of recent growth from 2014 into 2015. STC grew its 4G population coverage from 77% in 2013 to a target of 95% by the end of 2014. STC 3G coverage was already at 96% in 2013[2]. Mobily had 78% 4G coverage and 97% 3G coverage in 2014[3].

Zain’s recent growth has been driven by a US$1.2bn project[4] to upgrade the technology of many of its sites to a minimum of 3G and also to rollout many hundreds of new and upgraded sites to improve coverage. While Zain’s 2G% population coverage was already over 90% the upgrade project will take 3G coverage from 86% to over 90% initially and 4G coverage from 55% in 2014 to over 90% by the end of the project. This has been undertaken in parallel with a brand refresh with new retail outlets and a push to encourage higher revenue users – Zain “opened, or refreshed, 91 Zain branded points of sale in 2015, bringing services closer to an ever increasing number of consumers”[5].

**MVNOs**

In early 2012 the telecoms regulator of KSA, CITC (Communications and Information Technology Commission), instructed each MNO to host a Mobile Virtual Network Operator (MVNO) to boost competition. So far, Virgin Mobile (on STC from September 2014) and Lebara (on Mobily from December 2014) have entered the market through this route. The third MVNO, to be hosted on Zain’s network, is due to be announced in early 2016. The MVNOs target niche gaps in the market, with Virgin aiming at younger Saudis and expatriates seeking low cost international calls while Lebara is targeting the low income mass market, both Saudis and expatriates[6], [7]. The MVNOs are at an early stage, but their overall market share is expected to remain relatively low and niche based.

**Regulation**

The market is regulated by the CITC a well-established regulatory organisation who provide reliable and consistent regulation. The current spectrum allocation for LTE in KSA includes 1.8GHz plus a totally non-harmonised arrangement in the 2.3GHz (STC) and 2.5GHz (Mobily) bands. A number of reports suggest that in order to match the increasing subscribers demand and realise associated benefits such as increases in GDP and
employment, KSA should release harmonised spectrum in the 800MHz and 2.6GHz bands in line with international standards. The military currently occupies a large portion of the spectrum in KSA, including portions of both the 800MHz and 2.6GHz bands.

**Tower sharing potential**

There are currently an estimated 29,000 mobile telecommunication towers in operation in KSA. At present all the towers are owned and operated by the MNOs and tower sharing has been very limited. There is no towerco active operationally in the market at present.

Although a towerco is yet to penetrate the market, evidence exists of small scale tower sharing between the three operators, suggesting some appetite for site co-location. Negotiations for the sharing of Mobily and Zain sites on a large scale have also been reported in the past though the operators failed to reach an agreement.

At the time of writing, Mobily and Zain have issued separate requests for formal proposals from third party investors/operators to buy their tower portfolios. The MNOs intention is to lease these back from the resulting towercos. Mobily are seeking to sell their full portfolio of around 9,000 towers and Zain to sell their growing total of about 5,800 towers. Given that the regulatory body CITC has been promoting competition, such as through the introduction of new MVNOs into the market, it is expected that CITC will welcome the increased competition that one or more towercos would bring.

The benefits of a towerco approach, such as consolidation and economies of scale, are likely to be greatest to all parties if a single company is able to acquire both sets of towers. Whether this is possible will depend on the progress of the bidding process. A factor that may constrain towerco expansion across KSA is the ownership model of STC. STC is majority owned by the KSA Government and therefore is likely to have different strategic drivers to the privately owned Mobily and Zain. It also has the largest base of towers in KSA and could alter the dynamics of the market considerably. The outcome of the Mobily and Zain processes are not yet known at the time of writing.

**Conclusion**

The KSA mobile market is highly competitive, growing and has some of the highest rates of data use worldwide. According to the networks are highly developed and 4G penetration is or soon will be over 90% on all three networks. The market also serves less data intensive users. For these, 3G coverage is over 90% on all networks, over 95% on STC and Mobily, and the 100% 2G coverage is also likely to be required for some time to come.

Given the very competitive nature of the market and the technology investments needed to keep up with demand, measures to increase efficiency and improve balance sheets will be of great value. As a result the prospect of tower sharing, not hitherto present in this market on any scale, is now highly likely with bidding in progress for the tower assets of both Mobily and Zain. Whether this results in a single operator or two remains to be seen, though the efficiency gains are likely to be greatest with only one.

The opportunities for the towerco(s) in KSA differ from those in African regions where tower deals have been more frequently observed. In KSA the mobile market is more mature and the emphasis is increasingly on technology updates rather than coverage rollouts. Towerco opportunities therefore lie in consolidation and efficiency of operation. Nevertheless, the sustained high levels of data use also make this a lower risk investment, though again this is dependent on the bidding process.

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- World Factbook (CIA)
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- Mobily Annual Report 2014
- Zain Annual Report 2014
Meetup Europe 2016
12-13 April, London

Meetup Americas 2016
16-17 June, Florida

Meetup Africa 2016
19-20 October, Johannesburg

Meetup Asia 2016
13-14 December, Singapore

See you at our future events!

Guest columnist Marcus Dowdeswell

Marcus Dowdeswell is a Consultant in Mott MacDonald’s Digital Infrastructure practice, working with telecommunications operators, vendors and investors across the Middle East and Africa. Marcus has analysed tower markets across three continents and has recently been working as a Market Analyst on multi-million dollar mobile tower transactions in Africa and the Middle East, covering tens of thousands of tower assets. Marcus graduated with a BA in Business Finance and is an Associate Member of the Institute of Consulting.

TowerXchange’s analysis of the independent tower market in Asia

Selected Asian tower market size comparisons, Q3 2015

- **Afghanistan**: TowerXchange understands that Etisalat and MTN attempted to create a joint venture carve out towerco, under the management of IHS, but that IHS investors balked at the deal based on it being too far beyond their SSA-centric remit. FPS towers operates a tower portfolio in the country for Afghan Wireless.

- **Australia**: TowerXchange understands there are around 9,000 telecom towers in Australia, 74% of which remain operator-captive. The Macquarie-led consortium that acquired Crown Castle Australia and its 1,772 towers is finalising the restructuring and integration of the business. This was the first major tower transaction to take place in Australia for some time, but TowerXchange is actively tracking more than one towerco with an appetite to enter this market. Broadcast Australia also operates a portfolio of 620 towers, some of which are leased out to MNOs. There are a number of smaller towercos in Australia which could become acquisition targets in a rollup play.

- **Bangladesh**: edotco operates a network of 6,000 towers transferred from Axiata’s Bangladeshi opco Robi. The edotco portfolio is maturing fast with 11 different customers including six MNOs.

  #2 operator Bangalink’s ~6,000 towers are believed to be coming to market as part of VimpelCom’s passive infrastructure monetisation process.

  There are around 27,000 towers in Bangladesh, with around 1,000 new towers going up each year.

  A merger between Robi and Airtel Bangladesh has been under discussion, and the two parties are seeking approval from the government and regulator the BTRC which have been given a mandate to come to a final decision by March.

  While the BTRC advocates infrastructure sharing, a proposed change of law that would prohibit licensed MNOs from operating tower sharing companies would restrict options for Axiata-owned edotco and Airtel-owned Bharti Infratel.

- **Cambodia**: With a crowded operator market of five operators serving a population of 15.5mn, and a regulator that supports infrastructure sharing, there seems to be potential for the 9,000 site tower market in Cambodia to grow.

  There has been an influx of Chinese operators and vendors prepared to invest heavily in this market. Challenges still remain including 20% of sites being off-grid and the risk of landmines in the more remote areas.

  edotco operates a portfolio of 1,700 towers in Cambodia. Local tower builder Camtower Link...
## Tower deals in Asia 2008-2015 (excluding carve-outs)

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Tower count</th>
<th>Deal value US$</th>
<th>Cost per tower US$</th>
<th>Deal structure</th>
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<tr>
<td>2016*</td>
<td>India</td>
<td>Viom Networks</td>
<td>American Tower</td>
<td>42,200</td>
<td>$1,180,000,000</td>
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<td>Acquiring 51% controlling stake</td>
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<td>1,250</td>
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<td>3500</td>
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<td>$131,429</td>
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<td>$70,336</td>
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<td>STP</td>
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<td>$34,000,000</td>
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<td>Hutchison</td>
<td>Protelindo</td>
<td>3692</td>
<td>$500,000,000</td>
<td>$135,428</td>
<td>SLB</td>
</tr>
</tbody>
</table>

*Totals / average | 99,414 | $8,007,900,000 | $102,460

*American Tower has announced but not yet closed a deal to acquire a 51% stake in Viom Networks, also taking on some debt in a deal which creates an enterprise valuation of US$3.23bn thus a per tower valuation of US$76,540.
is also in the process of setting up operations as a towerco. Some operators in this market, such as Mfone, have fallen victim to the intense competition and price wars leaving some infrastructure assets abandoned.

For further insights into the Cambodian tower market, don’t miss our round-up of the Cambodia Round Table at the TowerXchange Meetup Asia 2015 later this issue.

**China:** China Mobile, China Unicom and China Telecom have completed the handover of their tower assets to the newly-formed China Tower Company (CTC). The three operators have handed over an estimated 1.16mn towers creating the world’s largest towerco which analysts have suggested is worth US$34-36bn. Unconfirmed reports suggest a further 500,000 legacy towers may be added to CTC in 2016. Equity is divided between China’s three MNOs with China Mobile holding 38%, China Unicom holding 28.1%, China Telecom holding 27.9%. The State’s involvement in pushing through China’s migration to a shared tower model is illustrated by the 6% of CTC acquired by China Reform Corporation, a kind of sovereign wealth fund with a particular focus on reforming state-owned enterprises. CTC are believed to be building toward a partial IPO as soon as 2017.

CTC will operate any backup power solutions at their sites, providing a full power service, and will build all the new towers – China’s MNOs will no longer build their own towers. Over a hundred thousand new BTS are already being managed through CTC – although reports suggest a number of those builds are being subcontracted to a rapidly growing independent towerco segment in China, which already numbers ~20,000 towers.

The potential consolidation from three to two operators in China would obviously have a significant effect on the country’s emerging tower industry.

For more insights into the Chinese market, see the roundup of the China Roundtable from the TowerXchange Meetup Asia later this issue.

**India:** 68% of India’s 400,000+ towers are owned and operated by towercos, making the Indian tower market second only to the U.S. in terms of penetration and longevity, and second only to China in terms of scale. The Indian tower market was adversely affected by the restructuring of MNO licenses in 2012, but has recovered and been boosted by ongoing waves of spectrum auctions and the associated rollout of 4G. Tower transaction deal flow continues to pick up as towers worth an estimated US$10.2bn are either under discussion for sale, or moving between announcement and close.

American Tower has announced the acquisition of Viom Networks (~42,200 towers, tenancy ratio 2.3) for US$3.23bn. American Tower Corporation’s existing 14,000 towers in India will be merged with Viom. American Tower Corporation will acquire

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**Estimated tower count for Bangladesh**

<table>
<thead>
<tr>
<th>Operator</th>
<th>Tower Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grameenphone</td>
<td>7,800</td>
</tr>
<tr>
<td>Banglalink</td>
<td>6,000</td>
</tr>
<tr>
<td>edotco</td>
<td>5,300</td>
</tr>
<tr>
<td>Airtel</td>
<td>3,800</td>
</tr>
<tr>
<td>Teletalk, CityCell and non-traditional MNOS</td>
<td>4,100</td>
</tr>
</tbody>
</table>

Sources: TowerXchange research, edotco, Hardiman Telecommunications
Indian tenancy ratios approaching and exceeding 2.0

Source: Quarterly and Annual Reports, TowerXchange research

Estimated breakdown of towers owned by Indian towercos

Source: TowerXchange research, quarterly filings, site lists

BSNL has received “in-principle” approval to carve out its estimated 65,000 towers into a separate
Indonesia: Indonesia remains one of the most mature tower markets in the world, with solid tenancy ratios, excellent organic growth, and strong market caps boasted by three major towercos; Protelindo (11,675 towers), Tower Bersama (11,154) and STP (6,690). IBS Tower, KIN, Retower, Persada Sokka Tama and Balitowers all also have some scale in Indonesia. There have been rumours that IBS Towers, which has some ownership links with its number one tenant Smartfren, could be coming to market. TowerXchange has upwardly revised its estimate of the total number of towers owned by Indonesia’s 30 smaller towercos to 4,000.

Disappointingly, Tower Bersama’s innovative share-swap acquisition of Mitratel now stands cancelled, owners Telkom having terminated the deal at the behest of the commissioner. The future of Mitratel and their 5,500 towers remains uncertain.

Telkom still has a further 17,615 towers on their balance sheet, of which 13,000 could potentially be sold at an unspecified point in the future. XL Axiata has plans to sell up to another US$500mn worth of towers to improve its balance sheet, and hopes to finalise this in 2016. XL Axiata are rumoured to retain around 6,500 towers. Indosat may also have an appetite to divest their remaining towers, totalling ~8,500, although it is not clear what the timeframe would be. Protelindo and Tower Bersama are holding firm against downward pressure on lease rates, which are believed to average around US$1,150 in Indonesia. However, 2015 may prove to be a slight down year in terms of BTS volume.

Meanwhile, the new battle ground for competition between Indonesia’s towercos seems to be microcells and fibre, as illustrated by Protelindo’s acquisition of iForte. STP also has substantial fibre and microcell portfolios, while Balitowers have also added substantial stock of smaller sites to their portfolio.

Malaysia: Towercos own 31% of Malaysia’s towers, led by edotco’s 3,600 towers carved out of Celcom...
Estimated tower count for Malaysia

- edotco: 3,600
- DiGi: 3,400
- Maxis: 3,800
- Telekom Malaysia: 1,000
- State backed towercos: 3,200
- YTL: 5,000
- Unaccounted for: 2,000

Source: TowerXchange

Malaysian commentators felt that the 2014 sale of one of the State-backed towercos, KJS, is an isolated incident, and that a substantial rollup of Malaysia’s smaller towercos is unlikely, given the alignment of political and personal interests it would require across the country. In 2016 and beyond, we expect the majority of new towers and special structures in the country to be built by edotco, which could also join YTL in a drive to rollup selected State-backed and independent towercos.

Driven by the rollout of LTE, around 1,000 new towers went up in 2016, with Celcom building through edotco and Maxis and DiGi building their own – although that may be about to change. The State-backed towercos also continued to expand, including new rural sites supported by Malaysia’s Universal Service Provision Fund. It has been estimated that an additional 8,000 structures may be needed in Malaysia for 4G, although much of that demand will be met by microcells, lamp-poles, DAS and IBS.

For more information on the Malaysian market, see our editorial later this issue.

Myanmar: The Myanmar tower count reached 7,470 by Q4 2015, approaching the half way point in the 17,300 tower rollout which is the total the
GSMA forecast the country would require to meet Telenor and Ooredoo's license obligations.

edotco has closed a deal to acquire a 75% controlling stake in Digicel Myanmar Tower Company (MTC). Yomas Strategic Holdings, part of Burmese finance and real estate tycoon Serge Pun’s empire, retained their minority stake. The transaction values MTC at an enterprise value of US$221mn. edotco’s acquisition sets a benchmark price per tower of US$176,800 in Myanmar. edotco has since stated its intent to invest US$200mn into Myanmar over the next five years, and is planning to construct 5,000 towers in the country in the next three years.

Phase three of the Myanmar tower rollout has seen a re-alignment of towerco-MNO partnerships, with IGT now building for Ooredoo – when we last checked in they had lit 1,500 of 2,900 contracted towers, making IGT Myanmar’s leading towerco. IGT recently secured a syndicated loan of US$122mn, forming part of the company’s US$230mn investment plan to deploy more than 2,000 towers in Myanmar. Apollo will be number two, with around 1,100 of 1,827 contracted towers for Telenor built by Q3 2015.

Telenor has signed a memorandum of understanding with Malaysia’s OCK Group and its local Myanmar partner King Royal Technologies for the construction and lease of more than 900 towers.

Myanmar Infrastructure Group (MIG) is a joint venture between majority shareholder Singapore Myanmar Investco (SMI) and Golden Infrastructure Group (GIG), a venture involving Dan Ryan’s Square1 Infrastructure. MIG had proved themselves building rooftops and poles in for both Telenor and Ooredoo in Yangon, as well as executing a substantial DAS project within Yangon’s airport, off the back of which they have secured a contract to build 503 towers in phase three of Ooredoo’s rollout. MIG has access to the capital markets via SMI’s Singapore stock exchange listing. MIG provides a full service tower+power proposition.

All the towercos in phase three of the Myanmar tower rollout are required to provide full service tower+power, a departure from phases one and two in which Ooredoo retained ownership of power assets. Ooredoo’s phase one and two towers, built by PAMEL and Digicel MTC, may be excellent targets for ESCOs.

A culture of infrastructure has yet to fully take root in Myanmar – Telenor and Ooredeo built a lot of parallel infrastructure in the country’s three biggest cities, but demand for infill sites to improve capacity and QoS, plus the economics of rural coverage, may see tenancy ratios climb above the current ~1.2 toward and beyond 1.3 by the year end on Myanmar’s healthiest tower portfolios.

Whilst tenancy ratio growth has been slower than anticipated, pressure is growing on lease rates and capex per site in Myanmar. The situation could be eased if and when Myanmar’s fourth operator is finally licensed; bidding for the fourth telecom license in Myanmar has taken place after a nearly four month delay with seven international companies participating. The successful applicant will receive a 15-year license and form a joint venture with a consortium of eleven local companies including Yatanarpon Teleport (YTP).

For a more detailed look at the Myanmar tower market, checkout the updated “Myanmar FAQs” later in this edition.

Nepal: The Axiata Group has reached an agreement to acquire TeliaSonera’s stake in mobile operator Ncell for US$1.03bn, continuing its expansion across Asia. There have been no tower deals in Nepal to date, but this move by the Axiata Group will likely pave the way for Axiata’s towerco edotco to enter the market in the near future.

Pakistan: An agreement was reached between VimpelCom (Mobilink), Global Telecom Holdings, Warid Telecom Pakistan and Bank Alfalah to merge their Pakistan telecom businesses and creating a new combined entity with 15,000 towers serving 45 million customers. Looking forward to the next potential tower deal, with upwards of 50% overlap between Mobilink and Warid’s networks, the necessity of decommissioning suggests the same towerco may have to acquire both portfolios. It remains to be seen whether edotco, Quippo or Towershare (the

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most likely bidders) have an appetite to invest the over US$1bn into Pakistani telecoms to acquire both Mobilink and Warid’s towers.

Etisalat’s Ufone are also believed to have commenced a process to monetise their Pakistani towers. The political context and operational challenges of Pakistan seem likely to preclude the participation of U.S. listed and U.S. funded towercos in Pakistani tower divestiture processes.

We have been unable to confirm speculation that #2 MNO Telenor may bring their Pakistani towers to market too, but they have recently reached an agreement with China Mobile Pakistan (Zong) to share their fibre-optic network assets.

There is some growth potential in a Pakistani tower market with 3G only launched in late 2014, with 138m subscribers and five competitive MNOs, but there may also be some need for decommissioning of parallel infrastructure.

Sri Lanka: Dialog has transferred 2,150 towers to edotco, and Bharti Infratel are again believed to be interested in entering the market. High levels of bi-lateral sharing means tenancy ratios are closer to two than one. 4G driving need for cell site densification. There are around 7,000 towers in Sri Lanka.

Deal activity in the Sri Lankan tower market may be picking up with Bharti Airtel reportedly looking into selling its 2,500 towers. Bharti Airtel has not confirmed the deal, but it would be in line
with their strategy of eliminating less profitable operations.

Thailand: Thailand has a tower market unlike any other in the world! Joint venture towercos are being established as vehicles for the resolution of long standing BT0 (Build-Transfer-Operate) disputes. Thailand’s three commercial MNOs were due to transfer 2G infrastructure back to SOEs CAT and TOT. The 2G equipment has little value, but of course the towers do. CAT, which ran the concessions for the 850 and 1,800 MHz bands, is reportedly in the final stages of forming a 49-51% JV towerco with majority stakeholder DTAC, into which 11,000 disputed towers would be injected. Negotiations to create a prospective 12,000 tower JV towerco between AIS and TOT, which ran the 900 MHz concession, were called off late in 2015.

We reckon there are 47,483 towers in Thailand, of which 12,183 sit on the balance sheet of DIF, formerly TRUEGIF, a towerco created by True Corp and SCB Asset Management and successfully listed on the Thai stock exchange. DIF has little debt, a high leverage ceiling, and an appetite to consolidate more Thai towers - especially if True reduces their shareholding to increase the perceived independence of the entity.

A further 10,000 towers were built by AIS and 800 by DTAC outside the concession for 3G usage. True’s non-concession towers sit on DIF’s balance sheet... It all gets very confusing! Read AEC Advisory’s excellent “A guide to the Thai telecom tower market” in TowerXchange for a detailed understanding.

The important question is: are Thailand’s telecom towers investible? The steady leaseup of DIF’s towers is a good sign, as is the recent 2,000 site infrastructure sharing deal announced between AIS and DTAC - a culture of infrastructure sharing is slowly emerging in Thailand. With 4G auctions imminent, we are cautiously optimistic about the investibility of Thai towers, as long as investors have the stomach for politics and don’t mind a 49% FDI limit.

Vietnam: Towers are being built and co-locations added more quickly in the 55,000 Vietnamese tower market than in Myanmar! But it’s a complicated ecosystem. A fragmented group of around 30 local towercos own ~10,000 towers. Alcazar Capital’s Golden Towers has embarked on a rollup play. Meanwhile the restructuring of Vietnam’s Ministry owned #2 and #3 ranked MNOs MobiFone and VNPT could unlock a decent sized sale and leaseback opportunity in the mid-term - at the very least, VNPT will be even more incentivised to co-locate as they had historically relied on MobiFone’s network. Even market leaders Viettel appear to have warmed to the idea of co-location. 4G spectrum in the 2.3 and 2.6 GHz bands, together with refarmed 900MHz spectrum, is expected to be auctioned in 2016.
Asia heatmap

Legend

- **Blue** TowerXchange research has not revealed any infracos or towerco's to date
- **Green** Towercos or infracos active in the market. No recent transactions have taken place and none rumoured to take place soon
- **Yellow** Towercos or infracos active in the market. No current transactions taking place but an attempted tower sale has taken place in the last 3 years or there are unconfirmed rumours of a deal in this market.
- **Orange** Towercos or infracos active in the market. Rumours of deals confirmed in the market.
- **Red** Towercos or infracos active in the market. Deals of significant size have taken place in the last 5 years.
- **Dark Red** Towercos or infracos active in the market. Deals have taken place in the last year and more imminent deals rumoured

Note: Russia is covered under Europe; we estimate it to have a 5% towerco penetration and we expect it to be a growth market.

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16-17 June, Florida

Meetup Africa 2016
19-20 October, Johannesburg

Meetup Asia 2016
13-14 December, Singapore (tbc)

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Snapshots of the Asian mobile markets where towercos are less active

Tower counts and commentaries on under-developed or dormant Asian tower markets

Figure one: Estimated tower counts

Excluding Russia and the CIS, which we include in our European analysis, TowerXchange estimate that there are 2,205,708 telecom towers in Asia, 53% of which are in China and 20% in India. Towercos own 71% of Asia’s towers, but the picture is significantly distorted by the high towerco penetration in China (100%) and India (68%). In this analysis we look at the relatively untouched tower markets in Asia, finding some virgin towerco markets that might be a good fit for the independent towerco business model.

**Afghanistan:** There are five licensed 3G MNOs in Afghanistan; Etisalat, MTN, Roshan, Aftel and AWCC. Security obviously remains a key issue for local towerco Frontier Tower Solutions, who have built or manage around 1,200 towers for AWCC, while there were rumors that MTN and Etisalat approached IHS about operating a shared towerco in Afghanistan, but the deal fell outside IHS’s investors’ remit. There are over 20mn subscribers and over 90% population coverage in Afghanistan. The local MCIT shares annual tower count data as seen in figure two.

**Bhutan:** GSMA Intelligence report that Bhutan has 676,400 SIMs among a population of 779,500, which still represents formidable growth for a market only liberalised in 2008. The mobile market is a duopoly between market leaders B-Mobile (Bhutan Telecom) and TashiCell, which launched in 2008. A 3G rollout has been ongoing nationwide since 2008, with LTE being deployed in Thimpu by B-Mobile. Infrastructure sharing has been mandated by the Bhutan InfoComm and Media Authority (BICMA) since September 2015, although some limited tower

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**Keywords:** Afghanistan, Asia, Asia Research, Bhutan, Brunei, Japan, Laos, Mongolia, Nepal, New Zealand, North Korea, Oceania, Papua New Guinea, Research, Singapore, South Korea, Tower Counts, TowerXchange Research

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**Read this article to learn:**
- Estimated tower counts for Afghanistan, Brunei, Japan, Laos, Nepal, New Zealand, North Korea, Mongolia, Papua New Guinea, Singapore and South Korea
- Commentary on the mobile market in each country
- TowerXchange’s tower count research methodology
sharing had taken place prior to the regulator getting involved.

Brunei: Another very small market with a duopoly, this time dominated by DST with Progresif Cellular having acquired B-Mobile in 2014. There were 521,000 connections and a SIM penetration rate of 122% at the end of 2015 according to GSMA Intelligence. The Brunei Times quoted Brunei’s Minister of Communications stating that there were 235 network towers in the country in March 2015, 151 belonging to DST and 84 belonging to Progresif Cellular, which is believed to be building relatively aggressively, hence our current estimate of 250 towers in Brunei.

Japan: Japan is one of the most sophisticated mobile markets in the world. Yet towers are still seen as a source of competitive differentiation, which perhaps explains why initial interest in carving out a towerco a few years ago seems to have tailed off, and why tower count data is so hard to find – readers should consider our estimate a very rough guide. Japan is famous for having the fewest number of subscribers per tower in the world – reportedly around 500 – suggesting a staggering tower count of around 220,000 for a nation of 127mn people and a landmass of just 378,000 sq km. LTE was launched as long ago as 2011 by former State owned monopoly NTT DOCOMO and in 2012 by the nation’s other MNOs, SoftBank and KDDI (au). DOCOMO has already started rolling out LTE-A. Japan’s three leading MNOs are believed to have each added up to 30,000 microcells and small cells as infill sites. TowerXchange understand several tower companies are trying to establish themselves in the Japanese market, but that their penetration remains negligible.

Laos: According to the World Bank, Laos has the lowest population density in the ASEAN region (29 per sq km) and a notably mountainous terrain, which presents obvious challenges for mobile network planning. Market leader Unitel, backed by Viettel, claims to have 3,100 2G and 3G base stations, but other clues to Laos’ tower count are few and far between. The country is home to four MNOs (Unitel, ETL, Lao Telecom’s M-Phone, and Beeline, from which Vimpelcom are seeking to exit) who between them have achieved 75% population coverage and a little over 5mn subscribers among a population of 6.8mn. 3G coverage is fairly widespread, 4G largely limited to capital city Vientiane.

Mongolia: Infamously the most sparsely populated country in the world, yet almost half of Mongolia’s 2.9mn citizens live in Ulaanbaatar, where the network is sufficiently developed that small cells were installed as long ago as 2013. ARPU is around US$6. Outside of the capital, Mongolia is home to a dispersed in some cases nomadic population with
typical rural coverage challenges. Telecoms were liberalised in the mid nineties and the country is now home to a competitive mobile market led by Mobicom (39%) and Unitel (36%), followed by Skytel (14%) and G-Mobile (11%) with 34% of subscribers on smartphones and 26% of subscribers on 3G (statistics courtesy of the Communications Regulatory Commission of Mongolia, 2014). 3.5G is available in most provincial capitals, and LTE spectrum auctions are expected within a year. With 4.5mn subscribers, subscriber penetration is around 150%.

**Nepal:** Ncell and Nepal Telecom have 46% market share each (NTA, August 2015) in a five MNO market with a well funded sixth MNO launch by the Chaudhary Group imminent. TeliaSonera has reached agreement to sell their majority stake in Ncell to Axiaita, which may herald the entry of Axiaita’s fast-growing towerco edotco into Nepal within the next year. SIM penetration is 93% in this 28.7mn population country (statistics again courtesy of GSMA Intelligence, from Q4 2015).

TowerXchange estimate there are around 6,000 towers in Nepal. The GSMA’s Mobile for Development study for Ncell (http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/10/NCell-report-October-2015.pdf) revealed 90% population coverage but only ~40% geographical coverage in Nepal. The same report called attention to Nepal’s unreliable grid, with nearly a third of the country’s 5.4mn households off grid. Of Ncell’s 2,378 towers, 156 were off-grid at the time of the report (September 2015).

**New Zealand:** We've heard two credible reports of prospective towerco activity in New Zealand, so don’t expect this ~4,000 tower, 6mn subscriber market to be dormant for long. 2degrees (Trilogy) has around 1,000 of those towers, Vodafone New Zealand and Spark about half each of the remainder. LTE is offered by all three MNOs. New Zealand’s US$175mn Rural Broadband Initiative (RBI) has accelerated investment in towers, targeting coverage in all communities with greater than 300 inhabitants. Under the RBI Vodafone had added 104 new towers and upgraded 305 others by Q2 2015.

**North Korea:** Mobile telephony remains limited to affluent members of society, with penetration at around 11%. Orascom Holdings has a 75% stake in Koryolink, which launched in 2008 and which seemed to be the sole MNO in in North Korea until the recent licensing of ISP Byol, with which Orascom is attempting to merge. The complexity of that proposed transaction recently prompted Orascom to deconsolidate Koryolink, making it an associate rather than a subsidiary. Telegeography suggested in 2014 that Koryolink’s 3G network had 90% population coverage, but mid-teens geographical coverage. There remains almost no prospect of international tower company investment given sanctions and the near impossibility of repatriating funds. TowerXchange estimate there may be just 600 towers in North Korea.

**Philippines:** The world’s eighth biggest mobile market, with around 100mn subscribers, the Philippines became a virtual duopoly in 2011 with PLDT’s acquisition of Digitel, merging it with their Smart mobile operation which then had around 13,000 base stations. A third MNO may soon enter the market: Aussie market leader Telstra in a JV with San Miguel Corp’s (SMC) Vega Telecom, which has been rolling up telecom assets in the Philippines. The opportunity to accelerate time to market for a new entrant would amplify the attractiveness of the Philippines to towercos.
The opportunity to accelerate time to market for a new entrant would amplify the attractiveness of the Philippines to build-to-suit-centric towercos, but family ownership and fierce competition between incumbent MNOs means their towers are unlikely to come to market.

We haven’t found any hard data on PLDT / Smart’s tower count, but bearing in mind that the entity is the market leader by a significant margin, combines two networks, has achieved almost 90% 4G coverage with LTE-A being selectively overlaid since 2014, we conservatively estimate Smart’s tower count at 11,000. Globe are more transparent about tower counts, stating that they had 6,227 cell sites in their most recent annual report, with a reported 4,300 new cell sites currently being deployed for LTE. The currently dormant Express Telecoms and Liberty Telecoms’ Wi-Tribe Asia, both controlled by SMC, may account for several hundred more towers, indeed Liberty Telecoms themselves had considered leasing out their 500 base stations in metro Manila.

**Singapore:** Singapore’s macro tower network is supplemented by a substantial IBS and small cell deployments to boost LTE network capacity. According to the iDA there were 8,166,100 mobile subscriptions in the city-State in August 2015, representing 149.3% penetration. Outdoor 4G coverage is approaching or above 99%, while all three of Singapore’s existing MNOs – SingTel, M1 and StarHub – are making rapid progress upgrading to LTE-A. There is stiff competition for Singapore’s fourth MNO license, expected to be awarded in Q1 2016: ISP MyRepublic is trialling 4G and promising unlimited data plans, while facing competition from Circles Asia and OMGtel. A public sector network could also provide opportunity to add tenancies to Singapore’s existing towers, although TowerXchange are not aware of any commercial towercos operating in the city-State.

**South Korea:** According to GSMA Intelligence, SIM penetration was at 113% among a population of 50.4mn in Q4 2015. South Korea boasts one of the most sophisticated telecommunications infrastructures in the world, cultivating an insatiable demand for high speed mobile broadband among its citizens. Mobile broadband penetration in South Korea is above 99% and fibre has been widely deployed. South Korea is a three operator market featuring SK Telecom, KT and LG Uplus, while the Ministry of Science, ICT and Future Planning (MSIP) has announced intention to license a fourth MNO. South Korea was the first market in the world to migrate the majority of users to LTE, with LTE-A rollout now well under way. TowerXchange are starting to pick up the first faint signals that towerco activity may be emerging in South Korea.
Asia News

edotco, CTC, AMT, RTIL and other towercos making headlines

Bangladesh: Public hearing on proposed Robi-Airtel merger requested, and deadline set

The Prime Minister of Bangladesh’s ICT affairs adviser has directed the telecom regulator to take a public opinion poll before making a final decision on the proposed merger between Robi and Airtel. A high court bench has now given eight weeks on 26 January for the government and the telecom regulator to reach a final decision. The BTRC has six weeks to give a final opinion after which the government will have two weeks to make its final decision.

China: Handover of assets to China Tower Company completed

China Mobile, China Unicom and China Telecom have completed the handover of their tower assets to the newly-formed China Tower Company. The three operators have handed over an estimated 1.2 million towers creating the world’s largest towerco worth an estimated US$34bn. The three companies have been allocated shares in the new company with China Mobile holding 38%, China Unicom holding 28.1%, China Telecom holding 27.9%.

China: Alibaba and Tencent showing interest in China Tower Company

Chinese internet companies Alibaba and Tencent are rumoured to be interested in acquiring a stake in China’s state-owned China Tower Company (CTC). Other interested investors include Blackstone and Goldman Sachs via its advisor China International Capital Corporation (CICC). China Tower Company is said to be looking to sell a 20% stake that could raise up to US$9.7bn, and is looking to list the company on the market in 2017.

China: Miteno and Q Towers added to TowerXchange advisory board

As TowerXchange continue to explore the possibility of hosting a TowerXchange Meetup for China, we are grateful for the ongoing support of Zhiying Zhang, Chairman and President of Beijing Miteno Tower Company Limited (“Miteno”), and Ted Zhong, CEO of Q Towers International. Both gentlemen have been appointed to the TowerXchange ‘Inner Circle’ informal advisory board. Miteno has around 1,000 and Q Towers 120 independently owned towers in China, and they are two of the most active members of a growing segment of independent towercos in China who own over 10,000 towers between them.

India: American Tower acquisition of Viom Networks approved

The Competition Commission of India (CCI) has approved the sale of a 51% stake in Viom Networks to American Tower Corporation for US$ 3.23bn. Viom Networks owns and operates approximately 42,200 towers and has another 1,000 mobile masts under construction. As a pre-condition of the deal, American Tower Corporation’s existing 14,000 towers in India will be merged with Viom. American Tower Corporation will acquire stake from the other shareholders including 18.5% from SREI, and some shares from Tata Teleservices, GIC, Macquarie, Oman Investment Fund and IDFC Private Equity.

India: Reliance Communications to sell Reliance Infratel

Reliance Communications announced last December that it had signed a non-binding exclusivity agreement valid until 15 January to sell Reliance Infratel to Tillman Global Holdings and TPG Asia. The exclusivity agreement has been extended by 15 days to resolve some issues so that a conclusive agreement can be reached. Rcomm is
said to be making this US$3.21bn sale to decrease its debt which stands at US$5.97bn. Tillman Global Holdings and TPG Asia are also evaluating the potential acquisition of Rcomm’s 190,000km fibre optic network.

**India: Reliance Communications, Aircel and Sistema discuss merger**

RCom, Aircel and Sistema are in talks to create a new combined entity that could offer 3G services in 18 circles and launch 4G services on the 2300 MHz band in eight cities in India. The new entity would combine the assets of the three companies into a new US$ 5.22 bn entity. The talks began in late December and are set to last 90 days. Obstacles to the deal include regulatory limits on the amount of spectrum allowed to a single company, and the heavy debt burden of RCom and Aircel.

**India: Reliance Jio employs green towers to counter public opposition to deployments**

Reliance Jio Infocomm has developed state-of-the-art green towers that operate on lithium-ion batteries and are designed to consume only 600-700 Watts, 75% lower than most conventional towers currently used. The towers are also built to rise 25m to 30m above the buildings and streets below to reduce the exposure to radiation. The towers also have a small footprint and can be used to mount lighting, security cameras, and equipment for public messaging. Reliance plans to deploy over 100,000 of these towers over the next three years to support its planned launch of 4G services in March.

**India: Ascend Telecom to merge with ROI Acquisition Group**

Ascend Telecom Holdings Limited (“Ascend Holdings”) and ROI Acquisition Corp. announced a merger agreement for a business combination transaction. Ascend Telecom Infrastructure is to become an indirect wholly-owned subsidiary of Ascend Holdings and ROI stockholders will exchange their shares of ROI common stock for ordinary shares of Ascend Holdings on a one-for-one basis. The proposed deal was amended in October in response to market volatility in the equity markets of emerging economies. The aim of the agreement is to provide Ascend Holdings access to U.S. capital markets as it embarks on its next phase of growth in order to meet the increasing demand for mobile voice, data and information in India.

**India: New Chief Executive Officer-Designate at Indus Towers**

Bimal Dayal, COO of Indus Towers has been promoted to Chief Executive Officer -Designate. Dayal is taking over from outgoing CEO B.S. Shantharaju who is retiring after six years with Indus Towers. Dayal has 28 years of telecoms industry experience and has worked with companies such as Ericsson, Qualcomm and Tata Telecom. Bimal is a member of the TowerXchange ‘Inner Circle’ informal advisory board.

**Indonesia: Controversy over allowing foreign ownership of assets in Indonesia**

There is an ongoing debate about permitting foreign investors to enter the tower business in Indonesia. The Minister of Communications and Information Technology (MCIT) Rudiantara confirmed that there has been no formal discussion on the subject and that it would be a cross-ministry matter, and at this point the building of towers remains closed to foreign investors. Local companies fear that the entry of foreign investors would lead to increased competition and local players could be pushed out, and the proposed change is facing resistance.

**Indonesia: Protelindo and Tower Bersama interested in IBS Tower**

Both Protelindo and Tower Bersama have reportedly expressed interest in acquiring PT Inti Bangun Sejahtera, Tbk (IBS), however no formal bidding process has started at this point. IBS has 2,000 towers, but with a relatively low tenancy ratio, having one major client, Smartfren. There are strong ownership links between IBS Tower and Smartfren.

**Indonesia: XL Axiata reduces losses by 40%, and plans another infrastructure sale**

XL Axiata announced that measures taken by its management team last April have enabled the company to trim its losses by 40% to US$37.1mn. The end results were also impacted by forex losses due to the strengthening of the US$. The company is
also looking to increase its balance sheet by selling up to US$500mn worth of its infrastructure assets, and hopes to conclude the sale by the end of 2016. Furthermore, XL Axiata says it is continuing to invest in its networks and services, spending IDR3 trillion in the first nine months of this year. With a strong emphasis on mobile broadband, XL deployed almost 18,000 3G base stations in 9M15, and boosted the number of 4G sites to 1,018, taking its overall total to 56,300 base stations by the end of the period under review.

**Indonesia:** Indosat Ooredoo and XL Axiata launch network cooperation to increase 4G coverage

Indosat Ooredoo and XL Axiata announced that they will share infrastructure for 4G through MORAN (Multi Operator Radio Access Network). The deal, which had been in negotiation for two years, will include the companies’ existing 4G network in cities including Banyumas, Surakarta, Batam and Banjarmasin. This marks the first instance of network sharing in Indonesia.

**Malaysia:** Axiata obtains funding from the sukuk market to support acquisitions

The Axiata Group has negotiated a US$500 mn sukuk to help fund recent acquisitions in Myanmar and Nepal. The five year deal was priced at a rate of 3.466%. The deal is an important one for Axiata and will create a benchmark for future US dollar issuances. This is the first sukuk that Axiata has obtained since a one billion renminbi offering in 2012.

**Malaysia:** CSMO of edotco receives industry award

Wan Zainal Adileen Puteh, Chief Sales and Marketing Officer of edotco, was recognised as one of the “100 Most Influential Marketing Leaders” at the World Marketing Congress in Mumbai. The award celebrates the best marketing leaders from top organisations, identified based on a combination of marketing competencies, strategic perspective, track record, integrity, ethics, and their commitment to sustainability.

**Malaysia:** edotco launches unique mobile cell site

The edotco Mobility Solution (eMOS) is a mobile cell site consisting of a cellular antenna tower and electronic radio transceiver equipment, and is used to provide extended cellular network coverage for short-term demands in areas where cellular coverage and capacity is minimal, was never present or was compromised by natural disaster.

**Malaysia:** edotco extends footprint to Myanmar with acquisition of MTC

edotco has closed a deal to acquire a 75% controlling stake in Digicel Myanmar Tower Company (MTC). The transaction values MTC at an enterprise value of US$221mn. Minority shareholder Yoma Strategic Holding will retain their 25% stake, giving edotco a connection with...
Burmese tycoon Serge Pun who has invaluable local real estate and financial connections. The deal brings edotco’s tower count to 16,450 and extends their footprint to include Malaysia, Bangladesh, Cambodia, Sri Lanka, Pakistan and now Myanmar. edotco’s acquisition sets a benchmark price per tower of US$176,800 in Myanmar. While this is a considerably higher price than India, where towers changed hands for an average of US$114,301 between 2009 and 2015, lease rates in India are typically just US$600 whereas in Myanmar lease rates range from US$1,400 to US$1,700, driven by relatively high opex. edotco has since stated intent to invest US$200mn into Myanmar over the next five years, and planning to construct 5,000 towers in the country in the next three years.

**Myanmar: Seven companies bid for Myanmar’s fourth telecom license**

Bidding for the fourth telecom license in Myanmar has taken place after a nearly four month delay. The Ministry of Communications and Information Technology declined to share the names of the bidders. The successful applicant will receive a 15-year license and form a joint venture with a consortium of eleven local companies including Yatanarpon Teleport (YTP). The consortium will retain a 51% share of the joint venture and the foreign partner will hold a 49% share.

**Myanmar: IGT acquires loan of US$122mn to support network deployment in Myanmar**

Irrawaddy Green Towers has secured a syndicated loan of US$122mn, forming part of the company’s US$230mn investment plan to deploy more than 2,000 towers in Myanmar and provide coverage to 14 million people. The Netherlands FMO arranged a subordinated loan of US$13m via its Infrastructure Development Fund, and a senior loan of US$109mn was provided by Deutsche Investitions und Entwicklungsgesellschaft (DEG), France’s Proparco, CDC Group (UK), the Belgian Investment Company for Developing Countries (BIO) and Austria’s Oesterreichische Entwicklungsbank (OeEB).

**Myanmar: Telenor Myanmar signs MoU with OCK Group and King Royal Technologies**

Telenor Myanmar signed a memorandum of understanding with Malaysia’s OCK Group and its local Myanmar partner King Royal Technologies for the construction and lease of more than 900 towers. Telenor has enlisted new tower companies to expand its supply chain and enable it to reach the coverage required by its license, 90% of the country, within five years. Telenor had built 3,700 sites in 13 states and regions in Myanmar as of December and has estimated that 9,000 sites will be needed to provide the necessary coverage.

**Nepal: Axiata Group acquires Nepal MNO Ncell**

The Axiata Group has reached an agreement to acquire TeliaSonera’s stake in mobile operator Ncell for US$1.03bn, continuing its expansion across Asia. Axiata will acquire 60.4% stake in the company, and TeliaSonera will also receive an additional US$48mn after dissolving economic interests in a 20% stake in the company owned by a local ownership structure in compliance with local laws. Axiata will then pay approximately US$335mn to acquire SEA Telecoms stake, giving it a total 80.4% stake. Axiata has cited Ncell as both a rare and opportunistic expansion of its footprint in South Asia due to its sizeable, high quality assets and number one market leadership position. TowerXchange expect Axiata’s entry into Nepal to herald edotco entering the market in 2016.

**Pakistan: Towershare selects Qowisio for RMS**

MENASA-focused towerco Towershare, currently the largest independent tower sharing company in Pakistan, has installed Qowisio products to monitor their sites 24/7/365 from their NOC. “This transaction is key to our growth plans and commitment to remaining the leading tower company in the region,” said Jonas Thessén, CTO of Towershare. “The ability to remotely access and collect data regarding the operation of each tower site and react in real time to any alarms is extremely important to consistently meeting and exceeding our customers’ expectations on availability.”

“Towershare and Qowisio share the same vision of having a scalable infrastructure and providing simplicity in terms of installation, usage and maintenance. Qowisio is proud to support Towershare with the most innovative and reliable RMS solution based on fully wireless equipment to meet those high level expectations,” added
Guillaume Houssay, General Manager of Qowisio.

**Pakistan: Etisalat looking into sale of towers in Pakistan**

Etisalat’s Ufone is said to have started to look for buyers for its towers in Pakistan. Ufone is the fourth largest MNO in the country, and has several potential buyers interested including edotco. Etisalat has owned Ufone since PTCL’s privitisation in Ufone has a market share of 18% of Pakistan’s mobile subscribers and a network encompassing 10,000 locations.

**Pakistan: VimpelCom and Global Telecom Holding combine Pakistan telecom business with Warid Telecom**

An agreement was reached between VimpelCom, Global Telecom Holdings, Warid Telecom Pakistan and Bank Alfalah to merge their Pakistan telecom businesses and creating a new combined entity serving 45 million customers. This is the first merger in the mobile telecommunications sector in Pakistan and it will allow Mobilink and Warid to increase the availability of high-speed services. Mobilink will first acquire 100% of Warid’s shares and then the parties intend to merge Warid into Mobilink. The transaction is expected to close by late May subject to obtaining approvals from the relevant authorities in Pakistan and the satisfaction of the necessary closing conditions.

The closure of the transaction may precipitate one or both parties selling their towers to reduce debt, indeed Mobilink’s process is under way. With upwards of 50% overlap between Mobilink and Warid’s networks, the necessity of decommissioning suggests the same towerco may have to acquire both portfolios. With around 15,000 towers on the two MNO’s balance sheets, and assuming a per tower valuation similar to the US$76,540 Southern Asia benchmark recently established by the American Tower-Viom Networks deal, the question must be, do edotco, Quippo or Towershare (the most likely bidders) have an appetite to invest the over US$1bn into Pakistani telecoms to acquire both Mobilink and Warid’s towers?

**Pakistan: VimpelCom receives first offers for its Pakistani towers**

VimpelCom has reportedly received the first offers for the divestment of its tower portfolios in Pakistan and Bangladesh. The company had long been rumoured to be looking to divest its tower assets in these markets to reduce debt and focus resources on other markets.

**Pakistan: Telenor and Zong to share fibre-optic networks**

Telenor Pakistan and China Mobile Pakistan (Zong) have signed an agreement to share their fibre-optic networks. The agreement allows access to hundreds of kilometres of deployed fibre, and will enable the companies to meet rising demand for mobile data services while improving transmission capacity and reducing costs.

**Pakistan: Pakistan reached nearly 16 million mobile broadband connections in August**

There were a total of 15.8 million mobile broadband users in Pakistan in August 2015, representing a penetration of 13%. Over 1.1 million subscribers were added in the month of August alone with Telenor adding 395,000 customers, Zong adding 395,000, Mobilink adding 74,000, Ufone adding 343,000 and Warid Telecom adding over 18,000 4G connections.

**Sri Lanka: Dialog Axiata denies agreement to acquire Bharti Airtel Lanka**

Dialog Axiata has stated that it has not entered into a merger acquisition deal with Bharti Airtel Lanka, contrary to rumours circulating in November 2015. Dialog stated that it is evaluating opportunities for organic and inorganic growth, and that it will make a disclosure should it reach material certainty. Bharti Airtel Lanka operates 2,500 towers and provides 2G, 3G and 3.5G services.

**Thailand: Potential partnership between TOT and AIS under discussion**

TOT has set up a bid for a partnership to provide mobile services on its cellular infrastructure, including LTE services, and AIS is likely to be the partner. Under the proposal TOT will rent 80% of its mobile network capacity to AIS leaving the remaining 20% free to be leased to other companies.
Reliance Communications moves closer to the sale of Reliance Infratel

Sanjiv Ahuja’s Tillman Global Holdings and TPG team up to acquire Reliance Infratel for a reported US$3.3bn

The pace of potential major transactions in India continues with Reliance Communications’ announcement this week of the pending sale of Reliance Infratel, which owns India’s third largest tower portfolio (~52,000 towers), also the fourth largest in the world. The process of finding a buyer began midway through the year as Reliance Communications looked for options to decrease its debt and improve cash flow to support infrastructure rollouts and bids for 4G spectrum.

Keywords: 3G, 4G, Acquisition, Apollo Towers, Asia, Asia Insights, Bharti Airtel, Bharti Infratel, Deal Structure, Eaton Towers, Editorial, India, Investment, LightSquared, LTE, Market Overview, News, Orange, Private Equity, Rcom, Reliance Infratel, Spectrum, Staghorn Infrastructure, TDF, Tillman Global Holdings, TPG, Valuation, Vodafone

Read this article to learn:
- The details of the proposed sale of Reliance Infratel
- The motivating factors behind the sale
- Which companies are making the acquisition
- What to expect next in the Indian market

Reliance Communications entered a non-binding exclusivity agreement with Tillman Global Holdings and TPG Asia for the sale of RCOM’s Indian tower portfolio and related infrastructure. This was extended to the end of January, and the market is still waiting for further updates. According to RCOM’s press release, the new entity would be 100% owned by Tillman and TPG, and RCOM would continue as the anchor tenant under a long term MSA to maintain its nationwide footprint. Due diligence on the tower assets and the regulatory approval process are still ongoing. There is also a separate discussion regarding the acquisition of RCOM’s nationwide inter-city and intra-city fibre assets by Tillman and TPG in a separate transaction.

According to RCOM’s announcement the sale of Reliance Infratel is to have an enterprise value of Rs 22,000 crore (US$3.3bn), however with a significant amount of debt to be transferred to the new entity, the capital outlay for TPG and Tillman will be much lower. The recent sale of Viom Networks to American Tower Corporation has provided a new benchmark for the valuation of towers in India, but Reliance Infratel's tenancy ratios are estimated by TowerXchange at 1.84 which lags that of Indus Towers and Viom Networks which are both over 2.0.

Rcom currently owns a 96% share in Reliance Infratel; the remaining 4% is owned by other investors including George Soros’ Quantum (M), NSR Partners, Galleon, HSBC Daisy Investment (Mauritius), Drawbridge Towers, and Investment Partners B (Mauritius).
Rcom will maintain its tenancy on the towers in this portfolio to keep its all-India footprint as it continues to expand its services. Reliance Jio is the primary second tenant, with rumors that they had secured a discounted lease rate prompting a suggestion this may be offset by an elevated anchor tenant leaseback rate.

A look at the buyers

Tillman Global Holdings was created in 2013 by Sanjiv Ahuja, Founder and Chairman of Apollo Towers Myanmar and until recently Chairman of Eaton Towers. Previously Ahuja served as CEO and COO of Orange from 2003 to 2007, and as Chairman of LightSquared. TGH’s subsidiaries also include Staghorn Infrastructure, a new US tower builder, operator and ground lease aggregator; JC Decaux-Link, a market-leading shared small-cell infrastructure provider; and Tillman Green, which builds renewable green energy solutions.

TPG has experience in the telecoms sector including the acquisition of the French towerco TDF in 2006 which it later sold in 2014, and the backing of Apollo Towers infrastructure rollout in Myanmar. This is TPG’s first major telecoms transaction in India, but it has invested in other sectors in this market including health and retail. TPG currently has US$74.3bn in capital under management.

Overview of the Indian market

The Indian telecoms market is the second largest in the world with 941mn mobile connections. There are an estimated 450,000 towers deployed in India, providing coverage of 90% of its geography. 70% of these towers are currently operated by towercos, and the prevailing tenancy ratios of India’s five largest towercos are around 1.7, with many towercos having ratios at 2.0 or above. India’s cellular operators and towercos have built an average of 50,000 new towers per year to keep pace with the growth of data services in the Indian market. It is estimated that operators and towercos will need as many as 600,000 new points of service (combining new towers and co-locations) to meet the growing demand for 3G and 4G.

Spectrum auctions

The race for spectrum is having a major impact on this market with Indian operators spending close to US$50bn on auctions over the past four to five years; these auctions are ongoing and expected to continue until 2018-2019. Rcom has expressed strong interest in gaining ground in the competition to deliver 4G services in India.

It is now confirmed that the sale of Reliance Infratel has been planned to reduce Rcom’s debt which stood at nearly US$6bn at the end of 2014, and to free resources for future service development. Rcom is in fierce competition for spectrum with the top three Indian carriers: Bharti Airtel, Vodafone India, and Idea Cellular and they invested heavily in the latest auctions, having made bids worth Rs 4,299 crore (US$671mn) with an upfront payment of Rs 1,106 crore (US$172mn) to become the first Indian carrier with a nationwide 800MHz footprint for future 4G rollouts. Reliance Communications also entered an agreement to share spectrum in the 800MHz band across seven of India’s telecoms circles with Reliance Jio which will further boost its footprint.

What to expect next

The Indian tower industry will also be looking out for the next major tower transaction in 2016, with the proposed creation of a new carved out tower company with an estimated 64,500 towers by BSNL expected to be in the works. BSNL’s towers have a low tenancy ratio at 1.1 but are in highly desirable locations, meaning the towerco could be another valued above US$3bn.
Moody’s perspective on the sale of Reliance Infratel

How Reliance Communications’ tower sale will boost its financial and liquidity profiles

Reliance Communications Limited’s (RCOM, Ba3 with a stable ratings outlook) planned sale of its towers and related assets is credit positive because it will significantly improve the company’s financial profile.

Specifically, the proceeds will help substantially lower the company’s adjusted debt over the next 12 to 18 months and, in turn, its debt leverage and near-term refinancing risks, given its publicly stated intention to use the entire amount to lower debt.

The sale of the towers, which are owned by RCOM’s subsidiary, Reliance Infratel Limited (RITL, unrated), to two investment companies – Tillman Global Holdings, LLC (unrated) and TPG Asia, Inc (unrated) – is expected to bring in $3.4 billion (INR220 billion).

The non-binding agreement with Tillman and TPG has an exclusivity period until 15 January 2016. The proposed transaction is subject to final due diligence and regulatory and other approvals. RCOM expects the tower transaction to close in April-June 2016. In the event of technical or regulatory constraints on the proposed transaction, or delays in announcing the final transaction, there will likely be imminent downward pressure on the rating.

RCOM had around $7.0 billion of adjusted debt as of 30 September 2015, which will decline by $1.5 billion-$2.6 billion to about $4.4 billion-$5.5 billion pro forma with the application of the proceeds. While the operating costs for the towers will decline, its rental costs for leasing them back will increase its consolidated lease expenses, which we capitalize.

Read this article to learn:
- The short term objectives of the Reliance Infratel sale
- The timeline of the pending transaction
- The debt profile of RCOM, and the deal’s projected impact
- What still needs to happen for the deal to be completed
and add to its gross debt. However, given that lease rentals for towers in India are relatively low, RCOM’s adjusted debt should still drop substantially. Consequently, adjusted debt/EBITDA should decline to around 4.0x-4.5x for the fiscal year ending March 2017 (FY2017) and to 3.5x-4.0x in FY2018 from 6.1x as of September 2015.

These adjusted numbers incorporate the impact of RCOM’s acquisition of wireless company Sistema Shyam Teleservices (SSTL, unrated), which was announced in November 2015. RCOM has agreed to cover payments for spectrum allotted to SSTL, with scheduled annual payments of INR3.9 billion ($59 million) over the next 10 years. Our projections include these deferred payment liabilities as debt. However, this expected drop in RCOM’s leverage lags earlier expectations due to delays in the sale of other non-core assets, such as its sub-sea cable subsidiary GCX Limited (B2 stable) and its direct-to-home cable business and property assets in Mumbai and Delhi. The proceeds from the sale of these assets are unlikely to come through over the next two to three quarters.

The tower sale will also alleviate liquidity and refinancing pressure for the next 18 months. As of September 2015, RCOM had INR424 billion of reported debt, of which INR43 billion will mature in FY2016 and INR97 billion in FY2017.

Still, the company will need to obtain approvals from banks and bond-holders to carve out the tower assets from the respective collateral packages, and certain banks loans could be accelerated as a result of this transaction. These factors, however, are unlikely to create real refinancing risk, given RCOM’s track record of receiving semi-annual covenant waivers from banks.

Assuming that RCOM applies all the sale proceeds to reduce its debt, as it has stated, it should also be in a better position to meet its covenants and be able to meet its net debt to EBITDA covenant in FY2017. However, pressure could remain under its EBITDA/interest expense covenant.

Separately, RCOM is also pursuing the sale of RITL’s fibre optics business within the next few months for an estimated INR80 billion-INR100 billion ($1.2 billion-$1.5 billion). If the proceeds are fully applied towards its debt, this would lower RCOM’s adjusted leverage by an additional 50 basis points over the next two years.

While these asset sales are credit positive for RCOM, and allow it to reduce its leverage, any upward movement for its Ba3 rating would require continued improvements in its financial metrics stemming from operating fundamentals, further asset monetization or spectrum trading and sharing strategies.

The company’s operating performance has been in line with our expectations, with EBITDA margins of 33%-34% between Q1 2014 and Q2 2015. Going forward, improved fundamentals could stem in particular from RCOM’s core-Indian operations, if it grows revenue and earnings by expanding the number of subscribers and data revenue without compromising its EBITDA margins.

The proceeds will help substantially lower the company’s adjusted debt over the next 12 to 18 months and, in turn, its debt leverage and near-term refinancing risks, given its publicly stated intention to use the entire amount to lower debt.

www.moodys.com
TowerXchange’s analysis of the global tower industry

Industry created only 20 years ago now owns over 60% of the world’s towers, valued at over US$250bn

Towercos now own 61.1% of the world’s towers

2,058,123 of the world’s 3,368,247 telecom towers are now owned by towercos

TowerXchange estimate there to be a little over three and a quarter million telecom towers in the world, of which 61.1% are now owned and operated by towercos.

The transformation of the telecoms infrastructure ecosystem began in the U.S. in the mid nineties, where the independent towerco model has thrived. We estimate 82% of US towers are now towerco owned, as well as 80% of the country’s neutral host DAS and small cell nodes. The success of the towerco business model in the U.S. spilled into Southern and Central America, where towercos own 44% of the region’s towers, while the same philosophy drove towerco penetration in SSA from <1% in 2009 to 40% today – representing the majority of the investible towers in both markets.

Meanwhile, a different philosophy initially drove the Asian tower industry. Carve-out, operator captive towercos are built on economic models more favorable to MNOs - for example, the Indian tower industry, ostensibly inaugurated in 2007-8, has a standard lease rate of around US$600, with discounts applied as additional tenants are added. 68% of India’s ~450,000 towers are in the hands of towercos, a figure TowerXchange forecasts to rise to 85% in the year, driven by the carve-out of BSNL’s towers.

Keywords: Tower Count, Europe, Africa, Middle East, CALA, North America, Americas, Research, TowerXchange Research, Asia, China, India, USA

Read this article to learn:

- How many telecom towers are there in the world, and how many are owned by towercos?
- A comparison of towerco penetration by region
- The parallel evolution of the US and Indian towerco business models
- A new towerco business model for Europe?
China hosts the world’s largest and newest tower industry. But while the creation of China Tower Company (CTC), which owns more towers than the rest of the global tower industry combined, may make the headlines, TowerXchange are equally interested by the growing independent towerco market in China, which controls around 20,000 towers and which could be both supplier and feeder to CTC.

Meanwhile, Europe could develop its own tower business model incorporating as much decommissioning as new build, and perhaps one day as many micro cells as as macro cells. Is a towerco still a towerco if it manages active equipment too? Is it a pureplay towerco if as much revenue comes from TV and radio tenants as telecoms? Is it still a towerco if it’s owned by one or more operators? Crucially, is it as investible? We’ll search for some of the answers at our next event: we hope you’ll join us, and 200 other European tower industry pioneers, at the TowerXchange Meetup Europe in London on April 12 and 13!

Sources: TowerXchange, RBC, Delta Partners, Mott MacDonald

* Europe includes JV infracos as towercos. Independent towercos own 9%
TowerXchange now tracks 166 towercos and infracos who own 2,058,123 of the world’s 3.3mn telecom towers

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<td>30</td>
<td>Mitratel</td>
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* American Tower has announced, but not yet closed, the acquisition of Viom Networks - included here as a separate entity until the deal closes  ** Bharti Infratel also owns 42% of Indus Towers, making their portfolio almost 50,000 towers larger, excluded here to avoid double counting  *** Deutsche Funkturm: Comprises 500 Towers, 7000 Masts, 13000 Rooftops, 2500 Special Sites, 3000 leased sites (leased antenna space from other operators for their clients) and 7000 Sites under Omega Towers
<table>
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* ASEAEN Towers’ IGT contracted to build a total of 2,900 towers in Myanmar to date - figure here includes a little over 300 in Vietnam  
** Apollo Towers contracted to build a total of 1,827 towers, including 717 towers in phase three in Myanmar

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<td>VICTUS Networks, Greece</td>
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* Eco-Friendly Towers contracted to build 700 towers for Telenor in Myanmar
** Myanmar Infrastructure Group contracted to build 503 towers for Ooredoo in Myanmar
*** OCK contracted to build 900 towers for Telenor Myanmar

### Meet the towerco CXOs, their investors and their partners at your next TowerXchange Meetup!

**TowerXchange Meetup Europe**
April 12-13, London

**TowerXchange Meetup Americas**
June 16-17, Boca Raton, FL

**TowerXchange Meetup Africa**
October 19-20, Johannesburg

**TowerXchange Meetup Asia**
December 13-14, Singapore

For agenda information and to register, visit: [www.towerxchange.com/meetups/](http://www.towerxchange.com/meetups/)

### TowerXchange tower count research methodology

TowerXchange's famous global towerco league table provides a simple comparison of the scale of towercos by tower count. We have derived tower counts for the category's 13 listed entities from quarterly statements, where available, while the other counts are drawn from qualitative market research. Smaller towerco's count may be updated less frequently, while we have offer no guarantee that the counts they provide are accurate: we ask for a count of complete macro towers, but inevitably some towercos inflate their tower count by including works in progress, neutral host DAS, lamp-posts and other special structures. As such, TowerXchange's tower count should be considered estimates.

If you wish to suggest a correction, please email Kieron Osmotherly at kosmotherly@towerxchange.com.
Ten tower industry trends for 2016

TowerXchange forecasts ten hot topics for the next year in the telecom tower industry

The transfer of telecom tower assets from MNO-captive to independent towercos is driving multi-billion dollar capital flows and creating a new, highly investible asset class of infrastructure management specialists: towercos. Towercos now own 2,044,286, or just over 60%, of the world’s 3.3mn telecom towers. This change is also having a transformational effect on the supply chain as towercos become the new king buyers of passive infrastructure equipment and services. In this article, TowerXchange Founder and CEO Kieron Osmotherly highlights his top ten trends for the tower industry in 2016... Sorry, make that eleven top trends!

**Keywords:** Africa, Americas, Asia, Carve Out, Country Risk, DAS, Deal Structure, Decommissioning, ESCOs, Editorial, Energy Efficiency, Energy Storage, Europe, Hybrid Power, Market Forecasts, Middle East, Operational Excellence, RMS, Renewables, Sale & Leaseback, Site Level Profitability, Site Management System, Small Cells

Read this article to learn:
- Transaction trends: carve-outs, sale and leasebacks and strategic acquisitions
- Opex efficiencies through hybridisation and a stack of three critical platforms to ‘professionalise tower management’
- The beginning of a decommissioning wave
- Flexing deal structures to acquire remaining towers
- Integration and optimisation as more towercos pursue IPOs

**Number one** 2016 will see an increasing trend for MNOs to carve out their own “captive” towercos. Some of the first exponents of the carve-out towerco business model can be found in India, where the likes of Indus Towers, Bharti Infratel and Reliance Infratel have created tens of US$billions worth of capital value, some of which is now being monetised through IPO and sale to equity investors. More recently, Axiata carved out 15,000 towers to create edotco, which has since completed its first acquisition outside the Axiata footprint in Myanmar. America Movil’s Telesites made an underwhelming debut on the stock exchange in late 2015 but will be adding towers and tenants voraciously in 2016. Telefonica will hope that their carve out of captive towerco ‘Wireless Towers’ performs better when monetised in Q2-3 2016. Wireless Towers will initially be a vehicle for 11,500 Spanish towers but the strategy could be extended to carve out Telefonica’s towers in Germany and in the CALA markets where towers have not yet been sold. If Telecom Italia’s strategy to carve out, list 40% of the equity, then sell the rest of Inwit plays out successfully, expect more MNOs to carve out towercos in 2016 – lead by BSNL in India and MegaFon in Russia.

**Number two** The flow of pure sale and leaseback (SLB) transactions will continue in parallel, driving towerco penetration in India from 68% to 85%, in Southern and Southeast Asia (excluding India) from 27% to 45%, where we anticipate SLBs taking place in Bangladesh, India, Indonesia and in Pakistan. In MEA towerco penetration will rise from 19% to 30%. While most of the investible towers have
already changed hands in SSA, we expect the MTN South African towers to finally change hands, and most of the cancelled Airtel African towers to come back to market, excepting those affected by prospective opco sales to Orange. We forecast that towercos will build over 5,000 new towers in SSA in 2016. In MENA, the Mobily and Zain transactions continue to progress, while Vimpelcom could inaugurate a tower market in Algeria with the sale of ~6,000 Djezzy towers. Vimpelcom had already kick started the European tower market in 2015 with the sale of 7,377 Italian towers, and the same company is progressing toward the sale of 10,400 Russian towers, a process which could be extended to include certain CIS countries.

**Number three** Towerco consolidation will drive the deal pipeline in CALA and in Myanmar, where ‘middle market’ towercos will seek to consummate their exit strategies. With seven towercos, Myanmar is ripe for consolidation, while build to flip tower entrepreneurs are active all over CALA, from new portfolios in the Andean markets to maturing portfolios in Brazil, where deal flow will be slowed by currency devaluation.

**Number four** The integration of microcells and DAS into networks and towerco portfolios commenced in 2014-15 but will reach an inflection point in 2016. We are already seeing tens of thousands of “special structures” being installed into U.S., Indonesian and Indian telecom networks to provide infill capacity and coverage. As volumes increase and the cost of multi band antennas comes down, we’re going to see towercos increasingly diversifying into the provision and management of this and other semi-active infrastructure.

**Number five** 2016 will also see the drive for opex efficiencies continue, with an increasing volume of hybrid and renewable energy and innovative energy storage solutions being leveraged to reduce and ultimately eliminate diesel consumption from many cell sites on unreliable grids or off grid. While shipments from leading innovators such as Flexenclosures and Heliocentris will continue to rise, 2016 will not be the year of the ESCO. 2016 will see landmark ESCO pilots, but many towercos still prefer to deploy their own capital to improve site level profitability.

**Number six** 2016 will see tower management professionalised through the integration of three key intelligence solutions. The first half of this decade saw as many cautionary tales as success stories around Remote Monitoring Systems as many deployments failed to meet expectations. RMS has been made more robust and user-friendly, and effective RMS is now a quality differentiator.
between independent towerco managed sites and operator-captive sites. Meanwhile site management platforms designed for the tower industry, like those offered by Accruent, Infozech, FieldForce, Infozech, nexsysone, Tarantula and Treefrog, are being used to manage and optimise assets and projects, workforces and workflows. Complete the solution stack to professionalise tower management with identity access management solutions such as those offered by Acsys and Abloy.

**Number seven** In 2016 Regulators, Ministries and other National stakeholders need to establish clear, fair licensing and taxation regimes to encourage domestic and international towercos to foster investment in telecom tower networks - critical infrastructure for Nation Building.

**Number eight** The minority of MNOs still retaining their towers need to recognise that their tower networks are no longer a source of competitive advantage – the era of parallel infrastructure is at an end, and the efficiency and time to market advantages of tower sharing are best facilitated by carve out or independent towercos. MNO retained, single tenant towers risk being trapped on balance sheets, depreciating assets, while shared towers represent a source of increasing and recurring cash flow. If MNOs haven’t sold their towers already, 2016 may see peak valuations in many markets.

**Number nine** 2016 will be the first year when we’ll be celebrating towercos with falling tower counts. In markets characterised by significant parallel infrastructure (including much of Europe and Pakistan, for example), towercos will create value by consolidating tenants onto one tower and decommissioning the other. While there will be a near term adverse impact on balance sheets, as towercos liquidate the ground leases of decommissioned towers, proof of concept will come in 2017 and particularly 2018 when towercos are left operating fewer, more leased up towers.

**Number ten** Since the tower industry was inaugurated in the mid 90’s in the USA, late naughties in Asia and early part of this decade in Africa, many of the world’s most investible towers have now been acquired. What’s left? Towercos may have to set aside their established playbooks to acquire a significant proportion of remaining towers. Perhaps FDI restrictions limit equity stakes to 49%. Country and currency risk may be unpalatable. Perhaps the MNO wants to retain a substantial, even majority stake. They may not even want to sell the towers. The simple fact is that over 2mn of the world’s 3.3mn telecom towers have already been acquired by towercos – in order to maintain previous volumes of inorganic growth, acquisitive towercos may have to deviate from ‘ideal’ deal structures in 2016.

**Number eleven** Finally, for many towercos and their partners, 2016 will be a year of integration. The chaos of the land grab in many markets will give way to an increasing focus on integrating and leasing up acquired assets, and an increasing focus on operational excellence
Kanorias, Quippo look beyond India, beyond towers
Newest bidder for International telecom infrastructure is also one of the oldest players!

Quippo Telecom comes from the same stable as Viom Networks, the largest independent tower company in India. The foundations of independent telecom infrastructure industry in India was setup under the aegis of Quippo Telecom more than a decade ago when Sunil Kanoria forged a joint venture with Tata Teleservices to form Viom Networks. Viom Networks owns and manages over 43,000 telecom towers in India, has an industry-best ratio of 2.3 tenants per tower, and last October, American Tower announced intent to acquire a 51% controlling interest in the company. Thus Viom's sponsors are turning their attention to international markets. In this interview, Shankar Iyer, President – International Business, Quippo Telecom Infrastructure, gives an overview of Quippo's international expansion plans.

Keywords: Active Equipment, Africa, Allied Products, Asset Management, Asset Management, Europe, Insights, Middle East, Neutral Host Provider, Passive Equipment, Passive Infrastructure, Quippo, Russia, Towercos, Who's Who

Read this article to learn:
- How Quippo plan transfer knowledge from India whilst tapping local expertise
- Quippo’s appetite for tower opportunities in Russia and the CIS
- How Quippo plan to add value as a one stop shop asset manager
- Quippo’s plans to extend from passive infrastructure to managing active equipment

Shankar Iyer, President – International business, Quippo Telecom Infrastructure: We started business in 2005 with only 50 towers. Over the past ten years we have increased our number of towers to 43,000 through a combination of both organic and inorganic growth.

During that time period we managed to pass several milestones. We joined forces with the Tata Group and subsequently took over their tower assets. We also took over some towers from Spice Telecom, a mobile phone service provider based in Punjab and Karnataka.

Another significant milestone took place between 2010 and 2011 when we rolled out 15,500 towers in the space of only 12 months – a world record that remains unbroken.

After Srei Infrastructure Finance Limited agreed to divest their stake in Viom Networks and under the direction of the Kanoria brothers, the company has decided to focus more on international development.

TowerXchange: What is your background in the tower industry Shankar?

Shankar Iyer, President – International business, Quippo Telecom Infrastructure: I was part of the founding team member both at Bharti Infratel and Indus Towers, I have had the opportunity to
remain associated with the tower industry from its inception and as it evolved over the years.

The opportunity to again create a world-class organisation ground up is a fresh challenge for this role. The way the Indian telecom tower story has been built, needs to be shared with other geographies.

TowerXchange: Congratulations on Quippo’s leadership of Viom Networks culminating in the announced sale to American Tower! Please help us to understand in broad terms which portion of the management team will be transferred to American Tower and who will lead Quippo International?

Shankar Iyer, President – International business, Quippo Telecom Infrastructure: Recognising the changing market demand pattern, Quippo Telecom has established its core management team of reputed, well known and experienced professionals who will lead this initiative.

TowerXchange: What is your vision at Quippo International? Where will you fit into the telecom infrastructure ecosystem and what is your appetite for opportunities beyond India?

Shankar Iyer, President – International business, Quippo Telecom Infrastructure: We have seen in India and other countries that passive and active equipment is managed by different entities. Active infrastructure management is carried out by OEMs like Huawei, Ericsson, ZTE and Nokia. The mobile network operator today has to deal with multiple business partners for passive equipment. They may require partners for radio and allied products as well as power.

We want to differentiate ourselves from these companies by becoming a comprehensive asset management company. If you look at the market today, many of the operating companies want to hive off their towers. They are more interested in putting their time and capital into their core businesses. We believe that we can add value to these businesses as a single stop shop and an asset management company. Our aim is to manage everything on the client’s behalf.

TowerXchange: So what assets do you propose actually sit on Quippo’s balance sheet?

Shankar Iyer, President – International business, Quippo Telecom Infrastructure: Our initial plan is to be a pure play independent provider of passive
infrastructure on a separate P&L. We will buy towers from MNOs in a conventional pure sale and leaseback model to create a win-win proposition.

Over a period of time we intend to carry out strategic tie ups with active partners. It’s important to mention that we see ourselves as an execution partner, neutral host provider and an asset management company all rolled into one.

TowerXchange: Appreciating the confidentiality of the current process under way in Russia, what are the factors that generally appeal about opportunities in Russia and the CIS?

Shankar Iyer, President – International business, Quippo Telecom Infrastructure: It’s interesting that you mention this. Only last week we put out a statement on this subject (see sidebar).

In answer to your question, we’re evaluating opportunities in Russia, the Middle East and various other markets. Companies in each of those regions have appointed bankers to lead the divestiture process. There are open and closed bids going on in these territories and it’s fair to say that we are just one company amongst many that are bidding for the contracts.

Our knowledge and expertise comes from handling large transactions, dealing with asset migration, handling customer relations, managing the speed of delivery and overseeing people, processes and tools. We will make sure that the company is efficient from the start, but we will need to have a local partner from the beginning. We will be able to share our knowledge with the partner and make sure that it is self sufficient, but there will be an independent management team operating in the local area which will be supervised and guided by our corporate management team.

TowerXchange: Is Quippo’s remit exclusively beyond Southern Asia, or can you explore opportunities in India and other countries closer to home?

Shankar Iyer, President – International business, Quippo Telecom Infrastructure: Our remit is to look at any viable market out there that we think we can bring our knowledge and expertise to. As we are focussing on international business and therefore, we are interested in opportunities in Sri Lanka, Bangladesh and Pakistan, for example within the Indian subcontinent.

TowerXchange: Please could you sum up how you would differentiate Quippo from other towercos seeking to expand internationally?

Shankar Iyer, President – International business, Quippo Telecom Infrastructure: As I mentioned to you previously, we’d like to begin the company with passive infrastructure and graduate towards becoming a neutral host provider over a period of time once we have settled down.

Let me give you an analogy that might bring the concept to life. We’re a bit like a house of worship. Inside this, you have worshippers from an MNO background, people from active partners, and individuals with a system integration background. Quippo acts like a priest that brings the whole assembly together. We manage the entire complex from the out buildings to the main hall; bring people from different backgrounds together; and make sure that the institution is run to a tight budget. Our goal is to bring efficiencies to every operating company that works with us, so in a sense we want to be known as an efficient comprehensive service provider.

Kanorias give Quippo international remit

As a result of the impending sale of Viom Networks to American Tower, Quippo has a non-compete agreement in India. “We may have moved out of the telecom tower business in India, but that does not stop us from exploring the option of expanding in the telecom tower business outside India,” said Hemant Kanoria, Chairman of SREI Infrastructure Finance in a recent edition of Financial Chronicle. “We are particularly looking at the US, Russia, Africa and the Middle East. We are looking at both the options – taking our investments, technology and expertise abroad; and bringing in technology and funds from abroad. We are exploring inward partnership opportunities and also the options of operating assets overseas,” concluded Kanoria.
Special feature:

Cover story: Small cells, big opportunities

As an increasing number of towercos look to small cells and DAS to address MNO requirements for more cost effective urban infill we take an in depth look at the growing role that towercos are playing in this market and ask when mass adoption will take place.

Analysys Mason’s resident small cells expert, Chris shares his thoughts on why 2016 will be the year that small cells takes off and we interview Cellnex and Wireless Infrastructure Group, two of Europe’s leading installers of small cell and DAS networks, and question them on how Europe can learn from more established small cell markets.

Indus Towers provide insights into how they are deploying heterogeneous networks in line with India’s vision for smart cities, and in the Americas we examine how the neutral host DAS business compares to the macro tower business.

Please read:
113 Analysys Mason: 2016 - The year for small cells to finally ramp up
116 How Cellnex are embracing small cells and DAS
119 Opportunities for an independent infrastructure provider in European DAS and small cells
125 Indus Towers’ vision for Smart Cities, small cells and a smarter nation!
131 Multi-carrier Distributed Antenna Systems in the Americas today

Image courtesy of Cellnex
2016 - The year for small cells to finally ramp up

Insights on where and why growth is to be expected this coming year and how some of small cells’ limitations are now being addressed

The maturity of small cells has increased significantly over the past two years, with significant advances and cost savings being made in not only the technology but in installation and network management. 2015 saw the first significant shipments of small cells being made leading observers to believe that 2016 will be the year when small cells finally start to take off. With Europe lagging behind in small cell adoption it positions them well to learn valuable lessons from the US and Asia in the rollout of the technology. In this interview TowerXchange speak to Chris Nicoll, Analysys Mason’s Head of the Network Technologies Research Practice. Focusing on the path to 5G and 4G network innovation, his primary areas of specialisation include wireless network technologies, network evolution, mobile infrastructure and operator strategy.

Keywords: 3G, 4G, Active Equipment, Airvana, Alcatel Lucent, Analysys Mason, Asia, Business Case, Capex, China, Core Network, Backhaul, DAS, Densification, Ericsson, Europe, Europe Insights, FTT, Huawei, Installation, Leasing & Permitting, LTE, MNOs, Monitoring & Management, Network Rollout, Nokia, North America, O&M, Outdoor Equipment, Regulation, RMS, Small Cells, South Korea, US, ZTE

Read this article to learn:
- Timelines for projected growth of the small cells and DAS market and where the biggest uses will be
- Where the biggest costs and challenges reside in small cells deployment
- How the European market can learn from more advanced markets in the US and Asia
- To what extent small cells match up to macro cell technologies from a feature parity perspective
- What commercial opportunities will be opened up by the small cells market

TowerXchange: How big is the European small cell market at present and what growth do you forecast?

Chris Nicoll, Head of Network Technologies, Analysys Mason: We expect the European outdoor small cell market to grow from approximately US$116.5mn in 2015 to US$1.71bn in 2020. This is only for outdoor small cells.

TowerXchange: Where is the appetite for small cells going to be biggest?

Chris Nicoll, Head of Network Technologies, Analysys Mason: Two markets are really driving the outdoor small cell market right now: China and the US, but there are installations in every region and significant installations in Europe of course. The outdoor market for small cells finally started to get moving in 2015. The primary outdoor use case is macro cell densification, creating an ‘underlayer’ for the macro network to add capacity and especially coverage. AT&T has been very active in using small cells in this capacity as have the other US MNOs.

The second main use is filling in ‘not spots’ and in this capacity we finally saw some breakthroughs in small cell technology to make this easier – monopole formats and improved interference mitigation techniques. Particularly in the US I think we finally turned a corner with a court supported-ruling that the FCC takes precedent over local and state laws regarding small cell licensing and approvals. This should speed up small
cell installations significantly. This is one area where I think Europe is ahead – not that it is easy anywhere, but more so than in the US.

TowerXchange: We have heard comments that the small cell market is somewhat dampened by various factors including multi-band small cells just coming to market and so MNOs wanting to hold off deployment (potentially waiting for 5G). To what extent do you agree with this? What factors do you see holding the market back?

Chris Nicoll, Head of Network Technologies, Analysys Mason: I think there is some truth to not having multi-band small cells holding up the outdoor market. The bulk of the cost of a small cell network remains installation and backhaul so having to go back to a site and upgrade or replace a unit to support additional spectrum bands, or change a 3G module to a 4G one, is a non-starter for most MNOs. There is still a lot of 3G, especially in Europe, and refarming plans to 4G are not yet set. Small cells remain a key strategy for European MNOs but today a lot of the use is still tactical – fixing coverage and capacity issues.

Another challenge is backhaul. Where small cells are being deployed for densification, fibre access is an issue, but usually one that can be overcome. We are seeing more use of radio backhaul using both TD-LTE and microwave technologies but I would say both of these are in early days. Give them another year or two to really get moving.

I don’t think any of the MNOs are waiting on 5G to deploy small cells. We won’t see commercial-grade 5G Small Cells for three years and at that point prices are going to still be very high, and if you think we have a backhaul bottleneck problem with 4G small cells, wait till the downlink speeds are in the 5G gigabit range to really create a backhaul problem.

TowerXchange: How has the US market evolved and what can Europe learn from it? Who are the key players there?

Chris Nicoll, Head of Network Technologies, Analysys Mason: This is where the European MNOs leaning on their advanced 3G networks and taking time to deploy 4G will serve them well. In both China and the US (as well as early installations in South Korea and Japan) problems with call hand off from the small cell to macro cells were identified. Interference in real-world situations is now better understood, and in general the maturity of outdoor small cells has significantly increased over the past two years.

The key suppliers are the major vendors such as Alcatel-Lucent, Ericsson, Huawei and Nokia with Airvana, IP.Access and ZTE rounding out the top tier of suppliers. I expect in 2016 we will see some significant small cell product announcements that will help boost the outdoor small cell market.

TowerXchange: What are the main challenges and risks in the small cell/ DAS market?

Chris Nicoll, Head of Network Technologies, Analysys Mason: Scalability and spectrum support...
are big issues today. How many of what bands can I support to ensure a smooth handover from the macro cell and ensure future service parity – especially with LTE-A. Support or non-support (in the case of DAS installations) for Wi-Fi may be an issue, although in outdoor settings Wi-Fi tends to require a more dense installation than most cellular bands. Avoiding congestion on the backhaul networks could be an issue for non-fibre backhaul.

Management is where I think big gains have been made the past few years with small cells. It is now possible to manage small cells using the same systems as for the macro network and this is a big cost reducer that is easily underestimated.

TowerXchange: How advanced is small cell/ DAS technology? Do you anticipate any major advances on the horizon? Can we expect prices to fall dramatically?

Chris Nicoll, Head of Network Technologies, Analysys Mason: Small cell technology is pretty much on a par with macro-cell technology from a feature parity perspective. There is still catching up needed to support multi-carrier (>3 carriers) LTE-A carrier aggregation and more advanced 4x4 MIMO. The size of the units has been an issue with the municipalities regulating small cell installations but I think we will see some advances here.

Pricing of small cells themselves has not been a top concern of the MNO’s for a few years now. The main cost drivers are still
1. Cost of site acquisition
2. Power
3. Backhaul

TowerXchange: When do you forecast mass deployment of small cells/ DAS?

Chris Nicoll, Head of Network Technologies, Analysys Mason: After so many years of saying ‘this is the year of the small cell’, I think in 2016 we will see the outdoor market finally accelerating. The indoor market for small cells will likely not take off till 2017 or maybe 2018. The indoor market (large venues/stadiums/commercial buildings) is where I see 5G having a big initial impact.

TowerXchange: Ultimately in the era of small cells, what are the commercial opportunities for telecom infrastructure providers?

Chris Nicoll, Head of Network Technologies, Analysys Mason: Macro network densification is a real ‘thing’ that solves real problems for MNO’s. Coverage and capacity have long been called out as the use-case for small cells, but I think we finally understand how to deploy small cells in a way that complements the macro networks in the right way. LTE-A has given the macro network an extended lease of life by supporting mobile broadband speeds not seen before: right up to 1Gbps today already in tests. This in turn pushes the small cell technology to support faster speeds and more spectrum bands that are finally coming to market such as 2.3, 2.5/2.6 and 3.5GHz. These bands, and the emerging cloud-RAN solutions, will increase antenna requirements on the existing towers, as well as spur new installations on rooftops and building sides and corners.
How Cellnex are embracing small cells and DAS
Europe’s most acquisitive towerco expands their strategy beyond macro-structures

Cellnex currently manages a portfolio of 15,140 macro sites across Italy and Spain and with a large appetite for new acquisitions (following its 2015 IPO and acquisition of 7,377 sites from WIND in Italy). Their focus has expanded to also looking at opportunities in Europe’s small cells and DAS market. In this interview we speak with Cellnex’s International Business Development Manager, David Bernal to get a snapshot of Cellnex’s activity in the small cells and DAS market to date and where they forecast the business to be heading.

Keywords: Acquisition, Active Equipment, Active Infrasharing, Business Model, Capacity Enhancements, Capex, Cellnex, Construction, Core Network, Backhaul & FTTT, DAS, Densification, Europe, Europe Insights, Italy, Leasing & Permitting, LTE, Manage with License to Lease, Market Entry, Market Forecasts, Masts & Towers, MNOs, Monitoring & Management, Network Rollout, O&M, Outdoor Equipment, Passive Equipment, Rural vs Urban, Sale & Leaseback, Small Cells, Spain, TowerCo, Towercos

TowerXchange: Please can you provide an introduction to Cellnex’s experience in the small cells and DAS market?

David Bernal, Business Development Manager, Cellnex: When it comes to small cells and DAS, we have different kinds of projects underway. In Italy, we have deployed DAS networks inside tunnels, along motorways and on provincial state and regional roads. This is through our subsidiary, TowerCo and we have over 300 sites installed providing coverage for multiple mobile operators alongside the motorway network as well. In Spain, we have an agreement with the City of Barcelona which gives us the rights to use the city’s public infrastructure to install small cells for MNOs and we are currently doing a project with an MNO to deploy small cells in different areas of the city. Furthermore, we have ongoing projects with MNOs to install small cells in specific areas like football stadiums, malls and other high traffic places.

TowerXchange: What are the different business models and what is the appetite of MNOs for each?

David Bernal, Business Development Manager, Cellnex: There are two distinct business cases; in the first (such as our project in Barcelona) we are acting as a real estate provider. We have the rights to the city’s infrastructure - the different mobile operators then install their own small cells and pay a lease rate. In the alternative business case, we install and own the active equipment which is then used by the different MNOs.

Read this article to learn:
- How Cellnex have entered the small cells and DAS market in Europe
- What different business models exist and what is the appetite of MNOs for each
- Where Cellnex see the biggest opportunities for small cells and DAS deployment
- How issues relating to obtaining permits for small cells deployment can be handled
As to which option the MNOs go for, it really depends on their strategy in the coming years and the location that we are speaking about. Our general impression is that they prefer to own their own active equipment, but it can vary and this will probably evolve since it is difficult to imagine that as many small cells networks as operators will be deployed in the urban areas.

Due the growing data traffic, the MNOs need to differentiate with coverage and extra capacity in hotspot locations - this presents an opportunity in the small cells ecosystem and Cellnex is betting on this business.

TowerXchange: Where do you see the biggest opportunities in small cells and what size market do you forecast?

David Bernal, Business Development Manager, Cellnex: We see the opportunities for small cells and DAS as country-wide. Whilst this kind of deployment is well suited to densely populated, high traffic indoor and outdoor areas like city centres, tourist zones, shopping malls and stadiums, there are also key applications in rural locations where the economics of developing macro structures are not favourable.

We see tower companies becoming a natural partner for telecom companies in the small cell markets as the MNOs continually seek to reduce their capex and opex. Finding the best locations for small cells is a time-consuming business and something that the MNOs may consider to not fall in their core activities – towercos are much better positioned to provide this service. In this instance, planning and deployment become tasks outside the MNO’s core business, having to plan an efficient network that takes into account the macro cells’ locations to avoid interference, topology, subscriber distribution and higher backhaul costs, amongst other factors.

When it comes to sizing the market, it is very difficult. Different market sources estimate that there are currently three million small cells (both indoor and outdoor) deployed and that for the next few years this number will grow significantly as MNOs rollout their strategies. Europe is lagging behind North America and Asia significantly, but we estimate that the European market should grow to 350,000 small cells deployed in the next four years (2020).

In terms of where the opportunities sit to get to this number, just considering a country like Spain we are speaking about a landscape with more than
8,000 municipalities and city halls. In addition to the public sector, there are a lot of private players like stadiums, malls, small highways and supermarkets - our work is to find these potential location portfolios.

TowerXchange: What are the biggest challenges in the small cells market?

David Bernal, Business Development Manager, Cellnex: In order to deploy small cells there is a need for a high number of permits with the government and also the private sector which are not always easy to get. We can call upon our experience in the macro site sector in this, with most towers being on third party owned land and sometimes in close proximity to public places, we are well versed in dealing with such parties. Creating a correctly structured, long term contract is the way forward.

A further challenge is presented by the diverse nature of the potential opportunities, from cities to shops to venues - a lot of work goes into identifying and opening dialogue with such parties - something again that clearly fits with the profile of a neutral telco infrastructure operator rather than an MNO.

Further challenges include the high cost of deployment (especially associated with outdoor networks) and also connectivity issues when MNOs are looking for fibre backhaul.

TowerXchange: How do you plan to manage the O&M of small cell sites?

David Bernal, Business Development Manager, Cellnex: We are very open and flexible in our model. We can manage either the passive or both the passive and active infrastructure depending on the requirements of the operators.

TowerXchange: Do you see any hesitance in the deployment of small cells from the MNOs as they wait for example, for 5G technology to become available?

David Bernal, Business Development Manager, Cellnex: Technology in this space is always evolving. MNOs need to start deploying small cells now to cover the growing requirements created by high traffic consumer applications. We don’t see MNOs waiting for 5G or further generations of technologies as these could take years to arrive.

TowerXchange: What is next on the horizon for Cellnex in the small cells market?

David Bernal, Business Development Manager, Cellnex: We plan to work together with the different players (mainly mobile operators and suppliers) to find the best way to facilitate the widespread deployment of small cells in order to develop a broadband market which meets requirements for coverage and data traffic.
Opportunities for an independent infrastructure provider in European DAS and small cells

Wireless Infrastructure Group, an independent towerco with over 2000 macro sites in the UK, Ireland and Netherlands entered the DAS and small cells business in 2012 and have since grown to be the biggest installer of large venue-DAS systems in the UK. With not only ambitious plans for expansion of the venue-DAS business in the UK and other European markets but also a developing business in outdoor small cells, WIG see strong opportunities for growth. In this interview we speak to Wireless Infrastructure Group CEO, Scott Coates.


Read this article to learn:
- How WIG developed the largest venue-DAS side business in the UK
- The value proposition of an independent infrastructure provider in small cells and DAS and how this is viewed by venues and MNOs
- How and why the European outdoor small cells and DAS market will differ to the US
- Where WIG forecast the biggest growth in small cells and DAS and how this compares to the macro-structure side of their business
TowerXchange: When did you decide to enter the small cells and DAS market and what was your rationale behind entering?

Scott Coates, CEO, WIG: We started looking at DAS and small cells five years ago and entered the market in 2012. When people talk about small cells, they use the term very openly but effectively there are two different streams. The first is the indoor side of our business which we term as venue-DAS. This is where we build and operate shared infrastructure in large venues such as shopping malls. Then there is the outdoor small cell market. In the US you have outdoor DAS as well but we don't currently see that architecture in the UK or elsewhere in Europe.

When we launched, our focus was on venue-DAS. We looked around Europe and couldn’t see anyone independent DAS, one or two of the larger broadcast players had dipped their toe in the market but the MNOs didn’t seem happy with the product. We wanted to find technical solutions and a business model that could gain support and traction with the MNOs before launching this business stream.

We spent some time in the US and noted the presence of independent infrastructure providers in the space, either towercos (such as Crown Castle) who had extended into small cells and DAS or independent small cells players such as ExteNet Systems (the largest independent distributed network business in the country). The type of business model that we aspired to was being executed by ExteNet Systems; we liked the way that they were approaching the market and we set out to at least try and follow their customer driven model.

TowerXchange: What barriers to entry were there?

Scott Coates, CEO, WIG: One thing I would say about entering this market is that DAS and small cell delivery requires very long lead times. When building new networks you have to first of all secure the relationship with the venue owner and then with the anchor MNO. A lot of the early business development for a new network involves persuading venues to value the wireless utility that the infrastructure will deliver. We have to make the case that venues seeking income from these solutions will only push up prices to the MNOs and risk the bigger prize of better coverage. We launch all of our venue-DAS with a single anchor MNO which is part of the value proposition that our independent network infrastructure has brought to the market. We allocate capacity on the network to our anchor MNO and they only pay for what they use, which significantly lowers lifecycle costs compared to an MNO deploying their own network. We take the risk that other MNOs will
use the network over time, which we are highly incentivised to pursue as we don’t make a return until we’ve got the network populated.

We launched our first venue-DAS in early 2013, launched another in 2014 and at the end of 2015 we’re up to twenty deployed networks. Momentum is now building and we have a pipeline over fifty venues we’re working with – it’s taken a while to build that momentum but we’re now seeing the benefit.

**TowerXchange: What differentiates WIG’s value proposition and makes it so customer centric?**

Scott Coates, CEO, WIG: In venue-DAS, the venue generally only wants one DAS network deployed and it’s also costly for the industry to invest in separate DAS networks to support each MNO. As an independent infrastructure provider we are incentivised to get all of the MNOs onto the same network which is highly desirable to our venue partners.

Another part of doing business differently is the level of service that we offer – all of our networks come with full SLAs for our MNO customers, we provide service credits if there’s downtime and we have an obligation to monitor and maintain the network around the clock.

Furthermore, we work hard to create the very best network designs that people want to support, we have invested heavily in getting the technical specifications for our networks right from the beginning. This is key when your business model is dependent on getting additional customers to sign up, you need to design a network that is desirable to all MNOs. It has taken time but our design standards are now being adopted by some MNOs when specifying their own network requirements which gives us confidence that we are delivering a design that our customers really value.

**TowerXchange: Which verticals did you decide to focus on when entering the venue-DAS market?**

Scott Coates, CEO, WIG: Shopping malls and large office developments were the verticals we decided to focus on initially. Our first venue-DAS was deployed at MediaCityUK in Manchester (see picture one) which is still to this date, the UK’s largest multi-operator DAS network. It was the first 4G MIMO DAS network in the UK, it covers two million square feet, has 300+ antenna points, 40-50km of cabling and provides service to a number of venue tenants including BBC and ITV’s offices, Europe’s largest studio facility, a hotel, a university and over 200 SMEs. The second installation we completed was a top five UK shopping mall – intu Trafford Centre in Manchester, which was the first shopping centre in the UK to get a dedicated 4G network.

The majority of our deployments to date have been in shopping centres and offices. There is still huge potential in both – if you look at the top 100 UK shopping centres, less than 20% have 4G. We have a relationship with Intu (the largest shopping centre owner in UK) who are a partner in our venue-DAS deployments and this is an important part of building our business. We have completed installations in hotel and leisure venues and see potential in concert arenas, hospitals and other sectors. This month for example we will switch on new networks in The Leadenhall Building (the City
of London’s largest building, see picture two) as well as Center Parcs latest holiday village in Woburn.

TowerXchange: What is the route to market in the venue-DAS business?

Scott Coates, CEO, WIG: Generally this would be us going out and speaking to the venues (or the venues reaching out to us) and creating network solutions that we can present to the MNOs. We are however increasingly getting asked by MNOs to try and acquire specific venues on their behalf, putting in place our infrastructure so that they can deliver services on a cost effective basis.

TowerXchange: You mentioned at the time of launching that your focus was on venue-DAS but what opportunities do you now see in outdoor DAS and small cells?

Scott Coates, CEO, WIG: Our view is that in the next ten years, the UK needs over 50,000 small cells deployed across city streets. Whilst there is some wireless technology which can help connect small cells, over time we believe that the vast majority will need to be on fibre.

Fibre companies (such as BT) would like to connect all the nodes individually and charge for transmission to each separate node. We can provide an alternative solution and disrupt that business model by creating outdoor distributed networks, tying multiple nodes on a single fibre backbone and effectively creating savings relative to buying separate circuits from players such as BT.

In the US market you find that the DAS and small cells market is more of a fibre business as operators tend to deploy their own equipment at the end of the fibre. This model typically results in single operator nodes whereas in the UK and Europe,
operators are much more cost conscious and willing to share infrastructure and this creates opportunities for independent infrastructure providers such as ourselves to help facilitate this demand.

In the UK, the venue-DAS business is based very much on infrastructure sharing - we own, operate and manage the nodes and share the capacity between the MNOs. Infrastructure sharing goes right the way down the network to a far greater degree than it does in the US, and we think that outdoor small cells will be the same.

The value proposition for the MNOs under our model is shared economics on both the fibre and the node and a partner that is doing all the asset management – the prospect of lowering our customers cost of ownership is significant and we see huge opportunities there.

**TowerXchange: What work has been done on developing your outdoor small cell business model and what has been deployed to date?**

**Scott Coates, CEO, WIG:** About two years ago we started R&D on outdoor small cells and have developed some very interesting IP, essentially enabling an installation that can support multiple MNOs at a single lamp-post in a way that works for UK streets. It will involve a cabinet on the ground which can support eNodeB and cloud-RAN architectures and even a more traditional DAS approach should the market require it. In terms of how we’re starting to go into the market, we competed successfully against BT last year and were awarded rights to the City of Aberdeen’s lampposts and so are developing a trial there. We are also working in various stages with other cities in the UK to become their partner.

**TowerXchange: Will Aberdeen be the first UK city to run a trial for an outdoor small cell network?**

**Scott Coates, CEO, WIG:** We know that some of the MNOs are doing trials, and in the UK a lot of the cities have run concession tenders for Wi-Fi but Aberdeen was the first city to award a 4G small cell led concession. Some other cities are now starting to look at that as well.

**TowerXchange: How does the UK compare to other European markets in terms of outdoor small cells deployment?**

**Scott Coates, CEO, WIG:** Trials are taking place across Europe, particularly in the dense metro areas. The UK, however, has very fast take up of 4G and we believe that the combination of demand for online and our urbanised nation will position the UK amongst the European front-runners. What we might find in Europe is more MNO-led solutions as a starting point – from a WIG perspective, we first need to create the market for independent infrastructure providers, we don’t expect it to land in our lap.

**TowerXchange: Do you envisage permitting problems with municipalities and other authorities to be a hurdle further down the line?**

**Scott Coates, CEO, WIG:** We are a communications code operator which means we have the rights to deploy infrastructure in certain places. Part of a partnership that you need to form with a city or municipality (which is where a lot of the hard work goes in) is in assessing and setting up the processes for deployment. What assets do they have? What is the physical capability of their lampposts and traffic light systems and can they handle our infrastructure on top of them? Is everyone happy to sign off on that? How do you connect up power and transmission to these? We have been doing a lot of that work over the past 12 months with Aberdeen, just getting all the processes set up for deployment. That is a big part of our value-add to the MNOs, handling all this in the field.

**TowerXchange: How will monitoring be managed and how costly will this be relative to management of macro structures?**

**Scott Coates, CEO, WIG:** We run 24/7 monitoring on all of our venue-DAS assets at the moment and carry out both routine preventative and unscheduled corrective maintenance. Our monitoring system is intelligent enough to tell us when something is wrong and we work with a group of partners who both build the assets and support some of the monitoring activities as well.

With outdoor small cells, we need to look at the US to see what experience they have. The trick is that we need to build good networks on day one and we
need appropriate monitoring and maintenance. It will be a different kind of monitoring and maintenance to that with macro structures – coming with its own set of challenges.

**TowerXchange: How do you forecast the outdoor side of the business developing?**

Scott Coates, CEO, WIG: With outdoor systems it is too early to say at the moment, we are still in the trial phase and it’ll probably be 2017 before we see anything of any scale coming through. We’re not getting into any revenues for outdoor small cells yet, we are still developing the product however this is critical groundwork for us ahead of MNOs starting to look at options for deploying small cells in a major way, we need to be ready.

**TowerXchange: What have been MNO attitudes towards using an independent infrastructure provider versus developing networks themselves?**

Scott Coates, CEO, WIG: We’re seeing a really open mindset from the MNOs and whilst we are still at early stages of engagement, we’re optimistic about their appetite to partner with an independent infrastructure provider that can deliver a cost effective alternative to the fixed line incumbent.

**TowerXchange: Where do you see the immediate opportunities for WIG in the small cells and DAS market?**

Scott Coates, CEO, WIG: There is a huge amount of work for us to still do in venue-DAS in the UK. Whilst it’s very hard to size the market, there could be around 1000 venues that need infrastructure and we’re just starting on that journey. We’re the market leader in the UK in the deployment of venue-DAS networks, having deployed more than anyone else last year including (we think) the MNOs. We are also looking at the UK transport network and are very keen to deploy infrastructure along tunnels in the UK which is a big priority for the government. Our next move for venue-DAS will then be outside the UK, potentially forming partnerships with other mid-market European towercos.

**TowerXchange: Which countries would be the most logical next step for WIG in venue-DAS?**

Scott Coates, CEO, WIG: There are a few different thoughts around that. As a company we already have macro-structures in both the Netherlands and Ireland which gives us an understanding of those markets and so both could be attractive options. Secondly, a lot of European real estate gets run through London and so relationships we have built with companies here could facilitate our entry into other European markets. For example, our largest partner, Intu, also has three shopping centres in Spain and so we are in discussions with them about providing networks to those venues. Our focus will be on capturing multi-venue owners to facilitate further venue-DAS deployment.

**TowerXchange: How do you see the small cells and DAS side of the business shaping up relative to the macro side in years to come?**

Scott Coates, CEO, WIG: We’re a long way off it being close to the revenues from the macro side but small cells and DAS is definitely a key area of growth. If you look at Crown Castle’s last set of results, small cells represented around a third of growth. We see towers as long term infrastructure assets which will provide steady revenues in supporting wireless networks for many decades. DAS and small cells represents an entirely new and very significant independent infrastructure opportunity as network densification becomes critical to our customers.
Indus Towers’ vision for Smart Cities, small cells and a smarter nation!

Bringing architectural design sensibilities into the creation of a new layer of 30,000 small, smart cell sites by 2020

With the inauguration of India’s Smart Cities vision, and INR 100,000 Crores budget (~US$15bn), by the Prime Minister in August 2014, the country’s towercos and MNOs sit with an opportunity to add a layer of smart connectivity to urban landscapes, leveraging existing and new street furniture and cell sites to create heterogeneous networks, creating a tremendous increase in demand for micro and small cell sites. TowerXchange spoke to Indus Towers’ Meenu Sharma to learn how India's largest towerco is rising to this challenge.

Keywords: 3G, 4G, Asia, Asia Insights, Batteries, Capex, DAS, Densification, Energy Storage, India, Indus Towers, Insights, LTE, Leasing & Permitting, Lithium, Opex Reduction, Renewables, Small Cells, Smart City, Towercos

Read this article to learn:
- The vision and the budget for the creation of 100 Smart Cities in India
- Methods of deploying small cells within existing mobile network architectures, implications for backhaul
- Creating PPP to accelerate permitting of smart cell sites and to define capex and opex sharing models
- Innovating street furniture design to incorporate small cells and associated backup power and backhaul solutions
- The current and potential scale of the small cell market in India

Meenu Sharma, Indus Towers: India is on the move! Growth focused economic reforms are fueling huge investments and creating rich opportunities for the people of India. As per recent data published by Ministry of Urban development, the fast rising Indian urban population is expected to touch 600mn and contribute 75% of GDP by 2030 driving a near fourfold increase in per capita income across the nation. India is uniquely positioned with a potential demographic dividend, with a young, rapidly growing population. For this dividend to payout, India needs thriving cities to foster smart citizens and smart nation.

Cities being engines of growth for every nation’s economy, they represent the greatest opportunities for improving human lives through better infrastructure and innovation, especially for emerging economies. It is in this context that India is fast catching up with the global concept of the Smart City to support its unprecedented growing urban population with better and smartly managed facilities.

During 2014’s Indian Independence Day’s address to the nation on the 15th of August, 2014, the Indian Prime Minister unfolded the vision of Smart Cities with an objective of creating 100 smart cities in the next five years.
The key focus of this mission is to have sustainable and comprehensive development of cities based on four pillars: institutional, physical, social and economic infrastructure, with added layers of ‘smartness’ with ‘Smart Solutions’ in every aspect of it. Central and State governments both would be allocating a whopping budget of INR 100,000 Crores in the next five years to achieve this objective with an average of 200 Crores per city per year. With this, India is set to witness the next phase of digital revolution.

A Smart City is always connected and employs information and communication technologies (ICT) including H2H, M2M and M2M2H communications to use resources efficiently and intelligently, resulting in cost and energy savings, improved quality of life, and reduced environmental footprint. So you need to leverage towers and embed smart devices like computerised sensors into the urban fabric, collect information in real time, send it for processing by intelligent analytics systems with the results being used to optimise key city services such as transport systems, energy supply and healthcare.

In a Smart City environment, a great variety of infrastructure systems, city equipment and home/building appliances such as CCTV, traffic lights, car parks, energy meters, elevators and plugs will be connected to the network in what is referred to as the Internet of Things (IoT) (although personally I prefer the term Internet of Everything). Data has to flow freely and to the right areas so it can be properly processed, analysed and acted upon. Further, development and commercial affordability of mobile handsets, broadband mobile connectivity, digital sensors and big data analytics technologies coupled with cloud computing have been big enablers for creating this ‘Smart connectivity web’.

Ensuring the circulation of data to key organs within the Smart City will be the job of carriers and mobile operators. MNOs will have an increased play in the sector for meeting rising data traffic levels, delivering significantly higher Quality of Service (QoS) and compliance to Service Level Agreements (SLAs). This will drive the evolution of mobile broadband networks to HetNets i.e. heterogeneous networks that leverage an evolved macro cell layer complemented with integrated small cells to provide seamless outdoor coverage on the streets. This will result in a tremendous increase in the demand for creating micro and small cell sites.

After the mobile transformation wave and the data and video services transformation wave, the creation of the Smart City data pipeline will be the third biggest transformation wave for Communication Service Providers (CSPs) and in this transformational journey toward Smart Cities, towercos have even larger role to play supporting CSPs’ exponential network growth requirements by providing passive network infrastructure at the RIGHT place, in the RIGHT time and at the RIGHT cost.

TowerXchange: What do you consider a microcell and a small cell, and what kinds of equipment and services can be provided from these sites?

Meenu Sharma, Indus Towers: Small cells are an integral part of future LTE networks: these aid...
Machine-to-Machine (M2M) communications. The result is an increased drive in the consumption of PoEile data and traffic congestion across the networks. This unprecedented growth momentum in data is largely driven by traffic at present. On average, a 3G subscriber consumes more than three times the data compared to a 2G counterpart. The use of 3G devices capable of supporting speeds of up to 21.1Mbps has increased from 25% to 50% in last two years. 4G in India is still at a nascent stage with approximately 5mn owners of devices capable of supporting 4G networks, out of which, very few are using the 4G network on their smartphones. These 4G subscribers are expected to reach to 100mn by 2020.

So, the exponentially rising data traffic growth clubbed with the government’s increasing mandate on MNOs for improving network quality and call drop minimisation, expected rounds of spectrum re-farming and auctions in next three to four years, is forcing MNOs to continually expand their mobile networks.

To meet these requirements, MNOs are facing a huge challenge of the ‘capacity and coverage crunch’ without incurring prohibitive costs. The challenge lies in providing faster wireless speeds and improved network performance to end-users and their mobile devices by bringing mobile network antennas and radios closer to mobile phones. To support this in the next five years the number of towers in India are expected to grow from 450,000 to 600,000 by 2020 with a contribution of around 30,000 micro cell sites.

As compared to macro cells, small cell antennas take 70% to 80% less space, do not need higher elevation like 30m or 40m – and these do not have a large BTS footprint. Having said this, these small cells can be easily deployed in congested locations and busy streets either on rooftops or on the ground. Typical roof top deployments can be done on small poles or directly on building facades, where these can be readily camouflaged to gel with the building elevation. Ground based deployments include installation on street light poles, existing street furniture or any other suitable public utilities infrastructure available on the streets.

TowerXchange: What role will DAS, small cells and microcells play in network planning and in network topologies as India migrates to 4G?

Meenu Sharma, Indus Towers: With smartphones becoming more affordable in the last one year, India has witnessed the growing popularity of social media apps, Internet of Things and associated

The challenge lies in providing faster wireless speeds and improved network performance to end-users and their mobile devices by bringing mobile network antennas and radios closer to mobile phones. To support this in the next five years the number of towers in India are expected to grow from 450,000 to 600,000 by 2020 with a contribution of around 30,000 micro cell sites.
30,000 micro cell sites. DAS, small cells and micro cells are proving to be vital elements for handling network densification and mobile bandwidth problems. MNOs can significantly increase wireless network access speeds and improve coverage through the strategic deployment of small cells as compared to using just macro cells. Small cells are efficiently able to offload 4G and 3G data, therefore, MNOs are capable of managing LTE advanced spectrum more efficiently. These cells can be deployed to enhance both capacity and coverage requirements. There are tremendous options available in small cells fitting in wide range of air interfaces including GSM, CDMA2000, TD-SCDMA, W-CDMA, LTE and WiMAX.

Within existing mobile networks, the best possible way to deploy small cells involves homing small cells back to existing macro cells, with aggregated small and macro cell traffic backhauled to the Mobile Switching Center (MSC). This results in increased capacity requirements onto existing macro backhaul links to the MSC. 4G network technologies being inherently packet-based, backhaul networks based on packet-over-optical networks allows for seamless traffic handoffs to and from data centers, where the content being accessed physically resides.

This would require upgrading current backhaul capacity to increased wireless capacity and significant improvements in the mobile backhaul technology to ensure the backhaul does not become the bottleneck in deployment of small cells.

**TowerXchange: A core competency of towercos**

**is ability to liaise with urban planners to permit and protect macro cell sites – how do the challenges of planning and permitting differ when comparing Ground Based Towers (GBTs) and street furniture?**

**Meenu Sharma, Indus Towers:** Large scale deployment of small cells can be realised by deploying these solutions on street furniture. This kind of street deployment poses its own challenges in terms of appropriate site selection, timely site acquisition, efficient power back-up and backhaul solutions, installing the small access points, and having the right tools to analyse network traffic in order to determine where a small cell would be needed in the first place. This is all becoming more difficult, adding time and money to the network planning process as compared to macro 3G or LTE networks.

All in all, there are three main areas of consideration on which planning of small cells depend: power, backhaul, and operations, administration and maintenance (O&M). Due to closely located small sites (typically 200m to 500m), towercos are hardly left with any options to explore multiple locations for any one site. The city infrastructure is generally built and maintained by municipal authorities and various public bodies. The ecosystem is complex, creating a need strong for strategic integration of local municipal bodies, street furniture owners, and towercos. Trying to get all of them together to create one solution that’s cheap and simple to operate in a cost-effective way is an interesting challenge to work upon.

To get the permission to build these sites, towercos are largely dependent on municipalities, which typically have a longer gestation period to arrive at a decision on site allocations. However, the moment a decision is taken there are strong possibilities of getting bulk site allocations due to the larger land holdings of the public authorities. As the concept of small street sites has just started gathering momentum in India, it will take some time for public authorities to consider this as an interesting revenue generation opportunity. Some of the early action has been generated by municipal authorities in the cities like Delhi, Ahmedabad, Nagpur and Jaipur by permitting deployment of low footprint sites on metro stations, municipal parks, institutional buildings, public parks et cetera. To successfully realise the vision of Smart Cities and provide smart connectivity, street furniture based small cells or macro sites are going to be the key catalysts. There is a strong need to drive a robust Public Private Partnership (PPP) model and sectoral reforms which will create win-win scenarios for all: government, MNOs, tower companies, backhaul providers and citizens.

**TowerXchange: How do the economics of street furniture and GBTs compare - for example, how does the capital cost compare, how do opex costs compare, and how do lease revenues compare?**

**Meenu Sharma, Indus Towers:** Rolling out of smart cell sites brings exciting and creative opportunity for towercos by integrating street infrastructure utilities like street light poles, traffic light signals, flyover pillars, bus stops, foot over bridges et cetera with
telecom sites in an aesthetic and innovative way such that it becomes more socially acceptable and becomes integral part of any city’s infrastructure.

There are two ways to do this – either to utilise existing street furniture for deploying these sites or create new street furniture with integrated micro sites. Both the models drastically differ in terms of capex and opex modelling, with utilisation of existing street furniture definitely bringing in better cost economics than creating altogether new street furniture. While creating new street furniture, it all depends on capex and opex sharing model adopted between towerco and municipalities.

Developing countries like India need to create a lot of new street infrastructure, and towercos are uniquely placed to create this infrastructure and provide a valuable service to the government, to the public and to MNOs. So if we can create a new bus shelter and leverage those sites to provide services to MNOs for ten years, if we can create an optimal and sustainable business model, there could be a range of interesting and exciting solutions around such scenarios.

While small cells are estimated to give 40-50% cost reduction in TCO for the MNO, the costing model for the towerco is still under evolving stage and at this point it is difficult to state any figures. What we can say is that in general, if we are building standalone microsites, they can seldom accommodate more than two operators, whereas if we are adding small cells to existing macro sites, it may be possible to share with three, four or even five operators. So the entire cost dynamics varies depending on the type of small cell deployment.

TowerXchange: How do you deal with backup power solutions and with backhaul at microcell and small cell sites?

Meenu Sharma, Indus Towers: Powering up microcell and small cell sites is a challenge which differs from site to site. DC power backup solutions required for small cell sites need to be with an aesthetic edge, compact in size, easy to deploy (for example wall or pole mountable with an ease to strap on to the street furniture), reliable, repeatable, with flexible power distribution options and remote monitoring facility. There are two options to provide DC power backup. The first option is cabinet mounted which is a mini replica of the power system provided for macro cell sites. These can be deployed on sites where the back-up requirement goes up to 4 to 6 hours. Though not so aesthetically pleasing, there can be challenges installing these systems in public areas. The second option can be with wall or pole mounted systems. This category of power systems are all-in-one systems that usually have less configuration flexibility and limited battery back-up options. However, they blend well into the background, are light, easy to install and offer a power output range up to 1KW for a variety of base station applications.

Being deployed in open public spaces, these sites need to be ‘green’ and without DG power backup, so options like compact, high capacity Li-ion batteries or integration of renewable energy sources on the street furniture in an elegant way can be interesting options for exploration.

Small cells being deployed on streets typically in congested areas or difficult locations, presence of fibre to support site deployment is a big challenge due to the limited fibre availability at present in India. At present, 25% of telecom sites are fibreised in India against developed countries where 70-80% of the sites are fibreised. Therefore, the initial leg of deployment of small cell sites is only possible with backhaul connectivity through microwave antennas to meet the current data traffic requirements.

To address the social acceptability challenge of such installations in public places, radio friendly camouflaging solutions are being explored to provide better aesthetics. For example, I feel microwave dishes up to a maximum of 0.3m should be placed on small cell sites, and I’m interested in advanced technologies being tested where use of deflection may one may not need direct line of site between microwave backhaul antennas.

To sum up, a compact and efficient power back up, and easy to deploy backhaul solution would be the catalysts for successful deployment of small cells scattered across a city.

TowerXchange: What is the current size of the microcell and small cell market in India? What scale could it reach in the next five years?

Meenu Sharma, Indus Towers: Though there are no firm numbers available on the current size of micro cell sites, these are only estimated to be around 4-5%
There are tremendous opportunities for towercos to intersperse DAS and micro cell site deployment with various public utilities in the form of ‘Smart Street Furniture’. In this interesting transformational journey of the nation; towercos can contribute significantly in this entire value chain and help in this nation’s drive for creating smarter citizens, smarter cities and a smart nation!

Meenu Sharma, Indus Towers: There lies a great opportunity for DAS, micro and small cells becoming a way of life in providing the best network coverage to subscribers. For these deployments to become successful, there is a dire need to create innovative operating models and solutions portfolios. The telecom tower industry has definitely to play a pivotal role, bringing an orbit shift in their solution design approach from conventional micro sites to compact, aesthetically appealing, more socially acceptable, greener and sustainable micro sites. To take this forward aggressively, there is a strong need to give an architectural edge to the solutions and create sites with interesting forms and shapes which can easily gel with the location aesthetics, making them happily acceptable to public bodies, site owners and the public in general on the streets.

There is lot of movement expected in this sphere and especially in the Indian market with government being highly focused in terms of providing basic essential services like street lighting, public toilets, kiosks, tourist information centers, bus shelters, information centers et cetera as part of the Smart City drive in addition to ‘smart connectivity’. There are tremendous opportunities for towercos to intersperse DAS and micro cell site deployment with various public utilities in the form of ‘Smart Street Furniture’. In this interesting transformational journey of the nation; towercos can contribute significantly in this entire value chain and help in this nation’s drive for creating smarter citizens, smarter cities and a smart nation!
Multi-carrier Distributed Antenna Systems in the Americas today
Comparing the neutral host DAS business to the macro tower business

DAS are used as both a coverage solution and for infill capacity in urban locations in the U.S. The indoor Distributed Antenna System (iDAS) market is still bigger than the outdoor market in the U.S., with some stakeholders reporting iDAS being leased up at three times the rate of outdoor DAS. American Tower leads the indoor market, while Crown Castle has relatively few iDAS but approximately two thirds of the outdoor market.

Crown Castle has acquired over 15,000 miles of fibre in major metropolitan U.S. markets, giving them over 15,000 small cell nodes to promote to provide dark fibre backhaul for small cell deployments. Crown Castle is increasingly focusing their capex on small cells rather than the slowing demand for macro sites in the U.S. Meanwhile, ExteNet Systems, recently divested by SBA Communications and acquired by Digital Bridge and Stonepeak Investment Partners, has a mid teens market share in the neutral host oDAS market and a low double digit share of the iDAS market.

The margins of the neutral host DAS model compare favorably with the macro tower business model. While tenants pay significantly less than for a macro site (perhaps US$500pcm for a prime urban DAS compared to around US$1,800pcm for a tenancy on a macro tower), the lease cost of lamp posts or other street furniture on which to hang oDAS is an order of magnitude less than the cost of leasing a plot of land big enough to build a 40m tower. Lease up rates are also comparable: American Tower has achieved a tenancy ratio of 2.5 in stadiums, shopping malls, hotels, convention centers and casinos in the U.S.

Of course fiberisation is a critical issue when it comes to providing backhaul to small cells, and the U.S. towercos are increasingly investing in fibre to offer a joined up proposition. But that doesn’t meant they are averse to leasing fibre to get an attractive new DAS on air.

There are around 75,000 neutral host nodes in the U.S. market today. Two thirds of those are owned by towercos, the rest are carrier owned, with around 10,000 owned by AT&T’s antenna solutions group (which markets their solutions to other MNOs), while Sprint are deploying their own small cell network. Even where projects are carrier-led, an increasing proportion of outdoor Distributed Antenna Systems (oDAS) and in-building solutions are able to support neutral host.
Europe features

As the European independent tower market starts to open up with a spate of MNO tower divestments and carve outs on the cards, TowerXchange are tracking 67 towercos, JV infracos and broadcast companies across Europe. Read our Europe who’s who and discover who are the key players to watch, and take a look at PA Consulting’s analysis of MNO consolidation across the continent.

As the towerco with the largest portfolio of sites in Europe, we speak to Germany’s Deutsche Funkturm whose new subsidiary, Omega Towers, acquired 7,700 towers from Telefonica in 2015 taking the company’s tower count to 33,000. With a successful carve out from O2 Czech Republic in 2015 obtaining numerous awards, we interview Petr Slovacek, the CEO of CETIN, the Czech Republic’s largest infrastructure provider.

We also take a deep dive into the Irish and Italian markets. In Ireland we examine how 3’s acquisition of O2 and the launch of the National Broadband Plan are creating new opportunities and challenges for the country’s numerous towercos and in Italy we look at the interplay of broadcast and telecom sectors and question Tecnorad on why they built and sold towers in the market.

We also take a look at emerging tower markets in Europe, with the IFC sharing their thoughts on the establishment of markets in the CIS, and Kazakhstan’s first towerco, Logycom, sharing their experience in the region.

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TowerXchange’s who’s who in European towers

TowerXchange presents an A-Z of 122 MNOs, towercos, investors and advisors who could be key stakeholders in the emerging European tower industry

The European telecom tower market may be opening up to the independent towerco business model. Held in stasis for many years whilst Europe’s MNOs didn’t need cash and towercos weren’t prepared to meet their valuations, successful new towerco ventures like Cellnex, Inwit, and CETIN are galvanising the tower transaction pipeline and rekindling interest in Europe’s existing telecom and broadcast towercos.


Read this article to learn:
- Who’s who of 41 towercos and joint venture infrastructure sharing firms in Europe
- Maps showing the footprints of Europe's leading MNOs and commentaries on their history and appetite to share towers
- An introduction to some of the most credible current and prospective investors into European towers
- An introduction to the TMT advisory firms with experience of tower transactions

**2rn:** Irish broadcast towerco with around 150 towers, some of which are used by telecom clients.

**3GIS:** Operates a shared network between Telenor and 3 (Hi3G) in Sweden.

**Abertis Telecom:** See Cellnex.

**Alinda Capital Partners:** Acquired 100% equity in Polish broadcast towerco Emitel in 2013. Emitel has diversified into telecom co-location. Alinda are believed to have appetite for more investments in the tower industry.

**Altice:** French billionaire Patrick Drahi’s Altice acquired French #2 MNO Numericable-SFR from Vivendi in 2014 and has been trying to merge this entity with third ranked MNO Bouygues Telecom, a transaction which may shake loose more of one or both entity's towers. Altice also acquired Portugal Telecom in June 2015, and has been similarly acquisitive in the Americas. Altice is relatively highly leveraged and has advocated efficiencies that have not to date explicitly extended to divesting towers, but it seems plausible that either monetising network assets or divesting towers to reduce competitive concerns might be a plausible extension of their current strategies.

**Alticom:** Dutch towerco with 24 towers and 9 masts primarily at high altitudes (by Dutch standards!) primarily used by broadcast tenants but also by telecom operators for microwave links. Services include provision of power and cooling.
America Movil: See Telekom Austria.

American Tower: The world’s largest independent commercial towerco, American Tower need no introduction within this publication. Present in Europe to date only in Germany, where the company owns and operates a network of 2,031 sites, the majority acquired in 2012 for €393mn from KPN.

“We liked the opportunity in Germany because of the size and economic stability of the market, the absence of other independent towercos, and an attractive valuation that allowed the portfolio to yield over 8% on day one,” said Hal Hess, President of EMEA and Latin America for American Tower in an August 2015 TowerXchange interview. “The acquisition made economic sense for us despite the acquisition of E-Plus by Telefónica – we knew this was a likely scenario, so when we structured the transaction we made adjustments to be able to meet our objectives. Our German business continues to perform above the expectations we set out in our acquisition business case.”

“We are very interested in further transaction opportunities in Germany, provided of course they meet our investment criteria,” continued Hess. “We feel it may make sense for an independent towerco to be involved in the consolidation and rationalisation of the other national tower portfolios.”

Analysys Mason: Marco Cordoni and his team at Analysys Mason are among the ‘go-to-guys’ for tower market analysis and due diligence on a global basis, and Europe is no exception.

Antenna Hungaria: Hungary’s recently re-Nationalised broadcast towerco also sells co-locations to and provides installation and maintenance services to telecom clients.

Antin Infrastructure Partners: One of the first movers in the European telecom tower asset class, Antin are investors in FPS Towers which owns over 2,000 towers and the rights to 15,000 rooftops in France, and Axion the leading broadcast towerco in Andalucía, Spain. Antin has appetite for further European tower investments.

Arcus Infrastructure Partners: Arcus has been an active investor in European towers for over 11 years with the predecessor of what is now UK and Dutch towerco Shere Group. More recently Arcus manages their own and other consortium members’ investments in TDF, France’s largest towerco with 9,950 sites. Arcus has an interest in further opportunities in European towers which may or may not be addressed through their existing platforms, depending on scale and geo.

Arqiva: The largest independent towerco in the UK with around 10,550 active towers with a tenancy ratio around 2.5 and a portfolio of 16,500 in total, of which less than 1,000 are pure broadcast sites. Acquired by a Macquarie-led consortium in 2005, into which was rollup up the NTL Broadcast and National Grid Wireless assets. Arqiva has over 2,000 employees and has deep I&C and O&M competencies and resources spanning broadcast and telecom. Arqiva is currently restructuring debt which could result in a change of strategic direction for the company.

Ashmore: Another investment firm with an appetite for telecom towers.

Axion: Operates 586 broadcast towers with some telecom co-location in Spain, 70% of which are in Andalucía. Owners Antin Infrastructure are believed to be seeking to sell some or all of their stake.

Azerconnect: Infrasharing business in Azerbaijan.

Berkshire Partners: Berkshire backed Crown Castle during their successful foray into European
towers in the late nineties, and currently has active investments in Protelindo (largest towerco in Indonesia with a small footprint in the Netherlands), Torres Unidas (Andean region of CALA) and Tower Development Corporation in the US and Puerto Rico.

**Blackstone:** Another serial towerco investor currently working with Phoenix Tower International in CALA with at least one other investment in the asset class imminent, none of which is in Europe leaving a vacancy in their stable!

**Bouygues Telecom:** Bouygues Telecom was one of Europe’s first MNOs to sell towers to an independent towerco, selling 2,166 of their estimated 17,000 towers to Antin’s FPS Towers in 2012 for €185mn. Acquisition overtures from Altice, which already owns Numericable-SFR, could result in the divestment of more towers.

**Britannia Towers / Hibernian Towers:** Privately owned towerco with 60 towers in the UK under the Britannia brand, 60 towers in Ireland under Hibernian and a further 20 towers in Northern Ireland under Ulstercom.

**Broadcast Networks Europe:** Association of 18 broadcast companies operating in 21 European countries whose remit includes ensuring the economic competitiveness of Europe’s broadcast networks, optimising platform developments and representing the industry with regards to policy developments and regulatory intervention.

**Brookfield Infrastructure Partners:** Participated in the consortium which acquired equity in TDF in 2014 and known to have an appetite for further opportunities in European towers.

**BuyIn:** A 50/50 procurement joint venture between Deutsche Telekom and Orange with an annual budget of €28bn across network technology and other telecom equipment categories.

**Capital Group:** Another investor keen on the telecom tower asset class, Capital Group has or had capital at work in Russian Towers as well as Eaton Towers in Africa.

**CEE Equity Partners:** Investor exploring opportunities in CEE towers.

**Cellnex Telecom:** Catalysts for the opening of the European tower market, Cellnex (formerly Abertis Telecom) have to date deployed over €1.2bn rolling up a portfolio of 15,140 telecom and broadcast towers across Spain and Italy. To put that into context, the sum represents more than half the total capital spent on European towers in the last five years. Flush with capital and confidence from their successful IPO, Cellnex has a €multi-billion acquisition war chest. Although Cellnex dominates the European deal table, it still has plenty of room for growth in its existing markets: towercos own just 18% of towers in Spain and 48% of Italy’s towers. Telecom Italia’s Inwit could be Cellnex’s next acquisition target.

“Our model (in Europe) is not based on the idea of getting three or four tenants on a tower, it’s based around the idea you can dismantle the tenants on an existing tower and transfer them to new sites,” said David Bernal Cantero, BDM at Cellnex in a recent TowerXchange interview.

“Our plan in Europe is diversification,” continued Bernal Cantero. “Germany is an attractive market at the moment, reducing the number of operators from four to three will shake things up. The UK is also interesting but it’s a very competitive market with strong incumbent towerco’s. France is a strong market with some MNO transactions in the pipeline which might drive some changes in the market. We see some good short term opportunities in Europe, not only in the countries mentioned above but also in other European countries.”

**České Radiokomunikace:** With 1,000 access points across the Czech Republic, České Radiokomunikace provides structures and services to broadcast and telecom clients. Owned by Macquarie.

**Česká Telekomunikační Infrastruktura (CETIN):** When PPF acquired O2 Czech Republic from Telefónica in January 2014, they immediately set about separating the retail assets from the infrastructure, in the latter case creating CETIN which was briefly listed on the Prague stock exchange prior to a squeeze out of minority shareholders putting PPF as sole shareholders. CETIN owns 20,000,000 km of metallic cable pairs, 38,000 km of fibre and 5,300 outdoor base stations plus 750 micro base stations, providing 99.6% population coverage. With O2 having set up a
network sharing agreement with T-Mobile prior to the carve out, CETIN have taken over O2's role in managing the RAN sharing with T-Mobile

**Cignal**: Owns 115 towers developed for Hutch in Ireland, plus the ground leases under a just under 300 other operator towers. Recently sold to InfraVia prior to which it was known as Coillte.

**Citi**: One of the world's leading tower transaction advisory groups can be found within the TMT team at Citi.


**Crown Castle**: Publicly listed U.S. towerco Crown Castle had a profitable foray into European towers between 1997 and 2003, acquiring a £75mn revenue tower business from the BBC and transforming it into a £233mn revenue tower business with a tenancy ratio of 2.9 by 2003, selling it to National Grid Wireless for £1.1bn (just over US$2bn). While Crown Castle has largely retrenched from their international strategy to deploy capital domestically diversifying into small cells and fibre, TowerXchange would not rule out the U.S. giant returning to Europe.

**CTIL**: Joint venture between Vodafone and O2 (Telefónica) in the UK with around 18,000 sites. Predecessor Cornerstone established the passive infrastructure sharing business, the new CTIL business now has around a £1bn of passive assets on its balance sheet whilst also leading the Beacon active infrastructure sharing project, again between Vodafone and O2. Status of the JV remains unclear if the O2-Three merger is approved.

**Deutsche Funkturm (DFMG)**: Towerco carved out of Deutsche Telekom in 2002. Their parent company remains their lead client representing around a third of DFMG’s tenancies. Operates 26,000 sites, of which around half are rooftops. Deutsche Telekom has twice been rumored to be on the brink of divesting DFMG, but to date the assets are retained on their balance sheet.

**Digita**: Greek broadcast towerco.

**Digital Bridge**: Serial tower entrepreneurs Mark Ganzi and Ben Jenkins are building another empire having sold their last venture, GTP, to American Tower for US$4.8bn. Digital Bridge is an investment vehicle through which stakes are invested in towercos around the world. Digital Bridge recently appointed Phil Cooper as Managing Director EMEA, having previously kicked the tyres on the opportunity to invest in TDF. We expect Digital Bridge to have an active investment / platform in Europe by Q2 2016.

**ECS**: Polish tower builder with an appetite to move up the value chain.

**EE**: UK MNO joint venture between T-Mobile and Orange currently subject to a proposed acquisition by BT which could destabilise the country’s JV infrastructure sharing companies – in this case particularly MBNL.

**EI Towers**: Broadcast towerco with a progressive management team and an appetite to diversify into telecoms – a strategy they are well under way in executing having acquired 700 telecom towers from various small independent towercos in Italy. Telecom now represents 8.9% of EI Towers’ revenues. EI Towers more recently made headlines for their aggressive but ultimately justifiable pursuit of an acquisition of Italy’s other broadcast towerco Rai Way – the combination of the two entities could create tremendous efficiencies given the estimated 60% overlap in their networks.

**Emitel**: Polish broadcast towerco diversifying into telecoms. Own 300-400 sites. Acquired by Alinda Capital Partners.

**ESB Telecoms**: Subsidiary of Irish National power company ESB Networks developed to operate telecom sites. Most of their sites, which total around 400, are in substations.

**ESN Group**: Russian oil and gas, energy, engineering and infrastructure giant founded by Grigory Berezkin. Had been interested to bid for Vimpelcom’s Russian towers when the process started and stopped in the past – interest in the current process unknown.
ETB: Serbian broadcast towerco.

European Wireless Infrastructure Association (EWIA): Trade association for independent towercos in Europe whose members included (at time of press): American Tower Germany, Arqiva, Axion, Cellnex, EI Towers, FPS Towers, Open Tower Company, PCIA, Protelindo Towers BV, Towercom and Wireless Infrastructure Group, whose CEO Scott Coates chairs the EWIA.

EuroTower: Aspiring towerco for Europe with big vision and a willingness to evolve the business model to meet the needs of European MNOs. Yet to close their first deal.

EY: TMT strategy and corporate finance advisory team with extensive experience of advising on tower transactions.

F2i: One of the largest infrastructure funds in Europe, and owns a majority stake in Metroweb, which operates a fibre network in Milan and Lombardy. F2i was rumored to have bid for Wind’s towers ultimately acquired by Cellnex, and has been again linked with a bid for Inwit, possibly coming in as partners of Cellnex.

FMO: Dutch development bank 51% government owned, 49% by commercial banks and financial institutions. Have invested in African towercos, not yet in Europe, where Eastern Europe is a better fit than the West given their developing market remit.

FPS Towers: FPS was formed in 2012 by Antin Infrastructure Partners to acquire and manage just over 2,000 towers acquired from Bouygues Telecom – the company now owns 2,051 towers, primarily in rural areas. FPS is currently focusing solely on the French market.

“We aim to push our development programme in both our rural and urban rooftop portfolios. FPS now employs 70 people and we are expecting gross revenue of more than €45 million for this year, representing 30% growth in the last three years,” said Frederic Zimer, CEO of FPS Towers in a recent TowerXchange interview. “In terms of rooftop growth, we currently manage with exclusivity around 20,000 and expect to reach 30-35,000 in the next two years. Within this number we also aim to have more than 1,000 rooftop sites owned outright. In terms of value added, we seek to own the rooftops and every site we have in our portfolio. FPS is a towerco and a towerco is an infrastructure investor and manager – we invest to grow our assets and after that it’s a cash machine. That’s why we seek to replicate our rural model in urban areas,” concluded Zimer.

Galata: Wind towerco acquired by Cellnex – see WIND Telecomunicazioni.

Global Tower: Founded in 2006 as a subsidiary of Turkcell, Global Tower is the biggest infrastructure operator in Turkey with more than 23,000 points of service, of which 7,500 are towers, the rest being rooftops and IBS. Tenants include GSM and fixed-based operators, TV and radio broadcasters, public institutions and service providers. Global Tower also owns UkrTower in the Ukraine, which has just under 400 sites.

Goldman Sachs: Experienced advisors on tower transactions and lenders to towercos.

Hardiman Telecommunications: A unique consultancy equally capable advising on engineering and operational issues as they are on commercial strategy and corporate finance. Extensive experience advising on both the buy-side and sell-side in tower transactions.

Hibernian Towers: See Britannia Towers.

Highpoint: See Obelisk Group.

Hutchison: MNO typically operating under the Hutchison / 3 Group
brand 3. Active in Europe in Italy, the UK, Sweden, Denmark, Austria and Ireland. Hutchison has sold four tranches of towers in Indonesia to Protelindo and STP, but has not yet completed any divestments in Europe, although they have participated in infrastructure sharing JVs such as MOSAIC in Ireland and MBNL in the UK. Speculation suggests that the merger of Vimpelcom’s and Hutchison’s 3 Italia may result in the sale of Hutchison’s 8,000 towers in Italy, while the proposed merger of Three and O2 in the UK may also precipitate the separation of towers, either at the bequest of regulators, or to satisfy Three UK’s investors’ liquidity requirements.

InfraVia Capital Partners: Acquired Coillte’s 300 sites in August 2015 for an undisclosed sum, renaming the company Cignal.

ING Commercial Banking: Leading Dutch bank with considerable experience of providing debt finance to the tower industry.

International Finance Corporation (IFC): The IFC is a member of the World Bank Group, the world’s leading DFI. The IFC has invested around half a billion dollars in debt and equity into eight towerco across emerging markets, with an objective to double that total investment by 2018. IFC’s exposure in Europe to date is a US$20mn equity investment into Russian Towers.

Intrepid Advisory Partners: Advisory firm established by Daniel Lee, the “Rainmaker” of the African tower industry – Dan advised on 11 of the first 13 deals to close in Africa.

Inwit (Infrastrutture Wireless Italiane S.p.A.): Telecom Italia carved out Inwit as an independent towerco and listed 40% of the equity in the company in a successful IPO on the Milan stock exchange, raising €875.3mn. Telecom Italia has since commenced a process to sell a further 45% of the equity in the company to a third party, with E1 Towers, Cellnex and F2i (the latter two reportedly in a joint bid) believed to be interested. RBC reports that approximately 5,000 of Cellnex’s towers overlap with Inwit’s, suggesting substantial scope for rationalization.

Inwit operates 11,519 towers in Italy, of which 7,400 are in suburban or rural areas, commanding a €1577 lease rate, and 4,100 in urban areas, with a €2297 lease rate. At the time of the IPO, Inwit’s tenancy ratio was 1.55, with Telecom Italia as their anchor tenant, Vodafone as their primary second tenant and around 1,500 Wind tenancies.

ITAS TIM: Family owned towerco which operates 420 towers in France with a combination of broadcast, radio, M2M, WiMAX and MNO tenants.

J.P. Morgan: Leading TMT advisory team with extensive experience in towers, including some of the landmark European transactions.

Konsing Group: Serbian managed service provider active in multiple European markets, also own and operate 74 towers in their home country.

KPN: Leading telecom and IT service provider in The Netherlands. Sold a total of 1,322 Dutch towers in four tranches between 2008 and 2012 to Open Tower Company, Shere Group and Protelindo. Sold a further 2,031 towers in Germany to American Tower in 2012 before the sale of their German subsidiary, E-Plus, to Telefónica in October 2014.

KPR Consulting: Renowned ‘tower doctors’ – go-to guys for structural / technical due diligence, improvement capex planning, decommissioning and just about anything to do with tower design and maintenance. KPR also manage a significant proportion of the towers in Denmark through co-location management agreements.

Levira: Estonian broadcast towerco, data centre, network, cloud and media service provider. 51% owned by the government, 49% by TDF. Owns 22 transmitter towers across Estonia and provides co-location services to MNOs.

Link Development: Operates over 300 towers, primarily in Northwest Russia, supplemented by a growing fleet of smart poles.

Logycom Group: The first independent towerco in Kazakhstan, with a contract for their first 100 BTS towers.

Macquarie Group: Serial towerco investors, with capital at work in Europe within Arqiva and Russian Towers, and farther afield with Axicom (formerly Crown Castle Australia), Mexico Tower Partners and Viom Networks (soon to be part of ATC India).
Macquarie also has an excellent TMT advisory practice with experience of advising on tower transactions.

**MBNL:** Joint venture between EE and Three (Hutchison) in the UK with around 18,000 sites, although the assets remain on its shareholders’ balance sheets. Status of the JV remains unclear if the O2-Three and BT-EE mergers are approved.

**Media Broadcast:** Broadcast towerco operating over 300 transmitters across Germany. Media Broadcast was separated from TDF in April 2015.

**MegaFon:** Number two MNO in Russia, announced in October 2015 that they were auditing their asset register and planning to carve out around 14,000 towers into a towerco, perhaps with a view to an IPO or sale and leaseback. “This is a good idea, because operators all over the world spin off their passive infrastructure to invest the money into what brings higher margins. We are also studying this option,” MegaFon CEO Ivan Tavrin said in October. “We are starting the project, but it will certainly take more than a quarter,” he added.

**MOSAIC:** Vehicle for the infrastructure sharing partnership between Three and Eircom in Ireland. Assets remain on the balance sheets of the MNOs.

**Mott MacDonald:** Digital Infrastructure team has extensive experience of advising on tower transactions and investments.

**MTS:** Unlike their competitors, Russian market leading MNO MTS has yet to provide any hints of potential appetite to monetise their towers.

**Net4Mobility:** Swedish joint venture infrastructure sharing firm founded in 2009 by Telenor and Tele2.

**NetShare:** Former Vodafone-Three Ireland JV from which Three were compelled to exit under the terms of their merger with O2. NetShare continues to administer the Vodafone network.

**NetWorkS!** 50-50 Polish joint venture infrastructure sharing firm responsible for the management of T-Mobile and Orange’s networks. When launched in 2011, and prior to consolidation, NetWorkS! managed 10,000 base stations.

**Norkring:** Wholly owned subsidiary of Telenor which owns both the Norwegian and Belgian broadcast towercos. Norkring has 2,750 transmission stations across Norway, with space leased to broadcasters, MNOs, broadband and public service providers. Norkring Belgie is 25% owned by PMV, itself owned by the Flemish government.

**Obelisk Group:** Obelisk Group is a diversified energy and telecoms EPC contractor which also owns Highpoint, a towerco which markets and manages more than 150 sites in Ireland.

**Open Tower Company:** See Communication Infrastructure Partners.

**Orange:** One of Europe’s largest MNOs with a footprint across France, Spain, Belgium, Luxembourg, Germany, Poland, Slovakia, Moldova, Romania, Ireland and the UK, where they are a 50% shareholder in EE. Orange has agreed active infrastructure sharing deals in Spain, Poland and Romania, and has partnered with Three to create MBNL in the UK. While Orange has partnered with independent towercos in Africa, agreeing ‘manage with license to lease’ deals with IHS in Cameroon and Cote d’Ivoire and selling towers to Eaton Towers in Uganda and Egypt, the MNO has not yet extended their passive infrastructure monetisation strategy to Europe. That may change in 2016, with rumors of Orange
being interested to sell their towers in Spain and Poland.

**ORS:** Austrian broadcast towerco carved out of national broadcaster ORF in 2005. ORF still owns 60%, with Medicur Sendeanlagen, part of Raiffeisen group, owning the balance. ORS’s 450 transmitter sites are offered for co-location by MNOs.

**PA Consulting:** Consulting, technology and innovation firm, advising operators, infrastructure owners and investors on strategic decisions. Have extensive experience in tower transactions; acting as advisors to both buy and sell-side

**Portugal Telecom:** Largest telecom service provider in Portugal. Acquired by Altice for €7.4bn in June 2015. Rumors circulated in 2014 and again in 2015 that Portugal Telecom might be interested in selling 2-3,000 towers, but no deal crystallised.

**PPF:** Investment fund founded by the richest man in the Czech Republic Petr Kellner. PPF acquired O2 Czech Republic and spun off it’s infrastructure as CETIN.

**Protelindo:** Brainchild of Michael Gearon and his loyal management team, Protelindo is the largest towerco in Indonesia where they own over 11,500 towers. Protelindo acquired 261 towers from KPN in the Netherlands in 2012 for €75mn.

**Providence Equity:** Communications and media investment specialists with capital at work in Indus Towers (India), Grupo Torresur (Brazil) and KIN (Indonesia). Expect Providence to have considerable interest in European towers.

**Quippo International:** The ownership team behind Viom Networks in India, now seeking new international opportunities following their successful exit and sale to American Tower. Believed to have an appetite for opportunities in Russia, among other markets.

**Radicom:** Broadcast towerco from Romania.

**Rai Way:** Listed Italian broadcast towerco with 2,300 towers delivering 99% coverage. Manages both active and passive infrastructure for their broadcast clients. Since Q4 2014 Rai Way have dedicated resources to leasing up their existing towers, and report having MNO tenants on ~700 of their sites, as well as towerco’s usual “non-traditional MNO” tenants: emergency services and fixed wireless access operators.

Rai Way has been the subject of much consolidation speculation. EI Towers’ initial interest in acquiring Rai Way earlier in 2015 was met with a distinctly negative response by government stakeholders. Whilst Rai Way is an autonomous business with it’s own decision making authority, when it comes to M&A, the State remains a critical stakeholder

**Rothschild:** Investment and advisory firm with a strong pedigree in European towers.

**RTRS:** State-owned Russian television and broadcasting network with some MNO tenants on their towers, but they don’t seem to be proactively promoting co-location.

**Russian Towers:** Leading independent towerco in Russia with around 1,600 towers. Russian Towers have a unique partnership with the Russian Railway enabling them to build along the railway infrastructure, while more recently they have deployed a number of multi-tenant light poles. Auspicious roster of backers includes UFG, EBRD, IFC, Macquarie, ADM Capital and Sumitomo Corporation. Will be a leading contender to acquire Vimpelcom and MegaFon towers, if they come to market, and could extend their footprint into the CIS if the right opportunity presents itself.

**SBA Communications:** Publicly listed US towerco with over 25,000 towers in North and South
T-Mobile branded as T-Mobile in Austria, Croatia, Czech Republic, Hungary, Montenegro, Netherlands and Poland, branded as Telekom in Albania, Germany, Macedonia and Slovakia and as EE (company owned 50% with Orange) in the UK. America. No presence in Europe. Yet.

**Service Telecom:** Towerco with over 100 towers and microsites in Moscow.

**Shere Group:** Independent towerco owned by Arcus Infrastructure with 860 towers across the UK and the Netherlands.

**SUNAB:** Active infrastructure sharing joint venture between Tele2 and TeliaSonera in Sweden.

**Swisscom:** Swiss broadcast towerco.

**T-Mobile:** Leading European MNO which has been involved in network sharing JVs in Poland, the Netherlands, the Czech Republic and the UK (through their 50% stake in EE). T-Mobile has not yet sold any towers in Europe but has done in the US, where they also operate their own towerco T-Mobile Towers.

**TAP Advisors:** Boutique M&A and investment advisory firm with long history of advising on tower deals, including advising Inwit on their IPO.

**TDF (Télédiffusion de France):** Leading French towerco with 9,950 sites and over 2,000 employees. Refinanced in March 2015 with Brookfield, APG, PSP, Arcus Infrastructure and Credit Agricole becoming shareholders. In recent years TDF has refocused on their domestic French market and has less appetite for international opportunities, selling broadcast towercos Axion (Spain), Alticom (Netherlands), Digita (Finland), Antenna Hungaria (Hungary) and separating Media Broadcast (Germany). In 2014-15 41.2% of TDF’s revenues came from telecom, 30.3% from TV and 18.3% from radio broadcast.

**Tele2:** Tele2 has undertaken active infrastructure sharing with Telenor in Sweden and passive infrastructure sharing with T-Mobile in the Netherlands, but has not to date sold any towers. Tele2 exited the Russian operator of the same name in 2013, the latest in a series of divestments.

**Tele2 Russia:** Joint venture between Rostelcom (45%), VTB Group and a consortium of investors, which owns 55%. Tele2 Russia is driving network investments in Russia as it expands from a regional to a nationwide player. Tele2 Russia is building around 1,000 towers per year itself and leveraging co-location to accelerate time to market. Tele2’s network investments are driving Russian towerco expansion, for example Russian Towers derives 37.6% of its revenue from Tele2 Russia compared to 19% from Vimpelcom, 17.7% from MTS and 13.1% from Megafon.

Tele2 Russia’s low cost business model has made some early market share inroads and forced Russia’s three incumbent operators to increase their own network capex. Introduced services in Moscow and Moscow Oblast in October 2015 having built a formidable network of 5,000 3G and 2,000 LTE base stations.

**Telefónica:** Spanish owned multinational MNO Telefónica has made the headlines by carving out its 11,500 Spanish towers into a new entity - Wireless Towers, and are following a dual strategy approach
to either list or sell the newly created infrastructure business.

Following rumours that a potential 60,000 Telefónica assets could be for sale, it is widely thought that they will follow a similar approach in Germany where it is estimated they have a further 10-12,000 towers remaining.

Telefónica has already sold 500 towers in Spain to Abertis (now Cellnex) in 2012 before a further bundle of 4,277 Telefónica and Yoigo towers was sold to the same company in 2014, raising €385mn. Telefónica’s acquisition of E-Plus from KPN in Germany precipitated the transfer of 7,700 sites – mostly rooftops – to Deutsche Telekom and ultimately to Deutsche Funkturm.

Telefónica has also sold a total of over 9,000 towers in Brazil, Mexico, Chile and Colombia, raising a total of over US$1.5bn.

**Telemont**: Leading Russian tower I&C and O&M subcontractor.

**Telenor**: Multinational Norwegian owned MNO Telenor has shared infrastructure all over its footprint, but has tended to partner with towercos in greenfield launches, such as the launch of Uninor (now Telenor India) and the launch of Telenor Myanmar. Within established markets, Telenor has seemingly preferred to retain towers and instead form active infrastructure sharing partnerships such as with TeliaSonera in Denmark and with Tele2 and Hutchison in Sweden.

**Telekom Austria**: America Movil owns a 59.7% stake in €4bn MNO Telekom Austria, which has a footprint across Austria, Slovenia, Croatia, Serbia, Macedonia, Bulgaria and Belarus. TowerXchange have picked up the first hints that Telekom Austria might be receptive to some form of infrastructure outsourcing deal, possibly involving passive and active equipment.

**TeliaSonera**: TeliaSonera has completed one tower transaction to date in Europe – their Spain subsidiary Yoigo contributed some of the 4,277 Telefónica and Yoigo towers sold to Cellnex in 2014. TeliaSonera has engaged in active infrastructure
sharing partnerships in Denmark, with Telenor, and in Finland, with DNA. TeliaSonera’s proposed merger with Telenor in Denmark, which may have shaken loose some towers, has been called off. However the acquisition of Tele2 Norway has been closed, with network integration ongoing – anticipate some towers being sold or decommissioned as a result.

TeliaSonera recently appointed UBS to explore their potential exit from Kazakhstan, Uzbekistan, Azerbaijan, Tajikistan, Nepal, Georgia and Moldova, enabling the group to sharpen its focus on the rest of Europe and the Nordics.

**Telacom:**) Broadcast towerco for Denmark and Sweden.

**Three Italy:**) The merger of Vimpelcom’s Wind and Hutchison’s 3 Italia may result in the sale of Hutchison’s 8,000 towers in Italy.

**Three UK and Ireland Ireland:** Three’s merger with Telefónica’s O2 in Ireland precipitated Three exiting the NetShare joint venture with Vodafone – could this be a precedent for a similar outcome should Three and O2 merge in the UK also, forcing Three to exit CTIL?

**Threefold:** Leading Irish tower I&C and O&M firm which led the buyout of Eircom’s mast infrastructure in 2007, and the subsequent establishment of Towercom. Threefold now provides tower strategy advice to stakeholders across Europe and beyond.

**TOWERCAST:** French broadcast towerco owned by NRJ Group. Also sells co-location to telecom clients.

**Towercom:** Towerco in the Republic of Ireland carved out and sold by Eircom in 2007. Operates over 400 towers. Sold to the Irish Infrastructure Fund in 2013.

**TT-Network:** Danish infrastructure sharing joint venture with around 2,500 towers established in 2012 by TeliaSonera and Telenor.

**Turckcell:** Leading MNO in Turkey. Carved out and retained their own towerco, Global Tower, in 2006.

**UFG Asset Management:** Russian focused alternative investment group is one of the founding shareholders of Russian Towers.

**UkrTower:** The first and only towerco in Ukraine, providing around 400 towers and IBS to MNOs, television and radio broadcasters and civil and military wireless communication operators.

**Vertical:** Russian towerco, formed in 2013, experienced large growth in 2015, acquiring and refurbishing over 500 sites, leaving them with a portfolio of 1600 sites. Wholly owned by the company founder, the company has a heavy focus on the Moscow region and has in addition completed a number of build to suit programmes for multiple MNOs in rural areas.

**VICTUS Networks:** Network sharing joint venture created in 2014 with 50-50 participation between Vodafone Greece and Wind Hellas. Uses a partial MORAN business model.

**Vimpelcom:** Kick started the current phase of European tower sales with the sale and leaseback of 7,377 towers from their Italian opco Wind to Cellnex for €693mn in 2015. Vimpelcom has subsequently commenced processes to sell 10,400 towers (and up to 19,000 rooftop sites) in Russia - receiving 8 offers and processes also under way in Bangladesh and Pakistan. Vimpelcom may subsequently divest tens of thousands of towers in Armenia, Kyrgyzstan, Uzbekistan, Tajikistan, Kazakhstan, Ukraine and Georgia.

**Vodafone:** Vodafone is an advocate of infrastructure sharing and has entered into passive
annum, and provides procurement services to third parties, including independent towercos.

**Wind Telecomunicazioni**: Vimpelcom’s Italian opco whose towerco Galata was sold to Cellnex in 2015, with Wind retaining a 15% equity stake, as well as a small proportion of the towers. Wind is currently engaged in a merger with Hutchison’s 3 Italia, which could shake loose more towers.

**Wireless Infrastructure Group (WIG)**: One of Europe’s most entrepreneurial middle-market towercos, WIG became a bona fide towerco in 2007. Through a combination of organic growth and small to mid-sized acquisitions, WIG has grown a portfolio of over 2,000 active sites. The company and their investors Wood Creek Capital Management remain acquisitive.

“If we get to half the level of outsourcing as the US market there would be an additional 100,000 towers owned by towercos,” said WIG CEO Scott Coates. “The opportunity also extends beyond towers – WIG for example has an active DAS business and we are looking at outdoor small cell networks for cities in the UK. Whether it’s towers or small cells, the wholesale sector has a major role to play in the next chapter of European wireless networks.”

**Wireless Towers**: Formed in January 2016, Wireless Towers in Telefonica’s newly created Spanish infrastructure business which manages the company’s 11,500 towers in the country. Telefonica are looking at a potential sale or listing of the business, employing a dual strategy approach, in order to reduce its debt burden.

**Vodafone Procurement Company (VPC)**: Vodafone founded VPC in 2008 to leverage scale and a leaner procurement and SCM model. VPC administers a total procurement budget in excess of €20bn per annum, and provides procurement services to third parties, including independent towercos.

**Who have we missed?**

Advance apologies: we’re bound to have missed one or two key stakeholders in European towers – if so we’d like to know as we’re on a mission to assemble everyone at the inaugural TowerXchange Meetup Europe on April 12-13 in London (see www.towerxchange.com/meetups/meetup-europe)! If you feel your company should be profiled in the TowerXchange who’s who in European towers, please email Laura Dinnewell, Head of TowerXchange Europe, at ldinnewell@towerxchange.com.
Perspectives from Germany’s leading towerco on Europe’s largest telecom market

An interview with Deutsche Funkturm

Deutsche Funkturm (DFMG), a subsidiary of Deutsche Telekom, is Germany’s largest towerco, operating 27,000 sites across the country. They recently acquired 7,700 towers from Telefonica in July 2015 which are now managed under a newly created entity, Omega Towers. They are currently constructing a significant number of new macro-locations across the country and are also starting to explore micro-sites to address Germany’s growing bandwidth requirements.

Keywords: 4G, Acquisition, American Tower, Anchor Tenant, Co-locations, Construction, DAS, Decommissioning, Densification, Deutsche Funkturm, Deutsche Telekom, DFMG, Energy, Europe Insight, Europe News, Germany, Infrastructure Sharing, LTE, Market Overview, Masts & Towers, MNOs, Novation of Leases, PASM, Passive Equipment, Rooftop, Small Cells, Tower Count, Towercos, Transfer Assets

Read this article to learn:

- Germany’s largest towerco’s focus on new macro-site build and small cells
- The rationale behind formation of Omega towers following Deutsche Funkturm’s acquisition of 7,700 Telefonica towers
- Deutsche Funkturm’s attitudes toward decommissioning
- The priorities of MNOs in Germany and what opportunities this presents for a towerco

TowerXchange: Please introduce yourself, how did you get into the tower business?

Günther Stein, Senior Vice President, Sales & Marketing, Deutsche Funkturm (DFMG) & General Manager, Omega Towers: I have worked in the telco environment for the past 25 years. In 2009 I joined DFMG as the Head of Technology and moved to heading Sales and Marketing in 2012.

TowerXchange: Please tell us a little about Deutsche Funkturm and Omega Towers.

Günther Stein, SVP, Sales & Marketing, DFMG: Deutsche Funkturm (DFMG) was founded in 2002 as a subsidiary of Deutsche Telekom with the specified aim of renting out antennae space in the German market. The company currently operates 27,000 sites.

Since the deal with Telefonica in July 2015 we have also taken over another 7,700 sites which are managed under a new entity (100% owned by DFMG) called Omega Towers, of which Thore Doernemann and myself are the General Managers.

TowerXchange: What was the rationale behind creating Omega Towers to manage the sites acquired from Telefonica?

Günther Stein, SVP, Sales & Marketing, DFMG: Legal requirements made it necessary to found Omega Towers in order to transfer the sites in question from E+/O2 to our group.
We are currently constructing a significant number of new macro locations per year and this could well augment for the next couple of years. A large portion of this is due to the need to re-locate sites following the termination of leases by landlords. When it comes to micro-sites this is something that we just started to get involved in. If new infrastructure is required, for example antennae on houses, then MNOs may approach us to support them in this.

TowerXchange: Are permitting processes and landlord agreements becoming increasingly challenging in Germany?

Günther Stein, SVP, Sales & Marketing, DFMG: Let me put it this way: we are dealing with well informed and highly sophisticated landlords, therefore our competence in the acquisition process must meet these challenges.

TowerXchange: As well as building new sites, is DFMG heavily involved in decommissioning existing sites?

Günther Stein, SVP, Sales & Marketing, DFMG: Since the merger of O2 and E+ we are in the process of decommissioning sites as part of a project for them. Decommissioning for us tends to be project based rather than a major strategy with Deutsche Telekom having no requirements to decommission.

TowerXchange: Speaking of the merger between O2 and E+, what impact has this had on DFMG and the market?

Günther Stein, SVP, Sales & Marketing, DFMG: Whoever rented out space to the two companies – including DFMG - loses revenue from the merger between the two companies.

TowerXchange: What capabilities does the company keep in house versus subcontract out to third parties?

Günther Stein, SVP, Sales & Marketing, DFMG: DFMG subcontracts the entire construction work, some acquisition, and some business support activities. Our company philosophy though is that we control and project manage every single investment and technical project ourselves. This is why we have a substantial workforce of architects and engineers managing our technical business.

TowerXchange: Who owns the energy assets at the sites? Is there an appetite for shared back-up solutions?

Günther Stein, SVP, Sales & Marketing, DFMG: DFMG or its sister company PASM (Power and Air Condition Solution Management) generally own
“LTE rollout is definitely a priority for the next 3-4 years and then the assumption is that 5G technologies will kick in around 2020, creating a further 3-5 years of infrastructure expansion to support this energy assets at DFMG locations. Definitely power and backup solutions provide opportunities for win-win solutions for MNOs and ourselves.

TowerXchange: In terms of the remaining towers and masts in Germany, who has control and do you foresee other tower companies entering the market?

Günther Stein, SVP, Sales & Marketing, DFMG: American Tower is the only other pureplay towerco in the German market at present. We have observed a lot of changes in the management of American Tower in the country and that casts some doubt about their appetite to stay in Germany, so we are watching closely.

The remaining sites are owned by MNOs, broadcast companies, the military, public security and other users who all try to lease out space for commercial benefit. We don’t see any other small tower companies in the market.

When it comes to new market entrants, there have been various press releases and rumors about European operators looking at the German market.

TowerXchange: Do you anticipate any further divestment of infrastructure assets by MNOs in Germany?

Günther Stein, SVP, Sales & Marketing, DFMG: There have been rumors that a big MNO might try to sell more assets but this has not yet been confirmed.

TowerXchange: What do you see as the priorities for German MNOs at present and what impact does this have on towerco?

Günther Stein, SVP, Sales & Marketing, DFMG: LTE rollout is definitely a priority for the next 3-4 years and then the assumption is that 5G technologies will kick in around 2020, creating a further 3-5 years of infrastructure expansion to support this.

With increasing bandwidth demands from consumers and existing cable being unable to meet the data requirements of the population, MNOs are focused on adding additional capacity as a service to offer to their customers. These increasing bandwidth requirements will force the need for an increase in macro- and micro sites and so present a great opportunity to towercos.”
Carving out O2 Czech Republic’s infrastructure business

An interview with CETIN CEO Petr Slováček

Česká Telekomunikační Infrastruktura (CETIN) manages the largest telecommunication network in the Czech Republic comprising of 5,300 towers, with access to a further 5,000 through a network sharing agreement with T-Mobile, 20,000,000 km of metallic cable pairs and 38,000 km of optic cable. The company was formed in 2015 following a spin out of O2 Czech Republic’s infrastructure business. Following a brief stint trading on the Prague Stock Exchange, CETIN is now wholly owned by investors PPF. In this interview we talk with CETIN CEO, Petr Slováček to discuss the details behind the successful carve out and delve into the company’s business strategy in the Czech Republic.

Keywords: 3G, 4G, Active Equipment, Active Infrasharing, Business Case, C-Level Perspective, Carve Out, CETIN, Core Network, Backhaul & FTTT, Czech Republic, Deal Structure, Decommissioning, Europe, Europe Insights, Infrastructure Sharing, Insights, Masts & Towers, MNOs, Network Rollout, O2, Operator-Led JV, Passive Equipment, Regulation, Tenancy Ratios, Tower Count, Towercos

Read this article to learn:
■ Who CETIN are and what role they play in the Czech telecoms sector
■ What motivated the separation of the infrastructure and retail businesses
■ How CETIN’s separation from O2 impacted on their network sharing agreement with T-Mobile
■ Why trading of CETIN on the Prague Stock Exchange was terminated in January 2016
■ What synergies exist between sharing towers and networks and sharing backbone and last mile fibre

TowerXchange: Please can you provide a brief introduction to your background and how you got into the telecoms sector?

Petr Slováček, CEO, CETIN: I graduated from the Technical University, Prague, with a degree in telecommunications and then obtained a postgraduate Master of Business Telecommunications at the Technical University of Delft in the Netherlands. After graduation I joined the Telecommunications Research Institute in Prague, prior to joining SPT TELECOM (the previous commercial name of O2 Czech Republic) in 1989, working in switching, technical development, network management projects and OSS. In O2 Czech Republic, I was in charge of the Infrastructure and Wholesale Division and a member of the Board of Directors from 2003, serving as Vice Chairman from June 2008 - March 2014. Since June of last year I am now the Vice Chairman of the Board of Directors and CEO of CETIN

TowerXchange: Please introduce CETIN - how would you describe the company’s business model? Do you see yourselves as a ‘towerco’, an ‘infraco’ or something entirely unique?

Petr Slováček, CEO, CETIN: CETIN (short for Česká telekomunikační infrastruktura) was created in June of last year when it separated out from O2 in the Czech Republic. We manage and operate the largest telecommunications network in the Czech Republic, consisting of 20,000,000 km of metallic cable pairs, 38,000 km of optic cables, 5300 macro towers and 750 micro-sites. We would class ourselves as an infrastructure provider
rather than a towerco as we also own and operate both the active and passive infrastructure as well as the connectivity between towers. We are an autonomous and fully independent wholesaler, entirely separate from O2 out of which we were separated through corporate spin-off as of June 2015. We provide open access to the network offering fair and equal conditions to all operators (B2B). We do not sell to end customers (B2C).

TowerXchange: What motivated O2 to separate CETIN as an infrastructure business from their retained retail business?

Petr Slováček, CEO, CETIN: The decision was suggested by O2’s board of directors to separate the business for a couple of reasons. As a former CTO at O2 I appreciate the advantages offered by the separation very well (both for O2 and CETIN).

Firstly, decision-making within a vertically integrated company always involves a number of compromises – the telco and infrastructure part of the operator have to certain extent different business targets with different investment horizons and different amounts of customers. Separating these two parts of the business enables each to make decisions independently which are in their own better interests.

Also from the regulatory point of view it is better to have these two businesses separated – most of the regulation applies to CETIN, O2 in the future will only be slightly regulated. This frees up O2 to make decisions in relation to retail price determination, balancing of the services portfolio, etc. But that is enough of O2, what is crucial for CETIN, as we are not active in the retail segment, fulfilment of our regulatory obligations will be easier.

The separation was completely voluntary and based purely on business merits. CETIN can now plan on more appropriate investment horizons, looking for an ROI within a longer 5-10 year period which better suits our business model. This helps significantly with setting our network plans - we have, for example, just approved a seven year investment of US$900mn in backbone and FTTC.

What is necessary to emphasise from the competition office and other regulator’s points of interests – the separation of O2 and CETIN is not only of a corporate character. The separated companies have the same owner but apart from that they are fully independent. PPF, as the owner of majority of shares in both companies, does treat O2 only as a financial investment, only CETIN is part of the PPF group. After the separation was completed, we have separated HR and legal teams, we have moved to separate premises, there is no overlap in our boards of directors or supervisory board and so we are two entirely separate entities. We are also different economic units from the competition regulation perspective.

The whole process was realised in less than a year. Other attempts to make similar (although not such total) separations in various countries have not been completed to such a standard as ours as well or in such record time. O2 has been granted several awards for the completion of the separation.

TowerXchange: How has the regulator responded to the creation of CETIN? For example, how is the business licensed?

Petr Slováček, CEO, CETIN: The telecom regulator has been generally favorable to the separation and has adopted a very pragmatic approach to the assignment of regulatory obligations between O2 and CETIN. We have been registered with the Czech regulator for the provision of fixed network and services.

TowerXchange: I understand O2 and T-Mobile have had a deep network sharing partnership (governing both active and passive infrastructure) since your joint 3G rollout, extending to accelerate time to market for 4G. How does the creation of CETIN affect that partnership with T-Mobile?

Petr Slováček, CEO, CETIN: O2 set in place a network sharing agreement governing both passive and active infrastructure with T-Mobile across 10,000 macro sites (of which 35-40% are targeted to be decommissioned). The creation of CETIN did not affect the cooperation. We act as a complete network outsourcing provider for O2CZ in terms of RAN and took over the network sharing agreement in full. From that point of view nothing changed in the operating model or management of different areas. We are only now the only contractual partner to T-Mobile instead of O2.

We continuously look for ways to deepen and expand the cooperation with other operators in order to bring better services to more customers,
accelerate deployment of 4G, reduce environmental impacts of the networks, etc.

**TowerXchange: Beyond the aforementioned network sharing agreement, is there a culture of infrastructure sharing in the Czech Republic? Do you foresee opportunities for more co-locations beyond T-Mobile?**

**Petr Slováček, CEO, CETIN:** Whilst the CETIN-T-Mobile network sharing agreement is a major one, even before this hundreds of sites were used by multiple parties – I would estimate at least 20% of towers in the Czech Republic have multiple users.

When it comes to additional partners accessing our networks, yes there are more operators and we want to attract more of them to use our infrastructure. Generally speaking we continue to offer and further develop fair, reasonable and transparent conditions for tower access.

**TowerXchange: Are there other independent infrastructure providers in the Czech Republic?**

**Petr Slováček, CEO, CETIN:** Nearly all other towers are owned by respective MNOs or by broadcaster, České Radiokomunikace, which operates in particular a DVB-T networks. The state has some of its own infrastructure, for instance for the operation of Tetra integrated emergency communication systems, but this is of relatively small scale in comparison to commercial networks. CETIN is the only company focusing exclusively on telecommunication infrastructure with the exclusion of retail.

**TowerXchange: I understand CETIN will invest just under US$900mn over the next seven years, in backbone and FTTC. What do you see as the synergies between sharing towers and networks and sharing backbone and last mile fibre - should all these assets be managed by the same company and provided on a wholesale basis to all retail operators?**

**Petr Slováček, CEO, CETIN:** I do not see a reason why not. Although this is not the case in the Czech Republic, not all or most assets (towers, backbone and last mile fibre) are held by one company, CETIN or other. We believe that investment in both backbone and FTTC is a natural direction of such a company as CETIN, being active in both these infrastructure markets.

We do offer both last mile wholesale access as well as fibre optic backhaul on a transparent and non-discriminatory basis to all interested parties and we are convinced this is the most efficient and effective way to bring high quality services to the end customer. We believe that the investments to be made will only help the end users in this respect.

In terms of towers, there is significant reuse of these assets for other forms of last mile radio access in the enterprise market, e.g. via high capacity microwaves to locations which are difficult or costly to reach with fibre.

**TowerXchange: CETIN listed on the Prague Stock Exchange on 1 June 2015 - what can you tell us about the ownership and investability of CETIN?**

**Petr Slováček, CEO, CETIN:** CETIN is not listed on the regulated market of the Prague Stock Exchange. It was the activity of other independent parties which registered our shares to be traded on the un-regulated market of the Prague Stock Exchange and we had no influence of the fact. In any event, since 4th January 2016 trading of CETIN shares on this market was terminated due to the squeeze out of minority shareholders at the General Meeting of CETIN in December 2015. PPF (who had originally bought O2 from Telefonica) is now the sole owner of the company.

**TowerXchange: Please sum up your impressions of the CETIN carve out - and should other European countries and MNOs consider following O2’s lead to carve out a infraco?**

**Petr Slováček, CEO, CETIN:** It was a great and unique step for us, as it enables better business and investment planning for both the telco and the infrastructure company. We do not necessarily advise other operators abroad to follow our example, as every market is slightly different and such a fundamental decision must be taken in light of an individual company’s strategy, national regulatory framework and economic situation, but it was a good solution for the Czech Republic. We can see even now (some few months after the actual spin-off in June 2015) that both the market as well as the regulatory bodies do acknowledge the positive effects of the separation and we are confident that this approach will only grow/expand.
How many towers are there in Ireland?

There are currently 4,000 towers in the Irish market, of which 60% sit in the hands of the three incumbent MNOs - Vodafone, Meteor (owned by Eir, previously known as Eircom) and 3 (Hutchison) who have just recently acquired O2 (Telefónica). The remaining 40% of towers are owned and operated by a number of towercos, broadcasters and state enterprises.

Who are Ireland’s MNOs and what scale are their networks?

The history of MNOs in Ireland is complicated by a number of mergers and acquisitions and network sharing agreements. Eircell, 100% owned by Eircom was the first 012 in the Irish Parket In 001 Eircell was bought by Vodafone, demerging from Eircom. Vodafone currently has the largest market share in Ireland sitting at 38% with 99% network coverage.

The second MNO to launch in the Irish market was Digifone, owned by Irish billionaire Denis O’Brien. Digifone was rebranded O2 in 2001 following a takeover by BT, and was then owned by Telefónica following their takeover of O2 Ireland’s parent company in 2006 (until their recent acquisition by 3).

Meteor Mobile, at the time owned by US company Western Wireless, launched in Ireland in 2001 as the third MNO in the market and then was subsequently acquired by Eircom in 2005, still...
operating under the brand Meteor. Meteor currently have 21% of the market share in Ireland with 75% network coverage and is the only Irish owned MNO in the market.

3 (Hutchison) was the latest MNO to launch in the Irish market in 2005 and up until 2014, held only 9% of the market. Following an acquisition of number two operator, O2 from Telefónica in 2014 for €780mn, the newly formed entity currently controls 33% of the market with over 95% network coverage. The consolidation from four to three MNOs (following 3’s acquisition of O2) has been further complicated by network sharing ventures set up by each of the operators. Vodafone and 3 formed a network sharing venture called Netshare which has since been restructured - Netshare is now wholly owned by Vodafone. Prior to O2’s acquisition by 3, O2 created a network sharing agreement with Meteor - the EU has ruled however that following O2’s acquisition the network sharing agreement must remain - thus tying together the O2, 3 and Meteor networks.

Who are Ireland’s independent tower companies?

40% of towers in the Irish market are outside the hands of MNOs, higher than the 27% average in Europe. The biggest towerco players are Towercom and ESB Telecoms each with around 400 towers, joined by six further tower companies which TowerXchange are tracking, with portfolios ranging from 40 to 113 towers (see table two). In addition, state owned broadcaster 2RN (RTE) owns 150 towers, the Office of Public Works 180 and CIE, the Irish national railway company, 100. See sidebar one for information on each company.

How has MNO consolidation impacted towercos in the market?

Towercos have been affected to varying degrees by the acquisition of O2 by 3. Towercom, whose towers had a predominance of Vodafone tenancies have felt the impact less than others. Those that had a high concentration of O2, 3 and Meteor have most acutely felt the impact of consolidation as, due to the network sharing agreement between O2 and Meteor, the three networks are now effectively one. In order to mitigate the loss of tenancies, some towercos are looking at the added value they can bring to their towers to position them as core assets for the MNOs - one of the primary mechanisms being the deployment of fibre to sites.

What tower transactions of scale have occurred in the Irish market?

In August of 2015, Coillte, the state forestry agency, sold a total of 113 masts and 400 plots of land (on which Coillte masts and those of third parties - predominantly MNOs sat) to French investment fund InfraVia Capital Partners. Following the deal a new entity, Cignal, was created to manage the sites on InfraVia’s behalf. Whist details of the deal value have not been released by any of the involved parties, rumours indicate this was in the order of

**Could we see Ireland’s three MNOs divesting towers?**

Despite the sale of 340 masts from a cash-strapped Eircom to Towercom back in 2007, MNOs have not to date expressed an interest in the sale of their towers. Whilst tower companies have approached the incumbent MNOs with sale and lease-back proposals, the well capitalised operators have not yet been motivated to sell.

Prior to the takeover of O2 by 3, observers were watching O2 closely with the belief that their financial pressures may necessitate the sale of towers to raise capital. The recent carve out of 11,500 Telefónica towers in Spain and speculation surrounding divestment of further assets has brought credibility to this theory, however since the acquisition by 3 we are unlikely to see a sale in the near future. Similarly, Vodafone, who have yet to monetise many of their towers globally, do not look set to be bucking this trend in Ireland. So no divestiture is currently expected from their Irish operations.

There have been no rumours of any further tower divestments by Meteor, although Eir is now selling its exchange portfolio (including some very valuable urban locations). Potentially once they’ve run out of unused properties some commentators believe they could look to sell their 525 towers.

**Could we see M&A amongst Ireland’s towercos?**

As a highly fragmented market, there exists strong potential for consolidation between Irish towercos. Whilst 2015 saw one transaction of note, no further transactions are currently expected in 2016, although the more acquisitive towercos are keen to engage in dialogue on the subject.

Insiders believe that a sale from a state or semi-state entity could be more likely. An ESB Telecoms tower sale had been considered a few years ago as a means to help reduce state debt, however with ESB now being in a much better financial position and with strong management in place, a tower sale in the near future seems unlikely. There has been talk that OPW could look to sell some of their towers and some observers believe there is a potential for a sale among them.

**Figure Three: Who owns Ireland’s 4,000 towers?**

*113 owned towers with additional ground lease income on 400 plots of land on which Cignal and 3rd party towers sit

**MNO** | **Number of installations** | **Number of towers**
--- | --- | ---
Vodafone | 2400 | 800
3 + O2 (Hutchison) | 3600 | 1100
Meteor (Eir) | 1800 | 500

*3 had 50% network coverage prior to merger with O2 which had 95%. There are also two key MVNOs in Ireland- Tesco Mobile and Lyca Mobile which account for the remainder of the mobile market share
What level of new build is happening in Ireland?

Following the amount of MNO consolidation that has occurred in the market, MNOs are currently very closed regarding future rollout plans and most believe appetite to be limited in the market with operators instead using existing assets and rights on rooftops. The last major batch of towers to be developed was as part of the National Broadband Scheme, led by 3 (which Cignal’s towers played a major role in).

Whilst rumours surrounding rollout are limited, we have heard talk that Vodafone are approaching towercos in the market regarding a build to suit programme but discussions are very much in the early stages.

What is the level of decommissioning?

Following the acquisition of O2 by 3, a requirement for decommissioning of existing sites has been created. The lengthy regulatory process surrounding the acquisition had stalled decommissioning but a program over the next two to three years has commenced and represents a key focus for some towercos. There are mixed opinions when it comes to the volume of decommissioning in the market however there is a growing sentiment...
that the level of decommissioning required will be lower than people originally thought and that potentially there may be a risk of “over-decommissioning” as MNOs look to focus on short term stock market performance over longer term network planning.

**What role have ground lease aggregators played in the market to date and how exposed are each of the towercos?**

The exposure of Ireland’s towercos to the actions of ground lease aggregators varies company to company. State or semi-state towercos are relatively safe - 2RN owns the land under most of its portfolio, ESB Telecoms own all of their own sites and OPW are in the same position. Other companies not at risk from the interference of ground lease aggregators are Cignal (who are end owners of the land) and Towercom (who have full rights to all of their sites). Cellcom have long leases but are exposed somewhat, whilst the majority of Hibernian, Highpoint and WIG’s sites are leased.

Ground lease aggregators who have been looking at the market include AP Wireless, but to date they have reportedly not been getting a huge amount of traction. The problem in the market is not finding the product, rather it’s finding a party to offload it to. Towercos are not mature enough and the financial institutions won’t pay a large enough multiple.

**Is there a focus from the MNOs on improving rural coverage?**

Whilst there are a few not-spots in rural areas, the issues are very much localised. After a deep recession some of the MNOs took their foot off the pedal in addressing these not-spots but they are now working on infill for some very specific locations. Due to the fragmented and very localised nature of this infill, it does not constitute a major opportunity for towercos.

**What is the National Broadband Plan and what implication does this have on Irish towercos?**

In December, a new National Broadband Plan was announced for Ireland to build upon the work of the National Broadband Scheme initiated in 2006. The original scheme, awarded to 3 Ireland, was to provide a minimum of 1.2MB of download speed to rural areas; the aim of the new National Broadband Plan is to bring this up to a minimum of 30MB. The state have done a lot of mapping and there are approximately 750,000 premises in the catchment area to be covered by the plan.

Companies were invited to enter the pre-qualification process just before Christmas and responses need to be in before the end of February, after which a formal tender process will be opened. Details need to be extrapolated within the plan, however thinking is that the delivery will follow both a fibre and a wireless strategy, potentially creating requirements for new tower build (as was the case with Coillte’s towers in the original scheme) and also the bringing of fibre to towers (which is something that is currently being planned by some towercos in the country).
The formation and ambitions of Ireland’s newest towerco
An interview with Cignal’s Chairman and CEO

Cignal, a newly formed Irish towerco, came into life last year when it purchased 113 towers and 400 plots of land (on which its towers and those of third parties are situated) from Coillte, the state owned forestry company. In an Irish market where 29% of towers sit in the hands of eight independent towercos with portfolios ranging from 40 to 400 towers, the acquisition gives Cignal a strong foothold in a market ripe for consolidation. In this interview, Cignal’s CEO and chairman explain the Coillte transaction and how Cignal came into existence. We also discuss the newly announced National Broadband Plan and ask them to share Cignal’s ambitions for expansion in Ireland and overseas.

Keywords: Asset Register, C-Level Perspective, Cignal, Co-locations, Coillte, Deal Structure, Decommissioning, Europe, Europe Insights, InfraVia Capital Partners, Investment, Ireland, Irish, Leasing & Permitting, Managed with License to Lease, Market Entry, Market Forecasts, Masts & Towers, MNOs, Network Rollout, Passive Equipment, Private Equity, Tower Count, Transfer Assets, Urban vs Rural, Valuation

Read this article to learn:
- What the drivers were behind the acquisition of Coillte’s towers and why it was such a unique portfolio
- Who the Cignal management team are and what experience they have in the market
- How Cignal plans to expand their presence and revenues
- What opportunities are presented for a towerco by the Irish National Broadband Plan?

TowerXchange: Please can you tell us a bit about yourselves and your background in the telecoms sector prior to Cignal?

Colin Cunningham, CEO, Cignal: I have been working in the telecommunications sector for over 20 years after starting my career in Esat Digifone (now O2). I was a Founder and former CEO of Vilicom providing technical consultancy and property management services to the telecoms industry and have a wealth of experience managing Telecom Infrastructure portfolios including Coillte and the Office of Public Works (OPW) in the provision of Towers, Distributed Antenna Systems and Fibre solutions with a focus on customer engagement.

Donal O’Shaughnessy, Chairman, Cignal: I have over ten years experience in the highly successful Digicel group of telecoms companies in the Caribbean and Central America including roles as Chief Operating Officer and Chief Executive Officer. I was previously involved with the Irish mobile telecommunications company Esat Digifone as a member of the team responsible for the rollout of the network throughout Ireland. Over the last five years I have been involved in developing and investing in businesses spanning technology, property, financial services, media, hospitality and utilities both in Ireland and internationally.

TowerXchange: Please can you provide an introduction to Cignal and its structure?

Donal O’Shaughnessy, Chairman, Cignal: Cignal is a...
newly formed towerco in Ireland having purchased the communications assets of the state forestry company, Coillte, in 2015. The portfolio consists of 113 owned towers and approximately 400 plots of freehold land, on which both Cignal owned towers and those of third parties (principally owned by Ireland’s MNOs) sit. The portfolio is strategically located right across Ireland.

Cignal is backed by Paris based Infravia Capital Partners through their infrastructure Fund II.

The board of directors of Cignal is comprised of myself (as Chairman), Colin as CEO and three representatives from InfraVia Capital Partners. Cignal’s management team is Colin and a team of six people, all based in Ireland and each with extensive experience in all aspects of telecommunications infrastructure asset management.

The management team formed by Cignal has experience of managing multiple and prominent portfolios of assets both domestically and internationally. The company is newly formed and the corporate structure, brand, balance sheet, accounts systems, IT, banking facilities have all been set up within the first three months following the acquisition. Cignal has also successfully completed a financing arrangement with Bank of Ireland and Investec in December 2015.

TowerXchange: Was Coillte’s asset register in good order and most of the acquired assets in good condition when Cignal took them on?

Donal O'Shaughnessy, Chairman, Cignal: All of the paperwork for the sites including the various agreements with MNOs were in very good shape which has enabled a seamless transition of the assets and agreements into the company.

Colin Cunningham, CEO, Cignal: The portfolio was pretty unique in that it was only one landlord selling property on which 400 towers sat - unusual for a transaction of that size. This made it very straight-forward and clear from a title point of view.

Donal O’Shaughnessy, Chairman, Cignal: When it comes to the 113 Cignal owned towers, they were all built as part of the National Broadband Scheme in 2008 and 2009 and so they’re all less than ten years old and in superb condition and capable of multi-tenant occupancy.

TowerXchange: What was the rationale behind Coillte selling the assets?

Donal O’Shaughnessy, Chairman, Cignal: The sale of the assets was part of a state strategy to free up investment for other state projects such as the €59mn investment by Coillte in its SmartPly facility and investment in Coillte’s extensive wind power development projects – essentially the deal put fresh capital on Coillte’s balance sheet.

TowerXchange: What details can you tell us about the tender process and how smoothly it went?

Colin Cunningham, CEO, Cignal: Coillte announced the sale at the start of last year, announcing in January and closing in June. From a process point of view, six months from start to finish is very good. The process went extremely smoothly and kept in line with the timelines laid out from the start.

TowerXchange: What kind of competition was there in the bidding?
Colin Cunningham, CEO, Cignal: The information on who bid was never made public, however we understand there to have been a good number of expressions of interest.

TowerXchange: What can you tell us about the deal value?

Donal O'Shaughnessy, Chairman, Cignal: Some numbers have been put out there but they are just speculated numbers and nothing that has come directly from us. We made the decision to not to disclose details of the transaction, we have an appetite for further acquisitions down the line and so it makes business sense to keep this confidential.

TowerXchange: Why did InfraVia look at the Coillte portfolio?

Donal O'Shaughnessy, Chairman, Cignal: The interest from InfraVia was on a number of fronts. Firstly it’s a sector they invest in and know well and they had already been looking at other opportunities in the infrastructure sector in Ireland. The asset base was also highly attractive - it’s very rare that state owned telecom assets come to market. One of the principal motives was that it was a great way to get a foothold in what is a pretty fragmented towerco market. The ownership of Ireland’s towers sit in many hands, some private, some state, some MNOs - there is good consolidation potential here.

TowerXchange: What areas of growth do you see for Cignal?

Donal O'Shaughnessy, Chairman, Cignal: We see three areas of growth. The first is to maximise the portfolio we bought from Coillte, increasing revenues and tenancies down the road, especially as new technology gets rolled out. Secondly it’s to invest further money in either new site build out (if the industry requires it) or by bringing fibre up to our sites. As part of the acquisition of this portfolio, we also have the fibre wayleave rights to all of these sites which is a huge benefit to the MNOs and those who may participate in the National Broadband Plan (which is being unveiled by the government currently). The final area of growth is in terms of strategic acquisitions of towers.

TowerXchange: Do you foresee any challenges presented by MNO consolidation in the market?

Donal O'Shaughnessy, Chairman, Cignal: Although we are in a consolidating market, the MNOs are all in the process of adding new technology layers and rolling out more equipment so ultimately a strategic set of sites like ours will always be a key part of the operators networks.

TowerXchange: Is Cignal considering developing their own fibre capabilities to play in the National Broadband Plan?

Colin Cunningham, CEO, Cignal: We will probably enter the fibre business through a partnership approach, acting as a facilitator. A lot of Cignal’s sites are multi-operator sites and so the plan is to try to facilitate a fibre strategy that allows everybody open access to fibre at these locations in the most cost effective way possible. The site locations are within forests and surrounded by land owned by Coillte, so the wayleave rights we have are very significant - having the framework agreement with Coillte makes the process a lot easier. In addition, the operators are aware of the strategy to bring fibre to the sites as Coillte started to promote this before they entered the sale process - in fact, two of the sites today are already fibre enabled.

TowerXchange: What can you tell us about the National Broadband Plan and its rollout?

Colin Cunningham, CEO, Cignal: The government issued a PQQ before Christmas which outlined the process. The responses have to be back in by the end of February and after the pre-qualification process they’ll enter into a formal tender process with the pre-qualified candidates. Criteria for the National Broadband Plan are very well set out in the document but there seems to be a lot of flexibility in there about what will happen in relation to availability of future spectrum and there has been a lot of discussion about whether or not the strategy will be a fibre to the home strategy. We certainly believe that part of the delivery will form a wireless strategy but details are still up in the air. The positive thing is that the process has commenced and all the key players have started to engage.

TowerXchange: Is the primary goal of the plan to expand coverage to rural areas?

Colin Cunningham, CEO, Cignal: There was a National Broadband Scheme initiated in 2006 - 2007
in which 3 Ireland was the preferred bidder. The criteria at the time was to provide a minimum of 1.2MB of download speed but the Broadband Plan is to bring this up to a minimum of 30MB - creating a real step change in broadband provision to rural areas. The state have done a lot of mapping and there are approximately 750,000 premises in the catchment area to be covered by the plan.

Donal O’Shaughnessy, Chairman, Cignal: A key thing to note is that the 113 towers that Cignal owns were built primarily for the original National Broadband Scheme and as such, they will be strategically relevant in the National Broadband Plan. The physical structures are already built, they’ll just need the new technology capability added to provide the necessary coverage and broadband speeds.

TowerXchange: Moving away from the growth potential offered by fibre and focussing on potential acquisitions in the Irish market for Cignal, where do you see opportunities?

Donal O’Shaughnessy, Chairman, Cignal: Whist there have been no rumours or talk from tower owners in Ireland, either state or privately owned, we will hold discussions with all interested parties to discuss potential opportunities. It is too premature to speculate at this early stage of Cignal’s development but we see excellent potential.

TowerXchange: What volume of decommissioning is happening and are there any opportunities for Cignal in this field?

Donal O’Shaughnessy, Chairman, Cignal: Across our portfolio we don’t envisage a huge amount of decommissioning because of the strategic geographic spread of the site locations.

We’re in the very early stages of upgrading networks and the plans of the operator are still evolving and so it is too premature to guess which sites or whose sites will be decommissioned. We think that the amount of sites that will be decommissioned will be smaller than what everybody thinks, whilst the amount of new equipment added to the existing sites will be higher that what people commonly think.

TowerXchange: Is the plan for Cignal to focus solely on Ireland or is international expansion likely?

Donal O’Shaughnessy, Chairman, Cignal: At the end of the day the InfraVia Fund is a European fund. Cignal is the fund’s first investment in a tower company and certainly there would be an aspiration there to expand beyond the Irish market. We don’t have any plans or any specific markets in focus at the moment but we would be very keen to bring Cignal beyond the shores of Ireland.

TowerXchange: How would you sum up the first four months of trading as Cignal?

Donal O’Shaughnessy, Chairman, Cignal: We have had an exceptional first four months setting up the business, putting a first class and highly experienced management team in place, successfully raising finance and have had excellent engagement with our 30 customers. We are very excited about taking the business forward and developing our relationships as a true infrastructure partner for our customers.
Protecting towerco revenues from MNO consolidation in the Irish market

Insights from Irish towerco and fibre business ESB Telecoms

The acquisition of O2 by 3 in Ireland coupled with the EU ruling that Mosaic, the network sharing agreement between Meteor and O2, must remain has effectively created two transmission networks in the Irish market – Vodafone and the rest. Not only must consolidation of the O2 and 3 tower infrastructure take place, but where some towers originally may have had four MNO tenants in the past, this will be reduced to two, threatening towerco revenue. In this interview Ronnie Horan, Infrastructure Manager for ESB Telecoms (which owns and operates 377 of Ireland’s 3,780 towers and manages 1,600km of national fibre optic cable) shares some of the challenges this consolidation has placed on Ireland’s towercos and discusses strategies that the company is deploying to protect their revenues.

Keywords: 3, 4G, Access Control, Acquisition, Active Infrasharing, Build-to-Suit, Business Case, Business Model, Capex, Cignal, Co-locations, Coillte, Construction, Decommissioning, Eircom, ESB, ESB Telecoms, Europe, Europe Insights, Europe Research, Health & Safety, Hutchison, Infrastructure Sharing, Ireland, Market Forecasts, Meteor, Monitoring & Management, Mosaic, Netshare, O2, O&M, Office of Public Works, Operator Led JV, OPW, Procurement, Regulation, Site Level Profitability, Site Management System, Small Cells, Telefonica, Tenancy Ratios, Tender, Towercos, Towercom, Transfer Assets, Urban vs Rural, Valuation, Vodafone

Read this article to learn:
- How ESB Telecoms evolved and what additional challenges are presented by its link to Ireland’s electricity network
- The challenges of MNO consolidation
- How ESB Telecoms are increasing the customer value of their towers to mitigate loss of tenancies
- What opportunities are arising in fibre rollout and what this means for towercos

TowerXchange: Please can you introduce yourself and how you got into the telecoms sector?

Ronnie Horan, Infrastructure Manager, ESB Telecoms: I started my career training as a telecoms technician in the state telecoms company which used to be called the Department of Posts & Telegraphs before joining ESB in 1980. Back then there was no commercial telecoms business at ESB and I worked on our own microwave and radio network. In the nineties, when ESB set up a commercial business to leverage the towers they had, I transitioned into this area, and then in the early 2000s a fibre optic component was added to my remit. My current role is as infrastructure manager for three teams – the tower team, the fibre team and the safety team (critical for a business particularly in the power sector).

TowerXchange: Can you give us a bit of background to ESB Telecoms’ role in the telecommunications industry?

Ronnie Horan, Infrastructure Manager, ESB Telecoms: ESB is the Electricity Supply Board of Ireland and ESB Telecoms is a wholly owned subsidiary of ESB Group. The telecoms business was originally founded back in the seventies as the incumbent operator wasn’t delivering a network that could meet ESB’s requirements and so we developed our own radio and microwave network to support our operations on the power side.

As mentioned previously, it was decided back in
the nineties to set up a commercial business to leverage the towers that we owned and we started renting tower space, originally to MNOs and then to wireless broadband operators. In the early 2000s ESB decided to roll out a fibre optic business and so as well as the 400 towers that we own, we have 1,600 km of fibre. Excess capacity on this fibre optic network is leased to MNOs and broadband providers.

TowerXchange: We understand the majority of ESB Telecoms’ towers to be located adjacent to power distribution stations – what challenges does this bring, particularly in regards to safety?

Ronnie Horan, Infrastructure Manager, ESB Telecoms: Whilst our telecom tower sites are adjacent to power distribution stations they have separate access systems and usually separate compounds. Access to sites is controlled by our own safety extranet system which also includes method statements and work plans. Contractors are only issued a permit for the system once they have been through our own rigorous training and induction programme. Generally supervision is not necessary once the training and induction programme has been completed. The only exceptions being for example, if they’re using lifting equipment which may bring them in close proximity to power cables and they are not allowed to do any digging on site.

We process 4,000 access requests per year and ESB Networks, that controls the power distribution stations, allow us to grant this access because of the rigorous safety control measures we implement. When it comes to contractors working on the fibre network, even more rigorous procedures are required due to the added safety risks. For both the tower and fibre business, we have our OHSAS system (like an ISO18001 safety management system) and every manager in the business has a safety audit quota so the work and sites are monitored and checked regularly.

TowerXchange: With such a rigorous process for contractors to go through does this mean that you tend to be reluctant to change contractors?

Ronnie Horan, Infrastructure Manager, ESB Telecoms: Our contractors are generally on three year cycles, but this is more of a procurement value thing. We operate on framework contracts which go to tender every three years – the safety angle doesn’t stop us going to tender.

TowerXchange: There has been a great deal of MNO consolidation in Ireland, what challenges does this create and how does it affect your ability to forward plan?

Ronnie Horan, Infrastructure Manager, ESB Telecoms: It has been challenging. Up until recently the four MNOs (Vodafone, O2, 3 and Meteor) were independent and so all four MNOs were occupying our towers. Consolidation means that aside from engineering challenges, there are going to be serious revenue challenges going forward, as the number of tenancies are set to decrease – where you had four MNO tenants previously this in effect could reduce to two. Complexity has also been added by the network sharing alliances that MNOs had been forming. For example O2 and Meteor created a joint venture called Mosaic. Since the acquisition of O2 by 3 the EU has mandated that Mosaic must remain, effectively tying O2, 3 and Meteor networks together.

In terms of required new build, the MNOs’ current focus appears to be on consolidation rather than new build, we need to get past this to plot new build opportunities. Our sales and marketing people are in negotiations with different entities to try and see what can be retained and progressed. We have made significant progress, but it has been challenging for both sides. Our business development people are constantly exercised by this, before the purchase of O2 by 3, our team were well advanced in negotiations but that takeover changed the Mosaic/Netshare configuration. All the towercos in Ireland are facing the same challenges, there is a huge degree of uncertainty.

This uncertainty has been around for the past two years so we are working on enhancing the value of our sites for our customers and entering into long term tenancy agreements.

TowerXchange: What strategies are there to increase the value of your towers to tenants and mitigate loss of tenancies through the period of MNO consolidation?

Ronnie Horan, Infrastructure Manager, ESB Telecoms: One of the key things that we are looking
One of the key things that we are looking at is bringing fibre optic cable to more towers. With this added feature, operators are more likely to view them as core sites and thus retain them.

We are also starting to look more at small cells and less expensive structures. The days of building huge lattice structures in urban areas are probably numbered – with 4G technology you need to be closer to users and in lot of cities, towers are just not an option. We are looking at more discrete monopole structures and have had some early traction with one of the MNOs in that space.

**Ronnie Horan, Infrastructure Manager, ESB**

**Telecoms:** When we started in this business we were mainly dealing with transmission engineers and so if we wanted to do something on a site, the conversation was from one engineer to another. Now we have started to deal with property managers, so it’s a landlord type scenario and a different type of discussion.

We have also found that a lot of MNOs are moving away from core staff and are looking at leveraging more value from their contractors. Instead of looking for contractors to do pure rigging and climbing they are looking at contractors to do the setting up and commissioning of links for example. As a result of this we have seen a lot of the important experts within MNOs taking early retirement and leaving.

We also see variation between MNOs in how they manage their strategy and decision making. For example, one MNO still operates very much as an independent entity, whereas another seems to be heavily influenced by the parent global organisation.

**TowerXchange: Beyond the challenges presented by MNO consolidation, what are some of the other key challenges that you face?**

**Ronnie Horan, Infrastructure Manager, ESB**

**Telecoms:** For us, one of the biggest problems is in the bandwidth business. The price per MB is being squeezed but the capital cost for network deployment and maintenance is not. The business case is getting very difficult as there are limitations on what the retailer can ultimately charge, but for us the cost of rolling out fibre is at best stable.

We try and drive down costs through our contracting framework as we operate a heavily outsourced model, but there are only so many savings that you can achieve before you start compromising on safety, which we will not do. With our business being linked to the power side our safety standards are more stringent than other companies, for example in burying fibre in the ground we do it in the same way that we would with the power network.

With our contractors, we get them to sign up to a rate card when we appoint them, we list as many tasks as possible and ask for prices for everything from cement to building a fence so that there are no random items – that is where unexpected costs can arise. We also arrange both volume discounts and regional discounts if they’re working on
This model ensures best value and speed of delivery to our customers.

**TowerXchange:** Given the pressures on both the tower and the fibre business, how do you anticipate each to contribute to revenues going forward?

**Ronnie Horan, Infrastructure Manager, ESB Telecoms:** At present, the towers business is more reliable - despite everything that is going on with MNOs the tower business is solid. With regards to both sides of the business we need to wait another few years and see how it plays out, although pressure on fibre revenues will continue, there will have to be a realignment in the value chain to ensure commercial returns for future fibre investment. In parallel, ESB has significant opportunities to drive growth by broadening our customer base and enhancing our product portfolio.

**TowerXchange:** Is a fibre business a natural fit for towerco?

**Ronnie Horan, Infrastructure Manager, ESB Telecoms:** I believe increasingly so. As mobile traffic volumes increase the number of microwave hops are reducing with fibre connection required at an increasing number of towers. We are unusual in that we do both, as far as we’re aware we’re the only player active in both in the country. As mentioned, other site owners are looking at increasing value to their sites by bringing fibre to the tower, but they are speaking to fibre providers (including us) to do so and we also expect a lot of other towercos to do the same.

**TowerXchange:** Following the sale of towers by Coillte to Cignal last year do you forecast any more tower transactions or towerco buyouts in the Irish market?

**Ronnie Horan, Infrastructure Manager, ESB Telecoms:** We looked at the Coillte network and whether we could buy it but couldn’t justify it on the basis of the expected return. We are always constantly looking at potential acquisitions but they have to add value and a good fit with our existing portfolio.

With regards to MNOs and towers we will have to wait and see still.

At a slight tangent, on the fibre side there are some interesting opportunities arising. Rural Ireland has a serious issue with lack of broadband and just this December the government have opened a tender to address the issue. The challenge remains as to how to make this profitable, it will take massive capital investment to run fibre to remote areas and it almost becomes more of a social than a commercial play. This fits well with ESB’s track record of operating commercially in the national interest. The government is putting forward funding and whilst wireless operators are seeing this fibre rollout as a threat, opportunities will arise as fibre can’t be deployed to all areas – and with this will come new opportunities for towercos.
Consolidation of Italy’s telecom and broadcast towers

Are mergers of EI Towers and Rai Way and Cellnex and Inwit inevitable?

It’s ironic that clarity on the future of Italy’s telecom and broadcast towers should be provided at meetings in Chicago rather than Rome or Milan, but it’s also appropriate given growing international investor interest in Italy’s towers. TowerXchange were invited to keynote the RBC Towers Investor conference in Chicago, and subsequently met with the CEOs of EI Towers, Rai Way, Inwit and the Head of Investor Relations at Cellnex. Respecting the confidentiality of those conversations, here are a few impressions we were left with.

**Keywords:** 3, American Tower, Bankability, Broadcast Towers, Carve Out, Cellnex, Decommissioning, EBITDA, EI Towers, Europe, F2i, Hutchison, Infrastructure Sharing, Inwit, Italy, Market Overview, Rai Way, Research, Small Cells, Stakeholder Buy-In, TIM, Tecnorad, Telecom Italia Mobile, Tenancy Ratios, TowerXchange Research, Towercos, Vodafone, Who’s Who

Read this article to learn:
- Consolidation in the broadcast segment: what needs to happen for a EI Towers, Rai Way merger
- Who will acquire Inwit?
- Are Italy’s remaining MNO captive towers acquirable?
- Italy’s fragmented private towerco market
- Opportunities in decommissioning, fibre and small cells

EI Towers – Rai Way merger a distinct possibility in medium term

Whilst it won’t happen within the next 12 months, the consolidation of Italy’s two broadcast towercos, Mediaset’s EI Towers and Rai Way, seems a distinct possibility within a 12-24 month timeframe. In an era of infrastructure sharing, there is simply no need for parallel broadcast infrastructure. An estimated 60% of EI Towers and Rai Way’s sites are in overlapping locations.

Those who follow tower industry news will be aware that EI Towers’ initial interest in acquiring Rai Way earlier in 2015 was met with a distinctly negative response by government stakeholders. Whilst Rai Way is an autonomous business with its own decision making authority, when it comes to M&A, the State remains a critical stakeholder. Therefore there are two key hurdles which must be overcome to facilitate consolidation. First, government stakeholders must either fully buy-in to consolidation, or relax a regulation that requires that broadcast towercos should remain at least 51% state controlled. Secondly anti-trust acceptance is required that broadcast towers are a “natural monopoly” run most efficiently by a single provider.

Another issue to be resolved will be the shareholding to be retained by Italy’s leading broadcasters Mediaset and RAI – each broadcaster retaining 15% equity with the balance being floated on the public markets was one structure suggested.

Both EI Towers and Rai Way are already listed
entities, and each company owns a similar sized 2,300 broadcast tower network. Rai Way operates at an EBITDA margin just above 50%, EI Towers just below. Their business models differ in that EI Towers manage passive infrastructure only, whereas Rai Way also manages active equipment for their broadcast clients.

Italy’s broadcast towers are increasingly being promoted for co-location by telecom tenants as their high coverage levels (over 99% for Rai Way, 96% for EI Towers) mean that co-location on their sites can extend telecom coverage beyond what could be economically achieved alone. Rai Way report that 8% of their 2,300 towers deliver 80% of coverage, ~200 deliver the next 10%, meaning ~2,000 towers are required to provide the last 10% of coverage – illustrating the geographical disbursal of broadcast towers. Meanwhile the hilltop sites, height and structural capacity of broadcast towers makes them attractive potential hub sites for MNOs’ microwave networks.

Rai Way and EI Towers have both diversified their revenue streams to sell co-locations to telecom clients, albeit with contrasting approaches. Since Q4 2014 Rai Way have dedicated resources to leasing up their existing towers, and report having MNO tenants on ~700 of their sites, as well as towerco’s usual “non-traditional MNO” tenants: emergency services and fixed wireless access operators. In contrast EI Towers’ TowerTel has acquired 700 telecom towers with an aggregate EV of up to €55mn, ~300 of which have been added through several small acquisitions in the last year (for an example, read TowerXchange’s interview with Tecnorad later in this edition). Mobile clients represented 8.5% of EI Towers’ core revenues in FY14 (compared to 84.9% from broadcast).

The broadcast tower segment in Italy could be seen as a test case for the rest of Europe. The potential
to create efficiencies through consolidation, and to create new revenues through diversification into telecoms, may be demonstrated by EI Towers and Rai Way in the coming two years.

**Who will acquire Inwit?**

Inwit’s CEO Oscar Cicchetti made for an eloquent and knowledgeable representative in Chicago. With a successful IPO behind them, Inwit’s Board of Directors are ready to relinquish control of the towerco, and the process to sell at least two thirds of TIM’s remaining 60% stake in Inwit is well under way.

Inwit has 11,519 towers and a tenancy ratio of 1.55. TIM are obviously the anchor tenant, with Vodafone co-locating on many of the sites.

The current share price of Inwit, plus the premium necessary to close a deal, may price it beyond the reach of all but the most enthusiastic prospective acquirers – unconfirmed reports cite Cellnex, together with F2i, EI Towers and American Tower as bidders for Inwit. F2i is Italy’s leading infrastructure fund, whose investments include a majority stake in fibreco MetroWeb. They were rumored to have bid on the Wind tower sale process from which Cellnex ultimately emerged victorious. While the price of Inwit may be high, the company has no debt, giving prospective acquirers an opportunity to minimise the increase in their own leverage.

TIM’s contract with Inwit, which is based on an ‘all you can eat’ flat fee regardless of how many sites are used and what equipment is on those sites, will probably need to be renegotiated by any future prospective acquirer. On the positive side, Inwit’s agreement with TIM also includes a commitment for the operator to add 2,500 further tenancies, and a programme to reduce costs through the decommissioning of several hundred sites overlapping with the network of Inwit’s other major tenant, Vodafone Italy.

**Are any of Italy’s remaining operator-captive towers acquirable?**

Vodafone Italy has an estimated 11,400 towers. While they have shared a large number of sites with TIM / Inwit, Vodafone has historically been reluctant to divest tower assets, preferring to retain them on their balance sheet or hold them close in operator-captive ventures such as CTIL in the UK or NetShare in Ireland. A tower portfolio more likely to come to market in Italy might be Hutchison / 3 Group’s 7,000 towers, which could be released as a product of the Wind-Hutchison merger. Wind has also retained around 2,600 towers after selling the majority to Cellnex.

**The current scale and potential opportunities within Italy’s tower and small cell markets**

TowerXchange estimate there are around 42,917 macro telecom towers in Italy in addition to the 4,600 towers built for broadcast.

Coverage is more or less complete, and there is significant parallel infrastructure in Italy – decommissioning may outstrip an annual macro site growth rate of around 1% in the coming
“there is significant parallel infrastructure in Italy – decommissioning may outstrip an annual macro site growth rate of around 1% in the coming years

years. Decommissioning is value accretive for Italy's towercos – with tenants consolidated onto the most attractive / robust of two overlapping towers, the capital deployed to remove or relocate a tower and to liquidate the remaining lease is quickly recovered by the savings on that lease. As long as CTOs can be comforted that there will be no interruption in service, the full benefits of decommissioning can be realised.

Experts suggest that each MNO might need around 20,000 base stations mounted on macro sites to achieve full coverage and adequate capacity in Italy. As Italy consolidates from a four MNO to a three MNO mobile market, and as independent towercos acquire a the majority of towers and make them available for co-location, the goal could be to drive Italy as close as possible to a market of 30,000 towers with a tenancy ratio of two. In the near term decommissioning programmes target hundreds not thousands of towers, but if Italy's restrictive EMI laws change, then decommissioning could accelerate.

The fiberisation of Italy remains incomplete, but there seems to be a mixed appetite from Italy's towercos to deploy capital into fibre – some foresee return on capital invested being slower than when investing in towers, others are attracted by the opportunity of FTTT to increase available bandwidth at their towers while enabling new wholesale broadband service offerings. Less capitably intensive investment in small cells and IoT infrastructure may be more appealing in the near term. With an estimated ten small cell sites required for every macro site for 5G, there will be an opportunity for the country's towercos to play a critical role in the creation of a heterogeneous, high performance, shared network for Italy.”
The appetite of an Italian broadcast towerco for telecom towers and tenancies

Rai Way’s take on the changing dynamics for a broadcast company in the Italian telecoms sector

Rai Way, with 2,300 towers, is responsible for around 45% of Italy’s broadcast tower market. A failed take over by competitor EI Towers in 2015 coupled with speculation surrounding their interest in the acquisition of the Inwit portfolio thrust the company into the limelight in 2015. In this interview, Rai Way’s Head of Investor Relations, Giancarlo Benucci sheds some light on the failed EI Towers acquisition and explains why the company’s attitude towards M&A in the telecoms sector has changed since their IPO at the end of 2014.


TowerXchange: Please can you provide an introduction to Rai Way?

Giancarlo Benucci, Head of Investor Relations, Rai Way: Rai Way is a listed Italian broadcast towerco which owns 2,300 broadcast towers used to provide broadcasting and transmission activities to RAI – the public service broadcast company in Italy. Around 850 towers also host third party equipment including MNOs, broadcasters (other than RAI) and tenants such as emergency services and wireless access operators. They are one of the two big players in the broadcast tower market in Italy and each account for around 45% of the market. The other major player is EI Towers who also owns 2,300 broadcast towers and then after that there are a number of smaller companies which account for the remaining few hundred.

TowerXchange: Rai Way has been the subject of much consolidation speculation following an interest by EI Towers in acquiring the company – what can you tell us about this and whether an acquisition still looks to be on the cards?

Giancarlo Benucci, Head of Investor Relations, Rai Way: Talk around an acquisition of Rai Way has cooled off since earlier in the year. At the time of the offer by EI Towers, RAI, in accordance with the decree issued in the context of the IPO of Rai Way, complied with the condition to maintain a stake in Rai Way of at least 51%. There was also some preliminary indication (although not final judgment) from the Italian Anti-Competition Authority that the potential creation of dominant
market positions should be investigated. Whilst a merger seems rational from an industrial perspective (as synergies certainly could be created for both businesses), we don’t expect any movement on this in the short term.

**TowerXchange: EI Towers are looking at a potential acquisition of the Inwit portfolio, is this something of interest to Rai Way?**

**Giancarlo Benucci, Head of Investor Relations, Rai Way:** We understand that EI Towers have been invited to tender but it is not something that we are looking to get involved in. Back in September of 2015 we presented our first industrial plan following our listing on the Milan Stock Exchange. At that time we presented our strategy with regards to inorganic growth and stated that whilst we were committed to exploring M&A opportunities this was focussed on the broadcast and not the telecom sector. When it comes to the telecom sector, in terms of small M&A we do not see many opportunities to build a portfolio and critical mass to be competitive with the likes of Cellnex and Inwit who have portfolios of thousands of towers. You could spend years building a portfolio with a few hundred towers and still not be competitive with the big portfolios. There could be some financial rationale for small M&A in the telecoms sector but it is not something that we are pushing as it’s not a strong proposition for us.

When it comes to large M&A, the narrative of our company story has changed since the time of our IPO to today. Before the IPO we had said we had the ambition to consolidate in the telecoms sector and look at for example the Telecom Italia or the H3G tower portfolio. At the time of our IPO there were only two players in the market – ourselves and EI Towers – two broadcast towercos with the ambition of consolidating telecom assets. Since then we have however seen the entry of Cellnex and also Inwit as a separate entity. Competition for potential tower acquisitions in the telecom sector has become really tough.

Cellnex and Inwit have much higher synergies to achieve by acquiring towers. If you put together two or three telco tower portfolios you have a much higher overlap than putting together a tower and a broadcast portfolio. These higher synergies mean that they are willing to pay a higher price than Rai Way would be willing to pay.

The bottom line is that when it comes to M&A in the telecom space, Rai Way do not consider it compellingly in line with their strategy – which is focused on increasing the value of our broadcast portfolio.

**TowerXchange: Do you foresee any changes in demand from MNOs on renting space on broadcast towers?**
Giancarlo Benucci, Head of Investor Relations, Rai Way: We expect that demand from MNOs will remain more or less stable for a couple of reasons. Firstly, MNOs in Italy are much more focused on cost optimisation than they are on expanding their network coverage. The second reason is that broadcast towers are generally in rural locations – while MNOs are focused on expanding their network in metropolitan and densely populated areas.

As to why we don’t expect a decrease in tenancies from MNOs: they tend to use broadcast networks for emergency coverage. When their networks go down, the network on broadcast towers serves as back-up so that they can continue to deliver coverage to their customers. As this is an essential service, we don’t expect tenancies to decrease.

TowerXchange: When it comes to optimising costs and levels of service to tenants what are Rai Way’s strategies?

Giancarlo Benucci, Head of Investor Relations, Rai Way: In the telecoms sector we have no issues at all when it comes to delivering a high service level to MNOs. We offer a pure tower hosting service, providing the space, air-con and energy whilst the MNOs keep ownership of their equipment and management of their network.

TowerXchange: Is energy something that you provide or is it a pass-through?

Giancarlo Benucci, Head of Investor Relations, Rai Way: We don’t provide it as a pass-through rather we pay the bill and the cost is recovered via fixed revenues in the tenancy payments.

TowerXchange: How healthy is the Italian broadcast sector and revenues within it? Will the telecoms sector become increasingly important to protect revenues?

Giancarlo Benucci, Head of Investor Relations, Rai Way: The broadcast sector in Italy is stabilising - which is good news. In the past few years, advertising has decreased a lot and many regional broadcasters have had a lot of issues and have ended up either financially distressed or going bankrupt. The situation has however, now bottomed out as the economic conditions in Italy have started to improve.

We haven’t been too affected by this as before our IPO, our activity with third party broadcast tenants was pretty limited meaning that we haven’t lost revenues as these companies have gone bust.

Whilst the telecom sector will experience higher growth than the broadcasting sector, if you look at the top line growth for Rai Way we expect this to be mainly from the broadcast side. The majority of growth is expected to come through the provision of new services for RAI and will be a key focus for us going forward.
Why Tecnorad Italia built and sold towers in Italy

Leading turnkey service provider develops remote monitoring and control solution for Europe

TowerXchange wanted to deepen our understanding of the independent developers who own, or owned, around 1,000 towers in Italy. As previously noted in this Journal, Europe has relatively few ‘middle market towercos’, yet several independent developers have built and sold towers in Italy. To understand the drivers, we spoke to Tecnorad Italia, a turnkey service provider who recently sold a 134 tower portfolio to EI Towers for €17mn.

**Keywords:** Who’s Who, Towercos, Managed Services, Monitoring & Management, O&M, Construction, Valuation, Tenancy Ratios, Capacity Enhancements, Market Entry, Network Rollout, Build-to-Suit, Exit Strategy, EMI, Leasing & Permitting, KPIs, Decommissioning, RF Design, RMS, Job Ticketing, Europe, Italy, Cellnex, Inwit, Vodafone, Tecnorad Italia

- The structure of the Italian turnkey telecom service provider and ‘middle market’ towerco markets
- The effect of EMI limits on the Italian tower market
- The convergence of the broadcast and telecom tower markets
- What drove portfolio growth, and why Tecnorad Italia sold their towers to EI Towers
- The Teletower telemetry platform – built for European towercos, by a European towerco

Mauro Cerboni, CTO, Tecnorad Italia: Tecnorad Italia has operated since the ‘80s in the radio telecommunication industry in Italy. We were founded by two shareholders who still own the company – with no external investors we can be a genuinely independent partner to our clients. Up to 2015 the company developed two main Business Units, acting as a tower company and as a turnkey service provider.

As a tower company Tecnorad Italia built up and managed up to 140 towers, mainly in the center of Italy. The company developed the know-how to control the end-to-end process: from RF engineering to site acquisition, contract tendering, site design to permit, civil works to I&C and to O&M.

We also resell and use an RF planning tool called EDX SignalPro. Together with our deep relationships, this gives us unique insights into the expansion plans of Italy’s MNOs, which enabled us to propose sites we knew they would find interesting, and propose sites where we knew we could secure a second tenant.

As a service provider the company started in the broadcasting installation and maintenance field. Since the mid ‘90s Tecnorad Italia contributed to the start up of the first privately-held MNO (Ominitel Pronto Italia, now Vodafone); then in the 2000s the company worked on important wireless broadband
projects, and was one of the companies involved in Italian WiMAX trials. In the last ten years Tecnorad Italia expanded its competencies into the remote control and automation field, both for controlling TLC infrastructure and for telemetry and field automation for Acea (one of the biggest multi-utility companies in Italy).

The know-how and the relationships developed as a tower company have been a competitive advantage for the service provider business and vice-versa.

_TowerXchange: What is the structure of the turnkey telecom service provider market in Italy? Are there a few nationwide contractors or lots of smaller, local firms?_

_Mauro Cerboni, CTO, Tecnorad Italia:_ There are different approaches from the MNOs. Telecom Italia Mobile (TIM) and Vodafone control the RF design, project management and network development process in-house, thus assigning work packages to professional services firms (for site design and permit) and to “field companies” (for civil works and I&C). H3G and Wind have agreed big national contracts with Ericsson and Huawei respectively; Ericsson and Huawei then assign work packages to professional services firms and field companies.

Turnkey service providers in Italy are mainly regional companies; MNOs understand the importance of a profound local understanding and the importance of local relationships with public bodies for permitting, so they assign activities to the service provider who can perform best in a given area. Tecnorad Italia are particularly strong in central Italy.

O&M contracts are sometimes awarded nationwide, sometimes regional – but there is seldom a single contract covering both I&C and O&M.

_TowerXchange: How has the creation of Cellnex and Inwit affected the Italian passive infrastructure supply chain?_

_Mauro Cerboni, CTO, Tecnorad Italia:_ As of today we have not experienced much difference. Galata (Cellnex’s Italian company) is still working with former Wind service partners and Inwit with former Telecom Italia service partners.

Something may change if Inwit changes ownership, particularly if Cellnex will acquire it.

Over the next years they will doubtless select their own partners.

_TowerXchange: Has the entry of the towercos accelerated tower strengthening or decommissioning programmes?_
Decommissioning programmes started four to five years ago, driven by early site sharing deals between TIM and Vodafone. We’ve been involved in the decommissioning process – managing the situation and proposing our higher capacity towers. In terms of reinforcement, Tecnorad Italia made some investments in strengthening our former towers, but this is generally more frequently undertaken when a towerco needs to increase the number of tenants on a tower. If we analyse MNO-derived towercos – many of their sites, especially the rooftops, have capacity only for one operator – so they will need to add a second pole or reinforce structures in order to propose those sites for additional tenants, and increase their tenancy ratio.

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TowerXchange: How much of a limitation on co-location have the strict EMI limits in Italy proven to be?

EMI limits have two consequences: either you need to raise higher poles on rooftops, which has an adverse aesthetic and environmental impact; or you simply cannot host an extra tenant as there is no more EMI space, which drives demand for new purpose-built, higher towers.

Again, it comes down to the need to know MNOs plans. Towercos in Italy may be quite small but even managing a few thousand sites it’s difficult to know the unique characteristics of each site – we know from experience that you can maximise tenancy ratios if you know and manage each tower on a site by site basis – if you know the story of each site, the local issues. It’s not just about I&C and O&M but it’s a commercial issue too – you need local knowledge and local people that can act as your ears on the territory, get information and act quickly – you have to be quicker than your competitors.

TowerXchange: Do you see the telecom tower and broadcast tower markets as quite distinct, or can a company like Tecnorad Italia meet the requirements of both segments?

For a long time telecom and broadcast towers have been two different markets, with RAI WAY and EI TOWERS focusing on the broadcast towers. RAI WAY and EI TOWERS grew up with a single customer each (RAI and Mediaset respectively). Now each has to consider multiple customers. Meanwhile, the independent telecom tower market started in Italy just one to two years ago. Now the two markets seem to be converging; broadcast towers are very valuable hub sites for MNOs microwave networks and broadcast tower companies understand the economic value of MNOs lease contracts. So broadcast towercos now diversifying to address the telecom market.

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Tecnorad Italia is one of the very few companies in Italy addressing both markets: we started in the broadcast market, we have a deep knowledge of national FM radio broadcasters, we do consultancy for them; and we have known the telecom tower market for 20 years.

Our cross sector capability has been highlighted by Italian towercos, who asked for our consultancy in developing their telecom tower market proposition.
TowerXchange: We understand EI Towers recently acquired Tecnorad Italia’s 134 tower portfolio (63 owned) in a transaction that valued the enterprise at €17mn (8.5x EBITDA). What can you tell us about the origins and characteristics of that portfolio and how it compares to other small towerco portfolios in Italy?

Mauro Cerboni, CTO, Tecnorad Italia: Tecnorad Italia started to build up and manage towers in the mid ’90s, following the startup of Omnitel Pronto Italia (now Vodafone).

Omnitel needed to rapidly rollout to achieve government coverage requirements, so were searching for sites to help them get to market quickly. Sometimes we proposed existing towers which we acquired, sometimes we proposed broadcast towers, whilst in other instances we had good relationships with local municipalities which accelerated the site search and permitting process. Tecnorad Italia deployed the capital to build towers, and Omnitel were happy to have new towers to lease quickly. Some of the very first Omnitel Sites in central Italy were hosted on Tecnorad Italia towers.

The growth of our portfolio was achieved through different key factors:

- A day-by-day and site-by-site commercial activity with all MNOs.
- Tecnorad Italia technical capabilities, e.g. RF planning helped us anticipate MNOs’ plans, thus proposing our towers with dramatic advantages in term of time and cost for MNOs.

- Our role as a service provider, giving us further insights into MNO’s plans, letting us propose towers at the right moment to the right people.
- A profound understanding of our macro-region (central Italy), thus being able to build up towers where no one else succeeded.

All these factors contribute to us building up an extremely valuable portfolio of 134 towers, with €3mn revenues, €2mn EBITDA, and a 2x tenancy ratio.

This has been the final result of a 20-years high quality team work giving us the possibility to offer our services to the biggest tower companies in Italy. We have been a tower company for 20 years, and this is a strong differentiator from other service providers!

TowerXchange: What motivated you to sell those towers to EI Towers, and does Tecnorad Italia have appetite to build and retain any more of your own towers?

Mauro Cerboni, CTO, Tecnorad Italia: Tecnorad Italia shareholders understood that the lifecycle of tower market in Italy was moving toward to a concentration of towers into a few big tower companies. In the meantime, the number of MNOs was consolidating from four to three. In a few years Tecnorad Italia would be too small to compete and so this was simply a very good moment to monetise the asset and reinvest to let Tecnorad Italia grow as a service provider, both in the telecom market and in new markets.

We do not preclude participating in any opportunities in tower building – we have the competence and financial capability to make new investments – but we are now focusing on our proposition us as a valuable partner for tower companies and MNOs, so we’ll probably build towers for them.

TowerXchange: Can you tell us any more about the ‘middle market’ and ‘mom and pop’ towercos in Italy – we’ve heard small independent towercos could own as many as 1,000 Italian towers?

Mauro Cerboni, CTO, Tecnorad Italia: Cellnex acquired TowerCo and EI Towers has acquired...
many small and medium towercos in Italy in the last year. There are still a few independent developers left, some hosting multiple MNOs. Many are regional broadcast tower operators. Several are already acquisition targets. I suppose there could be as many as 1,500 between them, if one includes broadcast and telecom towers, but it’s quite a fragmented market – most remaining players have tower counts of tens and twenties, I don’t think there are any independent developers left with more than 50 towers.

TowerXchange: Please introduce us to your Teletower remote monitoring solution – how was the solution developed, what are the KPIs you monitor, and who is using it?

Mauro Cerboni, CTO, Tecnorad Italia: We started developing Teletower in the second half of 2014 as a project to revamp our old tower telemetry platform. We wanted an innovative platform, giving us the possibility to install an industrial PC in every tower, so enabling telemetry, control and field automation and, in the near future, IoT functionalities.

We designed and realised the solution in-house, so it took us longer than purchasing an “on the shelf” solution. But we wanted to customise it to meet the real needs of a tower company and we wanted to develop a deeper know-how in programming PLC, SCADA and building up a complete solution.

The innovative approach has been appreciated by the technical committee of “Forum Telecontrollo” (the main Italian event in the remote control / telemetry industry), letting us to present Teletower in a plenary speech.

Teletower is designed to monitor and control environmental, electrical, access and security parameters. It’s mainly intended for tower companies but its use can be extended to operators hosted on the towers (with separate login credentials and access permissions) and to O&M companies.

TowerXchange: What is your impression of the market for RMS among European towercos?

Mauro Cerboni, CTO, Tecnorad Italia: The bigger towercos are developing their own remote monitoring and control solutions – for example Cellnex has developed their own solution in Spain, but, as far as we know, they do not have RMS on their Italian tower portfolio yet. Larger towercos need to integrate the towers they acquire into their NOC, but acquired towers often don’t have any remote control. Acquisitions from small towercos are unlikely to have RMS, even when acquiring towers from MNOs their remote monitoring tends to focus on control of the active network, not the passive infrastructure. We believe there is room in Europe to develop and promote such services.

We looked at the many RMS vendors in the TowerXchange Journal, and noticed that most focus on Africa and Asia, few had a significant presence in Europe. Even small and medium towercos don’t have the investment capability to build their own remote monitoring and control systems – we feel Tecnorad Italia could be a service aggregator for small and medium towercos. When EI Towers saw our Document Management System (called Towerfinder) and our Remote Monitoring System (Teletower), it was the first time, since they started acquiring small-medium tower owners about ten years ago, they had seen such a document and field control solution; Teletower helped us maximise the value of the asset when we sold them our towers. RMS is a key enabler of value when small and medium towercos divest their towers – it means the buyer knows the sites are better managed, better controlled. We want to promote Teletower to European towercos, although we understand from TowerXchange research that it is a fragmented market.

TowerXchange: How proven is the Teletower RMS?

Mauro Cerboni, CTO, Tecnorad Italia: EI Towers have Teletower on a significant percentage of the most critical towers they acquired from us, and we are proposing the solution to all the towercos in Italy. We have a business plan, developed with a LUISS Business School Executive MBA program, to expand into international markets. Teletower can enabled a single hub control room to control assets across several different countries, supported by local partnerships for maintenance and commercial activities. We program the industrial PCs ourselves. The presence of an industrial PC (and not just an RTU or PLC) gives us the capability to expand the solution in unimaginable ways, easily carrying tower companies to the IoT era.
The emergence of independent tower markets in the CIS?

IFC insights into how the region could be following in Russia’s footsteps

The commencement of Vimpelcom’s sale of 10,400 towers in Russia coupled with the public declaration they are looking into the sale of additional assets in the CIS marks the start of a new wave of activity in developing markets in Eastern Europe and Central Asia. Whilst towerco activity and infrastructure sharing in the region are currently very limited (with only a handful of towercos and JV infracos of note outside the Russian market) there remains significant potential for the formation of new commercial entities through the assemblage of local technical expertise, regional and international capital and experienced management teams. In this interview we speak to the IFC’s resident tower expert Eric Crabtree and the bank’s Head of Telecom, Media & Technology for the region, Temel Oktem to discuss the dialogue they are having with MNOs, investors and local stakeholders surrounding the development of an independent towerco market in the region.

**Keywords:** 3G, 4G, Acquisition, Active Infrasharing, Carve Out, CCE, Cellnex, Central Asia, Cinven, Country Risk, CVC, Debt Finance, Deutsche Telekom, Emitel, Europe, Europe Insights, Global Tower, Greece, IFC, Infrastructure Sharing, Investment, LTE, KKR, Market Entry, Market Overview, Masts & Towers, Mid-Europa, MNOs, Orange, Ovidiu Telecommunications, Poland, Private Equity, Providence Equity, Regulation, Risk, Romania, Russia & CIS, Russian Towers, Serbia, Telekom Austria, Telenor, TeliaSonera, Towercos, Transfer Assets, Turkcell, Turkey, Ukraine, UkrTower, Victus Networks, Vimpelcom, Vodafone, Wind Hellas

**Read this article to learn:**
- What culture of infrastructure sharing exists in the CIS
- Who the key MNOs, towercos and JV infracos are in the region
- Where the next tower divestment would be likely to happen after Russia
- How new towercos could form in the respective markets
- What role the IFC is playing to support the development of an independent tower market

**Eric Crabtree, Chief Investment Officer, IFC:** If you look at the region, Russia is the most advanced with towercos such as Russian Towers and Vertical present and also an active bid process underway with the Vimpelcom divestiture. This is by far the biggest thing happening in the region at the moment and is also the clue to what may happen next. Vimpelcom as an entity is now looking across its networks for divestitures, so any place where they have a presence therefore becomes a potential market where we will next see independent towercos emerging. Vimpelcom will drive the creation of the industry as they move, they are quite serious about the divestiture process and it’s not just going to be Russia, it’s going to be others in the region and so that’s where to place your bets on anything happening.

**Temel Oktem, Head of Telecom, Media & Technology, Europe, Middle East and North Africa, IFC:** In terms of existing towercos in the region, you only find examples in Russia (as Eric mentioned) and Poland where the company Emitel is present - to my knowledge there are no other materially sized independent towercos. I came across a company, Konsing Group, with 47 towers in Serbia and there may be others like them, but in terms of sizeable independent towercos, you are really limited to
Russia and Poland. We also see an appetite amongst local tower builders to move up the value chain (as they have done in Russia) but to date, outside of the Russian market this has not yet resulted in the formation of any new towercos.

In both Turkey and the Ukraine, Turkcell have subsidiaries which manage their towers (Global Tower and UkrTower respectively) but they are wholly owned by Turkcell and as such, cannot be classed as independent towercos.

We also see some infrastructure sharing in the region. In Greece, Victus Networks exists as a network sharing agreement between Wind Hellas and Vodafone; and in Romania there is Ovidiu Telecommunications, a network sharing agreement between Vodafone and Orange. In both scenarios there is both active as well as passive infrastructure sharing, however the joint venture infracos don’t actually own the towers, rather they manage them on behalf of the operators.

**TowerXchange: Could we see any of the big international towercos entering the region?**

**Eric Crabtree, Chief Investment Officer, IFC:** Cellnex are looking very aggressively at the Italian divestiture (Inwit) and when we look at the firms in Western Europe, they look likely to be the earliest major player that could go into some of the markets that the IFC is involved in. When they listed, however, the story given to investors was “Western Europe” and so their latitude initially is going to be limited. As a firm however, they know Vimpelcom well - it is one of their chief clients, and so that may entice them to enter the region at some point.

**TowerXchange: Could we see any local tower builders moving up the value chain to become towercos in the region? Are there any strong candidates that stand out?**

**Eric Crabtree, Chief Investment Officer, IFC:** When you look at developing markets globally, the generic observation is that there are always a number of local tower builders - there are fairly low barriers to entry, the margins aren’t particularly good as a general rule and they frequently get taken advantage of by the tower owners in terms of payment terms, however some of them do graduate. It is a leap, but in Russia we are seeing that a few builders are making the transition into ownership.

**Temel Oktem, Head of Telecom, Media & Technology, Europe, Middle East and North Africa, IFC:** Those principles apply to the region also. Some builders are bigger than others but it doesn’t change the fact that there are narrow margins and the builders are not strongly capitalised and so on their own they’re not able to acquire the towers and turn into a towerco by themselves. What the tower builders do bring however are many of the critical skills that are needed to play in the tower market, which is why they make a great combination with private equity funds who want to get into the business.

**TowerXchange: Could these potential new entrants compete effectively with more established regional players like Russian Towers?**

**Eric Crabtree, Chief Investment Officer, IFC:** Firms with the right assemblage of talent - the money and the build expertise but also someone in the mix who has managed a portfolio of towers could become genuine challengers. It’s one thing to put the site up, throw down the foundations and get the steel up - it is quite different to make sure the site is up and running and taken care of and that the relationship with the client is managed correctly. The money can’t accomplish that, you need other kinds of talent brought in. If you have all that in the mix it’s not impossible - Russian Towers will face and is facing competition on the bid for Vimpelcom’s towers.

**TowerXchange: It is quite fragmented when we’re talking about tower builders who could make the transition into towercos; when it comes to the financing part of the equation, who are the key players here? Are they mainly funds with a regional interest or is it more funds that have an appetite for towers globally?**

**Temel Oktem, Head of Telecom, Media & Technology, Europe, Middle East and North Africa, IFC:** The smaller deals tend to have interest from the regional funds. When we’re talking about larger deals, you will also see interest from the more sizeable regional funds (such as Mid-Europa, Cinven and CVC) but there will also be global players like Providence Equity and KKR who are very active in this sector.
Temel Oktem, Head of Telecom, Media & Technology, Europe, Middle East and North Africa, IFC: I don't think there are many active discussions at this point. The private equity funds need to smell the deal before they get really active and then they're able to move very quickly - they need to see the divestitures coming into the market first. I know that some of the funds are talking to advisors to get an idea of what potential asset sales are on the horizon, but they'll only act once there is a serious process in place.

Outside of the Eurozone, the obvious concern is going to be currency devaluation and the ability of towercos to negotiate dollarised or euro based lease payments, or at least partial ones, to cover off some of that risk.

Eric Crabtree, Chief Investment Officer, IFC: Outside of the Eurozone, the obvious concern is going to be currency devaluation and the ability of towercos to negotiate dollarised or euro based lease payments, or at least partial ones, to cover off some of that risk. That’s a big concern right now - even though eventually of course the Euro and Dollar will weaken against these emerging market currencies, they are not in a strong position today.

A second key indicator to look at is the number of healthy MNOs in any given market - this is usually the driver of a market's attractiveness and sits quite apart from any macro risk.

In relation to regulatory risk, one thing that I am observing in other markets, which holds up a lot of build out, is the auctioning off of spectrum. Anything that is holding up the data revolution on the regulatory side is another potential risk you must evaluate.

Another concern to note is as to whether the country has (and most haven't) made any noise about regulating the sector. The problem you find in developing markets globally is that you can often have a very interventionist state, a divestiture doesn't occur until certain personal interests are met or they get a piece of the tower company and as such the bidders don't go in. I haven't got any specific examples of that happening in the CEE but it is definitely something that investors need to be aware of.

Finally, If you're looking at a country like the Ukraine where you have a conflict that's obviously going to deter a lot of investors. On the other hand, for the IFC that situation makes it a priority market and one that we would be prepared to invest in with the right partner.

Temel Oktem, Head of Telecom, Media & Technology, Europe, Middle East and North Africa, IFC: What I can also add to the list is the availability of debt financing in some of these markets. Sometimes international lenders familiar with the tower business will not be active in the market and then you will be limited to local banks who have never seen a tower business trying to finance it. This can create problems for a potential investor and towerco.

TowerXchange: We discussed Vimpelcom’s appetite to divest some of their assets as a key factor in stimulating the independent tower market in the region. Who are the other key
MNOs in the region and what are their attitudes towards tower divestment?

Temel Oktem, Head of Telecom, Media & Technology, Europe, Middle East and North Africa, IFC: The other MNO with a very similar footprint to Vimpelcom is TeliaSonera - they have operations in Azerbaijan, Georgia, Kazakhstan, Moldova, Tajikistan and some of the neighbouring countries. The one caveat with TeliaSonera however is that they have announced an interest in selling up and exiting those operations and so may cease to be a major player there. Telenor who is an investor in Vimpelcom, is also looking at an exit from the region.

One interesting company to watch is Turkcell who are TeliaSonera’s partner in markets including Moldova, Georgia, Kazakhstan and Azerbaijan (where TeliaSonera is the controlling partner and Turkcell is in the minority). Turkcell also have operations in Turkey and the Ukraine. Turkcell have started to approach bankers regarding a potential sale of their towers and whilst it is most probably a longer shot given the regulatory barriers in Turkey, it is an important indicator of changing sentiment in the region.

When you go to more Southeastern Europe, you start to see operators such as Telekom Austria, Deutsche Telekom, Vodafone and Orange active in multiple markets, as well as Telenor having a presence here.

We have been talking with all the various MNOs for a while, and whilst generally they keep their cards close to their chests, we are starting to see movements. If you take Turkcell as an example, the tower business idea had been floated in Turkey a while back and it was a no go for them at that time. Now they’re approaching banks to give them advice on how to do a transaction which is a radical change. As in other markets, once someone takes that first step, the others will follow. I’m optimistic on the market developing having seen Vimpelcom advancing on their bid process and people like Turkcell publically considering it, it’s a very good sign that things will evolve, firstly in the Vimpelcom markets and then the rest of the region.

TowerXchange: What work is the IFC currently doing in the region to support the market?

Temel Oktem, Head of Telecom, Media & Technology, Europe, Middle East and North Africa, IFC: We engage with the MNOs, not only in relation to towers but also generally in the region and we talk to potential investors, government bodies and regulators. One role we are trying to play is to increase the awareness of the telecom tower market, highlighting potential issues and trying to make sure that risks are mitigated under the right structure - as the deals come through that will be more of a role we continue to play. As the deals emerge, we will help bring people together, both on the buy and sell-side and also play a key role in supporting the local and regional banks. We will share our experience of financing tower transactions globally and help them get more comfortable in understanding the tower business.
Kazakhstan’s first independent tower company

Established ICT service provider LogyCom diversifies into towers, and introduces TowerXchange to the Kazakh market

The prospective sale or carve out of almost 25,000 Russian towers has highlighted interest in the adjacent and formative Central Asian tower market, where almost all towers remain operator-captive. 20-year-old ICT service provider LogyCom Group recently launched the first tower company to serve the 4,000 tower / 17mn population market in Kazakhstan – TowerXchange spoke to Commercial Director Sergey Plissak to learn more.

Keywords: 4G, Altel, Asia, Asia Insights, Build-to-Suit, Business Model, Capex, Central Asia, Central Asia, Europe, Europe Insights, Insights, Kar-Tel, Kazahtelecom, Kazakhstan, Kcell, LC Commerce, Lease Rates, LogyCom, MLA, Market Overview, New Market Entrant, On-Grid, Regulation, Sale & Leaseback, Tele2, TeliaSonera, Tower Count, Towercos, Towercos, VimpelCom, Who’s Who

Read this article to learn:
- Introducing Central Asia’s towerco pioneers LogyCom’s – their credentials and financing
- The size of the tower market in Kazakhstan
- Mobile market share among Kazakhstan’s four MNOs
- LogyCom’s business model
- The potential for sale and leaseback transactions in Kazakhstan

Sergey Plissak, Commercial Director, LogyCom: LogyCom is a modern IT company supporting and developing our customers through innovations and efficiency; we strive for leadership in everything and we are proud of our business!

Today, the LogyCom group covers several sectors of the IT business:
- Equipment manufacturing under our own trademark;
- Developing and implementing high-tech projects for corporate business;
- Developing and implementing software products, such as the LogyCom ASTRUM ERP system;
- IT outsourcing of local networks of SME Customers;
- Retail and service maintenance in all the regions of Kazakhstan;
- e-commerce.
LogyCom JSC is a successful issue of the Kazakhstan Stock Exchange (KASE).

Logycom Group is financed through borrowed funds. We have established strong relationship with the top banks in RK.

In 2009, an automated celled warehouse with total area of 2,400m2 was built and brought into service on the premises of LogyCom.

In 2002, the company was ISO 9001:2000 certified. According to ranking results from Expert RA Kazakhstan for 2010 and 2011, LogyCom is a leader among Kazakh IT companies in the sphere of ICT. A LogyCom branded product won the “Choice of the Year” National Competition in the category of “Personal Computer No.1 in Kazakhstan” eight times.

TowerXchange: Congratulations on creating the first independent towerco in Kazakhstan! What can you tell us about your progress toward building your first 100 towers?

Sergey Plissak, Commercial Director, LogyCom: We have already signed 77 Site Area Lease Agreements with a local MNO called ALTEL. We plan to sign another 20 or so agreements in the beginning of 2016. They all have the same conditions. It was the request of Altel to shift from a Master Lease Agreement to separate Site Area Lease Agreements. The agreement is mixed and consists provisions for built to suit agreements as well as lease agreements. The duration of the contract is ten years. All other conditions are close to industry standards.

TowerXchange: Could you put that into context for us by introducing the structure of the telecom tower market in Kazakhstan – roughly how many towers are there in the country? Who owns them? Are towers widely shared already?

Sergey Plissak, Commercial Director, LogyCom: We don’t have exact numbers of towers in Kazakhstan. This information is secured by MNOs and regulator. We can just share the results of our analysis. We believe the total amount of base stations in Kazakhstan is about 18,000. We appraise the total amount of existing towers to be between 3,500 and 4,000. Among them 2,500 are owned by MNOs, about 700 tower are owned by the national operator of fixed line communications, and the rest are owned by private individuals. Local MNOs still consider passive infrastructure as a source competitive advantage and don’t share towers... Kazakhstan has undeveloped tower market and we consider ourselves evangelists.

We appraise the total amount of existing towers to be between 3,500 and 4,000. Among them 2,500 are owned by MNOs, about 700 tower are owned by the national operator of fixed line communications, and the rest are owned by private individuals. Local MNOs still consider passive infrastructure as a source competitive advantage and don’t share towers... Kazakhstan has undeveloped tower market and we consider ourselves evangelists.
Sergey Plissak, Commercial Director, LogyCom: At the end of 2014 sales of smart phones and mobile phones in Kazakhstan amounted to 4.079mn units, worth 177.809bn KZT (Editor: that’s around US$0.5bn).

In 2015 (January through September) sales amounted to 2.616mn units, worth 100.941bn KZT (US$0.3bn).

In 2015 smart phones and mobile phones market declined (compared to the same period in 2014) averaged 10% in pieces and 3% in the national currency.

The market leaders are Samsung (59%), LG (15%) and Apple (8.6%).

According to the Ministry of Transport and Communications, cellular communications in Kazakhstan are carried out in GSM (900, 1800), UMTS (700, 2100) and CDMA (450, 800) formats. The following mobile operators function in GSM and UMTS formats:

- “Kcell” JSC – the majority stock holding in the company is owned by TeliaSonera, purchased from “Kazakhtelecom” JSC; 47% is owned by FinTur Nordic-Turkish holding company. It is represented in the market by Kcell, Activ and Vegaline trademarks. At Q3 2015 they had 10.79mn subscribers – 39% market share.

- “Kar-Tel” LLP – a subsidiary of Russian MNO VimpelCom with the Beeline trade mark. At Q2 2015 they had 9.708mn subscribers – 35% market share.

- Mobile Telecom-Service LLP (Tele2)
- Altel JSC (Kazakhtelecom)

VimpelCom with the Beeline trade mark with 4.4mn subscribers in Q3 2015 and 16% market share.

The CDMA format is presented by the “ALTEL” JSC operator, owned by “Kazakhtelecom” JSC. The company is represented in the market by the Dalacom, Pathword and City trademarks. The 4G LTE standard is also represented in the market by “ALTEL” JSC. They had 3mn subscribers in Q3 2015, good for 11% market share.

Kazakhstan’s mobile penetration rate is 160%.

TowerXchange: What will be Logycom Group’s business model – for example will you provide power as a service, or will energy costs be passed through to the tenant? Will I&C and O&M be managed in-house or outsourced?
Sergey Plissak, Commercial Director, LogyCom:

Logycom Group’s tower business is organised through an affiliated company named LC Commerce LTD. We are striving to maximise our lease rate revenue and our partner’s satisfaction through the proposition of a wide range of services, e.g. security, active equipment installation, fibre line laying from a tower to the closest connection point of national fixed line operator, and provision of diesel generators.

We are not going to manage I&C and O&M in-house. It is not efficient in local conditions. Kazakhstan is a very big country by area and small by population. We have several I&C contractors in each region of Kazakhstan and one general countrywide contractor for O&M (the company provides to local MNOs FLM services for active equipment and has branches in each region of the country).

We are not going to provide power as a service. This kind of commercial activity is licensed and license requirements are very tough. We install our towers next to electricity distribution company’s lines or substations. Our tenants conclude direct power supply contracts with distribution companies. In case of absence of a close electricity connection point we lay the line from our tower to the closest connection point.

TowerXchange: Do you foresee potential for larger scale sale and leaseback transactions with Kazakhstan’s MNOs? Or does your focus remain on build to suit in the near term?

Sergey Plissak, Commercial Director, LogyCom:

The total number of towers in Kazakhstan doesn’t exceed 4,000. It is not huge scale for sale and leaseback transactions, but we hope to acquire entire portfolios after the establishment of built to suit relationships with all local MNOs.

We started our business with a trial built to suit transaction with the local MNO which the only has LTE frequencies in Kazakhstan. The company started development of its GUL network in 2012. Therefore, the company has the biggest capex plan among local MNOs and we hope that we will provide all necessary towers.

A recent initiative of the regulator gave a breath to the Technological Neutrality Principle in Kazakhstan in exchange for an obligation to cover rural areas. This change in the market will force local MNOs to increase capex to satisfy regulator obligations. Partnerships with a towerco will become the most efficient way to resolve the issue.

TowerXchange: Finally, what is your vision for the future of Logycom Group’s towerco business?

Sergey Plissak, Commercial Director, LogyCom:

We have a competitive advantage as a pioneer of the tower business in the Central Asian region. We see ourselves as the only towerco in Kazakhstan. We plan to expand our business through Central Asia in the near future. We will initiate sale and leaseback transactions as well as offer our clients built to suit opportunities.

We understand that our ambitious plans require significant financial resources as well as industry competence. Therefore, we started negotiations with potential partners to enter our business. The negotiations are on the initial stage and not binding. So, we are open for new cooperation offers from interested parties.
European mobile in flux

How Europe’s network landscape is about to undergo a new wave of change

The European mobile telecommunications market has been undergoing continuous change for some years, but more recently, seismic shifts have been taking place. The industry continues to face pressing economic challenges, which have been forcing mobile operators to reduce operating costs and capital expenditure. After a surge in operator-operator deals on sharing infrastructure, consolidation and tower portfolio sell-offs to independent third parties appear to be becoming more prevalent. Technological developments promise to help further in doing more with less. However, this may not be enough and, as a result, operators need to explore more innovative options for making network spending more efficient.

Keywords: 3G, 4G, Active Infrasharing, Altice, Arqiva, Bougues Telecom, Business Case, Capex, Carve Out, Cellnex, CTIL, Deal Structure, Decommissioning, EE, Europe, France, Germany, Hutchison, Infrastructure Sharing, Italy, KPN, Lawyers & Advisors, Market Overview, MBNL, Numericable SRF, O2, Operator-Led JV, PA Consulting, RAN Sharing, Sale & Leaseback, Small Cells, Spain, Strategic Consultancy, Tele2, Telefonica, Telia, The Netherlands, Third Party Research, Three, UK, United Kingdom, Valuation, Vodafone

Read this article to learn:
- The drivers and implications of MNO consolidation
- European MNO balance sheets under pressure
- Alternate models of infrastructure sharing: examples from across Europe
- Opportunities for towercos to move beyond passive infrastructure to running other shared infrastructure
- The separation of ‘NetCo’ from ‘ServiceCo’

A wave of consolidation is taking place across Europe. In Britain, BT plans to take over EE while O2 is in the process of selling its network to Three. In France, Altice’s subsidiary, Numericable-SRF, is acquiring Bouygues, while in Norway, Telia plans to acquire Tele2. These consolidations are primarily as a result of the pressures that mobile operators are facing due to declining revenues and margins. Voice revenues have been declining much faster than data revenues have been rising, creating intensive pressure on mobile operators’ finances.

To put this into perspective, the Financial Times reports that European mobile revenues decreased by 18% between 2008 and 2014, whilst the return on capital employed halved in the same period to around 10.9% (post tax). Further, the European Commission is pushing for a single market in digital communications in order to encourage economic growth and increased employment. As a result, an overhaul of EU telecoms rules is expected, with EU-wide criteria for spectrum allocation at a national level and incentives for high-speed broadband. The aim will be to ensure a level playing field for all existing as well as new players in the telecoms market. Whilst it is too early to speculate on the implications for existing operators, the changes are likely to result in the need for more investments by operators.

The introduction of higher-speed networks, cheaper smartphones and a thriving ecosystem of applications have resulted in a significant increase in mobile data usage. Ericsson estimates that, by the end of 2015, more than half of Europe’s mobile...
subscribers will be smartphone users and that, by 2019, the total number of smartphones will exceed the total population. Mobile broadband data has been increasing at annual rates of 40%–50% driven by new services such as new video applications and connected devices. Cisco forecasts that Western European mobile monthly data usage will increase seven fold between 2014 and 2019[3]. Whilst this may sound like good news for the mobile operators, the incremental revenue as a result of the new investments is limited; ABI Research reported in 2014 that the price premium for Long-Term Evolution (LTE) over 3G had declined to 20% in developed countries and it is likely to erode completely. The growing gap between demand and supply is forcing operators to do more with less and while technological step changes such as Network Function Virtualisation (NFV), Software Defined Networks (SDN), BBU pooling and multi-operator core networks with shared/pooled operator spectrum (MOCN) provide opportunities for efficiencies, operators are re-thinking their approaches to network infrastructure.

For many European operators, the access network is no longer seen as the key differentiator as evidenced by the number of shared infrastructure deals, active as well as passive, that have taken place in Europe. Differentiation is increasingly seen to come through launching innovative bundled data and communications services to end users, integration with unlicensed spectrum, loyalty programmes and premium content. Infrastructure sharing has been one strategy that operators have been pursuing for some time in order to reduce both capital outlay and operating costs. The majority of the active infrastructure deals have been set up through a joint venture, where typically the two mobile operators consolidate the shared assets, including towers and masts, which are transferred to the joint venture or decommissioned over time if deemed surplus to requirements. European regulators have generally been supportive of network sharing although deals are generally looked at on a case-by-case basis. The key concerns are typically around ensuring that such deals are not anti-competitive.

Active infrastructure-sharing deals typically provide operational savings of 25%–35%, depending on several factors. This is higher than for passive tower-sharing deals, which typically deliver 15%[4] operational savings. Operator-operator deals, typically via joint ventures, have been more prevalent in European markets (see Table 1-3) compared to the sale of an operator’s tower portfolio to third parties. More recently however, there have been several instances where operators are selling all or part of their tower portfolios to independent third-party companies under a sale-and-lease-back arrangement. The Dutch incumbent, KPN, for example, has been divesting its towers across The Netherlands in a phased approach for some time. In addition, the last two years have also seen operators in France, Spain and Italy selling off their towers or a majority of their shareholding (see Table 4) to independent tower companies. The shift towards the sale of most or all of the tower estate is

| Table 1 Active Infrastructure Sharing via MORAN (Dedicated spectrum) in Europe |
|-------------------------------|-----------------|--------------|
| **Country**                   | **Operators**   | **Date**     |
| Czech Republic                | O2/T-Mobile     | 2011         |
| France                        | SFR/Bouygues    | 2014         |
| Greece                        | Vodafone/WIND Hellas | 2013     |
| Poland                        | PTC/Orange      | 2011         |
| Romania                       | Vodafone/Orange | 2013         |
| Spain                         | Vodafone/Orange | 2006         |
| UK                            | EE/Three        | 2007         |
| UK                            | Vodafone/ O2    | 2012         |
partly due to the need to raise capital but also to the perceived need for trusted third parties to deliver a cleaner separation of network infrastructure. This separation not only helps in addressing anti-competitive concerns but takes away any inherent tension between competing operators trying to share the infrastructure. However, joint ventures and operator-operator agreements are difficult to unwind once established and can potentially make consolidation with other operators not involved in an agreement difficult or slow. The consolidation taking place in the UK is a case in point. Here, Hutchison’s Three is in the process of acquiring Telefonica’s O2 while BT is planning on acquiring EE. Currently O2 has an active sharing agreement with Vodafone UK and Three has a joint venture, MBNL, with active sharing with EE, which has already integrated T-Mobile and Orange.

Network and IT expenditure often constitutes 75% of capital expenditure and 45% of annual operational costs and thus the scope for efficiencies in this area can be significant. With consolidation more likely amongst European operators, further innovative ways to make network spending more efficient need to emerge. With NFV, it is possible to envisage, for example, multi-tenanted network elements, not just at the Radio Access Network (RAN) layer but deeper into the core network. Such sharing could however significantly impact service differentiation and independence among operators and will be subject to regulatory approvals.

Other developments are on the horizon, such as the move towards smaller cell technology with

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<tr>
<th>Country</th>
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<tr>
<td>Denmark</td>
<td>TeliaSonera/Telenor</td>
<td>2011</td>
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<tr>
<td>Finland</td>
<td>TeliaSonera/DNA</td>
<td>2014</td>
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<td>Sweden:</td>
<td>Telenor/Tele2</td>
<td>2009</td>
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<td>Sweden</td>
<td>Telenor/Hutchinson</td>
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<tr>
<td>Germany</td>
<td>Vodafone/O2</td>
<td>2009</td>
</tr>
<tr>
<td>Ireland</td>
<td>Vodafone/Three</td>
<td>2009</td>
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<td>Ireland</td>
<td>Three/Eircom</td>
<td>2011</td>
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<tr>
<td>Italy</td>
<td>TIM/Three</td>
<td>2009</td>
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<tr>
<td>The Netherlands</td>
<td>T-Mobile/Tele2</td>
<td>2013</td>
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<th>Operators</th>
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<tr>
<td>Netherlands</td>
<td>KPN</td>
<td>744</td>
<td>Protelindo, Shere Group, TDF</td>
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<td>France</td>
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<tr>
<td>Italy</td>
<td>Vimplecom WIND</td>
<td>7,300</td>
<td>Abertis (now Cellnex)</td>
<td>2015</td>
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<tr>
<td>Spain</td>
<td>Telefonica/Yoiga</td>
<td>4,227</td>
<td>Abertis (now Cellnex)</td>
<td>2014</td>
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heterogeneous networks and the deployment of 5G. These developments will however impact third-party infrastructure economics as tenancy opportunities decrease. As an independent tower company’s business model is generally built around tenancy additions, any deal with an operator starts to look more like an infrastructure outsourcing agreement where suppliers have to make their margin through service efficiencies, which may lead to a lower valuation of the operator’s tower portfolio.

European tower companies are looking at diversification. Arqiva for example, the UK’s largest independent provider of wireless sites, has recently partnered with SIGFOX to deploy a countrywide ultra-low-band network for M2M. Cellnex, the Spanish tower company, is looking to exploit its recently acquired cellular towers in Spain and Italy for other digital dividend opportunities as well as expand internationally. Could independent tower companies move from passive infrastructure to running shared infrastructure for the operators? With the right strategy and skill set, independent tower companies can offer additional value-added services to the mobile operators as witnessed by several organisations in Europe already offering managed services for active equipment and backhaul.

As for European operators, the pace at which returns on infrastructure investment have decreased over the last few years, with no sign of change, means that there is an urgent need to have a good strategy in place. The new technological step changes, in particular NFV, will bring significant benefit in operational efficiencies as well as reduced capital expenditure. However, this may not be enough and operators may need to consider more radical changes. Potential strategies beyond consolidation or network sharing include the separation of an operator into an ultra-efficient network-focused organisation (NetCo), with sole responsibility for the network infrastructure, offering wholesale services to a service company (ServiceCo), with responsibility for delivering services to end users. Such separation could allow NetCo to operate independently of ServiceCo, offering wholesale services to other service providers and ServiceCo could potentially outsource all its operations to a third party to achieve economies of scale. ServiceCo would focus on providing differentiated services by using wholesale services, not just from NetCo but also from other wholesale providers, to compete with the over-the-top providers. KPN, for example, has already created a NetCo that combines the operations of its IT and network infrastructure covering the mobile, landline and wholesale divisions.

European operators need to continually evaluate potential strategies and find innovative options for making their network spending more efficient in order to reverse the trends in revenue and return on capital employed. Bold options are needed; for example, if the network is no longer a source of differentiation, does a retail telecommunications operator actually need its own dedicated network? It could be argued that vertical integration of operators and the duplication of national networks is actually hurting investment and slowing down the proliferation of high-capacity end-to-end networks – both fixed and wireless. Competitive wholesale supply of capacity to nimble retail operators could be the delivery paradigm of the future. For this to happen, regulators, investors and operators need to start thinking about their industry afresh as the model developed during the 1980s looks increasingly unsustainable. What operators do with their network assets is central to this debate.

Over the next few editions of the TowerXchange Journal, PA Consulting will be exploring the state of the European mobile infrastructure market, reporting on existing joint venture initiatives, the impact of consolidation in Europe and assessing the potential strategies operators need to adopt in this shifting landscape.


About the authors

Michel Grech and Andrew Doyle work at management and technology consultancy, PA Consulting Group as part of the Technology and Innovation practice. There they work closely with network operators and blue chip enterprises, advising them on the implications of legislative and technological shifts and helping develop appropriate responses.
Regional coverage:

CALA features

In this issue of the TowerXchange Journal, we offer our readers a comprehensive review of the Guatemalan tower market with inputs from SBA Communications, IFC and Mott MacDonald. An interesting country with considerable potential for the expansion of its tower industry, Guatemala is one market to keep an eye on!

TowerXchange also conducted two interviews with two interesting CALA towercos: Andean Tower Partners, part of the Digital Bridge group, shared its plans in Colombia, Peru, Chile and Ecuador while Grupo TorreSur's CEO and COO discussed the current status of the Brazilian telecom tower industry, in light of the country’s economic slowdown.

Finally, we take a look at transmission sharing opportunities in Brazil and beyond with the executives behind newly formed Arqueiro Telecom.

Don’t miss:

189 The complex Guatemalan telecom tower industry
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204 ATP: a new towerco with solid foundations and bold plans
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211 Arqueiro Telecom: providing shared backhaul across Brazil
Guatemala had an estimated population of 16.3mn people and 16.9mn mobile subscriptions at the end of 2015, giving a mobile penetration rate of 102%. Predominantly a 2G market still, with only 24% of subscriptions 3G and 1% LTE.

Growth likely from overall penetration increase and roll-out of 4G

3G subscriptions were first rolled out by Movistar back in May 2005 and it was the sole provider of 3G services in Guatemala until Claro and Tigo enhanced their service offering in 2008. 3G coverage by population increased from 50% in 2008 to 80% by the end of 2010. There were 4mn 3G subscriptions at the end of 2015 (24% of subscriptions).

Rollout of 4G

In 2011, the Guatemalan telecommunications regulator Superintendencia de Telecommunicaciones (SIT) attempted to stimulate the rollout of 4G LTE services and identified seven suitable bands, including 450MHz, 800MHz,
to the operator, it is currently in the process of doing so, however it is unclear which areas will be covered.

Red (Intelfon) is an operator founded with capital from Guatemala, El Salvador and Panama, which uses Motorola iDEN technology.

It is understood that in recent years negotiations have taken place between IBW (a Costa Rican based Pan-Central American WiMAX operator) and operators in Guatemala regarding the introduction of a mobile virtual network operator (MVNO) business model, however there has been no evidence of an agreement to date.

Regulation

Following the passing of the Ley General de Telecomunicaciones (General Telecommunications Law) by the Guatemalan Congress in 1996, the formerly state owned telecommunications company was privatised opening the way for competition. Although its name and ownership have changed numerous times, the original company is still in operation under the name of Claro.

It is reported that the regulatory framework in Guatemala is accommodating to operators, meaning that the processes for gaining the permits required to build and develop sites is relatively straightforward. Despite this and the desire for increased coverage from consumers, it is reported that greenfield development projects are sometimes met with protests from municipalities who oppose

According to el Periódico, the head of public policy of the GSMA has identified Guatemala as lagging behind in the provision of spectrum for 4G – with the 700MHz band being used currently for television, for example. In May 2014, the GSMA released findings of a new report, “The AWS Situation in the Americas”, which highlighted the positive economic impact of allocating the AWS spectrum band (1700/2100MHz) to 4G mobile services in the Americas – including countries such as Guatemala where it has yet to be licensed. In May 2015 CentralAmericaData.com reported that SIT has converted two frequencies reserved for the State into regulated frequencies, which will be auctioned – although the legality of doing so has been questioned.

As of the end of 2015, GSMA estimates that there were 154,000 LTE subscribers in Guatemala (<1% of subscriptions), with Tigo leading the way with 90,000 subscribers (58%) followed by Movistar with 64,000 (42%).

Operator activity

Movistar (Telefónica) has invested substantially in its network in recent years. In 2014 Movistar invested US$100mn into its network in order to reach the market first with LTE services using its allocation in the 1900MHz band. In 2014 Movistar also invested US$5.4mn to improve its coverage in key tourist resorts, deploying 3G capable antennas on a number of sites. At Q4 2015 GSMA estimates that Movistar’s 3G network coverage reached 95% of the Guatemalan population.

Tigo (Millicom), the country's largest mobile operator by subscribers, was the second MNO in Guatemala to offer LTE, however in under a year Tigo has rapidly gained a leading 4G market share. In recent years, Tigo has pursued growth through targeting corporate customers, providing voice telephony, broadband and data transmission services through its new business unit Tigo Business. Following success in other Central American markets, Tigo also recently launched its Tigo Star product bundle in Guatemala which is aimed at the standard consumer and also offers a multi-service package.

The Claro brand was launched in Guatemala in Q3 2006 as a rebranding of the previously privatised state owned operator. Despite the fact that it holds the second largest market share of 30% behind Tigo, Claro is yet to launch an LTE service. According to the operator, it is currently in the process of doing so, however it is unclear which areas will be covered.

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It is reported that the regulatory framework in Guatemala is accommodating to operators, meaning that the processes for gaining the permits required to build and develop sites is relatively straightforward. Despite this and the desire for increased coverage from consumers, it is reported that greenfield development projects are sometimes met with protests from municipalities who oppose
such development – meaning that building in some areas can be difficult and even dangerous.

Minimal state and provincial government investment into fixed line communications infrastructure has led to the country having one of the lowest fixed line tele-densities in the region. Subsequently uptake in the mobile telephony market has benefitted and although government investment has also been scarce in mobile infrastructure, the market has benefitted through investment from the international MNOs that are active in Guatemala.

In an attempt to reclaim inactive mobile phone numbers, the Guatemalan government and regulatory body, Superintendencia de Telecomunicaciones (SIT), introduced a GTQ5 (US$0.64) tax per number on each operator at the end of 2014. This encouraged the MNOs to hand back a total of six million numbers.

The tower sharing market

There are approximately 3,400 telecommunications towers in Guatemala, the vast majority of which (80%) are owned by the operational MNOs. Tigo, the country’s largest operator by market share, owns the vast majority at c. 2,000, whilst Claro and Movistar account for 500 and 200 towers respectively.

Three towercos currently occupy the remaining towers. Having entered the market in Q4 2011, SBA Communications now operates around 600 towers across Guatemala, having also established itself in Costa Rica, El Salvador, Nicaragua and Panama.

The second operational towercos in Guatemala is Torrecom which owns and operates 155 towers. Established in 2008, Continental operates in Guatemala with approximately 100 towers. Initially Continental confined its operation to five countries in Central America including Guatemala, however following growth ambitions and a successful loan application for US$120mn in 2012, Continental has expanded its operations into Colombia.

Conclusions

With a population of around 16mn people and mobile penetration only just above 100%, there is considerable room for subscriber growth in the Guatemalan mobile market. 4G services have been launched and consumer appetite is growing, therefore there is likely to be demand for the infrastructure required to support 4G. The number of subscribers per tower (approximately 5,000) is also relatively high, which could drive a demand for new towers. However, protests affecting the safety of employees during site development have caused some difficulties for network expansion, and more spectrum for 4G will need to be made available in the long term.

The degree of market dominance of Tigo is not favourable from a towercos perspective. On the other hand, if Tigo decides to pursue a future strategy which compliments a leaseback agreement then this could pave the way for towercos to realise substantial growth in the Guatemalan market. Three towercos currently operate in Guatemala however none has been able to establish a substantial foothold in the market and the three of them account for just over 20% of the country’s infrastructure. There is certainly scope therefore for existing or new towercos to play an increased role.

Guest columnist Marcus Dowdeswell

Marcus Dowdeswell is a Consultant in Mott MacDonald’s Digital Infrastructure practice, working with telecommunications operators, vendors and investors across the Middle East and Africa. Marcus has analysed tower markets across three continents and has recently been working as a Market Analyst on multi-million dollar mobile tower transactions in Africa and the Middle East, covering tens of thousands of tower assets. Marcus graduated with a BA in Business Finance and is an Associate Member of the Institute of Consulting.
Guest columnist Ed Siegle

Ed Siegle is a Principal Consultant in Mott MacDonald’s Technology & Communications Division. He has 20 years of experience as a consultant, primarily focused on the telecommunications industry, working for operators, vendors, investors, regulators and public sector organisations. His particular expertise lies in market analysis, commercial due diligence, product and market strategy development, demand forecasting and business case production.

In the course of his career he has worked for clients in the UK, Europe, the USA, Africa and Latin America. He has spent over 2 years living and working in Latin America, including 18 months in Brazil where he helped establish new offices for two consultancies. Over the past 3 years he has been part of a Mott MacDonald team commissioned to execute a series of advisory projects for towercos looking to invest in developing markets.

See you at our future events!

Meetup Europe 2016
12-13 April, London

Meetup Americas 2016
16-17 June, Florida

Meetup Africa 2016
19-20 October, Johannesburg

Meetup Asia 2016
13-14 December, Singapore

www.towerxchange.com
Complexity and contradictions of the Guatemalan telecom industry

Towercos are yet to fully penetrate the country... But is worth it (and is it safe)?

Guatemala is not an easy country to do business in, with its history of contradictions and civil uprisings. And its telecom sector isn’t free from trouble either. In this article, TowerXchange analyse the current status of the telecom industry with a specific look at its sometimes complex dynamics and interactions with politics and social discontent.

Keywords: 4G, América Móvil, Americas, Build-to-Suit, Central America, Claro, Comcel, Continental Towers Corp., Digicel, Editorial, Guatemala, Intelfon, Millicom, Moody’s, Movistar, Red, Risk, SBA Communications, Superintendencia de Telecomunicaciones, Telefónica, Tigo, Torrecom, Urban vs Rural

Read this article to learn:
- An overview of Guatemalan telecom sector and its dynamics
- Troubles for Tigo and the attempted entrance of Digicel
- The saga of the 2015 telecom tax
- The tower sector: active players, penetration rates and tower counts
- The role of Mario López Estrada in Guatemala’s telecom and tower industry

The Guatemalan telecom landscape is dominated by three active carriers, Millicom’s Tigo (formerly Comcel) Telefónica’s Movistar and América Móvil’s Claro. There have been various attempts to introduce a fourth player in the country such as Digicel back in 2007 and more recently Intelfon's Red, which currently has a few hundred thousand subscribers. In a country defined as “complicated” by many commentators, some carriers haven’t been exempt from troubles either.

This past October, the rating of Tigo - Guatemala’s number one carrier - has been put under review for downgrade by Moody’s in light of bribery allegations. According to news outlets, both Tigo and Millicom are under scrutiny for improper payments and Moody's is following the investigation to estimate the overall risks from a financial and operational perspective.

And the story of Digicel’s attempt to enter the country is simply bizarre. Back in 2007, Digicel acquired Digicel Holdings Limited, a separate entity that had operated in El Salvador and had held an unused mobile license in Guatemala since 2003. Digicel received a full authorisation from the Superintendencia de Telecomunicaciones (SIT), the local regulator, and installed as many as 300 telecom towers across Guatemala. However, eight years have passed and Digicel has since ceased to operate in the country.

To fully understand Guatemala’s complexity, it’s important to remember that the country experienced an extremely violent civil war from...
1960 to 1996. Since the end of the war, the country enjoyed democratic elections, experienced a steady economic growth and saw the opening of many commercial sectors, including telecommunications. However, Guatemala’s ongoing struggles with poverty and crime are far from solved.

In fact, over 50% of the population live below the poverty line but at the same time, Guatemala enjoys a comparable GDP per capita in Central America. This extreme unequal wealth distribution makes the Guatemalan economy one of the most complex and heterogeneous of the region.

In the telecom sector, the investment of strong international operators such as Tigo, Movistar and Claro has contributed to extensive network upgrades and infrastructure investments. In fact, all three carriers now offer, or are in the process of launching, 4G services across major metropolitan areas. In the case of Tigo, the company is expecting as many as 700,000 users to move to 4G per year and is investing an estimated US$50mn each year on network upgrades.

However, the lack of strong initiatives from either the government or the regulator has so far prevented rural areas from being fully covered. On the contrary, mobile coverage in areas deemed commercially unviable is still extremely low.

In early 2015, a newly introduced tax on mobile lines resulted in the disconnection of six million dormant lines by the network operators. However, shortly after the introduction of the US$0.65 tax, the Constitutional Court suspended the collection after an appeal submitted by the three carriers along with the Chamber of Industry. To date, the tax hasn’t been reinstated and Guatemalan attorney Annie Dougherty told Prensalibre.com back in February 2015 that “…There is no clarity as to who should pay the tax for call centres or concentrated lines. Also, if the tax was transferred to the user, specifically prepaid services, this would increase the cost of services by over 50%.” Moreover, opponents of this measure commented that the tax

The role of Mario López Estrada in Guatemala’s telecom and tower industry

Guatemala’s richest man and former Minister of Communications (1986-91) Mario López Estrada is President of Tigo Guatemala, in which he owns a significant minority stake. Tigo is Guatemala’s leading MNO with 50% market share. Mr López Estrada also owns a significant proportion of the land under Tigo’s towers, making him effectively Guatemala’s largest towerco with around 2,000 towers. However, Tigo Guatemala seems to have a strong preference to rollout their own tower network, seldom co-locating on third party towers and almost never entering into swaps or commercial co-location arrangements to allow other tenants onto their sites. As a result, Guatemala has a significant amount of parallel infrastructure, which cannot help tensions with local communities developing a NIMBY mentality.
represents a form of double taxation as carriers already pay for the administration of lines.

Guatemala’s tower industry

There are over 3,400 telecom towers in Guatemala but the level of towerco penetration is still fairly low; just above 20%. In fact, both Tigo and Claro still own most of their passive infrastructure portfolios and towercos are mostly involved in BTS activities.

SBA Communications, the number one towerco in Central America, holds a portfolio of 600+ towers as a combination of the acquisition of most of Telefónica’s towers, the acquisition of Mobilitie, and organic growth. Torrecom operates over 150 towers and is currently receiving a high volume of orders from the likes of Claro, as recently disclosed by Maria Scotti, its CEO. TowerXchange estimates that Continental Towers owns approximately 100 towers in the country out of its portfolio of ~700 sites in CALA.

Local communities as well as municipalities themselves are crucial stakeholders in the tower industry. In fact, in spite of the efficiency of SIT in granting permits, towercos face problems at a local level where sometimes violent protests have been able to delay projects by weeks or even months.

Security is an aspect that local players take into serious consideration and recent political troubles have contributed to a series of vocal protests. In fact, this past September President Otto Pérez Molina resigned over allegations of fraud and bribery. While Molina was charged and awaits trial in prison, new Presidential elections took place and saw the win of Jimmy Morales who, prior to launching his political career, was a comic actor.

Morales is now tasked with the attempt to improve things for Guatemala, starting with its economy. As explained by the World Bank, Guatemala collects the lowest taxes in the world and spends the least on health, education and infrastructure as a proportion of its economy.

In a recent editorial, the New York Times quoted Mario López Estrada, minority owner of Tigo and the first Forbes billionaire of the country, stating that “businesses should support the social movements that emerge from the nation’s soul.” Mr López Estrada was referring to the recent protests that saw over 10,000 people taking the streets of Guatemala City and were the drivers behind Molina’s resignation.

Citing the New York Times, Mr López Estrada “was half-serious when he joked that Tigo’s drive to switch Guatemalans to smartphones made the street movement possible, and he seemed to think that the new push toward greater accountability would continue.” And TowerXchange can only hope that local communities and municipalities realise how big of a change towercos can bring to the country by improving the level of coverage across the nation and empower the people to drive the change - also - via their smartphones.
SBA Communications on the challenges and opportunities of doing business in Guatemala

Experiences in building, maintaining and leasing up SBA’s portfolio of 600+ sites

Ricardo Ruiz, International Operations Director for SBA Communications, is based in Guatemala and has spoken to TowerXchange about the local tower industry, its dynamics and which growth perspectives SBA has in the country.

Keywords: 3G, 4G, Americas, Americas Insights, Build-to-Suit, Central America, Claro, DAS, Guatemala, Insights, Market Overview, Mobilitie, SBA Communications, Small Cells, Telefónica, Tigo

TowerXchange: Please introduce yourself and your role at SBA Communications.

Ricardo Ruiz, International Operations Director, SBA Communications: I have been in the telecom industry for the last eighteen years, focusing on Central America. For the past six years, I have worked for SBA Communications where I am in charge of multiple countries in Central and South America. Currently I am based in Guatemala City.

TowerXchange: Please give us some context on the tower industry in Guatemala. What are the competitive dynamics among MNOs and indeed among the country’s three towercos? How would you characterise the regulatory environment?

Ricardo Ruiz, International Operations Director for SBA Communications, is based in Guatemala and has spoken to TowerXchange about the local tower industry, its dynamics and which growth perspectives SBA has in the country.

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TowerXchange: What are the main demand drivers in Guatemala, both for new builds and for co-location?

Guatemala has a fairly strong regulatory environment, with diverse initiatives from the authorities to establish a clear framework to build and operate towers, which is attractive for the network operators and towercos too.

TowerXchange: What is SBA’s future outlook for its Guatemalan operations?

Read this article to learn:
- SBA’s operations in Guatemala and in Central America
- BTS and co-locations drive the tower industry in the country
- Best practices in dealing with local communities and permitting
- Opportunities for heterogeneous network solutions in Guatemala
- What is SBA’s future outlook for its Guatemalan operations?
Ricardo Ruiz, International Operations Director, SBA Communications: We believe that opportunities for new builds and co-locations are driven mainly by the carriers rising demand for 3G data services, and also moving forward with 4G networks. There is a huge need for capacity sites at the main cities and busy suburban areas. In certain areas, coverage sites continue to be built as well. Site growth has been strong over the past few years and carriers are still pushing hard.

TowerXchange: What are the main operational challenges you face building and maintaining towers in Guatemala?

Ricardo Ruiz, International Operations Director, SBA Communications: Building sites at Guatemala can be very challenging. The team must know the various communities and follow up closely with the different authorities to make sure the sites are built timely and with all the permits required.

There are local community groups called COCODES which have a big say in whether or not a site gets local approvals. From an operations perspective, there are good reliable contractors we use at our sites in addition to our own employees. Labor costs are good and work quality is high. There is some vandalism but it can be controlled. There are also some security issues in certain areas that people visiting the sites must beware of. For SBA, our large scale helps to control our costs in Guatemala. With a dense footprint of 600+ sites we have been able to create a maintenance plan that is very cost effective.

TowerXchange: What is SBA’s footprint in Guatemala, how did you acquire the portfolio and how is it growing?

Ricardo Ruiz, International Operations Director, SBA Communications: We own and operate more than 600 sites with nationwide coverage, in urban, suburban and rural areas.

In 2011, SBA entered the market through an acquisition from Telefónica. In 2012, SBA acquired Mobilitie in Guatemala and Nicaragua, and since then we have been growing our portfolio with over 150 BTS sites completed, and many more co-locations.

TowerXchange: Having acquired the majority of Telefónica’s towers, what are the prospects of Claro’s or Tigo’s towers coming to market, given the preferences of both organisations to retain towers and retain control?

Ricardo Ruiz, International Operations Director, SBA Communications: With Claro and Tigo in Guatemala, we have been focusing on co-locations. These two carriers prefer to continue to build and own towers but they both have been good co-locators on our sites, both old and new ones.

TowerXchange: Finally, please sum up your three to five year vision for the Guatemala tower market.

Ricardo Ruiz, International Operations Director, SBA Communications: We believe that carriers’ networks will continue to grow, especially as the region catches up with smartphones and data services penetration. SBA is focused on continuous growth in Guatemala and the rest of Central America, but also focused on running our existing portfolio efficiently. We expect to continue to build and buy towers and other sites here for the foreseeable future.
IFC's Guillermo Mulville, a regular speaker at TowerXchange Meetups and columnist in the TowerXchange Journal, shares with our readers his views on the complex Guatemalan telecom industry. With issues concerning security and lack of infrastructure, very low towerco penetration and plenty of room for growth, the local telecom tower industry is one we need to keep a close eye on.

Guatemala has the biggest telecom sector in Central America, which is consistent with the fact that it has the largest population in this region. The telecom sector generates revenues of about US$3billion per year which is about 5% of GDP.

The mobile market share is heavily concentrated between the three largest operators. The investment climate is improving but concerns remain regarding security and poor infrastructure. We expect the sector to continue expanding in the following years due to improving macro conditions. Potential opportunities will emerge around the deployment of 4G networks.

The independent tower market business model is not well developed yet. 80% of the towers are still owned by MNOs, which is higher than Central America’s average of 30%. However, operators are now focusing on using capex for their core business growth and the trend is to move their tower assets to independent tower companies. MNOs are investing less in passive infrastructure and creating potential opportunities for sale and leaseback agreements and build-to-suit projects. This is important so as to assure higher capacity in big cities and coverage in rural areas. Towerco penetration rate of 20% and tower density of around 4,500 subscribers per tower provides for a
hugé growth potential, particularly with the shift from 3G to 4G.

**TowerXchange: How big of a problem is security in Guatemala? And how does that affect network and infrastructure development?**

**Guillermo Mulville, Head of TMT for Latin America, IFC:** Security issues have historically affected investor confidence in Guatemala and they have obviously impacted telecom networks and infrastructure deployments.

Security concerns are somewhat correlated with extreme poverty and half of Guatemala’s population still lives below the poverty line, while 13% live in extreme poverty. A weak security situation would continue to obstruct economic development. The country ranks as 81 on the World Bank Doing Business Report 2016, showing no improvement compared to last year’s ranking but while the challenges of operating in-country are recognised by the investor community, the market consensus is leaning towards an expected overall improvement.

**TowerXchange: What is the impact of political events such as the recent elections in Guatemala and its industrial development?**

**Guillermo Mulville, Head of TMT for Latin America, IFC:** The country has recently faced corruption scandals that harmed the investment environment and investor confidence, especially during the last semester of 2015.

Jimmy Morales, the recently elected president, will commence his term on January 1, hopefully putting an end to the recent political uncertainty. Mr Morales’ posture is considered as pro-business. He has campaigned on the promise to clean up Guatemalan politics and to implement political reforms.

Regarding the telecom sector, relevant legislation and broad regulatory announcements have been passed in the last few years. In 2011, Guatemala’s regulator SIT announced that seven bands were suitable for the deployment of 4G, which opened the door for high speed data services. In 2014, the highly debated Law on Control of Mobile Telecommunications was meant to empower the SIT to regulate infrastructure installation. In 2015, a new tax regarding charges for each line in operation had an impact on the sector, with telcos returning to SIT a combined six million inactive lines. These inactive lines were mainly a consequence of the high percentage of prepaid customers in the sector. The market has a lot of margin to evolve and expand its postpaid accounts and therefore ensure a healthy growth in the following years.

**TowerXchange: Is the IFC involved in any specific project in the country?**

**Guillermo Mulville, Head of TMT for Latin America, IFC:** IFC has been investing in the country for decades. Currently we have an investment portfolio of US$255 million, mostly focused in the financial sector, with the balance being mainly in transport and agribusiness companies. In the telecoms sector, IFC used to be a lender to Continental Towers, but the loans have been fully prepaid. A few years back, IFC also structured a US$135 million syndicated loan to Tigo, but has since been prepaid. Presently, we are analysing several investment opportunities.

**TowerXchange: A relatively poor country with high rate of mobile subscribers and the need for major upgrades... What’s the outlook for its future?**

**Guillermo Mulville, Head of TMT for Latin America, IFC:** Guatemala’s SIM penetration of 103% is above the regional average. ARPU is relatively low due to the prepaid nature of the market. However, we believe that Guatemala’s mobile market may gradually shift more towards postpaid so ARPU will remain steady.

The mobile market has already grown tremendously, by around five times between 2004 and 2011, with mobile broadband subscribers doubling in size for the period 2010-2012. As is the trend globally, mobile data will lead the growth of the telecoms industry.

This growth will need a significant investments in infrastructure. Although 2.5G still represents the predominant technology, 3G connections are rapidly catching up, driven by network upgrades and the affordability of smartphones. By 2017, 3G is expected to be the leading technology in the market, while 4G/LTE connections enter a rapid growth path.
The sleeping beauty

Is the CALA telecom tower industry really as quiet as it seems?

After two years of non-stop news, I lately found myself longing for events to report on, as if the CALA tower industry had fallen into a dormant state. While it’s definitely true that the Brazilian economic (and political) situation is affecting industrial production as a whole, we’ve too often made the mistake of identifying the CALA tower industry with Brazil as a function of its importance as a market, where transactions happen in the order of thousands of towers, and everything is always on a grand scale.

In recent months, we were forced to shift our attention beyond Brazil and realise that there’s so much beyond it. From Mexico to Colombia, Peru and Argentina, the tower industry is far from dormant. It’s just not offering lots of news in terms of sale and leaseback transactions but to an alert eye, the region is not sleepy but just reshaping, with most towercos involved in less newsworthy BTS activities rather than acquisitions.

Here is a roundup of updates from the regional tower industry.

Keywords: Editorial, South America, Central America, Americas, Telesites, Mexico, Mexican Stock Exchange, Teléfonica, Wireless Towers, Submarine Telecom, Brazil, Chile, Colombia, Costa Rica, Peru, Argentina, Ecuador, El Salvador, Guatemala, Nicaragua, Panama, Uruguay, Venezuela, Andean Tower Partners, Digital Bridge, Argentina, Torresec, Innovattel, Torres Andinas, SBA Communications, Entel, Claro, Movistar, Build-to-Suit, Investment, Regulations

Read this article to learn:
- Mexico: from Telesites to AT&T, is the industry preparing for a big 2016?
- Is Teléfonica considering a LatAm carve-out?
- The Brazilian downturn and its effects on the national tower industry
- Andean states are the next big thing
- Argentina is not a virgin market anymore...

Telesites first weeks of trading

Telesites was listed on the Mexican Stock Exchange (BVM) on December 21 with an opening price of Mex$13 (US$0.76). During the first day of trading, shares peaked at Mex$13.38 to then fall by 10% on the following day. And since then, the stock has failed to recover and closed at Mex$11.00 as of January 29.

Five weeks have passed since Carlos Slim’s towerco started trading so it is too early to fully judge its performance but so far the company has met with a lukewarm response from investors. Lucio Aldworth, analyst at Banamex-Citi, speaking to Mexican financial newspaper El Financiero explained that “taking into account the debt transferred by AMX (editor: US$1.4bn) as well as the official goals set by Telesites, the capitalisation implies multiples of 19.9x with respects to the EBITDA projected for 2016, a 13% premium compared to the valuation of its more established U.S. competitors.”

Could it be that the goals set by Telesites are simply too bold or is the company going to prove itself as the leading towerco in Mexico (and beyond) both financially and operationally?

Telefónica: history repeating itself?

According to regional news outlets, Telefónica might go beyond the announced carve out of its tower business in Europe and follow América Móvil’s steps in Central and South America.
Telefónica’s transactions 2011-2013

<table>
<thead>
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<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Tower count</th>
<th>Deal value US$</th>
<th>Cost per tower US$</th>
<th>Deal structure</th>
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<td>93</td>
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Mexican financial news site Bolsamania published an article on January 13 stating that the telecom giant could be considering carving out its tower portfolio across CALA by opening an infrastructure sharing business across the region.

What is certain so far is that Telefónica has already created two new European entities, Wireless Towers, to transfer its 11,500 Spanish towers alongside Submarine Telecom, which will own all of its submarine cables and fibre (more details can be found in our European news section).

Telefónica owns assets in most CALA countries and by carving out its passive infrastructure business, it would create the first entity to operate in countries such as Venezuela and would become CALA’s most diverse towerco with operations in Brazil, Chile, Colombia, Costa Rica, Mexico, Peru, Argentina, Ecuador, El Salvador, Guatemala, Nicaragua, Panama, Uruguay and Venezuela.

So far, TowerXchange tracked down eleven Telefónica’s transactions in CALA which resulted in the sale of 9,076 towers in Brazil, Colombia, Mexico and Chile between 2011 and 2013 (plus several transactions prior to 2011).

Brazil

According to the Financial Times “Town and cities across Brazil are being forced to scrap the annual carnival parade as the country is braced for what is expected to be the worst recession since at least the 1930s.” And in a country where the carnival is more of a way of living rather than a festivity, this speaks volumes about the extent of the financial and political crisis that is hitting Brazil.

In the midst of the crisis, carriers are coming up with cost effective plans such as the rumoured merger between Oi and TIM and the infrasharing agreement between TIM Brasil, Vivo, HI Mobile and Claro, which was recently approved by competition watchdog CADE.

And what are towercos doing in the meantime? I have always backed the idea that middle market towercos would scale their businesses to the “right” level to then sell to the likes of American Tower (AMT) and SBA Communications. An opinion shared by most experts in the industry such as Dr Chahram Zolfaghari, CEO of Brazil Tower Company who smartly said “In Brazil, other than AMT and SBA, everyone has an exit strategy”. But I don’t think now is the time when AMT and SBA are likely to commit to huge investments to acquire their fellow competitors... A risky business at a time when, according to Barclays, Brazil has the highest level of inflation of all emerging markets and prices of virtually everything - including salaries and raw materials - are far from going down.

So with at least a dozen towercos with portfolios...
ranging between 18,800+ to 50 towers, the industry is likely to have to wait a while before any consolidation takes place.

**Western CALA**

Do you know how many towercos operate in Colombia? So far, I tracked down ten and I am pretty sure that this number is likely to go up in the near future. With Andean Tower Partners (ATP), part of Ganzi’s Digital Bridge Group, the last entrant in the country, Colombia is getting pretty crowded...

ATP’s CEO, Estrella Zaharia, explained to TowerXchange the drivers behind its entrance in Colombia in an exclusive interview published in the latest issue of the TowerXchange Journal. The delayed spectrum auction which is likely to set new coverage targets to awarded companies, in addition to a staggering growth in data consumption, are creating the perfect storm for towercos to enter the country and work on BTS programmes.

This said, I am firmly convinced that after the initial excitement, we are likely to witness consolidation among towercos and a rationalisation of the Colombian market.

Peru is another common target for towercos with as many as seven companies already active, including new comer ATP. With Peruvian carriers committed to a combined capital outlay in the order of US$3.9bn and a favourable regulatory environment, towercos have good reasons to get excited!

With Peruvian carriers committed to a combined outlay in the order of US$3.9bn and a favourable regulatory environment, towercos have good reasons to get excited!

Ecuador and Chile are quieter markets in terms of towercos activity. Ecuador doesn’t necessarily present the right market characteristics for towercos, considering it’s effectively a duopoly between Claro and Movistar. However, ATP has announced its entrance in the country and it will become the second active towercos in addition to SBA Communications. Torres Andinas’ COO Eric Ensor stated with regards to Ecuador that “Claro’s dominant position doesn’t help the towercos model spreading in Ecuador and we are still trying to understand how to position ourselves there. So far, we haven’t been able to answer that question entirely as we aren’t sure about how much business we can get there.”

Chile is a story of its own... The most mature market in the region and host to three healthy carriers - Entel, Claro and Movistar - the country seemed to present the perfect scenario for the adoption of the towercos business model. However, as previously reported by TowerXchange, the Towers Law (N. 20.599) suppressed Chile’s BTS market with its “onerous restrictions on building in saturated or sensitive areas, its somewhat heavy-handed attempt to mandate infrastructure sharing, and its requirements both to invest in camouflage, and at times to compensate local communities.”

Once again, newly founded ATP is planning to enter the country in 2016 and we are eager to follow its developments especially since the company plans to focus on developing small cells and DAS across Chilean metropolitan areas.

**Argentina opens up to the towercos model**

As the era of Kirchnerismo is over and President Macri takes office and promises to open up to international investors while negotiating the debt crisis with U.S. hedge funds, I cannot help but think Argentina is likely to open up to towercos very soon. And actually, the change is already happening.

In fact, while carriers in Argentina aren’t interested to sell their tower assets at the moment, Torresec
has recently secured its first Build-to-Suit contract and is positive that the BTS model is likely to become popular in the country, especially since at least 5,000 new towers are needed to bring 4G coverage up to speed.

In spite of the need to update and modernise its regulatory environment and its ever-uncertain political situation, Juan Cueria, COO of Torresec said that there’s plenty of equity funds interested in doing business in Argentina. In his own words “everybody recognises that this is a sleeping market, ready to awaken.”

With around 16,000 towers and stringent coverage targets for carriers that were recently awarded 4G spectrum (Movistar, Telecom Personal, Claro and Arlink), it comes as no surprise that carriers are welcoming an entrepreneurial towerco such as Torresec, able to provide BTS services. And the BTS model could be the perfect entry ticket for towercos looking at developing new business in this practically virgin market.

The CALA tower industry has had more exciting phases, and is now not only maturing but clearly slowing down from a deal flow point of view. The Brazilian crisis as well as the near-saturation of the Mexican market since the creation of Telesites provide an occasion to look beyond the obvious and find new revenue channels. While the Andean countries are increasingly in the spotlight, I would bet we are likely to see developments in Argentina, especially in light of the new government and its willingness to open up to international trades.
Andean Tower Partners: a new towerco with solid foundations and bold plans

Part of the Digital Bridge group of companies, ATP is a new disruptive force in the tower industry

Estrella Zaharia, CEO and President of Andean Tower Partners is a skilled business leader who exudes confidence and knowledge. Interviewing her gave me the clear perception that ATP is likely to become a strong competitor to the other towercos operating in Colombia, Peru, Chile and Ecuador. And this comes as no surprise considering the track record of Estrella's boss Marc Ganzi, from GTP to Digital Bridge.

Keywords: 3G, 4G, Active Infrasharing, Andean Tower Partners, Americas Insights, Build-to-Suit, C-Level Perspective, Chile, Colombia, DAS, Digital Bridge Holdings, Ecuador, Infrastructure Sharing, Insights, Leasing & Permitting, Market Entry, Market Overview, Network Rollout, Peru, Regulation, Small Cells, South America, Tenancy Ratios, Tower People

TowerXchange: Please tell us about ATP’s footprint, operations and plans for expansion.

Estrella Zaharia, CEO and President, Andean Tower Partners: Andean Tower Partners (ATP), founded by Digital Bridge Holdings, is headquartered in Boca Raton with an office in Bogota and a planned opening in Lima. During 2016 ATP will start operating in Colombia and Peru with plans to expand in Q3 2016 in Chile and in Q1 2017 into Ecuador.

In Q4 2015, ATP acquired two companies which secured us a base of 300 towers in Colombia as well as relationships with most of the carriers in the country. One of the two companies we’ve acquired had a track record in dealing with remote and technically challenging sites so now we have gained this specific skill which will give us a competitive edge in Colombia. Thanks to these 300 sites, we already cover 25% of the Colombian territory.

In addition to macro sites, we are also focused on deploying small cells for our customers. Thanks to Digital Bridge’s acquisition of ExteNet Systems in the U.S., we will offer neutral-host services throughout Latin America, where this concept is still in its infancy. ExteNet is the leading independent provider of Distributed Network Systems (DNS) in the U.S. and we will surely benefit from working side by side and expanding this business in South America.

TowerXchange: Estrella, tell us about your background and expertise and the journey to ATP.

Read this article to learn:

- Andean Tower Partners: bold expansion plans and highly skilled professionals
- Find out why Colombia and Peru are likely to be the top tower markets of 2016
- Chile: a more mature market in need of innovation
- The tower market: just like the internet boom?
- ATP’s growth projections beyond macro sites
Estrella Zaharia, CEO and President, Andean Tower Partners: In my career, I have gained in-depth expertise in operating telecom companies and, specifically, in building both satellite and fibre networks. As COO for Grupo Salinas’ Azteca Comunicaciones, I worked on the deployment of fibre in Mexico which connected over 1mn customers in Mexico City. Then we won two large public-private projects to build fibre in Peru and Colombia. In Colombia, we are talking about a 20,500km fibre network which covers 80% of the national territory while in Peru I followed the first two phases of the project and worked on the installation of 3,000km of fibre across the Sierra.

Then Marc Ganzi contacted me and I decided to join ATP which represents a new format of tower company, not only focused on towers but on serving its customers as a business integrator – that’s where I hope my expertise will be useful.

TowerXchange: Who else joined the ATP team so far?

Estrella Zaharia, CEO and President, Andean Tower Partners: The Digital Bridge team is made of phenomenal professionals and we can count on the likes of Marc Ganzi who serves as our Chairman, and Alex Gellman who is the Director of the Board as well as CEO of Vertical Bridge in the U.S.

We are now forming ATP’s team and we are delighted with the way it’s shaping up. To name a few, Piero Busani is the Chief Legal Officer with a wealth of experience as general counsel for multi-billion dollar organisations and Leo Sarria, VP of M&A, has been with Marc since GTP and dealt with many transactions at Vertical Bridge too. On the operational side, Saira Ballesteros, former Head of Operations at Azteca Comunicaciones, has joined us as VP and Cecilia Reissmeier, an experienced B2B marketer, is in charge of marketing and sales. We are very pleased with our team and will look to expand further as we grow.

TowerXchange: What were the drivers for Digital Bridge’s entrance into the Andean region and specifically, for each country?

Estrella Zaharia, CEO and President, Andean Tower Partners: After our success in Mexico with MTP we believed the Andean Region was the next logical geography to continue serving our carrier partners. We’ve decided to enter Colombia and Peru first as they are growing very fast and they both need at least an additional 10,000 towers each to comply with their coverage needs. Chile is the more mature market where we will enter later and focus more on DAS and small cells.

Colombia

With regards to Colombia, market drivers include the (delayed) spectrum auction for 700MHz, 900MHz, 1900MHz and 2.5GHz bands which is likely to set new compulsory coverage targets to awarded companies. On the consumer side, we’ve seen that data adoption is still a growing and positive trend for the tower market. In fact, the volume of SMS and MMS has lowered 52.3% YOY and resulted in an exponential increase in internet usage, which for us is great news!

Our expertise in dealing with difficult sites is giving us a technical advantage against our competition and we believe this will be a major differentiator for our success. Our expertise includes working on tailor-made solutions such as low budget infrastructure, small cells, monopoles et cetera.

The October 2015 local elections are likely to cause the renewal of local planning normatives and this is a delicate phase where stakeholders can support the creation of rules beneficial for the telecom industry
as a whole and to enhance connectivity.

The National Development Plan (Art. 193) is already helping the deployment of infrastructure, ensuring a positive shot clock of 60 days for permits and licenses, and by eliminating barriers against deployment of infrastructure in local legislation.

Peru

We believe Peru will become one of Latin America’s top markets in terms of tower growth in 2016-2017, especially since market trends as well as government support are leading to large investment outlays from carriers.

The telecom regulatory environment has been improving and contributing to speed up investments in infrastructure, thanks to a simplified administrative process to acquire permits and licenses. The government is playing a role in expanding towers coverage, as it aims to provide universal service for its citizens through relaxed regulation, the introduction of a fourth operator, and the auction of 700MHz spectrum that has been delayed to 2016.

The fibre optic backbone project will contribute to providing connectivity to 5.1mn citizens thanks to its 31,716km network. In the meantime, carriers are planning huge investments and towercos are likely to see a wave of new business coming in.

To give you an idea, Claro is planning to invest US$980mn to enhance its coverage and capacity as well as offering its customers new value added services. Telefónica is investing as much as US$1.8bn in the biennium 2014-2016 to deploy 4G and keep its competitive edge. Entel Chile announced investments of US$1.2bn over the period 2014-2019, as it looks to turn its Nextel assets into a national operator. And finally, new entrant Viettel, operating as Bitel, is installing as many as 2,000 new towers and laying 15,000km of fibre to reach 80% coverage with its 3G services.

With this hyper-dynamic scenario, it’s pretty clear ATP is very excited about being part of the Peruvian tower market!

Chile

Coming to Chile, the situation is a bit different. In fact, the market is more mature and we won’t focus as much on macro-sites but on supporting innovation via small cells and DAS. We believe that one of the features of 2016 in the mobile market will be the battle for subscribers among smaller players such as WOM (editor: formerly known as Nextel Chile and now owned by UK-based investment fund Novator) and MVNOs VTR and Virgin.

TowerXchange: Colombia is a very crowded market with more than ten towercos operating... Why? And is there really room for everyone?

Estrella Zaharia, CEO and President, Andean Tower Partners: In the mid-term, Colombia needs as many as 10,000 towers so we consider it a good-sized market and one where there’s room for several players. Over the long run, however this will not be sustainable and only the scale players will survive.

What we are seeing in the tower market in Colombia - and elsewhere - is pretty similar to what we experienced with the internet boom. Suddenly dozens of companies started crowding the market but after a few years, only the best ones remain. In the tower market we are likely to see a comparable pattern with larger towercos acquiring middle market players and consolidation becoming the
norm in the future, as those with the lowest cost of capital usually win.

We expect ATP to be among the larger and more relevant players in Colombia and beyond thanks to our access to long term capital, flexibility and expertise.

TowerXchange: With Tigo, Movistar and ETB sharing 4G rollout, which business opportunities are still available for towercos?

Estrella Zaharia, CEO and President, Andean Tower Partners: The trend of infrastructure and network sharing goes way beyond Latin America and is becoming a global strategy as carriers explore new, more cost efficient ways of doing business. I don’t see network sharing as a threat for towercos. If anything, it’s a good opportunity to get involved with carriers in innovative projects such as small cells and DAS.

TowerXchange: Peru is definitely a less developed market. Tell us what ATP aims at achieving in the country. And is there potential for acquisitions on top of organic growth?

Estrella Zaharia, CEO and President, Andean Tower Partners: We definitely see the potential for acquisitions in Peru and hope to close some deals before the end of H1 2016. Our goal is to acquire 5% market share in Peru by the end of 2020.

TowerXchange: What are the expectations of ATP in terms of growth in the next two years?

Estrella Zaharia, CEO and President, Andean Tower Partners: The Andean region presents plenty of substantial market opportunities both in terms of organic growth and potential acquisitions. The key is to first listen to your customers and understand their needs. Our goal at ATP is to continue to grow via BTS, M&A and working with new technologies such as small cells to help our carrier partners densify their networks.

TowerXchange: What are the challenges ATP is likely to face from a sales and operations standpoint?

Estrella Zaharia, CEO and President, Andean Tower Partners: In Latin America there’s still a technical knowledge gap in the engineering field. It’s not easy to find experts in the tower sector capable of designing and building sites as well as deploying and incorporating new technology. Working side by side with carriers and suppliers, we hope to fill some of those gaps.

On the community side, we aim at providing a participative plan to offer information and help local populations and governments to understand our business and overcoming any reservation. There’s a lot of resistance with regards to new sites, their visual impact et cetera and our goal is to work closely with local communities while we develop new sites for the carriers. I believe this is a differentiator for ATP in this industry and will contribute to building a stronger reputation in the market.

TowerXchange: What tenancy ratio would you like to achieve in Colombia? And what about Peru?

Estrella Zaharia, CEO and President, Andean Tower Partners: Our goal is to reach 1.4x in Colombia and Peru within two years.
The Brazilian tower sector: the current economic downturn and the opportunity it creates

From BTS to consolidation, business goes on for Brazilian towercos

Jim Eisenstein and Jose Varela run one of the most successful towercos in Brazil, Grupo TorreSur, with its 6,300 towers located in São Paulo and across the country. In this interview, they’ve agreed to discuss with TowerXchange the status of the Brazilian tower industry in light of the current economic downturn, as well as the opportunities still available for disciplined yet well capitalised towercos.

Keywords: Acquisition, Americas Insights, Brazil, Build-to-Suit, C-Level Perspectives, Capex, Carve Out, Co-locations, DAS, Exit Strategy, Grupo TorreSur, Infrastructure Sharing, Insights, Investment, Market Overview, Network Rollout, Private Equity, QoS, Sale & Leaseback, Small Cells, South America, Universal Access

TowerXchange: Do you expect BTS to be the core of your activity for the next two years? And if so, what are your targets in terms of new builds?

Jim Eisenstein, Chairman and CEO, Grupo TorreSur: Build-to-Suit is certainly an important component of our activity, but our core focus will always be on adding new co-locations on our existing portfolio of towers and adding equipment on sites on which carriers have already deployed.

In terms of targets, we have a certain range of new towers we’d like to build each year, but we are much more focused on building good towers rather than just towers. So we’d rather build fewer great sites than try to hit an artificial target number.

Jose Augusto Varela, Chief Operating Officer, Grupo TorreSur: BTS represents a meaningful part of our growth over the next couple of years, but the most important business area for us is to grow organically our existing portfolio. We will keep building new sites but looking at the economics behind each project. One of GTS’ core strength is how careful we’ve always been with how we invest our money.

TowerXchange: How many towers or tenancies are required to deliver full economic coverage and a high standard of QoS in Brazil?

Jim Eisenstein, Chairman and CEO, Grupo TorreSur: I think it’s hard to determine what constitutes good service or full economic coverage for each carrier. But with greater data usage, there will continue to
be an increased need for greater capacity, which in turn will continue to require the need for more sites. We think the easiest way to look at it is to compare Brazil with the United States, where there are an average of 1,100 subscribers per site versus over 4,000 subscribers per site in Brazil. I don’t think we are likely to see the Brazilian rate go down to anywhere near 1,100 in the short or intermediate term. However, Brazil certainly needs a substantial number of new sites over the next five years, not just to add capacity but also to enhance coverage.

**TowerXchange: What is your take on the effect of Brazilian economic uncertainty on the local tower industry?**

**Jim Eisenstein, Chairman and CEO, Grupo TorreSur:** The economic downturn has significant effects on the overall Brazilian business environment. However, I’d say that the crisis has probably affected the wireless industry less than other sectors, especially since wireless devices are not considered a luxury or a desire anymore, but rather a necessity. Having said that, there is a negative impact on the wireless industry which is starting to have effects on the tower sector as a result. We have been fortunate not to experience much of the pain to date, but with the carriers now feeling the effects of the crisis more than they have over the past couple of years, the reduced capex allocated to new projects will have an impact on our sector too.

**Jose Augusto Varela, Chief Operating Officer, Grupo TorreSur:** This crisis will also potentially precipitate consolidations not only among carriers but also towercos, which could create opportunities for us. Times like these present opportunities for some companies and I think this is the case for GTS. Thanks to our large portfolio of sites, we are able to offer creative solutions to carriers looking at expanding their networks and reducing their capex. But the same might be challenging for smaller companies with less substantial portfolios.

**Jim Eisenstein, Chairman and CEO, Grupo TorreSur:** Carriers began selling their tower portfolios in 2010. These carriers have made the fundamental decision of leasing versus owning their sites. As towercos are becoming more and more sophisticated, carriers trust us not only to own and operate their sites but also to develop sites for them. This is particularly important at times when the carriers have capex constraints. The economic crisis has solidified their thinking that for each tower they don’t have to develop on their own, they can co-locate on someone else’s site with a far smaller burden on their capex. In that regard, this difficult period is contributing to the leasing versus owning decision.

**TowerXchange: Whilst the devaluation of the Brazilian Real has inevitably slowed the flow of capital from the US to the Brazilian**
tower industry, does it open up opportunities for domestic Brazilian investors to get more involved? Are there Brazilian investors with an appetite for towers?

Jim Eisenstein, Chairman and CEO, Grupo TorreSur:
Every difficult situation presents an opportunity for some. Some companies might need to sell and accept a lower valuation and this would present the right conditions for investors willing to enter the market at a competitive price. But I think it’s fair to say that no tower owner would look to sell when the market presents difficult conditions.

Jose Augusto Varela, Chief Operating Officer, Grupo TorreSur: I think any investor, whether international or local, always looks at their potential returns. Those looking at investing in Brazil right now are definitely willing to take risks, but they also have the opportunity to garner some very significant returns down the road.

TowerXchange: When we spoke with Dr Zolfaghari of BTC last, he said that every towerco in Brazil beside AMT and SBA has an exit strategy... Do you agree with his view?

Jim Eisenstein, Chairman and CEO, Grupo TorreSur: I can’t comment on how other tower companies might think, but it’s fair to say that any company backed by private equity at some point will be looking for an exit, either through a sale, merger or a public offering.

TowerXchange: How do you foresee the consolidation of Brazilian towercos playing out – how many towercos does Brazil need in the long term?

Jim Eisenstein, Chairman and CEO, Grupo TorreSur: Drawing a comparison with the U.S., there are a multitude of successful tower companies beyond the three large public ones (editor: Crown Castle, American Tower and SBA Communications). I don’t think there is a right number of towercos for the U.S. and I don’t think there is a right number of towercos for Brazil. Every company is different and each company has its own goals.

We haven’t done any significant acquisitions since the middle of 2013 and chose not to go after certain deals which we didn’t think would provide the appropriate ROE for our investors. We would like to believe that these were the right decisions, but time will tell.

Jose Augusto Varela, Chief Operating Officer, Grupo TorreSur: Much will depend on whether a towerco has the option to wait or their investors are looking for liquidity. As Jimmy explained, the consequences of each decision in the tower business - such as entering or not entering into a deal - tend to show themselves after a period longer than many other businesses. Therefore, all business decisions made in previous years will have repercussions in the next year or so. That’s why it’s key to have a very clear strategy and to know how to create value, not only in the short but also in the mid and long term.

TowerXchange: After the AMT-TIM transaction, what is left to acquire - if anything - in Brazil? And considering that Claro still retains its portfolio, would you expect the carrier to carve out its towers and create a Telesites branch in Brazil?

Jim Eisenstein, Chairman and CEO, Grupo TorreSur: At one point, América Móvil might decide to carve out their sites and either create a spin-off company or sell to a third party. This would be their decision of course, but beside those assets, there isn’t that much left to buy in Brazil.

TowerXchange: Are you seeing more ‘special structures’ integrated into the Brazilian network? We’re seeing a growing portion of infill sites in Asia and Europe being fulfilled through ‘Smart Poles’ / lamp-posts and microcells – are they starting to be used in Brazil?

Jim Eisenstein, Chairman and CEO, Grupo TorreSur: I think that the need for macro sites in Brazil is such that carriers aren’t likely to start focusing their primary attention on microcells or DAS in the near term. There are still far too many areas where macro sites are needed for capacity, in-fill and coverage, but at some point well down the road, carriers will start focusing on alternative options.

Jose Augusto Varela, Chief Operating Officer, Grupo TorreSur: There are some companies offering sites to deploy microcells but I don’t think the market is there yet, at least not in a way to achieve scale. We are likely to see carriers continue to focus mainly on macro sites in the short term.
Arqueiro Telecom: providing shared backhaul across Brazil

The infrastructure sharing model is now extending to new business areas, beyond towers...

The towerco model in Brazil has proven successful and some entrepreneurs involved in the early days of the “tower revolution” have looked beyond the telecom real estate business to find new lucrative business channels.

Alex Sepehri-Nik and Steve Roberts have a combined wealth of experience in the telecom space and are now offering carriers and towercos across Brazil a shared backhaul service through their newly created company, Arqueiro Telecom. In this interview, they discuss with TowerXchange why sharing microwave and fibre is the future of telecom transmission in Brazil (and beyond).

Keywords: 4G, Americas Insights, Arqueiro Telecom, Backhaul, Brazil, Build-to-Suit, Business Model, Capex, Debt Finance, Infrastructure Sharing, Insights, Microwave, Network Rollout, New Market Entrant, Private Equity, South America

Read this article to learn:
- Arqueiro Telecom, its offering and services in Brazil
- Why should carriers and towercos embrace the shared backhaul model?
- Is backhaul a dirty job? And why aren't towercos offering it?
- The economic situation of Brazil and what's in it for companies offering “shared services”
- Fibre versus microwave: pros and cons

TowerXchange: Steve and Alex, please introduce yourself and Arqueiro Telecom.

Steve Roberts, Co-founder and CTO, Arqueiro Telecom: I am from the UK and have been in Brazil since 1998, coming over with Nortel Networks. In my career, I have represented several major vendors such as Alcatel, Huawei and Nokia and I was one of the founders of a start-up project with ON Telecom, a wireless broadband internet operator. Around a year ago, Alex and I started discussing the opportunity to provide transmission to carriers in Brazil following a shared backhaul model and here I am now, with Arqueiro Telecom.

Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom: I am American and a lawyer by training. In the early days of my career, I worked within a San Francisco based law firm mainly serving TMT clients. From there, I became in-house general counsel for several major technology companies including Amber Networks (which we sold to Nokia in 2001). In Brazil, I firstly joined Nexius, where I met Dr. Chahram Zolfaghari, my partner and co-founder at Brazil Tower Company (BTC). At BTC, we raised more than US$50mn in debt and equity and deployed towers (editor: 753 as of Q3 2015) throughout Brazil.

When we first discussed creating a tower venture in Brazil, we realised that a shared backhaul model – although at an early stage – would be attractive for the market and potentially lucrative for us. That was the first glimpse of what is now Arqueiro Telecom.
Although we have a strong partnership with BTC, it’s important to stress that we are not a wing of the towerco. Obviously, there are some substantial connections in terms of the lead investor involved and the fact that I still sit on the board of BTC. However, we are two separate companies working in complementary sides of the telecom business.

**TowerXchange: How does Arqueiro Telecom’s backhaul service work?**

**Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom:** We’ve come to refer to our service as a Build-to-Suit backhaul. It works in a similar way to the tower-sharing model. For example, a major carrier may request the service. We will then do an internal feasibility study to see if it makes sense for us to deploy a shared backhaul in each instance. The general idea is that you should have more than one customer utilising your service. That being said, if a carrier requests our service, we will evaluate the ability of the carrier to deploy it, the topology, the degree of bandwidth we can offer and the likelihood that other carriers can benefit from sharing in the arrangement.

We have a nationwide SCM license, which allows us to call ourselves the carriers’ carrier. And we offer carriers much more than just the Build-to-Suit model. They can also use our design, vendor management (encompassing equipment providers and tower companies) and location services. In terms of the latter service, we use powerful databases to choose locations where tower space is confirmed as readily available for the carrier.

**TowerXchange: Who should provision backhaul in the era of independent towercos?**

**Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom:** In terms of who should provision backhaul, there really aren’t any standard rules in the industry as of today. We are creating our own model in Brazil. We are able to focus on this area of network deployment that nobody seems to enjoy handling. In a sense, we’re doing the dirty work!

**TowerXchange: Why aren’t towercos offering shared microwave links?**

**Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom:** Well, our concept was discussed before we even raised a single penny for BTC (five years ago). We looked at it as a service that could potentially be added to the BTC (or any other towerco’s) portfolio going from just the passive infrastructure – meaning the towers – to creating an active infrastructure involving a network.

Many people don’t appreciate that running a tower company is actually quite hard. So in the first instance you focus on raising capital from the market and shareholders, partnering with the carriers, designing and deploying towers where
they want them. Brazil is a big country. You also have to handle the licensing, the vendors, the site acquisition (leases), the build and the installation services. And it’s difficult to then tell your shareholders that you have raised capital to do these things, but now you want to become a carrier on top of that.

To put it more precisely, it’s difficult to take investor money – or in the case of a multi-national, the country budget – and tell the shareholders that on top of building towers you’re now going to plan, build, sell and maintain a network.

Our service does help to increase the tenancy rate of a towerco but works in a completely different way.

Towercos find it difficult to expand their focus into being operators. There is obviously a conflict of interest in being a tower company and a network operator at the same time. That is why we are doing this as an independent entity – we are solely focused on offering a shared backhaul network throughout Brazil.

TowerXchange: Should carriers do this themselves or outsource to a specialist who white labels the service?

Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom: We don’t white label our service. We’re an independent company that has agreements with the tower companies and the carriers.

By being on a tower, our purpose is to increase the tenancy ratio and not just provide backhaul to one carrier. We are a shared backhaul company, right? We actively seek new customers and, as a result, can bring a second or third tenant on a given site, in addition to the first one that deploys with us.

TowerXchange: Why do towercos focus so much on GBTs and so little on backhaul?

Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom: If you look at the build out in the Brazilian market, in the next three years, over 200,000 new sites will be needed for towers. The tower companies are just too busy handling all of that to focus on anything else. On top of this, we’re not even coming close to meeting the carriers’ requirements in terms of 4G deployment.

The tower companies just don’t have the resources to keep up with the demand on the tower side. Everyone realises that a shared backhaul network is a great concept, but when towercos don’t have enough manpower or even capital to fit the needs of the customers, they are unlikely to focus on adding services such as backhaul.

Then there’s the issue of transmission. As we’ve previously discussed, it’s the ugliest part of the business and no-one really wants to deal with it.

Steve Roberts, Co-founder and CTO, Arqueiro Telecom: I think people refer to backhaul as the dirty side of the business because it’s essentially very complex. Some might think it is easy to stick a microwave link onto a tower and off you go. It’s not as simple as that. You have to plan it carefully. You have to see if there is tower space and frequency available. There are many different factors that come into play. So for a tower company to think of deploying transmission, it will have to become like a mini operator. Then it has to employ a whole load of other people to plan it, engineer it, sell it and look after it. That is complex.

Some companies consider us a leased line provider. It doesn’t work that way and we don’t particularly like the phrase. We are an intelligent backhaul provider. We use sources of information to determine the number of residents in a particular area and their GDP and relate it to the economical feasibility of a transmission project. We use intelligent information, we don’t just provide microwave links.

We tend to associate towers with cellular or mobile networks. But all of these towers have big corporate areas under their control. Sometimes the tower companies do not concentrate that well on their corporate areas. So we can actually maximise these towers to bring new businesses opportunities to them such as corporate clients.

Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom: We have consistent requests from all the major carriers. In the early days, we were going around trying to convince companies this was the future. Now the response is just fabulous. They know that they can save money on capex – meaning that they don’t have to buy the
equipment. They can see that they can save time in terms of deployment resources because our people are responsible for installing and maintaining the backhaul service. And, lastly, they can see that they can get a better service at a cheaper price and have little to no capex in terms of transmission.

TowerXchange: What is the impact of the current economic and Forex situation in Brazil on raising capital for telecom infrastructure ventures?

Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom: What is happening in Brazil is undeniable, obvious and quantifiable. But it actually fits with what we are doing. Everyone knows that there is a lot less foreign capital coming into Brazil at the moment. It affects everyone from private individuals wanting to start companies to international tower businesses that want to pull resources from their parent companies. It’s no secret that carriers in Brazil plan to spend much less on deployment in Brazil in 2016. And they are not discussing 2017 while everyone is hoping things will improve.

We’re here to save them money on deployment. Using our service actually fits their plans to spend less. Our clients pay us monthly fees for our service and they can take the saved spending out of their capex budget.

The current downturn simply fits with our business model.

TowerXchange: Tell us about the progress of fiberization in Brazil – why does microwave continue to play such a significant role in backhaul and is it here to stay?

Alex Sepehri-Nik, Co-founder and President, Arqueiro Telecom: The overall state of fibre in Brazil is way behind the curve of what is needed to have a world class network. Deploying fibre is tough work in Brazil, and it’s unrealistic to think that fibre will be rolled out to many areas of the country in the near future. Fibre in Brazil doesn’t tend to be installed on the ground. Rather it is installed on telegraph or utility posts, which makes the situation even more complicated.

So in order to have a high capacity backhaul, it has to be done via microwave to speed up the process, at least in the next few years.

We think that microwave is a great way to start the process quickly and effectively. It allows backhaul to reach many parts of the country that would take years to cover by fibre. That being said, Brazil still needs fibre. Our customers are asking for it and we will probably start running it in 2017.

Steve Roberts, Co-founder and CTO, Arqueiro Telecom: The deployment of fibre isn’t being done very efficiently across Brazil. Fibre can be even more complex than microwave and we are seeing some projects being developed with the use of unsuitable resources such as energy posts, telegraph posts, et cetera.

Obviously you’ve got gains on capacity with fibre but if carriers deploy it all the time, it will be very expensive and hard for them to really map the capacity. I think that by starting with microwave, carriers can really track their growth and the demand in terms of capacity and can intelligently assess whether fibre is needed in a given area. By sticking to microwave for a few years, fibre can then be selected in high density areas where it will repay the investment.
A bumper bundle of roundtable reports and Nigerian market analyses awaits readers of TowerXchange’s MEA section.

First we’ll share insights from the 3rd annual TowerXchange Meetup Africa (October 2015), including Towexchange’s proprietary MEA tower market sizing and growth forecast data, a report from the towerco CEO keynote panel, plus reports documenting lessons learned at roundtable breakouts focusing on energy efficiency, and on DRC, Egypt, Ghana, Rwanda, Tanzania, Uganda and Zambia.

If you missed our 2015 Meetup, put October 19 and 20 into your 2016 diary and don’t miss the most important gathering of African telecom infrastructure decision makers this year!

Also in this edition; a deep dive into the dynamics of the new Nigerian tower market, plus BMI’s take on South African tower market, where the NCC’s US$3.9bn fine on MTN could finally force the long rumored sale of their towers to commence.

Don’t miss:
216 TowerXchange Meetup Africa 2015: event report
232 Tanzania, DRC, Egypt, Ghana, Nigeria, Uganda, Rwanda and Zambia plus energy roundtable reports
248 How the new Nigerian tower market will work
252 What we learned about HTN Towers
258 BMI: MTN fine the catalyst for South African tower sales

P.S. Don’t miss the latest MEA tower industry overview starting on page 60, plus MEA tower industry news, including coverage of the tower divestitures in KSA and Kuwait, from page 72!
TowerXchange Meetup Africa 2015: event report

Key market data, audience analysis and photos from Africa’s foremost telecom infrastructure event

254 leaders of the African tower industry gathered at the Sandton Convention Centre for the third annual TowerXchange Meetup Africa, including a record turnout of towercos and MNOs for this renowned networking event. Attendees toured a sold out expo of 45 proven passive infrastructure equipment and service providers, connected and shared best practices through over five hours of unique roundtable breakouts, and enjoyed the hospitality of the continent’s leading exhibition facility and Cape Town’s most famous steak restaurant!

TowerXchange assembled 254 of the most influential decision makers in African telecom towers for what has become the most unmissable networking event in the African telecoms infrastructure calendar.

74% of attendees of the TowerXchange Meetup Africa were Director, VP or CXO-level!

How we promote TowerXchange Meetups

- The core of our promotional campaign is TowerXchange’s proprietary database of the top 15,000 decision makers in the global telecom tower industry
- The TowerXchange database includes the management teams of 153 towercos who between them own over 2mn of the world’s 3.3mn towers
- We also maintain relationships with over 3,000 CXOs and Heads of M&A, Network Planning, Procurement and Tower Strategy at MNOs worldwide
- TowerXchange is read by 542 investment and investment advisory firms, providing an invaluable interface with the providers of debt and equity to towercos, MNOs and their suppliers
- TowerXchange also maintains the world’s most exhaustive database of telecom infrastructure suppliers, from tower manufacturers, managed service providers, to RMS, site management platforms, access control and energy equipment and


Read this article to learn:
- TowerXchange’s latest market size and growth forecasts for towers in SSA and MENA
- Audience demographics and the delegate list from the TowerXchange Meetup 2015
- How TowerXchange Meetups are promoted
- Ten reasons why you can’t afford to miss the TowerXchange Meetup 2016!
service providers

- Every month TowerXchange adds an average of 700 new highly qualified members to our community through a combination of “pull” marketing via TowerXchange research, and P2P introductions and research within the tower industry
- A total of 76,884 personalised emails with industry specific messaging were sent to our database to promote the TowerXchange Meetup Africa
- Our email campaign is supported by a direct mail campaign to 253 selected VIPs, and by a courtesy calls to over 1,000 key target attendees
- A key component of our promotional campaign is the TowerXchange Africa Dossier – this annual publication collates and updates critical baseline data and the best interviews with key African tower industry stakeholders
- We use Google Adwords to amplify the findability of the dossier, and other selected industry news and analyses, attracting new, qualified members to our community
- The TowerXchange Journal is our most important media partner; 94% of attendees were Journal subscribers, 66% of attendees had been interviewed in the Journal
- TowerXchange are grateful for the support of our media and association partners for Africa:
  - Africa Monitor
  - Analysys Mason
  - BMI Research
  - Hardiman Telecommunications
  - Inside Towers
  - The National Association of Tower Erectors

**The African tower market**

Towercos have deployed over US$5bn to acquire 39%, or 48,214 of the 122,739 towers in SSA, but just 1.4%, 2,040 of 139,800 towers in MENA. TowerXchange forecast that 96,000 towers in MEA could be owned and operated by independent towercos in a year's time, when we reconvene for the TowerXchange Meetup Africa 2016 on October 19 and 20 back at the Sandton Convention Centre.

Inorganic growth will be driven by the sale and leaseback of MTN’s towers in South Africa, the return to market of previously cancelled Airtel tower sales including in Tanzania and the DRC, potential transactions in Mozambique and Senegal, and in particular by a swathe of transactions in MENA, starting with Mobily’s sale of 9,600 towers in KSA and Zain’s sale of 6,600 towers across KSA and Kuwait.

After a down year in 2015, inorganic growth will pick up in 2016 with over 10,000 new towers to be built in 2016, the majority of which are destined for towerco rather than MNO balance sheets.
**Who owns SSA’s towers?**

- Remaining MNO-captive (56,540)
- Coming to market (15,800)
- IHS (23,765)
- American Tower (10,103)
- Eaton Towers (7,070)
- Helios Towers Africa (5,606)
- HTN Towers + SWAP (1,905)
- TowerCo of Madagascar (700)
- Others (1,250)

Source: TowerXchange

**Who owns the towers in the Middle East?**

- Remaining MNO-captive (120,050)
- Coming to market (17,700)
- Eaton Towers (2,000)
- Others (50)

Source: TowerXchange

**MENA tower counts, Q1 2015**

- **Saudi Arabia**: 30,600
- **Egypt**: 19,000
- **Algeria**: 17,500
- **Morocco**: 17,000
- ** Iraq**: 12,300
- **UAE**: 8,500
- **Tunisia**: 7,000
- **Jordan**: 5,900
- **Kuwait**: 5,100
- **Libya**: 5,000
- **Yemen**: 3,900
- **Oman**: 3,200
- **Lebanon**: 2,000
- **Bahrain**: 1,700
- **Qatar**: 1,100

Source: Delta Partners data, TowerXchange presentation
Ten reasons why you can’t afford to miss the TowerXchange Meetup Africa 2016 on October 19 and 20 at the SCC

1. The best and only opportunity to meet Africa’s leading towerco CXOs and MNO tower strategists
2. By 2016 towercos will own almost all the investible towers in SSA
3. Towerco penetration is forecast to increase 10x in MENA in 2016
4. For the first time, the TowerXchange Meetup Expo can be visited free of charge by buy-side decision makers!
5. The new TowerXchange Investors Club will attract unprecedented representation from debt, equity and institutional investors
6. The TowerXchange Meetup Africa 2016 will include senior representation from all Africa’s leading towercos, including IHS
7. Towercos and MNOs increasingly rely on TowerXchange to shortlist recipients of RFPs
8. Learn where the next tower transactions are taking place, and who the new decision makers will be
9. Identify where new tower builds and new technology rollouts are driving growth
10. Meet with existing and new business partners within the African tower industry supply chain
### SSA tower count estimates, no detailed study yet by TowerXchange

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated tower count</th>
<th>Towerco penetration</th>
<th>Towercos present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cote d'Ivoire</td>
<td>3,000</td>
<td>74%</td>
<td>IHS</td>
</tr>
<tr>
<td>Cameroon</td>
<td>2,500</td>
<td>80%</td>
<td>IHS</td>
</tr>
<tr>
<td>Sudan &amp; S Sudan</td>
<td>2,500</td>
<td>0%</td>
<td>IHS</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2,500</td>
<td>0%</td>
<td>IHS</td>
</tr>
<tr>
<td>Zambia</td>
<td>2,000</td>
<td>85%</td>
<td>IHS</td>
</tr>
<tr>
<td>Angola</td>
<td>1,500</td>
<td>0%</td>
<td>IHS</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>1,500</td>
<td>0%</td>
<td>Eaton</td>
</tr>
<tr>
<td>Madagascar</td>
<td>1,350</td>
<td>52%</td>
<td>ToM</td>
</tr>
<tr>
<td>Rwanda</td>
<td>1,300</td>
<td>77%</td>
<td>IHS</td>
</tr>
<tr>
<td>Niger</td>
<td>1,150</td>
<td>43%</td>
<td>Eaton</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>1,150</td>
<td>43%</td>
<td>Eaton</td>
</tr>
<tr>
<td>Guinea Conakry</td>
<td>1,100</td>
<td>0%</td>
<td>Eaton</td>
</tr>
<tr>
<td>Benin</td>
<td>1,000</td>
<td>2%</td>
<td>AMN</td>
</tr>
<tr>
<td>Congo Brazzaville</td>
<td>900</td>
<td>44%</td>
<td>HTA</td>
</tr>
<tr>
<td>Chad</td>
<td>900</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Congo</td>
<td>900</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>Malawi</td>
<td>750</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Others*</td>
<td>5,750</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

Source: TowerXchange

*None of the countries aggregated under “Others” has more than 1,000 towers, and TowerXchange are not aware of any towerco activity in any of those countries, which include: Burundi, Central Africa Republic, Djibouti, Equatorial Guinea, Eritrea, Gabon, Gambia, Guinea Bissau, Lesotho, Liberia, Mauritania, Mauritius, Namibia, Sierra Leone, Somalia, Swaziland and Togo
TowerXchange Meetup Africa 2015 attendee list

**Towercos**

American Tower CFO, International  
American Tower SVP, Treasurer  
American Tower Vice President IT and PE, EMEA  
American Tower President, LatAm and EMEA  
AMN Managing Director  
AMN Business Development Director  
ATC Ghana Chief Executive Officer  
ATC Uganda Chief Executive Officer  
Atlas Tower General Manager  
Atlas Tower General Manager  
Atlas Tower General Manager  
Connect Africa Managing Director  
Eaton Towers Acting CEO  
edotco Chief Sales & Marketing Officer  
Helios Towers Africa Business Development Director  
Helios Towers Africa Structural Engineer  
Helios Towers Africa Operations Director  
Helios Towers Africa CEO  
Helios Towers Africa O&M Manager  
Helios Towers Africa Chief Operations Officer  
Helios Towers Africa Supply Chain Manager  
Helios Towers Africa Head of Country Operations  
Helios Towers Africa Executive Chairman  
Helios Towers Africa Technical Director  
Helios Towers Nigeria CEO  
Hotspot Network CEO  
SBA Communications VP, Business Development  
SBA Communications President - International  

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Keynote panelists in 2015: Chuck Green, Executive Chairman, HTA; Hal Hess, President LatAm & EMEA, AMT; Nawar Atassi, Director, Towershare; Terry Rhodes, Acting CEO, Eaton Towers

**Division**

SWAP TECHNOLOGIES & TELECOMS PLC Country Manager  
SWAP TECHNOLOGIES & TELECOMS PLC Acting Group CEO  
SWAP TECHNOLOGIES & TELECOMS PLC Chief Marketing Officer  
TASC Towers CEO  
Towerco of Madagascar CEO  
Towershare President and CEO  
Towershare CTO  
Towershare Director Sales  
Towershare Manager Strategy and Planning  
Towershare General Counsel  

**MNOs**

Airtel Chief of Staff  
Cell C Executive: Technical Facilities  
Econet Wireless Group CTO  
Econet Wireless Head - Network Construction  
Econet Wireless Non Executive Director  
Etisalat Head of M&A  
Etisalat Director M&A at Etisalat Group  
Etisalat Director and Head of Business Planning & Valuation, M&A  
Etisalat Manager - Business Planning and Valuation, Corporate M&A  
Expresso Senegal Chief Executive Officer  
Expresso Telecom Group (Dubai) Chief Executive Officer  
Millicom Infrastructure Manager  
MTN GM Capital Projects  
MTN Senior Manager M&A  
MTN General Manager  
MTN M&A Executive  
MTN Senior Manager M&A  
Telkom Procurement Manager  
TIGO Head of Operations  
TIGO Head of Procurement & Supply Chain
Vodacom Manager: Strategic Technologies - Property
Vodacom National Network Property Manager
Vodacom Executive Head: Field Force Maintenance & Network Property
Vodafone Network Supply Chain
Vodafone Head of Network Supply Chain

Investors

3i Director
3i Senior Associate
Baybridge Investments Technical Consultant
Capital Group Private Markets, Inc. Associate
Capital International SARL Partner
Citi Head of Telecoms MENA
Credit Suisse Director
FMO Senior Investment Officer
IFC Chief Investment Officer
IFC Head - Telecom, Media & Technology Group
ING Bank Director
Standard Bank Managing Director, Global Head of Telecoms & Media
Sumitomo Mitsui Banking Corporation Manager
WENDEL AFRICA Managing Director, CEO
Yield Capital Partners Managing Partner

Access Control

Abloy Managing Director
Abloy Sales Manager South Africa
Abloy Area Director
ACSYS Sales Director Southern Africa
ACSYS
ACSYS representing CCT Strategic Partnership

Advisory Firm

Analysys Mason Senior Partner
Detecno International GmbH Managing Consultant
Hardiman Telecommunications Founder & Managing Partner
Hardiman Telecommunications Managing Partner
Hardiman Telecommunications Senior Consultant
Intrepid Advisory Services Managing Director
Norton Rose Fulbright Partner

Energy Equipment

3Tech Regional Manager
AKD Solar CEO
AMARARAJA BATTERIES LTD Head – Exports (ISBU)
AMARARAJA BATTERIES LTD Chief Marketing Officer (ISBU)
Apollo Solar CEO
ASCOT Industrial srl Area manager Africa
ASCOT Industrial srl
ASCOT Industrial srl President
ASCOT Industrial srl
Ausonia Export Dept Area Manager
Ausonia CEO
Ballard Power Systems Sales Director EMEA
Bladon Jets VP Market Development
Cambridge Clean Energy (CCE) Sales Manager, Africa
Cambridge Clean Energy (CCE) Managing Director, Africa
China Shoto Vice sales manager, Middle east & Africa branch, Marketing Department
China Shoto Sales personnel
China Shoto CTO
China Shoto Sales manager, Middle east & Africa branch, Marketing Department
COSLIGHT INDIA TELECOM PVT LTD VP - Sales & Marketing
COSLIGHT INDIA TELECOM PVT LTD Sr Manager - Solutions & Engineering
Cummins Power Generation Low KVA Segment Leader - Africa
Cummins Power Generation Business Director - VSPP Segments and Independent Business - Cummins Africa
Cummins Power Generation Regional Sales Director, Car and General, Nairobi, Kenya
Eltek Regional Sales Director
Eltek Regional Manager - SSA
Eltek Key Account Manager
Emerson Network Power Managing Director: Sales, Sub Sahara Africa
Emerson Network Power Vice President, Global Accounts
Emerson Network Power Sales Director, Sub Saharan Africa
Enatel Energy
Enatel Energy Director of Sales and Marketing
Energy Vision Executive Chairman, Founder
Energy Vision CFO, Co Founder
EnerSys Telecom Market Director EMEA
EnerSys Sales Director MEA
Enersys Powertech
Enertika CFO
Enertika Business Development Director-private sector
Ennera Chief Executive Officer
Ennera CCO - Telecom
Ergos Energy Managing Partner
Flexenclosure Commercial Director
Flexenclosure Sales Director Southern Africa
Flexenclosure Vice President eSite
Generator Logic General Manager
Generator Logic CEO
Greenpole CEO
GS Yuasa Manager
GS Yuasa Regional Manager - EMEA
Heliocentris Technical Sales Engineer, ICT Hub sub-Saharan Africa
Heliocentris Marketing Manager
Heliocentris General Manager ICT Hub - Sub Saharan Africa
Heliocentris VP Sales and Marketing
Hybrid Energy Solutions Ltd Business Development Director - Middle East and Africa
Hybrid Energy Solutions Ltd CEO
Inala representing Imergy Power Systems
Inala representing Imergy Power Systems
IPI Group Holding Chief Executive Officer
IPT PowerTech VP & COO
IPT PowerTech VGM - Power Division
Lineage Power Chief Strategy & Business Development Officer
MANTRAC Group Head of International sales
MANTRAC Group Power Systems Segment Manager - Africa
MANTRAC Group Power Systems Segment Manager – Telecommunications, Hybrid Microgrid & Mining
NorthStar
NorthStar Sales Manager Africa
NorthStar Head of EMEA
Pace Power Tanzania Limited Sr. Manager Business Development
Planetary Power VP Business Development
SolarCast President and CEO
Sunco Energy SL Business Development Director -private sector
TOTAL MEA Solar Coordinator
TOTAL Head of Energy Solutions
Trojan Battery Company Director Marketing Development
Voltalia Business Development Director
Wind-It Chief Executive Officer
Wind-It CTO

Managed Service Provider

Anchor Telecoms Chief Executive Officer
Anglobal SA New Business & International Director

Camusat Product Manager e.power
Camusat Group CTO & TCO Developer Officer
Camusat COO Africa
Delmec Engineering Ltd Chief Technical Officer
EkiStruct CEO
Eurico Ferreira Country Director
GreenX Group Inc. Chief Executive Officer
HOI-MEA Business Development Manager
HOI-MEA COO
ieng Group COO
Infratel Chairman
Leadcom Head of NTSS sales Africa region
Leadcom Head of NTSS Delivery Africa region
Likusasa Group Proposals Manager
Likusasa Regional Sales Manager, South Africa and Lesotho
M-P Infrastructure Managing Director
Mer Group Telecom Division VP Sales Africa-Asia
Mer Group Telecom Division Deputy CEO, C. Mer industries ltd.
Netis CEO
Netis Ghana Chief Executive Officer
NEWL Head of Business
NEWL Malawi Head of Operations
QTE CEO
QTE CCO
Quanta TowerGen President
R.S. INFRA PROJECTS. Pvt. Ltd Director
R.S. INFRA PROJECTS. Pvt. Ltd Telecom Head
Ramboll Project Director
Ramboll India Telecom Technical Director
Sagemcom Deputy Sales Director
Sagemcom Kenya Branch Manager
Zamil Infra Sr. Project Manager
RMS and Site Management Platforms

**Zamil Infra** Vice President- Sales
Zamil Infra CEO

**Accruent** Market Strategy Director

**AIO Systems** VP Sales
Azeti Partner Manager
Azeti VP EMEA & APAC

**Cisco** Solution Sales
Cisco Product Manager

**HMS Industrial Networks AB** Global Key Account Manager

**Inala Technologies (Pty) Ltd.** CEO

**Inala Technologies (Pty) Ltd.** Group Executive - Telecoms
**Industrial Data Xchange (IDX)** Managing Member
**Infozech** Business Manager - Africa
**Infozech** Head Africa
**Infozech** COO
**Invendis** COO
**Invendis** CEO
**nexsysone** CTO
**nexsysone** CFO
**nexsysone** CEO

**Qowisio** Sales Director
**Qowisio** Sales Director Africa
**Tarantula** Sales Director Europe

**Telemisis** Commercial Director

**ZNV** Managing Director

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**OEMs**

**Huawei** ESAR Energy & Infrastructure Solution Manager
**Huawei** Director, Network Energy, Telecom Energy marketing support department
**Huawei** Director, Energy & Infrastructure Solution Sales
**ZTE** Director of power and energy

**Static Asset Manufacturers**

**Ganges Internationale (P) Ltd.** GM - Exports
**LeBLANC Communications** Engineering Manager
**LeBLANC Communications** Director, International Sales
**Metalogalva** International Commercial Manager
**Metalogalva** Business Unit Manager - Telecom
**Orion Slobozia** Commercial Manager
**Sabre Industries** Director of International Sales
**Seccional Brazil** Director
**TowerTech Africa** CCO
**TowerTech Africa** COO

**Others**

**EXFO** Director of Technical Sales Support and BDM for Fronthaul/FTTA
**O3b Networks** Market Intelligence Officer
**SIGFOX** Director, Networks & Operators
**Unison Site Management** CEO
Towerco CXO keynote panel report

Leaders from Helios Towers Africa, American Tower, Eaton Towers and Towershare keynoted the TowerXchange Meetup Africa

Aby moderated by Enda Hardiman of Hardiman Telecommunications, Chuck Green, Executive Chairman of Helios Towers Africa, was joined by Hal Hess, President of American Tower's international business, Terry Rhodes, Acting CEO of Eaton Towers, and Nawar Atassi, a Director a MENASA-focused Towershare. Respecting the Chatham House Rule and not quoting the source of lessons learned, here is a summary of key topics discussed.

**Read this article to learn:**
- What Africa’s towercos have bought, what deal structure each MNO prefers, and what’s left to buy
- A focus on opportunities in North and South Africa
- 2016’s focus on integration and operational excellence
- Drivers of organic growth; comparing BTS volumes in 2014, 2015 and 2016
- African towercos’ timeline to the next major capital event

Are we approaching the limit of the effective economic model for towercos in Africa – do we agree with TowerXchange’s projection that towercos could own almost 70,000 towers across SSA and a further 17,500 in MENA?

The towerco CXOs agreed that the five year land grab had been focused on the most obvious countries, where the environment best fit the towerco business model and investment thesis. “A lot has been taken off the table that is of primary interest to us,” said one towerco, “we’ve all had the luxury of making our beds strategically, helped by Airtel.”

There are still six Airtel African tower portfolios yet to be acquired by towercos: DRC, Tanzania, Gabon, Madagascar, Malawi and Chad. Madagascar might be difficult for anyone but TowerCo of Madagascar to acquire, but the others are all investible to varying degrees.

“We’re happy with what we’ve got, and we’re focusing on integrating what we’ve bought and driving toward operational excellence,” said another towerco – highlighting the main theme for Africa’s Big Four towercos in 2016.

Africa’s towercos expect some remedial expenditure – a process they will all go through in 2016 as they digest newly acquired towers. When an MNO puts towers up for sale it tends to defer non-critical maintenance and upgrades, so there is a level of improvement capex necessary to get some sites up to the required standard to make co-location partners happy.
Most MEA markets currently untouched by towercos are untouched for good reason: the market might be so small that multiple operators are difficult to sustain, other markets are relatively unliberalised so there might be a single MNO, or an MNO so dominant that the towerco model doesn’t make sense. But there are still small but growing markets which may become more viable.

“We’ve built organically a portfolio of less than 200 towers which has been very profitable,” said one towerco. “That’s made us re-evaluate the minimum scale essential to operate – we’d look at opportunities with less than 500 towers. So the African tower market is a long way from being saturated.”

When it comes to inorganic growth “I don’t look at 52 countries,” said one towerco, “I look country by country, counterparty by counterparty. I tend to prefer opportunities where we’d be the first or the only towerco in a market. As all Africa’s ‘Big Four’ towerco have multi-country footprints, each also reviews new opportunities with the allocation of resources in mind.

How does the tower industry get from just under 50,000 towers today to 87,500? There are portfolios coming to market in KSA and Kuwait, Algeria could come to market. “I don’t think land grab is over, but the pace has slowed,” said one towerco, continuing: “you can’t get to 87,500 without South Africa.”

If an investible portfolio of towers did come to market in South Africa, there would be no shortage of interested parties. IHS would be favorites, able to leverage their relationship with MTN, and motivated by interest in securing some lower risk “ballast” to offset their West Africa-centric portfolio. American Tower have a good view into the South African market having been on the ground since their acquisition of Cell C’s towers in 2010. Also on the ground in South Africa are Eaton Towers, who have built to suit a portfolio of almost 300 towers with a tenancy ratio above two. Also building to suit but interested to buy are Atlas Towers, while SBA Communications could be a dark horse in any South African tower process.

Throughout the 2015 TowerXchange Meetup, the potential for MTN, Telkom or Vodacom’s towers to come to market was a hot topic of discussion. While all three South African MNOs’ tower strategists were represented at the Meetup, all were understandably tight lipped about their future strategies. What we do know is that the Telkom tower sale process was discontinued, and that Vodacom runs their ~11,000 South African tower portfolio very much like an in-house towerco, leasing towers to third party tenants at commercial rates – they lack any strong incentive to divest. News of MTN’s US$3.9bn fine from the NCC emerged after the Meetup: it remains to be seen whether that will provide the financial impetus for the market leader to divest their South African towers.

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Will the towerco club open up – are there opportunities for tier two and tier three MNOs to monetise their towers?

There’s clearly appetite from tier two MNOs to monetise their towers. And when towercos are seeking to expand in their existing markets, supplementary sale and leasebacks are always near the top of their capital deployment priorities. But it’s more difficult to do a market entry with a small portfolio – it takes longer to build to scale and it may not be viable at all to do a market entry with the third of three MNOs, for example. Many towercos are more inclined to start with an organic build to suit business than to start with an acquisition of less than 200 towers in a new country.

The towerco club is clearly open to new entrant MNOs; the likes of Africell and Viettel have often become the second or third tenant on shared towers to accelerate their rollouts in what would otherwise be difficult competitive situations.

Deal structure

The African MNOs have used a variety of different deal structures to monetise their towers from standard sale and leasebacks (SLBs), to manage with license to lease (MLL) deals where the operator retains ownership, to a mix where the MNO retains an equity stake in the towerco.

The first joint venture towercos in Africa were purely opportunistic on the operator’s part – seeking
Rwanda, Zambia, Cameroon and Côte d’Ivoire, they’ve taken a direct stake in IHS, and they’re thinking what to do in South Africa. Vodafone has no corporate policy on tower deal structure, and considers opportunities country by country – although they generally seem to have less appetite for towerco partnerships. Orange has done MLL deals mostly but recently sold a third of their towers in Egypt. Millicom recently restructured their stakes in Helios Towers Africa’s local opcos for a stake in the parent company. Etisalat have preferred straight SLBs to date, while Airtel commenced their African tower monetisation with an initial thought to retain 26% ownership, but to date have sold 100% equity in each country.

Newer, smaller towercos need to be flexible. For such companies, joint ventures can be easier in terms of funding capacity, while the operator maintains an interest in their continued success. MNOs can be cautious about divesting 100% of the equity in their passive infrastructure to a new entity. Credibility that comes from experience on the ground in emerging markets, and brand recognition is important for towercos. Towercos have got to get to a point where the MNOs have confidence to turn over their network to a third party.

Ultimately it’s not really in the towerco gift to decide deal structure – the MNO defines what they want and each towerco must decide if the opportunity and the deal structure meets their investment thesis. As the valuation metrics are better understood now, there are less barriers to getting deals done.
Valuation

We've seen significant spreads of valuation in African tower transactions, from US$65,575 per tower (Eaton and MobiNil in Egypt) to US$231,915 per tower (American Tower and Airtel Nigeria), but this only emphasises how well the metrics are understood. If an operator wants to maximise opex savings, they can leverage an anchor tenant lease rate below the current market rate. Others prefer a reasonable lease rate to release some cash, while we have seen some high lease rates agreed to maximise capital released for rollout. The attractiveness of the market and the quality of the assets also affects valuation, among a myriad of other factors.

MNOs in MENA are learning from markets like SSA, Indonesia and Myanmar and trying to find the model that suits them. Because MENA is a virgin landscape, decision makers in Algeria, Saudi Arabia and Kuwait are looking at the experiences in other geographies where some of their regional operators have already gotten a taste – Etisalat in Nigeria, Vimpelcom in Italy and from ongoing processes in Russia. They and their advisors generally have a preference for certain deal structures which dictate the process. Like many processes, they’re coming back with a range of lease rates and trying to determine what balance of opex reduction versus capital released best meets their needs.

Investor appetite

The pool of capital with appetite for this sector is deepening. Near the start of the decade, the investor roadshows took in a lot less stops when towercos were raising capital. The reality is that while the opportunity will drive investment in, operational experience (and in emerging markets that’s all about managing energy) often dictates success. Would-be new entrants continue to participate in processes, but investors are realising it’s more complex than meets the eye – they value operational credibility – and increasingly the view is that late entrants may be short term players destined to either partner up or sell out.

An increasing proportion of tier one investors in telecoms have invested in towers outside the US: Providence in Brazil and Indonesia for example, are emerging market tower deals too small for most tier one investors? As the established towercos grow we may see more activity at this layer of the investment ecosystem. As usual much depends on longevity.

“We’ve talked to all the tier one telecom investors, and it is tough to find something large enough to move their needles, but they’re getting more interested as we reach scale. Some realise they missed the boat in the last 24 months,” said one towerco. “I don’t see many big transactions left. It’s difficult for the big private equity players to take part in SSA now. It costs US$75-100mn to buy in to a toe-hold in African towers these days, we’re not going to see many deals for US$500mn+ outside of South Africa, or maybe consolidated transactions in MENA.”

Organic growth

Where do Africa’s towercos see the growth coming form? 2G rollout and QoS improvements, or 3G and 4G overlays?

All of the above! Smile are in a number of countries now and recently closed US$350mn of funding – there’s clearly a belief that these guys can carve out a niche. Single spectrum new entrants seldom build their own towers; towercos have the sites they need in their initial urban target markets and co-location gets them to market quicker while providing towercos with significant organic growth.

On the other hand, towercos have generally been a little disappointed by network growth of their main anchor tenants over 2015. Some are distracted by consolidation, which creates uncertainty, which in turn delays network rollout. However, this has created pent up demand, so the towercos remain confident of BTS opportunities in Africa.

“We’ve learned over last five years that it’s a lumpy business – MNOs go through stages of build, co-location, a rush to capacity, and other times when investment slows,” said one towerco. “But there is pent up demand inherent in the fundamental growth dynamic. SSA still has the best dynamics for the towercos in the world – if it’s not a straight line, over multiple years it still represents steady organic growth.”

“We saw huge growth off fairly modest expectations in 2014, the reverse was true in 2015,” said another towerco. “The investments by new entrants like Viettel in Tanzania, Cameroon and Mozambique represents a huge growth opportunity not only
because of their scale, but because they’re increasingly co-locating in urban areas and only building their own sites in rural areas. Plus new entrants like Viettel and Africell motivate incumbents to step up their own rollout to stay ahead.”

African towercos are still seeing cell site densification as the primary driver for co-location, but there is increasing demand for infill new build. “Demand for BTS is twice as high as it was five years ago in many regions,” said one towerco. Africa’s projected subscriber growth means a need for double the number of points of service, accommodated by a combination of BTS and co-location, but it can’t all be co-location. Connecting the unconnected will continue to drive new site builds.

To what extent is new spectrum driving densification?

As networks grow with given spectrum, cell sites have to shrink, which in turn drives the need to add more base stations and more towers. But new spectrum is not necessary to drive densification in SSA: when you look at the number of subscribers per tower (generally 4-8x the number in the US), even for 2G voice let alone 3G and 4G there is huge demand for capacity and coverage. Multi-SIMing masks the true level of penetration in SSA, and as mobile telephony becomes more prevalent, there will be a need for huge capacity improvement and for more points of service. QoS is becoming a major differentiator in Africa’s major cities where call drops are a continuing issue. This in turn is driving small but profitable pockets of IBS opportunities in SSA – small cells are beginning to make sense for urban infill capacity.

“I don’t think the existing infrastructure and the infrastructure on the horizon comes close to addressing demand for coverage and capacity – which itself is not static,” said one towerco. “Africa needs more base stations and infrastructure – we’re accelerating but still not keeping up with demand. Whether the end game is 1,000-2,000 subscribers per tower or not, there’s a lot to be built in Africa.” And towercos have positioned themselves to do the lion’s share of that building in Africa’s fastest growing mobile markets.

Are forex challenges putting pressure on lease rates?

Forex impacts country by country results. But African towercos’ long term MLAs have calculable and sometimes fixed escalation rates, reflecting currency risk. On new leases and new builds outside existing MLAs stakeholders can try to redress some currency depreciation, but ultimately the market price is what it is. Towercos have limited if any flexibility to make price adjustments – so they have to eat the FX exposure, and their customers have to absorb the escalators. This serves to further amplify the appeal of partially dollarised contracts or dollar-linked currencies.

What could be the negative impact of active infrastructure sharing? MNO consolidation? And declining ARPs?

Towercos face these questions in every transaction everywhere in the world. Active infrastructure sharing will eventually be a factor everywhere in the world. In order for valuations to make sense, towercos have to preconfigure their MLAs to deal with the potential threat of active infrastructure sharing and the associated pressure on pricing.
in a way that’s mutually acceptable with both counterparties. The reality is that SSA’s network infrastructure is still inadequate to meet demand, and the towercos will take time to catch up, so active infrastructure sharing is a stop gap solution. But shared antenna are only going to run out of capacity faster – the continent still needs tenancies and towers!

With regard to MNO consolidation, most SSA markets have room for three even four MNOs because of the underlying fundamental growth. Continuing consolidation is to be expected, as with Bharti and Orange at the moment, but new entrants will more than compensate for that in most markets. Consolidation is typically anticipated and provisions made in contractual negotiations. “We’ve been through this in Uganda,” said one towerco, “and been surprised how little overlap and decommissioning resulted. This is partly because all countries in SSA are still seeing tremendous subscriber and usage growth – it doesn’t really matter whoever has the subscribers, they still need service.”

“Declining ARPU is a driver of demand for what we do,” said another towerco. “When network expansion and demand for growth in points of service are combined with reducing ARPU it drives further outsourcing by MNOs, even those who had hitherto been reluctant.”

Future liquidity events

Since inception, Africa’s private equity-backed towercos have prepared their businesses for some type of liquidity event – acquisitions, processes and data management have been undertaken with that goal in mind. One towerco explained that they commissioned bi-annual IPO awareness audits by a major accountancy firm to ensure systems and processes were ready if and when the time was right to IPO. But that time is not now: “we’ve got some assets we need to sweat more,” said one towerco. “We’ve grabbed the land to achieve the scale necessary for a strategic sale or IPO – it’s now about leasing up the towers and driving down the opex through smart efficiency investments.”

“We’ve completed four rounds, raising US$1bn spread across eight African countries,” said another towerco. “Our priority in 2016 is to get our arms around those newly acquired businesses and make them operationally efficient. We have no pressure from shareholders to find liquidity. It will be 2017 or beyond before we’re at a state and scale to consider our next major liquidity event.”

“We’re on the same sort of timeline for similar reasons,” said the first towerco. “We are in the midst of what I think make be our final round of private equity, and we may utilise the high yield market in early 2016. We anticipate a series of liquidity events in 2017-18 involving us and IHS.”

The success of the Cellnex IPO has got bankers knocking on the doors of Africa’s towercos, but 2016 will be a year of co-location sales, integration and efficiency – plus a few last acquisitions.
Tanzania, DRC, Egypt, Ghana, Nigeria, Uganda, Rwanda and Zambia
plus energy roundtable reports
Lessons learned at the TowerXchange Meetup Africa 2015

TowerXchange Meetups are renowned for our small group roundtable breakouts. Attended by towercos, MNOs, investors, leading managed services subcontractors and suppliers, each roundtable assembles a cross section of the local tower ecosystem in each market, including many of the most influential telecom infrastructure decision makers. As those roundtables are held under the ‘Chatham House Rule’, protecting the confidentiality of contributors, we can share here some of the main lessons learned.


Read this article to learn:
- Experiences from the frontlines of operating towers in Tanzania, DRC, Egypt, Ghana, Nigeria, Uganda, Rwanda and Zambia
- Baseline data on selected markets: who owns the towers, tenancies ratios where known, as well as mobile market stats
- The impact of currency devaluations, operational and financial measures to mitigate risk
- Energy efficiency business models, priorities and investments
- Experiences and ideas for combating fuel and equipment theft

Country roundtable: Tanzania

As Helios Towers Africa’s most important market in terms of size and investment, TowerXchange Meetup Africa’s Tanzania focus roundtable was hosted by HTA Executive Chairman, Chuck Green. Historically having had a focus on integration of acquisitions and organic growth, with huge build to suit demand from both Tigo and Vodacom, 2015 saw a change in strategy for HTA with a shift towards operational excellence. With a new Group CEO (Kash Pandya) at the helm, bringing creative and innovative thinking to the business, HTA presented their plans to adopt a hands on approach, from the maintenance contractors on the ground, all the way up to the board room.

With this operational focus put to the forefront, discussions honed in on the main challenges to achieving SLAs in the Tanzanian market, with power troubles being identified as the number one challenge. Participants agreed that there needed to be a better way to optimise power provision, with power accounting for half of tower opex in the country and power failure being at the root of over half the cases of SLAs not being met. Participants discussed the importance of getting back to basics on power and with HTA’s new CEO hailing from Aggreko, the company has firmly demonstrated its intention to tackle the issue.

Diesel theft was unanimously cited as a significant challenge, with organised crime rather than pure opportunists underlying much of the activity. Increasingly creative strategies from criminals
- from watering down diesel with paraffin to tampering with gauges - requires companies to adapt and respond to meet these challenges. The biggest source of theft most parties agreed was administrative, requiring a much closer focus on being able to track what is actually being delivered rather than what is being stolen post delivery. Battery theft is also an increasing problem.

When it comes to tackling crime, some interesting strategies were presented by participants with extensive experience of living and working in the market. Community engagement was seen as a critical way to help alleviate problems, providing power to the local community, delivering lighting and offering a charging point as mobile phone usage instils a sense of ownership in the community. One participant discussed making the community the owner of the diesel genset so that they look after it well. Engaging with the chief within a given village was seen as key strategy as the community respect him - a security guard appointed by the chief is likely to be more honourable than one that has been selected through other means.

With regards to other challenges in the market, participants cited tough labour laws as something that people entering the market easily underestimate. Within Tanzania, there is very much a culture of employees taking employers to court - and the employees generally win. A tough hand that may help reap results in other African countries does not work well in the Tanzanian market. In order to be successful there you need professional man managers in your team, and those of Tanzanian descent will understand the culture better than others. There was a comment from a couple of participants that one of the risks people encounter in Tanzania is a false sense of security, whilst it is generally seen as a non threatening society, that does not necessarily translate into it being easy to do business there.

Discussions naturally led to the importance of recruiting and retaining reliable staff. The personality and values of the person that you employ is often more valuable than their qualifications. It is also important to maintain a continuous training programme. As employees or contractors progress and become more senior in their roles, they may often forget some of the essentials they learnt along the way and so retraining is important.

Beyond the social challenges tower operators face, it was commented that maintenance costs for a tower in Tanzania were extremely high - typically US$7,000 per year, ten times the costs in the US. A large part of this can be attributed to generators, with participants discussing how to minimise downtime and prolong the usable lifetime of the assets. The causes of generator failure can be diverse, and there is a real need to dig down into the root
causes - simple things such as a lack of water or coolant. Putting in place timelines for preventative maintenance and sticking to them is key.

Taking a step away from the day to day management of towers, the biggest topic on the table was the entrance of new MNO, Viettel into the market. In the 6-12 months leading up to the Meetup, dramatic changes had been seen in the Tanzanian market as a result of their entrance and participants were keen to see how this would evolve as we moved into 2016.

It was confirmed that Viettel have big expansion plans with 1,500 orders to process. Some participants commented that as a company, Viettel have an unorthodox way of rolling out their sites and as a result have done a lot of work on their own. Some participants raised concerns surrounding health and safety and poor training. As to whether this represented a concern to other tower owners in the market, it was commented that if Viettel were to try and put a tower near an existing site it would be blocked by the regulator.

**Country roundtable: Egypt**

Our Egypt roundtable, hosted by Eaton Towers, kicked off with an enthusiastic explanation of why the country represents such an exciting market at present. There is a big population, fast growing data usage, a presence of tier one MNOs (Vodacom, Etisalat and MobiNil) and a fourth operator coming to the market as well as a focus on 4G rollout and rapid urbanisation - as a country it ticks a lot of boxes for towercos. When it came to setting the stage for discussions, it was highlighted that there are currently 20,000 towers in the market of which all but 40 (which were built by HOI MEA) have been built by MNOs.

With both Eaton Towers and HOI MEA at the table, plenty of practical experience was offered with regards to operating in the country and whilst participants generally agreed that there is scope for more tower companies to enter the market, it was highlighted that there were big challenges in doing so.

In spite of the concerns of some participants who were not yet familiar with Egypt, those already active in the market mentioned that when it comes to security there are no major issues. Contrary to discussions being held on other African markets, theft and vandalism do not constitute major problem areas. The only area where towercos and their suppliers experienced heightened security concerns was Sinai. Where concerns do sit however, relate to the political instability of the country which can make operating there tough. Participants questioned international investors at the table as to their outlook for the Egyptian market and the sentiment was that Egypt was too big and too important a country to go the way of countries such as Syria and Yemen and so they had more confidence in the market. Youth unemployment needs to be addressed as a priority to improve the economy, and those around the table agreed that the recently discovered offshore gas reserves could also have a marked positive impact.

In order to be successful several participants agreed that it was of paramount importance to have Egyptian management and knowledge, whilst international experience carries a lot of merit, often where the real agreements happen are in a much less structured setting, and mainly in Arabic. Military permissions, and therefore military contacts or ex-military staff, were reportedly required to facilitate the acquisition of many sites in Egypt.

One of the biggest challenges cited in the Egyptian market was obtaining finance. With currency control, dollars are extremely hard to come by and sometimes must be purchased on the black market - when operating in Egypt you want to be buying in Egyptian Pounds. There were comments that many issues in finance stem from the local banks, they often make a lot of false promises, first inferring they have a lot of money and then further down the line saying they can’t get dollars.

Following discussions on finance, a large part of the remaining discussions focussed on the other big challenge that towercos face in Egypt - power. Grid interconnection processes are extremely slow, with it taking far too long to get the license to secure power from the authorities and as a result, many sites in Egypt are off-grid. The mentality of the authorities seems to be that the electricity grid is for the use of citizens and not to be prioritised for businesses.

Most sites in the country are reliant on diesel generators, with one towerco at the table mentioning
managing and marketing rooftops would be a difficult business model in Egypt, the biggest problems being finding the permit and securing an electricity connection - finding the responsible parties that you need to deal with can be extremely challenging

that due to the high load on the majority of their sites, some needed as many as three generators. This led to questions as to whether towercos in the market have tried renewable sources of power generation, primarily solar PV. A key factor which has potentially the stymied the switch to alternative sources of power is the low cost of diesel in the Egyptian market. The price is a lot lower than elsewhere in Africa, currently around a fifth of that in other markets. There are plans however to normalise the cost of diesel with a programme being introduced to reduce the government subsidies on the fuel.

With regards to solar, towercos at the table had some experience. Some sites they had recently acquired had solar on them and they had also trialled solar-hybrid solutions in the delta region. Speaking about these trials, which have been running for three years, the towerco reported good feedback with savings of power opex savings of 76% being reported. There are however lots of issues which still need to be tackled in order to optimise performance, such as monitoring or dealing with the high dust levels in the region. It was noted that the Egyptian government were very supportive when it came to granting land to develop solar projects.

When it came to power, participants enquired as to the potential impact of ENI’s discovery of offshore gas reserves. With production expected to commence within five years, the discovery has the potential to change the geo-political situation in Egypt and beyond, and may lead to the creation of substantial new infrastructure, including telecom towers.

Other mega-projects which could stimulate demand for new towers in Egypt include the enlargement of the Suez Canal and the building of a new capital East of Cairo.

Before rounding up discussions, questions led to the rooftop market and what opportunities were presented there. Thinking amongst participants was that managing and marketing rooftops would be a difficult business model in Egypt, the biggest problems being finding the permit and securing an electricity connection - finding the responsible parties that you need to deal with can be extremely challenging and often more effort than its worth. It is notable that Eaton’s acquisition of 2,000 towers from MobiNil did not include assets in the rooftop-dominated Cairo market.

In terms of a build to suit market, HOI-MEA is the only company that entered the market with this business model. It is a difficult market, with the process to start approaching customers being long and obtaining two tenants for new sites being challenging due to MNO’s differing strategic interests in different cities. When it comes to tower acquisitions in the market, it was referenced that towercos have had the opportunity to pick specific regions that they were keen to acquire, delivering some flexibility on that front.

A subsequent round table focused on building towers in Egypt, and was hosted by HOI MEA (“House of Inventions”), which has offices in KSA, UAE, Morocco, Sudan, Qatar and Egypt. At the time of the 3rd TowerXchange Meetup Africa (October 2015), HOI MEA had 40 sites in Egypt and they were
planning to drive toward 300+ in the next three years, mostly through organic growth. Insights from HOI MEA’s round table have been integrated into the above notes.

**Country roundtable: DRC**

As the only towerco in the market, Helios Towers Africa played host to our DRC focus roundtable. Whilst referenced as the toughest market in which they operate, and with the company’s SLA values being slightly lower than in other regions due to the inherent complexities, the company has outperformed their acquisition economics in the DRC from day one. The key to this, they felt was putting in strong processes from the off. In spite of the challenges of working there, they view the country as a huge market with the potential for significant growth. Being the only towerco present in the DRC and owning just under 25% of the country’s ~4,250 towers, Helios Towers Africa were hopeful that the Airtel DRC tower deal would come back to the table with their portfolio of assets having the strongest national coverage. Asked as to whether they thought another towerco would enter the market, HTA thought it unlikely as it is a very challenging market where local relationships are more important than ever (Editor: TowerXchange subsequently learned that negotiations to acquire Airtel’s DRC towers have resumed, with Helios Towers Africa and Eaton Towers interested).

When discussing the political situation in the DRC participants with experience of living and working in the country felt it was pretty stable. The upcoming elections in December 2016 would likely have some impact on the market however, with generally everything in the country shutting down around election time.

Rural coverage dominated a large part of discussions with participants commenting that operators were generally reluctant to go into rural areas, although there was a push from regulators to force the issue. The challenge for a towerco in servicing the rural market is that the likelihood is that you would only have one tenant on your tower. With the towerco business model being built on adding a second tenant, discussions centred on how companies were looking at technical solutions and business models that could make rural coverage a viable strategy for a towerco. It was suggested that a low power option, that can provide up time for a few hours a day, would make the single tenant business model work. Whilst coverage would be limited, giving six hours of connectivity where there used to be none is a significant step forward. Currently operators are mostly building their own rural sites due to the lack of a towerco solution. Revenue sharing business models where an operator and rural towerco work together in a rural area have been proposed – although to date the most progress is Infratel’s project to build some 800 rural sites for Vodacom in DRC, albeit under a conventional supplier model.

In order to drive the market further one participant called upon DRC regulators to look at the example set by India in stimulating the rollout of rural networks. In India, if operators were not covering
The DRC is a huge country with very limited transport infrastructure, which makes the movement of materials and services extremely difficult. Power accounts for half of operating costs at sites and also failure accounts for half of site down time. Fuel theft is a big problem. Furthermore outside of Kinshasa, fuel costs can be 2.5 times that in the capital (thus necessitating different pricing structures for these regions). With such significant power challenges, one participant questioned whether towercos should seek an ESCO model in order to remove some of the risk. Whilst this wasn’t ruled out as an option, others commented that the penalty for SLA failure would need to be passed along to the ESCO and in such an instance the ESCO would need to have a big enough balance sheet to take be exposed to such risks (which many don’t).

Another solution posed was the use of alternative energy in order to reduce diesel usage. HTA commented that they have had a positive experience in Tanzania working with solar and would be open to the opportunity, whilst HTN Towers have a major solar programme currently going on in Nigeria. The conditions in the DRC are such that there is little dirt or dust on roads which would interfere with the performance of a PV system and so the country could be an ideal candidate for solar rollout. With the government facing such power issues it was suggested that Helios Towers Africa (or a third party) could look to built a central site, in the magnitude of 20MW, whereby excess power was fed into the grid. With it being proposed that Helios Towers Africa were arguably the DRC’s biggest power consumer they should have some sway with the government in promoting such initiatives.

**Evaluating the best power options for sites across Africa**

This was one of the most popular roundtables at the TowerXchange Meetup Africa 2015. It was moderated by Samuel Tanon of Millicom, whose remit includes both tower strategy and opex improvements.

Samuel introduced himself and Millicom. He emphasised the fact that Millicom has outsourced their towers in most countries, thus transferring responsibility for power to their towerco partner – in many cases Helios Towers Africa, whose then COO Kevin Koch also participated in the roundtable. Samuel hinted that Millicom might be interested in outsourcing to an ESCO in Chad, where they retain ownership of their towers.

Mobiles operators are ready to pay a premium to maintain 99.99% uptime at certain sites. On the
other hand, at smaller sites (e.g. below 500W), they can sometimes accept uptime lower uptime of 99.95%.

The average capacity for existing sites was reportedly 1.5-2KW. For new sites, the capacity is typically much lower.

The importance of “community power” in rural areas was emphasised, where more and more sites consume less than 500W, and where perhaps one or two operators might share the same BTS.

On the question as to whether energy consumption at cell sites was generally increasing or decreasing, response was not very clear. On one hand, consumption was decreasing as technology evolved, but this was offset by the increase in traffic meaning more capacity was needed and thus more consumption. Millicom gave the example of Ghana where they have replaced their old sites (6-8KW) with new sites with less than 2KW.

Most equipment was running in DC rather than AC. In future batteries would be preferred which run in higher temperatures therefore with less requirement for cooling.

Towercos continue to report encountering challenges with energy storage and battery logistics, although report significant ‘quick wins’ could be achieved by investing in deep-cycle batteries. Battery theft was almost as big a concern as fuel theft, although solar panel theft was less of a concern. Measures taken to prevent battery theft included trying to make them look less like batteries, and burying them under concrete, an approach widely used in the US. Administrative theft remains the number one source of leakage, with guards sometimes making use of DGs for their own needs.

A few market snapshots gleaned from the roundtable. Grid power in Chad was reportedly at 180V rather than 220V with a significant proportion of towers off grid. Reducing genset noise is reportedly a priority. Millicom intended to upgrade their power equipment before outsourcing to an ESCO. Meanwhile, in Tanzania Millicom were undertaking a project to connect 200-250 off-grid villages.

In Rwanda and Senegal electricity grid power was reportedly improving, although prices had increased, with more and more solar panels seen on roofs. Nonetheless, solar power was not considered competitively priced compared to grid in those markets. While grid conditions were improving in many SSA countries, the situation had worsened in Ghana, compounded by currency devaluation and fuel shortages.

In conclusion, the roundtable agreed that towercos and aspiring ESCOs would have to adapt energy solutions to meet the unique requirements of each site.

Country roundtable: Rwanda and Zambia

Enda Hardiman of Hardiman Telecommunications moderated the session. Enda had been working for the Zambian Advisory Council and had done some consultancy projects in Rwanda and Zambia, in particular with Millicom.

The Rwandan and Zambian tower markets are both dominated by IHS, which owns around 2,700 towers across the two countries, including 1,100 acquired from Airtel in late 2015 plus 1,269 acquired from MTN in 2014 and topped up with BTS. There are around 2,000 towers in Zambia, giving IHS 85% market share, and 1,300 in Rwanda, of which IHS has around 77%. IHS remain bullish about achieving a tenancy ratio of two in Rwanda and Zambia within five years, driven by data growth and technology upgrades. Naturally IHS’s tenancy ratio dropped with the integration of the Airtel towers, which had historically not been widely shared with competitive MNOs beyond a few bi-lateral swaps. However, MTN’s enthusiasm to co-locate on Airtel towers, particularly in Zambia, should see tenancy ratios recover quickly.

According to GSMA intelligence, in Q4 2015 there were 8.8mn connections in Rwanda among a population of 11.7mn, representing 75% SIM penetration, with 35% mobile broadband. The same source suggests that in Zambia there were 11.9mn connections among a population of 16.5mn, representing 72% SIM penetration, with 16% mobile broadband.

Rwanda is a great place to do business. With GDP growth over 8%, it’s a well managed country with a stable government. The Rwandan regulator
mandates tower sharing, helping the development of towercos in the country.

MTN are market leaders in Rwanda, with Tigo and Airtel completing a roster of credit-worthy tower tenants, whereas Airtel are the market leaders in Zambia, followed by MTN and capital-constrained Zamtel. There are rumors of a prospective fourth MNO or MVNO entrant. ARPU’s are low in Zambia; in the US$2-3 range.

Towerco lease rates in both markets are inclusive of power. Grid power is more extensive and reliable than other SSA markets in Zambia and Rwanda, where battery banks are often the sole backup power needed. Power availability is improving but remains a challenge, and diesel theft remains a big issue.

Dion Djerling introduced the activities of Connect Africa in Zambia: a series of Wi-Fi hotspots installed in rural areas across Zambia. Base stations costs less than $10,000 and are partly funded by advertising. Connect Africa has over 200 sites deployed successfully with three operators. Connect Africa’s experiences illustrate how smaller cells present both threat for MNOs and opportunity for towercos.

Creating a sustainable energy mix for Africa

Another popular roundtable, with the conversation ably structured by Laurent Roineau, Group CTO of managed service provider Camusat. Laurent previously served as CEO of TowerCo of Madagascar.

The discussion started with an identification of towercos’ energy needs in Africa, including energy generation, energy storage and the measurement of key performance indicators through RMS.

For rural areas, low cost sites with integrated power solutions, or minigrid solutions were proposed. While Africa’s ‘Big Four’ towercos remain focused on sites with a more obvious path to a second tenant, a class of turnkey rural towerco is slowly emerging, represented at the Meetup by Africa Mobile Networks (AMN), Connect Africa and Infratel. MNOs also continue to be key stakeholders in rural connectivity, for example Tigo plans 100 low cost rural sites this year, 160 next year.

Business models and pricing was another hot topic, with regulation restricting options in some countries. While there was no clear consensus around the preferred model to deliver energy as a service, fixed monthly fees of charging per kWh, the prevailing preference among towercos at the TowerXchange Meetup Africa was still to drive energy efficiency through their own capital investments, capturing the value on their own balance sheets.
Deep cycle batteries continue to offer a ‘quick win’. The vast majority of battery banks at African cell sites still use lead-acid rather than lithium-ion or fuel cells. Battery recycling is seen as cost-neutral – the residual value of the equipment covering the cost of recycling, with the added complication that lithium-ion batteries would have to be exported to be recycled. Battery theft remains a critical concern, particularly in markets like Uganda where organised criminals extract the lead from batteries to resell on the black market. The business case for fuel cells is still felt to make more sense for datacenters than at individual cell sites.

Diesel gensets still represent a significant majority of distributed and backup generation solutions in SSA, with solar still perceived as being relatively risky and costly. Wind turbines remain a rare sight at SSA cell sites.

**Country focus: Senegal**

Abdalla Saeed, CEO of Expresso Senegal moderated the roundtable, joined by Expresso’s Group CEO Tarig Rahamtalla. The discussion focused on creating a market for Expresso’s towers in Senegal, and perhaps beyond.

Senegal is an attractive investment with low country risk: a stable political environment, steady 4.5% GDP growth and 2% inflation.

Expresso has around 2.5mn of the 14.7mn subscribers in Senegal, a country of just over 15mn people. While SIM penetration is approaching 100%, multi-SIMing means unique subscriber penetration is nearer 60%. 3G penetration reached a double figure percentage in 2015.

Orange-branded Sonatel are market leaders with around 55% of subscribers. Sonatel have been reluctant to sell their 1,800 towers (government and union opposition to any prospective sale has not helped), although Sonatel have been considering a managed services agreement.

For challenger MNOs to prosper, they need to quickly and cost effectively achieve coverage, but to date there has been little bi-lateral infrastructure sharing in Senegal, with #2 and #3 MNOs Tigo and Expresso keen to get onto Sonatel’s towers, but the market leaders reluctant to share. While partnering with a challenger MNO often doesn’t garner appetite of Africa’s large towercos, Senegal could be an interesting opportunity for a second tier towerco. For example, Expresso plans to expand from their current network of 450 to 700-800 towers. A potential partnership could also involve Millicom-Tigo, which retains their 1,000+ towers in Senegal.

Senegal could be one of the next countries in SSA to move toward a shared infrastructure business model – there are plenty of stakeholders lobbying government about the inefficiency of having three parallel mobile networks in a market where the total cost for a new macro tower is around US$200,000.

**Country roundtable: Uganda**

Terry Rhodes, Acting CEO of Eaton Towers, hosted the Uganda roundtable, supported by insightful contributions from Thomas Sonesson, CEO of ATC Uganda, as well as the leaders of several of
the country’s most important managed service providers and equipment suppliers.

Uganda has a young, fast growing, geographically dispersed population of just under 40mn, meaning there is need for broader coverage than in more urbanised emerging markets. Uganda had 28.7mn mobile connections at Q4 2015, 16% of which are mobile broadband customers, according to GSMA Intelligence.

Uganda’s local currency is under pressure (37% devaluation in one year) and the reserve position isn’t as strong as investors would like. With material costs often linked to the US dollar, and much of the revenue generated in local currency, towercos are exposed to currency risk.

In terms of new tower build, MNO consolidation initially slowed the build out, but a growth period is foreseen in the coming years. Towercos report Uganda has perhaps another 3,500 towers to build, particularly in Northern parts of the country. An annual growth rate in terms of total tower count of around 10% is anticipated with American Tower in 2011. ATC Uganda currently owns 1,388 towers. Eaton Towers entered Uganda soon after, combining 400 Orange towers with 300 Warid towers, to which they are in the process of adding Airtel’s towers, giving Eaton a count of around 1,600 Ugandan towers. TowerXchange estimate that there are just under 3,500 towers and a little over 4,000 tenancies in total in Uganda, suggesting an average tenancy ratio approaching 1.2.

There are a decent number of non-traditional MNO tenants on Uganda’s towers. There are national security tenants, weather information systems and various ISPs. Google recently started taking tenancies, as well as new entrant 4G operators. Tower Cash Flow (TCF) is a more important metric than tenancy ratios, and there is lots of revenue generating equipment on towers which isn’t reflected in tenancy ratios, such as new microwave dishes, a second RAD centre et cetera.

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Nobody is stopping Uganda’s MNOs from building their own towers, but most of the new build is being

The Ugandan MNO market has substantially restructured since the entrance of the towerco in 2011: Airtel acquired Warid, Orange sold out to Africell, and newer operators Smart and Smile started to establish themselves. While there are seven operators in Uganda, the market structure is essentially two leaders, a contender and some smaller niche players. Newest entrants Africell prefer a capex-light model, and are natural co-locators, so expect tenancy ratios to rise more swiftly in 2016. The regulator, the UCC, are not keen on further consolidation, but speculation continues surrounding the future of UTL (as ever, the politics around a struggling incumbent are complex!)
However, daily interruptions of one to three hours are common even in Kampala, so one towerco’s vision is to replace diesel with fast chargeable energy storage that can recharge 50% of the battery’s capacity in half an hour.

There has been a fair amount of hybridisation of power solutions in the Ugandan, with extra incentive since ATC Uganda moved from the power pass through business model to providing full power as a service (PaaS). Uganda’s towercos will invest in connecting towers to the grid, although they often have to pay for the transmission network extension.

What are the Ugandan towercos’ appetites to partner with ESCOs? Investors in American Tower view it as a stable, annuity play, so it might be appealing to offload risk and secure cashflow. On the other hand Eaton report having hybridised 300 sites from the original 700 they acquired in 2012 – “we’re keen to retain the benefits of that investment on our balance sheet, but once we know what we’re dealing with, we might consider partnering with an ESCO.” However, the near term view was that towercos were reluctant to partner with unproven, technology-centric ESCOs that haven’t given sufficient thought to the operational aspects of the business. “I’m seeing too much vaporware,” said one towerco. “We’ve put a lot of focus on energy efficiency ourselves,” said the other towerco, “we’re good at this.” At a smaller level than a full ESCO proposition, Uganda provides a special license for community power projects which could foster the development of new distributed generation plays – towercos would be interested in having a site or sites

Build costs are reportedly “higher than average for SSA, similar to Ghana, but not as high as Nigeria.” As a landlocked country with no domestic steel industry, getting towers and accessories into Uganda can be time consuming and expensive. The import of equipment is subject to a 5% duty just to cross the border.

One towerco reported having put a prosecutor and ex-policemen on their payroll to ensure the perpetrators of theft are jailed. Nonetheless, security troubles have not been enough to dissuade American Tower and Eaton from continuing to invest in Ugandan towers “we’ve put a lot of money into buying Airtel’s towers – we believe in this country,” said Eaton’s Terry Rhodes.

Telecoms and particularly telecoms infrastructure is relatively lightly regulated in Uganda – for example there is no regulation specifically for infrastructure or transmission companies. However, the regulator certainly seems aware of the need for coverage and capacity: Uganda has around 50% more subscribers per tower than Kenya. Permitting new sites in Uganda is reportedly easier than other SSA markets, although identifying the genuine landlord is always a challenge. A lot of the acquired towers lacked some of the necessary environmental permits – fortunately the retrospective application process has been relatively painless.

Maintenance costs are reportedly as much as double those in Ghana. Limited maintenance capabilities and capacity in Uganda forced one towerco to bring O&M for half their network in-house (“we don’t regret insourcing maintenance – it enabled us to really get to know the costs and the pain points, so now have a tender out for a five year maintenance contract, we’re in a stronger position to negotiate a new deal!”) However, the towercos report that, apart from steel, there is now an established ecosystem of local suppliers in Uganda.

There are significant logistical challenges to operating a tower network in Uganda, including operational management and delivery of fuel. While many SSA towercos struggle to combat fuel and battery theft, the difference in Uganda is that the administrative theft is compounded by the impact of organised crime, with armed robberies having a material effect on opex. This makes Uganda’s towercos keen on site hardening techniques.

What proportion of Uganda’s towers are on unreliable grids or off-grid? ATC Uganda say around 400 of their 1,388 sites are off grid, with around half the new build off grid. Eaton said “more of our towers are off grid than on”. Unreliable grid sites need backup DGs and battery banks, although “a few mobile DGs are sufficient to cover Kampala”.

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The opportunity to serve rural communities has not been fully met by any stakeholders as yet, but MNOs are generally looking for expanded coverage, somewhat driven by Mobile Financial Services.

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as anchor tenants in such an ecosystem.

**Country focus: Ghana**

Chuck Green, Executive Chairman of Helios Towers Africa (HTA), hosted the Ghana roundtable, with valuable contributions from Eaton’s Terry Rhodes. HTA completed the first sale and leaseback in Africa when they acquired 750 towers from Millicom-Tigo in Ghana for US$54mn back in 2010. Shortly afterward MTN came to a marketing services agreement with American Tower, creating joint venture ATC Ghana which currently has 2,098 towers in the country. Both Eaton and HTA were involved in the Vodafone Ghana process, which oscillated between a sale and leaseback opportunity, then a managed services deal, then back to a sale and leaseback before ultimately closing as a ‘manage with license to lease’ deal with Eaton. The Vodafone towers were a legacy of the old Ghana Telecom network, and needed substantial improvement capex to be readied for co-location. So within 12 months there were three towercos in Ghana.

While Airtel’s Africa Towers was registered in Ghana a couple of years ago, they were never really active, and the Airtel towers are in the process of being transferred to Eaton, bringing their Ghanaian tower count to around 1,400. To illustrate the economies of scale in emerging market towers, Eaton Towers Ghana reportedly needed add only three extra fulltime employees to their existing team of just under 40 to manage a network almost doubling in size. TowerXchange estimate there are around 6,000 towers in total in Ghana.

According to GSMA Intelligence, in Q4 2015 Ghana had a 27.7mn population with 121% SIM penetration, not reflective of the real level of penetration as multi-SIMing is common, and there is little stickiness. Ghana hosts a crowded MNO market with Airtel, Glo, MTN, Tigo and Vodafone all present, as well as a host of smaller operators.

There has been an injection of new blood into the MNO landscape with the licensing of 4G pioneers. Licensing rules restricted spectrum to local companies – and these are full LTE plays, not just fixed wireless. The rollouts of these new entrants have been reported as “more like ISPs” with “single poles not towers, and few with DG backups.” Towercos are inclined to view tenancies from such companies as short term incremental revenue because they know they won’t be around forever.

The history of the Ghanaian tower market had been one of stable operations, virtually unblemished SLA performance, and leaseup almost exactly as per acquisition business cases, until the Ghanaian Cedi started it’s dramatic and extended slide.
need to have dynamic processes able to get ahead of fuel shortages. At the time of the Meetup Ghana’s towercos had achieved nine consecutive weeks of positive SLA performance.

Despite the currency crash, one towerco reported still trading EBITDA positive albeit at a significantly lower margin due entirely to forex exposure. “Indexation and escalation clauses are vitally important when prices move around so much,” suggested one towerco. Ghana’s currency devaluation prompted at least one towerco to amend contractual terms that had previously provided for a once annual adjustment of power prices, bundled into lease costs – they’ve shortened the time between adjustments now. Securing at least a portion of revenues in US$ may have been another means of minimising forex exposure, but the Ghanaian government banned US$ contracts, and Ghanaian banks are not allowed to lend US$.

Another challenge in Ghana has been strict permitting and environmental policies, with tight definitions of where you can build (“you have to demonstrate you can’t co-locate on an existing tower in order to be permitted to build a new tower”). This has affected BTS volumes. However, this has the positive effect of driving up tenancy ratios because everyone has to share. One towerco reported a tenancy ratio approaching two nationwide, another said their tenancy ratio was significantly above two in urban areas, and around 1.5 in rural Ghana. Ultimately new tower build volumes in Ghana have not been what towercos were led to expect by MNOs: “I feel there are unlikely to be more than 100 new builds next year across the whole of Ghana,” said one towerco. However, the towercos have generally been very contented with the Ghanaian regulator's promotion of infrastructure sharing and their efforts to minimise the proliferation of towers.

How has the level of competition affected towerco performance in the only African market where three of Africa’s ‘Big Four’ towercos are active? “Permitting challenges and a lack of BTS has driven up lease up rates,” said one towerco. “We’re generating less dollar EBITDA solely because of currency exposure, and opex has been rising because of declining grid quality. But the factors affecting performance aren’t related competition. However, would I go in as a third towerco in another market now? No. If there’s two strong towercos in a country, then you look elsewhere.”

Towercos are trying to figure out the right model to serve rural Ghana. They may need Universal Service Fund subsidies where revenues are less secure, but they also have to have a business model that works in the long term. Shared revenue and shared risk models don’t overcome the simple fact that with the capital cost of sites at the moment there has to be the prospect of a second tenant in the near to medium term. Ultimately many felt that the rural market was better suited to specialist revenue share infrastructure operators built around low cost technical solutions (short, lightweight structures with solar+batteries power solutions, no DGs so near zero maintenance costs, and low power base stations with low power backhaul). Such solutions might make economic sense with just one tenant.

Hybridisation of cell site energy solutions is in the relatively early stages in Ghana. A common concern is the complexity of solutions from a maintenance point of view and the associated struggles to find the right skillset among O&M contractors.

Eaton initially managed security and maintenance in-house, but having built confidence in the local supplier ecosystem later decided to outsource.

Contractor performance management and performance improvement is a priority for towercos in Ghana and beyond. “The big stick approach hasn’t worked,” said one towerco executive. “We have to help our guys in the field understand the consequences of what we’re doing and of what they’re not doing. If a site goes down and there’s a medical emergency, emergency services won’t work. We’ve got to mold a culture to be more responsible.”

The reality is that field engineers and security guards are not always paid enough to counter the temptations of fuel theft. Instead of unqualified security guards being paid a low wage, one towerco advocated hiring junior electricians – maybe combining security with maintenance. Give your staff a career path, reduce theft and improve MTTR (Mean Time To Response) in the process!

Ghanaian towercos have active security on around 80% of sites, the other 20% with roving patrols, but they’re all looking at site hardening solutions to reduce opex. Theft of batteries is a big problem, with the re-use cases of 12V lead acid batteries too readily apparent. Contractors ieng shared
some experience of reinforcing cell site security with concrete bunkers. Other site modernisation approaches include building facilities for guards outside the fence to minimise risk of staff theft, while partnerships with communities provide incentives for the protection of sites. A community cell charging unit bolted onto the outside of a site’s perimeter fence – with the key to the box given to the closest house – means your nearest neighbor is going to look after the site because he’s providing an important community resource. Many sites are beyond the electricity grid, so towercos (or MNOs) can supply a refrigerator. Sickle cell and other vaccines can be kept cool in such facilities. This sends a message to the community: we’re protecting your families, if you steal from this, it’s your babies you’re going to harm.

How is procurement managed between towercos and their subcontractors? Towercos buy the large batteries (3-4,000 per year, according to one towerco!), rectifiers et cetera – the expensive stuff – but the contractors buy the consumables. One towerco was considering setting up supplier agreements with a price book, and driving their partners to use that at cost.

Country focus: Nigeria

Lawrence Onyema of SWAP Telecoms and Technology moderated the Nigeria roundtable, joined by senior representation from American Tower and several of IHS’s local contractors, including IPT PowerTech and MP Infrastructure.

Nigeria has a population of 170mn, around 60% of whom are youths. Coverage is maturing but incomplete: discussion suggested that MTN’s coverage was over 90%, Glo close to 90%, Airtel in the 80s. While more towers are needed for coverage, QoS issues also illustrate the need for capacity and infill sites: explosive data growth meant some participants felt Nigeria may need as many as 40,000 more towers beyond the current ~32,000. Voice revenue and ARPU is dropping in Nigeria, but data traffic is growing: there are around 38mn smart phones in Nigeria.

There are other tenants on Nigeria’s towers beyond Nigeria’s GSM operators. CDMA operators Visafone and Multilinks had 2,042,015 subscribers, plus 66,319 fixed-wireless subscribers. Fixed LTE operators SWIFT have over 100,000 subscribers. NATCOM acquired the NITEL license with intend to rollout LTE.

The structure of the Nigerian tower market may change now that 79% of the country’s towers are owned and operated by towercos, with three sizable towercos who could drive consolidation. While there was some speculation around the table as to whether ATC Nigeria would embark on a rollup strategy in an effort to close the market share gap on IHS, TowerXchange feel American Tower may acquire one or two of Nigeria’s four decent sized middle market towercos (SWAP, BCTek, Communication Towers Nigeria and Hotspot), but American Tower has always had the discipline to walk away from deals that don’t meet their investment thesis and valuation. There is simply not enough independently owned stock in Nigeria for ATC Nigeria to catch IHS.

HTN Towers are somewhat in limbo: they now have two large scale competitors, and four hungry smaller players, to compete with for BTS. HTN’s efforts to restructure their balance sheet have been ongoing for over a year, with their IPO cancelled citing interest from a prospective strategic investor. HTN Towers have reached an agreement with SWAP Telecoms and Technology, enabling HTN to manage and market the combined portfolio and pay commission back to SWAP. This may be a precursor to a merger.

As much as 70% of opex in Nigeria is diesel, with DGs running 24/7 on many sites. SWAP’s 702 sites consume a million litres of diesel per month on their own (that’s an average of 1,424.5L per site). IHS burned 1,900L of diesel per site per month when they acquired towers, they have brought that down to 1,200L with a technology pathway to 700L.
SWAP reportedly have around 250 of their 702 sites on-grid, but grid power is only usable at as few as 20 of those sites. One towerco stated “in Nigeria there is no such thing as a reliable grid site – and we define on grid as twenty plus hours per day of usable grid power”.

“Most sites have a grid connection but it is often not working, or the voltage may be high, low or one phase may be off,” said another towerco. “You can try to connect off grid sites to the grid, but many local authorities are too indebted to invest, and even where they can, their priorities will be residential and industrial electrification first,” he concluded.

Nigeria’s generation capacity is gradually improving with plans to grow from 4,500MW at the time of the Meetup (October 2015), to 5,000MW by the end of 2015, rising to 10,000MW by the end of 2016. While generation capacity is improving, transmission problems remain.

Diesel theft in Nigeria is systemic, well planned and choreographed, and accounts for ~30% leakage from the ecosystem. Theft isn’t restricted to fuel, with batteries and even whole diesel gensets targeted.

A growing proportion of Nigeria’s cell site energy solutions have been hybridised, with solar hybrid solutions to be deployed at many new sites. The opportunity was felt to be greatest in Northern Nigeria, where weather conditions were most suited to solar.

One vendor reported problems importing hybrid energy solutions into Nigeria, with different customs duties for PV and batteries requiring the dismantling of systems. The process of hybridisation is not just about getting equipment into the country and installed: a cultural change is required throughout the supply chain. Maintenance companies prefer sites to run on DG because they make more money that way! Roundtable participants were unanimous in their call for stable PPAs (Power Purchase Agreements) from the government, enabling the sale of excess capacity back to the grid, a critical incentive to renewable projects.

American Tower confirmed that power costs would not be a pass through for ATC Nigeria, which means Nigeria’s four largest towercos all provide power as a service (PaaS).

TowerXchange asked Nigeria’s towercos to explain the timelines for their investment in energy efficiency programmes. “For the first six months after an acquisition we will typically use the existing inventory of energy equipment, and the existing managed service providers,” said one towerco. “After 6-12 months we have enough performance data to start reviewing suppliers.” One of IHS’s contractors reported that they were already in the first 3 sites from an acquisition closed less than a year ago, with a further 180 sites to follow. While the time lag is generally manageable, managed service providers will often have to put deposits down on equipment before their new managed sites start generating revenue, creating a financing gap.

“We send out an RFP, do the usual proof of concept testing on any new innovations,” another towerco said. “We prefer an opex model where the provider

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**Mobile subscriber numbers, GSM operators, Nigeria**

![Pie chart showing mobile subscriber numbers for MTN, Globacom, Airtel, and Etisalat in Nigeria](chart.png)

- **MTN**: 62,493,732
- **Globacom**: 31,134,625
- **Airtel**: 31,306,472
- **Etisalat**: 23,492,214

Source: NCC, September 2015
owns the equipment and guarantees savings,” he concluded.

Building new sites is expensive and complex in Nigeria, with layers of bureaucracy and taxation to be navigated, and environment impact regulations dictating that new sites cannot be built closer than 10m to any existing buildings – this constitutes a major obstacle to rollout. “I have ten new site builds locked by local government and environmental legislation,” said one participant.

Landlords in Nigeria are getting smarter and greedier – one towerco cited an example of a site in a second tier city where the rent had been 3mn NGN per year, who now wants 8mn NGN. Lease rates in Abuja, Lagos and Port Harcourt are particularly high. Opinions differed about the comparative costs of rural leases “you can get sites as cheap as US$150pcm in some locations”, said one participant. “Rural landlords are getting smarter and demanding more,” said another.

Most of the land under towers in Nigeria is leased not owned. Land is typically passed on within families, and leases don’t typically exceed 15 years with five year extensions. The majority of landlords in Nigeria own the land under a single tower, there isn’t much aggregation. There hasn’t been the same level of activity from ground lease aggregators like we’ve seen in the US. Financing, scaling and packaging ground leases would be tough in Nigeria. While there may be an opportunity for towercos to acquire the land under Nigeria’s towers, the general feeling is that there are better ways to spend capital.

De-risking long term leases is a greater priority.

In contrast to towers, Nigeria’s fibre is largely retained and rolled out by the country’s MNOs. One participant estimated that MTN had around 6,000km of fibre, with Glo, Airtel and Etisalat having around 4,000km each. The MNOs have created a media gateway to media gateway backbone; the next challenge is to connect points of aggregation to terminal sites, amid huge demand for backhaul capacity. So there is an opportunity for third party infracos, including towercos, to run FTTT or to aggregation points. However, most towercos remain conservative about diversifying into fibre given the cost and lack of clarity about who will make those investments, and given the difficulty maintaining control of timelines given the difficulties securing rights of way. “Fibre adds a lot of execution risk, we’d prefer to stick to our core business,” said one towerco. IHS may be an exception: they are one of two infracos licensed by the government to rollout fibre, perhaps hinting at the beginning of a drive to share fibre.

Challenges in Nigerian fibre include a lack of redundancy, for example fibre can be unintentionally cut or uprooted during road construction – an alternative backhaul solution is needed. Rights of way remain another major inhibitor – “you have to pass through the eye of a needle to get rights of way in Lagos”.

For tower counts and further analysis of the Nigerian tower market, see “The new Nigerian tower market” and “What we learned about HTN Towers prior to their cancelled IPO”
How the new Nigerian tower market will work

Six towercos are battle for co-locations and BTS in a market that has almost completely migrated to the towerco business model

I’ve blended insights from the Nigeria round table at the TowerXchange Meetup Africa with some of the less confidential topics discussed by IHS at the recent RBC Towers Investor conference as well as some fresh TowerXchange analysis to build a picture of the structure of the Nigerian telecom tower market now that towercos own 79% of the country’s towers.


Read this article to learn:
- Who’s who: a guide to Nigeria’s towercos
- The co-location and build to suit markets in Nigeria
- Who now owns Nigeria’s towers?
- Power services, energy efficiency and Nigerian towercos’ appetite to partner with ESCOs
- Will we see much decommissioning in Nigeria?

IHS

65% of IHS’s towers are in Nigeria – the country currently dominates their portfolio, and they currently dominate Nigeria, owning 53% of the country’s towers and building the lion’s share of new sites.

Whilst IHS rolled 8,850 towers MTN Nigeria into a joint venture towerco, and acquired a further 2,691 towers from Etisalat during 2014 and 2015, IHS were already very familiar with the assets having built many of Nigeria’s new towers over the 14 years in which they’ve operated in the country.

When co-founders Issam Darwish and William Saad first came to Nigeria they were intent upon establishing what would have been the country’s first GSM operator. They turned their attention to building and managing towers, and, since its foundation in 2001, IHS has accumulated a reputation for operational and technical excellence.

The company has since expanded to a multi-country footprint with a distinctly West African flavor, and evolved from a roster of PE-backers so a combination of family fund (Wendel) and sovereign wealth fund backers, providing a substantial acquisition warchest filled with patient capital. IHS takes a conservative approach to debt, and say they are currently only levered 4x (relatively low given the longevity of towerco contracts). IHS has improved terms with debt providers significantly as the business matured, enabling IHS to compete
in auctions with the likes of American Tower with their low cost of capital.

While an IPO is a likely exit strategy for many of IHS’s investors, there is no pressure to list, which is especially pertinent now given the uncertainty in the market caused by the MTN Nigeria US$3.9bn fine.

**American Tower (ATC Nigeria)**

American Tower is in the process of integrating 4,700 towers acquired from Airtel Nigeria for US$1.09bn. The transaction marked the world’s largest independent towerco’s debut in SSA’s largest economy and largest wireless market.

American Tower has placed a sizable bet on Nigeria: according to the towerco, at the end of Q3 2015, Nigeria represented 44% of American Tower’s EMEA revenue. With the integration of Airtel Nigeria’s towers, which come with a ten year anchor tenancy, AMT’s average tenancy ratio across EMEA fell from 1.7 to 1.5, suggesting the Airtel Nigeria towers were acquired with a tenancy ratio of around 1.2.

American Tower will offer a full service power model from the get-go in Nigeria, leveraging the expertise they have built in turnkey power management as their Ugandan and Ghanaian businesses transitioned to that model.

Gordon Porter, formerly CEO at ATC Uganda and ATC Ghana, now leads the ATC Nigeria team.

**HTN+SWAP**

HTN Towers is an old growth organic build play, having built over 700 towers across Nigeria under their previous guise of Helios Towers Nigeria. The build to suit portfolio was supplemented by the addition of 491 Multi-Links towers claimed as a legacy of the restructuring of the aforementioned CDMA operator. 251 of those towers had tenants on them in Q3 2015. HTN Towers boasts an impressive “live tenancy ratio” of 2.2, a pathway to 2.7, with adjusted revenue of US$78mn and adjusted EBITDA of US$31.7mn in FY2014, rising from an EBITDA margin of 43% to 55% by H1 2015.

In what could be a precursor to a full integration, in 2015 HTN Towers reached agreement to manage and market 702 SWAP Telecoms and Technologies towers, raising the number of towers they are currently marketing to 1,905.

For a more complete profile of HTN Towers, read “What we learned about HTN Towers prior to their cancelled IPO on the LSE”.

**Nigeria’s smaller towercos**

There is a fragmented ecosystem of small towercos and private tower owners in Nigeria. The largest are BCTek, which has a 20 year contract to manage and market a portfolio of 700 towers originally built as a surveillance network, over 80% of which are police compounds. There is also Communication Towers Nigeria, which claims to have 500 cell sites across...
all 36 states. Also of note is Morenikeji Aniye’s Hotspot Network, which has built a network of over 100 towers under BTS agreements with Airtel and Etisalat.

The co-location market in Nigeria
Nigeria generally has high quality telecom towers. Initially over-specced by MNOs, then later built for co-location by towercos who have tended to deploy 45-50m structures, most towers are robust and have wind load capacity for three or four tenants. A culture of co-locating rather than building has existed for almost a decade in Nigeria, and the country’s towers have some of the highest tenancy ratios outside the Americas. Apart from the most recently constructed vintage, HTN and IHS portfolios have tenancy ratios well above two, with solid lease rates that are currently holding up against downward pressure from challenging trading conditions for tenants.

The proven healthy Tower Cash Flow (TCF) generated in Nigeria means acquisitions are expensive: the average price paid for a Nigerian tower in the 2014-15 sale and leaseback transactions was US$209k. But those acquisitions are expected to pay near term dividends. MTN, Etisalat and Airtel have pent up demand to get on each others’ sites, with the MTN network (almost twice the size of Airtel or Etisalat’s) expected to be particularly swiftly leased up. You can literally see what’s going on: if you drive around downtown Lagos, you’ll see a lot of towers, and a lot of equipment on those towers. You’ll also experience a lot of call drops – capacity is a major challenge in urban Nigeria, and QoS as a differentiator has been the battleground for Nigeria’s highest value customers.

It no longer makes sense for Nigerian MNOs to build a new tower rather than co-locate – even if they could get a permit, the time to market advantages of taking a matter of weeks to hang their equipment on an existing tower versus months to build a new site mean network planning has evolved to strongly favor co-location.

The build to suit tower market in Nigeria
Where co-location isn’t an option, the majority of new towers are being built to suit by towercos – with the exception of Globacom Nigeria’s MNOs don’t build their owns sites now. The cliché holds true in Nigeria: “each individual tower is a monopoly” meaning competitive towercos will seldom build another tower within 3-4km of an existing tower, urban infill sites for capacity notwithstanding. The structure of the market thus lends itself to the efficient deployment of capital and resources – a model less the regulators of less progressive tower markets might care to study.

Of course, it’s not just about efficiency but also about the creation of value through organic growth. To date, IHS has boasted double digit organic growth in Nigeria, and regularly builds a quadruple digit count of new sites per annum. With organic growth slowing across Africa, compounded by MTN’s US$3.9bn fine from the NCC throwing some doubt on their previously announced US$1bn capex budget in 2016, there is reason to be cautious about Nigeria’s BTS market.

Who will build each MNO’s towers? Airtel are believed to be contractually tied to ATC Nigeria for BTS – and their entry into the market will eventually create some pressure on pricing that had been hitherto quite stable. While IHS has no contracted right of first refusal on MTN and Etisalat new builds, they remain bullish that their anchor tenants will come to them first on the basis of performance, and with MTN retaining a 51% stake in their joint venture towerco partnership with IHS, there is good reason to suspect this will be true.

Reflecting on Nigeria’s sale and leasebacks
While Nigeria’s MNOs could never be described as enthusiastic to sell their ‘crown jewel’ tower networks (a policy Globacom clings to today), since 2008 a growing proportion of the country’s MNOs have come to think that tower deals made sense as a form of vendor finance: while the CDMA operators were first movers, yielding an uncertain proof of concept for towercos struggling in the turbulence in the wake of the CDMA operator’s loss of market share and financial turmoil, after many years of evangelising infrastructure sharing the culture in Nigeria has gradually shifted to an acceptance of the tradeoff of higher usage fees for better operational performance and improved time to market.

In 2014 Airtel and Etisalat’s towers coming to market forced MTN’s hands, and all three MNOs divested their towers, selling a total of 16,241 towers and raising over US$2.5bn. We don’t believe IHS were the highest bidder for either Etisalat nor MTN’s towers, but they leveraged their...
achievements in operational excellence to win the deals; they simply knew the cost base in Nigeria better than rival bidders. Another factor in IHS’s favor was their willingness to allow MTN Nigeria to retain 51% of the equity in their joint venture towerco, creating what executives call a “smart structure to avoid impeding exit,” whilst ensuring operational control.

The land grab phase of the Nigerian tower industry is probably over. NATCOM, the legacy of the CDMA operators, may have around 550 towers left on their balance sheet, and Globacom are believed to have around 6,000. Given Mike Adenuga’s personal control of Globacom, they’re unpredictable: he could start a process to sell those towers tomorrow, he could never sell. We won’t know until it happens.

Pricing
Lease fees remain confidential but healthy in Nigeria. The market generally defines lease costs as a set usage fee for space with a variety of different escalator models employed. Most tower leases in Nigeria are CPI indexed, and some of the currency risk is offset with a proportion of revenues US dollar linked. With currency depreciation in Nigeria linked to falling oil prices, there is a natural hedge as when the price of oil comes down, opex costs come down. The ‘Big Three’ towercos in Nigeria (IHS, ATC and HTN) charge a lease rate all inclusive of power.

Power
Power is the big differentiator between African and U.S. tower markets. Most Nigerian cell sites have one if not two DGs on site, a fuel tank (containing a very liquid asset!), battery banks and an increasing amount of solar panels. The presence of an entrenched ‘diesel mafia’ and the value of equipment on sites means security is a big issue, and effective remote monitoring is a quality of service differentiator.

IHS Nigeria reported their newly acquired sites were typically burning 1,600L of diesel per site per month initially, which they’ve reduced to an average of 1,200L now, with technology path to reduce that to 700L. A lot of the gains are made through battery hybridization and solar, while there’s an increasing use of gas at Nigerian cell sites.

IHS and HTN Towers are both delivering better than 99.9% uptime. It’s too soon to say for ATC Nigeria, but MTN informally reports high levels of satisfaction in other markets where they are partnering with American Tower.

ESCOs: pilots more likely than large scale rollouts, at least in the near term
American Tower and IHS are not capital constrained. Both towercos are proud of their acheivements in optimising their cost base and performance, and happy to capture the full value of those achievements on their own balance sheet. As such, while the independent towerco business model remains more conducive to the adoption of energy efficient solutions, there is no imperative to buy energy by the kWh and migrate toward an energy services company (ESCO) business model. Having said that, Nigeria remains host to most of SSA’s landmark hybrid and renewable energy proofs of concept. While the ESCO business model may be seldom seen today, Nigeria will probably be the first country in SSA to see the model rolled out at scale.

Decommissioning
Now that IHS Nigeria control most of the towers, they have an opportunity to rationalise consolidated networks. While decommissioning is value accretive for towercos, consolidating tenancies on one of two overlapping towers whilst eliminating the lease, operations, administration and maintenance costs of the decommissioned tower, don’t expect widespread decommissioning in Nigeria, where QoS is notoriously poor. Most of the duplicate towers are in urban areas where data demand requires infill sites, and where many towers are at or approaching their structural capacity. Even if there is structural capacity to consolidate tenancies on urban structures onto a single tower, the overlapping tower is likely to be retained or mothballed to provide supplementary structural capacity as 4G is rolled out.

The land under Nigeria’s towers
TowerXchange wanted to know if there was much threat from ground lease aggregators in Nigeria. “We try to acquire the land for new sites, if we can’t buy we’ll enter a long term lease,” said one towerco. “We’ll allocate budget to acquire underlying leases next year.”

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What we learned about HTN Towers prior to their cancelled IPO on the LSE

First towerco established in Africa, then Helios Towers Nigeria, steps back from IPO citing the interest of a strategic investor, amid turbulence of MTN fine

On October 23 2015, HTN Towers announced their intention to IPO 50-60% equity on the London Stock Exchange. On November 6 HTN Towers announced the IPO process would be discontinued due to “expressions of interest from potential buyers to acquire the company.” The following commentary is TowerXchange’s analysis of the HTN Towers business from a tower industry KPIs perspective – we are not financial analysts, and readers should make their own evaluation of the financial performance of the company.

The tale of HTN Towers is a twin narrative. One story is of Africa's oldest growth organic tower build in the continent's largest and most vibrant telecom and tower market – Nigeria. HTN Towers has built over 700 greenfield towers, many in prime locations, and over the last four years has added an impressive 0.25 tenants per annum to achieve one of the continent's highest tenancy ratios of 2.2, backed by solid lease rates on long term contracts.

The other HTN story is a successful turnaround play. In the early days of the African tower business, tier one MNOs were reluctant to divest towers – thus the first tower transactions were agreed with second tier CDMA operators. HTN Towers, then Helios Towers Nigeria, and their new partners SWAP Technologies agreed partnerships with Multi-Links and Starcomms respectively. Alas, the CDMA operators hemorrhaged market share and margin to their GSM competitors in 2010-11. HTN lost 50% of their revenues in a very short space of time, refocused on GSM clients, and settled the outstanding Multi-Links debts by taking ownership of their 491 towers from exiting parent Telkom South Africa. The decline of the CDMA operators left both HTN and SWAP with a legacy of zero tenant “dormant” towers, towers they acquired for a price well below the premiums that were later paid in a Nigerian tower sale spree in 2014. The second HTN Towers story has a happy ending; 65% of HTN's tenants and over 70% of their revenue now comes from tier one GSM operators, and 251 of those dormant towers now have tenants on them.

When the dust settled on the Nigerian tower...
sale spree of 2014, the country had transitioned from an operator-led tower market to one where independent towercos owned 79% of the county’s towers. Yet HTN Towers were financially outmuscled in those auctions by larger competitors IHS, Africa’s #1 towerco with over 23,700 towers, and American Tower, the largest towerco outside of China, which will have over 140,000 towers upon closing of announced acquisitions. With lots left to build but little left to buy in Nigeria, HTN may have to look beyond the borders of Nigeria for inorganic growth. HTN had been limited by an agreement with Helios Invest Partners’ other towerco, Helios Towers Africa, which restricted HTN to acquisitions in their domestic market (for the avoidance of doubt Helios Towers Africa remains a separate entity with a common shareholder in Helios Investment Partners – the two companies have in the past been close enough for one another’s CEO to serve on their respective boards of Directors, but that is no longer the case). The recent rebranding announcement of HTN Towers suggests that restricted remit might have been relaxed – there is a reason why the word “Nigeria” has been dropped from the company’s name!

The HTN towers narrative which was being promoted to prospective investors is primarily that organic growth success story. But prospective investors who dig deeper should be equally impressed at the successful turnaround of a business that started out as a cautionary tale of the hazards of towercos partnering with less than investment-grade tenants. HTN has since refocused to partner with some of Africa’s most investible opcos, they’ve
created value by leasing up towers left dormant by their defunct original partner, and they’ve restructured their balance sheet with the first bond issuance by an African towerco. They may have finite acquisition opportunities in Nigeria, but TowerXchange are tracking several opportunities outside of Nigeria which might represent good acquisition targets for HTN Towers.

**Solid performance in H1 2015**

HTN Towers achieved US$73.3mn revenue and US$31.7mn EBITDA in the FY ending 31 December 2014, rising to US$36mn revenue and $19.8mn EBITDA for H1 2015, representing a growth in EBITDA margin from 43% to 55%. Their tower count rose slightly from 1,202 to 1,203, tenants were added to three more dormant towers, bringing their live tower count to 869, on which their tenancy ratio rose from 2.16 to 2.20. HTN also reports having a further 300 co-location orders “in hand” as at June 2015, which would effectively raise their live site tenancy ratio to 2.4. Technology co-location, where the same tenant hanging equipment for two technologies on the same tower counts as two tenancies, stood at 2.7.

**History**

**2006:** The history of the African telecom tower industry starts with the inauguration of HTN Towers, then Helios Towers Nigeria, in 2006.

**2007:** HTN passes the landmark of having built their first 100 towers.

**2008:** HTN secures a managed services deal to operate 400 towers for CDMA operator Multi-Links.

**2010:** HTN takes control of 491 towers from Multi-Links en lieu of receivables.

**2011:** Losing market share and with parent company Telkom seeking an exit, Multi-Links is acquired by HIP Oils, an affiliate of Helios Towers Nigeria.

**2012:** HTN builds their 500th tower.

**2013:** Capcom acquires Multi-Links from HIP Oils. Towers remain on HTN balance sheet.

**2014:** HTN completes a US$250mn high yield bond, the first bond issuance by an African towerco. The bond, which matures in July 2019, was three times oversubscribed.

**2014:** We believe HTN Towers unsuccessfully bid to acquire one or more of three large tower portfolios sold by Nigerian GSM operators. The portfolios would later be closed by IHS (acquiring a total of 8,850 towers from MTN and 2,691 from Etisalat) and American Tower (acquiring 4,700 towers from Airtel).

**2015:** HTN reaches agreement to manage and market SWAP Technologies’ 702 towers.

**2015:** Rebranded as HTN Towers with a pan-African remit.

**2015:** Announcement of intent to float 50-60% of the equity of the business on the LSE.

**2015:** Cancelled IPO citing receipt of expressions of interest from prospective buyers.
What we know about the HTN Towers portfolio

At the end of Q2 2015, HTN Towers owned all 1,203 towers in their own portfolio, and had secured an agreement to manage and market a further 702 sites owned by SWAP Technologies. HTN Towers boasts one of the highest tenancy ratios in Africa at 2.2 tenants per live tower, having increased roughly 0.25 every year from 2010 to 2014. Any tenancy ratio growth above 0.2 per annum is generally considered very healthy. The live tower tenancy ratio on the SWAP towers is 1.4. HTN’s leases are typically five to ten years in duration with an average of 4.7 years remaining, representing future contracted revenue of US$336mn, excluding the effect of contracted lease rate increases.

Monthly TCF (tower cash flow) per live HTN site is just under US$4,500. Forex and fuel price exposure is limited by agreed increases in lease rates and, in some cases, US dollar pegged with power indexation. To date, Nigeria’s towercos have largely resisted downward pressure on lease rates being exerted by the country’s leading MNOs, but if the Naira continues to devalue against the US dollar, anticipate intense price negotiations when leases are up for renewal.

All of HTN’s own and managed sites are currently located in Nigeria, with around half the towers located in Nigeria’s ten biggest cities, but with a presence in 35/36 States. HTN Towers have done a tremendous job recalibrating their business away from their initial reliance on CDMA operators as anchor tenants. The decline and fall of initial client Multi-Links lead to the loss of more than 50% of HTN’s revenues at the time, and embroiled the company in lengthy legal proceedings culminating in the acquisition of Multi-Links by HTN affiliate HIP Oils. At the time, 2011, GSM operators generated just 31% of HTN’s revenue, but by FY14 76% of HTN’s adjusted revenues came from three credit worthy GSM operators: MTN, Airtel and Etisalat. A further 16 broadband and telecommunications customers are tenants on HTN towers, joined by broadcasting, transmission and corporate tenants.

Leasing up zero tenant towers

Of 491 dormant tower sites, acquired as a function of HTN’s acquisition of Multi-Links’ towers en lieu of debts, 251 have since been activated. HTN reports that it costs an average of US$126,000 for a new BTS tower in Nigeria compared to US$30,000 to bring a dormant tower live.

Opex and power

Over half of HTN’s opex is related to power (52% in FY2014, 56% in H1 2015). While dual DGs are extensively used to ensure uptime, HTN Towers has deployed battery hybrids at 600 sites in their network to reduce energy opex and improve margins, with a further 100 sites to be upgraded in 2015. This represents 81% of the current HTN network, an impressive rollout considering just 9% (58) of HTN’s towers were hybridised as recently as 2011. HTN had suggested that US$80mn of the proceeds from their IPO would be used to fund new hybrid and solar equipped BTS sites, with a further US$13mn deployed to upgrade existing sites with hybrid and solar technology. HTN reports that battery hybridisation can reduce opex by ~US$350pcm, and called attention to a 12% decrease in opex in the last year attributable to hybridisation. The company is also piloting solar hybridisation, which could treble those savings to US$1,000pcm, having identified up to 650 existing sites suited to solar, with intent to deploy solar on new BTS sites also.

HTN Towers achieved an average of 99.97% uptime in 2014, compared to SLAs calling for 99.5%, with MTTR (mean time to repair) of 136 minutes compared to an SLA of 180 minutes. Having started deployment in 2012, 95% of HTN’s live sites are connected with RMS (remote monitoring systems).

The Nigerian mobile market

We’ve written about this many times before: Nigeria is one of the most profitable and investible frontier telecom and tower markets in the world, but it’s not for the feint hearted. Unreliable grid power and a rampant diesel mafia pose inescapable operational challenges, meaning operating Nigerian towers is a job best left to experienced practitioners like HTN Towers and their peers.

On the plus side, Nigeria is the largest economy in Africa, one of the fastest growing in the world, and has a rising urban population. A country with 150.6mn subscribers and a population of 140mn might sound like a reasonably mature emerging
market, but Nigeria’s teledensity figure of 108% is distorted by widespread multi-SIMing. An urgent need to improve QoS suggests a long runway for growth both in network densification and coverage extensions – Nigeria may need to increase its current stock of 30,941 towers by 50% by 2020. Nigeria currently has 4,458 mobile subscribers per tower compared to 3,545 in South Africa and 1,417 in the UK.

**MTN fine**

The implications of the NCC imposing a US$5.2bn fine on MTN Nigeria, later reduced to US$3.9bn and the subject of legal challenge, remains unclear. Prior to the imposition of the fine, MTN had indicated a US$1bn capex budget to be deployed in Nigeria in 2016, with a healthy pipeline of build-to-suit search rings being issued and an equally healthy appetite for co-locations for both coverage and, in particular, capacity.

It seems likely that the threat of such a substantial fine will adversely affect MTN’s expenditure in Nigeria and, given that the operator is HTN Towers’ number one customer, the timing of the fine announcement, shortly after the IPO announcement, cannot have been ideal.

Nonetheless, TowerXchange remain bullish about the Nigerian mobile and tower market in the long term. MTN may have already paid a heavy price in executive jobs and a tumbling share price, but the company remains Africa’s most recognised brand and a blue chip client for HTN Towers and Nigeria’s other towercos. Nigeria needs a lot more towers, and as market leader MTN will remain at the vanguard of network investments, even if the challenges to the NCC fine and associated uncertainty cause a reduction in spend in the near term.

**Competitive landscape**

Independent towercos own 79% of Nigeria’s 30,941 towers. The combined HTN+SWAP portfolio is the third largest towerco in Nigeria: IHS’s deep partnership with MTN gives them an unassailable market lead with 16,541 towers (53% of the total stock), ATC Nigeria is integrating 4,700 (15%) towers recently acquired from Airtel, then you have HTN and SWAP with 1,905 (6%), followed by BCTek, which markets 700 towers on police compounds, Hotspot and Communication Towers Nigeria with around 600 towers and assorted small privately owned towercos representing around a further 200 towers.

Despite the fact that 10% of HTN’s towers are located within 100m of an IHS tower, 4% within 100m of an ATC tower, most telecom towers in Nigeria, indeed anywhere in the world, effectively operate as a monopoly. There is minimal competition on lease rates, which tend to settle at a ‘market rate’. Radio network planners seldom have choice between sites at overlapping locations, and the cost and time to market of building a new tower is usually so substantial that co-locating on an independent tower is preferable to building. This situation is accentuated in Nigeria by two important factors. One, layers of state and local taxation and bureaucracy make it even more time consuming and expensive to permit a new site – indeed such permits are unlikely to be granted if a co-locatable structure is in the near vicinity. And two, three of Nigeria’s four largest MNOs have divested all their towers, and with them has gone much of their internal competency and capacity to build towers. Almost all the new towers in Nigeria are being built
by towercos, and co-location is always preferable to building a new site.

HTN’s challenge will be to secure a significant share of BTS (build to suit) towers in the face of competition from IHS and ATC Nigeria. While IHS has no formal right of first refusal on tower builds, their joint venture partnership with MTN and anchor tenant relationship with Etisalat suggests they will be in pole position to continue building most of Nigeria’s new towers (IHS has already built around seven times the number of BTS towers HTN has constructed in Nigeria). Meanwhile ATC Nigeria will be keen to compete for BTS opportunities to supplement their acquisition from Airtel. Increased competition for BTS opportunities may mean towercos are less able to ‘cherry pick’ locations where a second tenant can rapidly be added to a BTS tower.

The future

With HTN Towers’ rebrand came the suggestion that they would now have a pan-African growth plan, whereas previously their remit had been limited to their domestic market by agreement with Helios Towers Africa.

HTN Towers has a stated intent to build a further 1,000 towers by 2020 in Nigeria, a realistic goal given the 3-5,000 new towers currently being constructed each year, but a goal which they will have to fight to achieve in the face of considerable competition. HTN Towers can also generate significant growth simply by adding tenants to their and SWAP’s dormant towers. The company has also called attention to the opportunity to diversify into rooftops, oDAS, iDAS, billboards and even electricity transmission towers.

HTN Towers also has an M&A agenda, although remaining inorganic growth opportunities are limited in Nigeria where only Globacom and NATCOM’s towers remain on MNO balance sheets. Acquiring full ownership and control of SWAP’s 702 towers may be one option for HTN to consider. HTN Towers’ potential to pursue and close sale and leaseback opportunities elsewhere in Africa may be facilitated by Africa’s ‘Big Four’ towercos (American Tower, IHS, Eaton and Helios Towers Africa) being increasingly focused on the integration of an unprecedented spree of recently acquired towers.

Full disclosure; Inder Bajaj, CEO of HTN Towers has served as a member of TowerXchange informal ‘inner circle’ advisory board for the past two years and continues to be a member of that informal body. However, TowerXchange have no investment or stake in HTN Towers, nor does Inder nor HTN Towers hold any stake or formal position within or own any stake in TowerXchange.

The HTN management team

Pierre Danon newly appointed (October 2015)
HTN Towers Director and Chairman Pierre Danon has an illustrious pedigree in telecommunications, having served as CEO of BT Retail (2000-5), in 2006 Danon helped Babcock and Brown Capital take over Eircom, becoming President from 2006-8. He served as President of the Numericable-Completel quads-play in France (2008-12), and is currently Chairman of Volia, a Ukrainian cable operator (2011-) and Vice Chairman of Danish market leader TDC.

Inder Bajaj has been CEO of HTN Towers since 2010, prior to which he managed the RCom's 50,000+ towerco Reliance Infratel. Previously Inder spent ten years in senior management roles at RCom and Bharti Airtel, preceded by ten years as GM of Xerox India. In my dealings with Inder I’ve found him to be affable, passionate and highly knowledgeable about both the tower industry in general and the Nigerian tower market in particular.

Abhulime Ehiagwina serves as HTN Towers’ CFO, prior to which he held the same position at Etisalat Nigeria. Abhulime’s 21 years’ experience include senior Financial roles at Airtel and Total. Possibly the tallest man to take the stage at a TowerXchange Meetup (!), the soft spoken Abhulime is eloquent and insightful.

Chandrakent Modi, HTN Towers’ CTO, represented the company at the TowerXchange Meetup Americas where he also led a round table on Nigeria. Prior to his current role Chandrakant spent nine years with RCom in Mumbai, where was SVP Projects for passive infra sharing and sites delivery to tenant operators.

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MTN’s multi-billion dollar fine in Nigeria will force the operator to advance its plans to sell its towers in South Africa. Smaller operators will likely follow suit, but Vodacom’s strong financial and competitive position mean it has little need to sell its towers, too. Competitive bidding between four major tower companies for access to the region’s most developed market will ensure high valuations.

BMI believes the outlook for South Africa’s towers market in 2016 depends on the final outcome of MTN Nigeria’s US$5.2bn fine. In early December 2015 MTN confirmed that the Nigerian Communications Commission (NCC) agreed to reduce the fine by around 25% to US$3.9bn, with a payment deadline of December 31 2015. For comparison, MTN’s total 2014 revenue for South Africa was ZAR38.9bn (US$3.6bn), and for Nigeria ZAR54.0bn (US$5.0bn). MTN’s inability to negotiate a more substantial reduction to the fine means it will still be forced to make serious cost savings in order to ensure it can maintain investment levels in Nigeria as well as across its Middle East and Africa footprint. MTN had already expressed interest in selling its South African tower assets in mid-2015, and BMI believes it will expedite this plan in order to help fund the Nigerian fine.

Looking at previous tower sales across Sub-Saharan Africa (SSA), using deal values and volumes as reported by operators, in the media and by TowerXchange, the table below shows that Cell C’s towers in South Africa sold at a relatively low price compared to other markets. However, the deal included a high leaseback rate for Cell C, which
pushed up the overall valuation of the tower assets compared to other markets in the region. This is partially a result of it being among the first tower sales in the region, but also reflects the higher consumer spending power and level of development of South Africa’s telecoms sector.

Robust growth in mobile data demand

South Africa is attractive to all four major tower companies in Sub-Saharan Africa - IHS Towers, Helios Towers Africa (HTA), American Tower and Eaton Towers - because it is by far the most developed. Although we forecast the total number of 3G/4G subscriptions in Nigeria to overtake South Africa by the end of 2015, data usage levels are far higher in South Africa. Vodacom reported that average MB of use per subscriber increased by 28.6% y-o-y to 425MB in Q315, while both MTN and Vodacom also report rising minutes of use, despite increased opportunity for substitution with over-the-top (OTT) services. We forecast strong growth in data services to continue over the five years to 2019, with the anticipated auction of more 4G spectrum resources sometime between 2016 and 2018 to fuel further investment into network upgrades and densification.

BMI forecasts total mobile subscriptions to reach 89.3mn in 2015 and increase to 94.4mn by 2019, for a penetration rate of nearly 170%. Over the same period, we expect the total number of 3G/4G subscriptions to increase from 31.1mn to 44.5mn, to account for 46.6% of the mobile market and 79% of the population by 2019.

Table one: A comparison of selected major tower transactions

<table>
<thead>
<tr>
<th>Mobile Operator</th>
<th>Tower Company</th>
<th>Deal Type</th>
<th>Year</th>
<th>Price/Tower USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell C (South Africa)</td>
<td>American Tower</td>
<td>Sale and leaseback</td>
<td>2010</td>
<td>142,857</td>
</tr>
<tr>
<td>MTN Ghana</td>
<td>American Tower</td>
<td>Joint venture</td>
<td>2010</td>
<td>228,375</td>
</tr>
<tr>
<td>Tigo Tanzania</td>
<td>Helios Towers Africa</td>
<td>Joint venture</td>
<td>2010</td>
<td>130,719</td>
</tr>
<tr>
<td>Tigo DRC</td>
<td>Helios Towers Africa</td>
<td>Joint venture</td>
<td>2010</td>
<td>102,881</td>
</tr>
<tr>
<td>MTN Cote d’Ivoire</td>
<td>IHS Towers</td>
<td>Sale and leaseback</td>
<td>2012</td>
<td>151,450</td>
</tr>
<tr>
<td>MTN Cameroon</td>
<td>IHS Towers</td>
<td>Sale and leaseback</td>
<td>2012</td>
<td>172,914</td>
</tr>
<tr>
<td>Etisalat Nigeria</td>
<td>IHS Towers</td>
<td>Sale and leaseback</td>
<td>2014</td>
<td>220,037</td>
</tr>
<tr>
<td>Airtel Nigeria</td>
<td>American Tower</td>
<td>Sale and leaseback</td>
<td>2014</td>
<td>218,750</td>
</tr>
<tr>
<td>Airtel Rwanda &amp; Zambia</td>
<td>IHS Towers</td>
<td>Sale and leaseback</td>
<td>2014</td>
<td>159,753</td>
</tr>
<tr>
<td>MTN Nigeria</td>
<td>IHS Towers</td>
<td>Joint venture</td>
<td>201</td>
<td>196,700</td>
</tr>
</tbody>
</table>

Source: BMI, TowerXchange, operators

The attractiveness of the South African market is also tied to the level of economic development compared to the rest of the region. South Africa has much more developed corporate and financial services sectors, which means telecoms operators and their partners benefit from much higher demand for sophisticated enterprise communications and IT solutions. In order to tap into this demand, telecoms operators are ramping up investments in mobile and wireline broadband infrastructure, thus pushing a positive cycle of adoption of cloud-based enterprise solutions. This creates opportunity for any potential tower company to depend on both strong consumer and enterprise demand for mobile services, with the possibility to diversify into new types of network services, to support the development of the machine-to-machine (M2M), Internet of Things (IoT), and enterprise mobility solutions segments. Aside from strong interest from SSA’s big four tower companies, the positive outlook for South Africa’s telecoms market has also attracted some new international players to the continent. First is US-based Atlas Towers, which began deploying towers in South Africa in late 2014. By June 2015, Atlas had built a dozen towers, with 25 more planned for construction. The company plans to build 75 new towers a year in South Africa, while also setting its sights on potential acquisition opportunities. Meanwhile, SBA Communications, which operates
more than 20,000 sites across the US, Canada, Central America and Brazil is also reportedly interested in bidding on MTN’s towers. The main risk for Atlas and SBA is that with little experience in more challenging emerging markets, where regulatory hurdles are larger and tower operators cope with a much wider range of logistical obstacles, such as the limited reach of power infrastructure, they could find themselves at a disadvantage compared to SSA’s established players. Nevertheless, strong competition for South African towers will ensure that mobile secure high valuations for their assets.

Aside from strong interest from SSA’s big four tower companies, the positive outlook for South Africa’s telecoms market has also attracted some new international players to the continent.

Not all will follow MTN’s lead

An acceleration of MTN’s tower outsourcing strategy could push smaller players to follow suit. Cell C’s backers, including Saudi Telecom Company (STC)-owned Oger Telecom, have ploughed money into Cell C’s operations to enable it to rapidly expand and improve network coverage in order to compete more effectively with market leaders MTN and Vodacom. Cell C has been successful in this strategy, reporting impressive subscriptions growth and boosting its market share from 17.6% to 25.0% over the two years to September 2015. However, Oger Telecom’s interest in cashing in on the investment is clear from acquisition discussions with incumbent Telkom and, most recently, Blue Label Telecoms. After refusing Telkom’s bid for Cell C, which it deemed too low, in early December 2015 Oger agreed to a restructuring deal with Blue Label. Blue Label will acquire a 35% equity stake in the mobile operator and buy out much of its debt, while Oger will bring its stake down from 75% to 26%, while also committing additional funding for Cell C’s further expansion. Although Blue Label’s entry as a shareholder reduces the financial burden on Oger, BMI still believes the sale of towers by MTN could push Cell C’s owners to look to a tower sale of their own as a possible option for gaining a return on their investments, especially if MTN secures a high enough valuation.
Meanwhile, Telkom needs to reassess its options in the mobile market after failing to secure regulatory approval for a network sharing agreement with MTN earlier in 2015, and Cell C rebuffing its acquisition bid. Given that Telkom had just 2.3mn mobile subscribers at the end of September 2015, despite offering many of the best value mobile data plans in South Africa, BMI considers its tower portfolio to be the least attractive in the country. Therefore, while selling its towers may also be an option for ensuring its small mobile business becomes profitable by 2016, BMI believes it would be of most value to American Tower, which already operates in South Africa, or paired to another mobile operator’s assets.

Vodacom would be less easily lured into a tower sale strategy. The operator still draws a significant competitive advantage from wider network coverage than its rivals, while its strong financial position means it has less need to implement cost saving measures than other operators. MTN has still not entirely recovered from the impact of mobile termination rate (MTR) reductions in 2014, which cut its incoming voice revenue in half and also triggered intense price competition across the market. In June 2015, MTN reported its lowest half-year revenue in South Africa since June 2011. By contrast, Vodacom’s revenue for the half year ended September 2015 was up 5.1% y-o-y to ZAR31.7bn.

Telecoms market less exposed to macro challenges

The macroeconomic outlook for South Africa is bleak. Besides the marked depreciation of the rand and the possibility of additional electricity tariff adjustments, upon hiking interest rates in November the statement of the Monetary Policy Committee (MPC) mentioned ‘worsening drought conditions and their likely impact on food prices’ as one of the increased upside risks to the inflation forecast. Five of South Africa’s nine states - Free State, KwaZulu-Natal, Mpumalanga, Limpopo and the North West - have been declared disaster areas on the grounds of water scarcity. El Nino is the trigger for the crisis but it has merely exposed pre-existing weaknesses in the country’s water infrastructure, as reservoirs and dams have been run down and businesses have experienced rolling outages to their water supply, much as they have experienced electricity load-shedding. As El Nino continues to apply well into 2016, the water shortage will continue, resulting in a drop in corn production, accelerating import growth and a rise in food prices.

Looking at the performance of the various sectors of the past several years, it is clear that the supply-side, i.e. mining and manufacturing, has stagnated, while the demand-side of the economy, e.g. finance and retail, has been relatively buoyant. Therefore, in order to drive improved economic growth, BMI believes South Africa’s government would have to implement challenging structural reforms targeting the supply side of the economy.

However we do not envisage these reforms happening in the near-term. State-owned utility
Eksom has managed to provide for stable electricity supplies during the second half of 2015, but major delays to new power capacity projects and weak finances mean the power sector will remain in crisis mode in 2016. Meanwhile, BMI’s mining research team sees a leftward shift in ANC policies to back further wage hikes as the most likely outcome of ongoing strike action, which would drive many major miners to pull out of South Africa. We therefore forecast GDP growth of just 1.6% in 2016, followed by average annual growth of 2.5% over the following years to 2020.

Nevertheless, strong mobile subscriptions growth, a recovery of ARPU’s in 2015, and the sector breakdown of GDP growth above all suggest that the telecoms market has been fairly insulated from South Africa’s economic woes. The out-performance of the retail sector is also reflected in the relative insulation of the Johannesburg Stock Exchange. Index from the South African macroeconomic collapse; food and drink plus personal and household goods account for 28% of the index, and although the latter has fallen somewhat since November, it is nowhere near what it should be if it were a reflection of the overall macro collapse. Therefore, while challenges relating to power supply and the strength of trade unions have impacted on telecoms operators - Telkom and MTN in particular - BMI believes demand for mobile data will continue to grow rapidly, requiring operators to maintain high levels of investment in upgrading and expanding 3G/4G networks, and creating a stable operating environment for tower companies.
The second annual TowerXchange Meetup Asia took place last November in Singapore, and this issue’s Asia coverage is dedicated to sharing some of the best insights from the keynotes, roundtables and networking with the leaders of the Asian tower industry.

We also continue the edotco 360 series, interviewing three of the company’s top executives to learn how the development of the first pan-Asian towerco is progressing. Finally, we share an update on the creation of China Tower Company, the world's largest towerco, and hear from Analysys Mason on the tower industry from the MNO perspective.

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TowerXchange Meetup Asia 2015: event report

Key market data, audience analysis and photos from the foremost meeting place for the Asian tower ecosystem

209 leaders of the Asian tower industry gathered on 24 and 25 November at the Marina Bay Sands in Singapore for the 2nd annual TowerXchange Meetup Asia, with executive level representatives from 25 different towercos, including 12 of the 15 biggest towercos in Asia, plus their partners from MNOs, solution providers, investors and advisory firms.

TowerXchange's sold out expo highlighted passive infrastructure equipment and service providers from across the tower ecosystem, and the attendees benefitted from over five hours of insights and best practices during the roundtable breakouts. The world-famous Marina Bay Sands hotel once again provided the ideal setting for such a prestigious gathering of tower industry and telecoms professionals.

Keywords: Asia, Asia Research, American Tower, Bharti Infratel, Common Tower, Indus Towers, Tower Bersama, Market Forecasts, Market Overview, Research, Tower Count, TowerXchange, TowerXchange Meetup Asia, Towercos

Read this article to learn:
- TowerXchange’s latest market size and growth forecasts for towers in Asia
- Audience demographics and the delegate list from the TowerXchange Meetup Asia 2015
- How TowerXchange Meetups are promoted
- What to expect at the TowerXchange Meetup Asia 2016

72% of the attendees at the TowerXchange Meetup Asia were Director, VP or CXO level

How we promote TowerXchange Meetups

The core of our promotional campaign is TowerXchange's proprietary database of the top 15,000 decision makers in the global telecom tower industry.

The TowerXchange database includes the management teams of 153 towercos who between them own over 2mn of the world's 3.3mn towers.

We also maintain relationships with over 3,000 CXOs and Heads of M&A, Network Planning, Procurement and Tower Strategy at MNOs worldwide.

TowerXchange is read by 542 investment and investment advisory firms, providing an invaluable interface with the providers of debt and equity to towercos, MNOs and their suppliers.

TowerXchange also maintains the world's most exhaustive database of telecom infrastructure suppliers, from tower manufacturers, managed service providers, to RMS, site management platforms, access control and energy equipment and service providers.

Every month TowerXchange adds an average of 700 new highly qualified members to our community through a combination of “pull” marketing via TowerXchange research, and P2P introductions and
Towercos
Energy equipment or ESCO
MNOs
Investors
Managed service providers
Advisory firm
RMS and site management systems
Tower manufacturers
OEMs
Others

research within the tower industry.
A total of 108,829 personalised emails with industry specific messaging were sent to our database to promote the TowerXchange Meetup Asia.

Our email campaign is supported by a direct mail campaign to 253 selected VIPs, and by a courtesy calls to over 1,000 key target attendees.

A key component of our promotional campaign is the TowerXchange Asia Dossier – this annual publication collates and updates critical baseline data and the best interviews with key Asian tower industry stakeholders.

We use Google Adwords to amplify the findability of the dossier, and other selected industry news and analyses, attracting new, qualified members to our community.

The TowerXchange Journal is our most important media partner; 94% of attendees were Journal subscribers, 66% of attendees had been interviewed in the Journal.

The Asian tower market
The Asian tower market has seen deal flow return over the past year with major transactions taking place in markets including India, Indonesia, and Australia. 2015 also saw the creation of the world’s largest towerco, China Tower Company with an estimated 1,160,000 towers. For the first time there are more towers worldwide in towerco hands than operator hands, marking a major transition and the increasing acceptance of the independent towerco business model.

TowerXchange predict strong growth in towerco penetration in 2016, with transactions likely in Indonesia, Bangladesh, Pakistan and potentially Thailand. Other markets to watch include India where we expect another 50,000 towers to be rolled out and where BSNL is in the process of spinning off its assets into a new towerco

TowerXchange are grateful for the support of our media and association partners for Asia:
End 2015 penetration of towercos in Asia

End 2016 (f) penetration of towercos in Asia

Why you can’t afford to miss the TowerXchange Meetup Asia 2016 on 13 - 14 December:

1. The only executive event to meet with Asia’s leading towerco CXOs and MNO tower strategists
2. Stay on top of projected deals and regulatory developments in the Asian tower markets
3. Strong growth in towerco penetration is expected in several markets including India, Bangladesh, Pakistan and Thailand
4. For the first time, the TowerXchange Meetup Expo can be visited free of charge by buy-side decision makers!
5. The new TowerXchange Investors Club will attract unprecedented representation from debt, equity and institutional investors
6. The TowerXchange Meetup Asia 2016 will include senior representation from all Asia’s leading towercos
7. Towercos and MNOs increasingly rely on TowerXchange to shortlist recipients of RFPs
8. Learn where the next tower transactions are taking place, and who the new decision makers will be
9. Identify where new tower builds and new technology rollouts are driving growth
10. Meet with existing and new business partners within the Asian tower industry supply chain

Sources: TowerXchange, RBC, Delta Partners, Mott MacDonald
Towerco penetration in Asia now and forecast for 2016

Current penetration
Forecast, Q4 2016

TowerXchange Meetup Asia Attendee List

**Towercos**
- **American Tower Corp**, Executive Vice President and President, Asia
- **American Tower Corporation**, Chief Strategy and Business Development Officer
- **Apollo Towers Myanmar**
- **Beijing Miteno Communication Infrastructure Investment Co., Ltd.**, Vice General Manager
- **Beijing Miteno Communication Infrastructure Investment Co., Ltd.**, General Manager Assistant & Business Manager

**Beijing Miteno Communication Technology Co., Ltd.**, Chairman of the Board
- **Common Tower Technologies**, Chief Executive Officer
- **edotco Bangladesh**, Director, Operations
- **edotco Cambodia**, Country Managing Director
- **edotco Cambodia**, Head Of Business Development
- **edotco Group**, Chief Executive Officer
- **edotco Group**, Chief Financial Officer
- **edotco Group**, Chief, Sales & Corporate Affairs Officer
- **edotco Group**, Director

**edotco Group**, Director, Business Development
- **edotco Group**, Director, Engineering
- **edotco Group**, Director, Strategy & Commercial
- **edotco Group**, Financial Controller
- **edotco Group**, Head Of Regional Operations Centre
- **edotco Group**, Head Of Strategic Decision Support & Contract Management
- **edotco Group**, Head Of Strategy & Analytics
- **edotco Group**, Regulatory Advisor to CEO
- **edotco Group**, Specialist, Marketing
- **edotco Group**, Specialist, Marketing Communication
- **edotco Malaysia**, Country Managing Director
- **edotco Malaysia**, Director Of Sales & Marketing
- **edotco Pakistan**, Country Managing Director
- **edotco Sri Lanka**, Country Managing Director

**GTL Infrastructure**, VICE PRESIDENT -STRATEGIC INITIATIVES
- **Helios Towers Africa**, Executive Chairman
- **Indus Towers**, CEO Designate
- **Indus Towers**, Chief Sales and Marketing Officer
- **Indus Towers**, Chief Supply Chain Management Officer
- **Irrawaddy Green Towers**, CEO

**Irrawaddy Green Towers**, CEO and Board Member
- **JTOWER**, Corporate Planning Manager
- **Komet Infra Nusantara**, Chief Operating Officer
- **Link Development**, Chief Executive Officer
- **Miteno USA, Inc.**, Director, Global Business Development
- **Myanmar Infrastructure Group**, Chief Financial Officer
- **Myanmar Infrastructure Group**, COO
- **Myanmar Infrastructure Group (MIG)**, President and Chief Executive Officer
Pan Asia Tower, Director
Protelindo, COO
Protelindo, Director of Business Development
Protelindo, Corporate Finance Advisor
PT Komet Infra Nusantara, Chief Financial Officer
Q Towers International, Chief Executive Officer
Russian Towers, Commercial Director
Sacofa Sdn Bhd, Chief Executive Officer
Sacofa Sdn Bhd, Director
Sacofa Sdn Bhd, Senior Manager of Accounts Management
Sanyuan Tec, Chief Executive Officer
Sanyuan Tec, COO
SBA Communications, VP, Business Development
Senno Telcom Co., Ltd, Chief Executive Officer
Senno Telcom Co., Ltd, Chief Operations Officer
Service-Telecom, Chief Executive Officer
STP, Chief Executive Officer
Tower Bersama, Founder
Tower Vision, Associate Director
Towershare
Towershare, CTO
Towershare, Director Operations
Towershare, General Counsel
Towershare, Strategy & Portfolio Manager
Viom Networks, Chief Mentor

**MNOs**
Axiata, Board of Directors
Bharti Infratel, Chairman
Celcom Networks Sdn Bhd, Head Implementation & Roll Out
edotco Group, Director
Etisalat, Director Procurement / Infrastructure
Indosat, Division Head Tower Planning & Engineering
KDDI Summit Global Myanmar, Manager
Mobitel Pvt Ltd, General Manager - Passive Network Infrastructure Business, Network Planning & Operations
Mobitel Pvt Ltd, Manager – Passive Network Infra Business Promotion
PT Indosat Tbk, Chief Strategy & Experience Officer
Seatel, Deputy Manager of Construction Dept

**Investors and Investment Advisors**
Deutsche Bank, Head of TMT SEA
Director, IGT, Chairman, Golden Towers
Goldman Sachs, Managing Director
IFC, Head TMT, Asia
IFC, Chief Investment Officer
JP Morgan, Executive Director
Khazanah, Associate
Khazanah, Associate
Kicking Horse Capital, Managing Director
Macquarie Group, SVP - Asia
Mitsui & Co., Ltd., Project Manager
Moody’s, Assistant Vice President - Portfolio of Telecommunications
Mubadala Infrastructure Partners Limited, General Counsel
Providence Equity Asia Advisors, Director
SCBAM – DIF, Senior Manager
SCBAM – DIF, Senior Officer
SCBAM – DIF, Senior Vice President
YCPLLC

Access Control
Abloy International, Business Development Manager
ACSYS, Founder & COO
ACSYS, VP Sales, Asia

Advisory Firm
Allen & Overy, Senior Associate - Corporate
Citigroup, MD, Head of Telecoms MEA
Delta Partners, Partner
Hardiman Telecommunications, Managing Partner

Consultant
Kicking Horse Capital, Advisor
KPR Consult A/S, Chariman
KPR Consult A/S, Chief Technology Officer
Nomura, Equity research - Asian Telecom and Media
Nomura, Managing Director
Palladium Partners, Managing Director
Providence Equity Asia Advisors Pte Ltd, Managing Director
Ramboll, Market Head Towers
Ramboll India, Associate Director
Vinson & Elkins, Counsel, Hong Kong
Vinson & Elkins, Senior Associate, London
Vinson & Elkins, Senior Associate, London
Analysys Mason, Partner
BMI Research, Trainee ICT Analyst

Energy Equipment
3Tech LionRock Power, Regional Manager EMEA
Alsanj representing Ameresco Solar, General Manager
Ascot Asia Pacific, Regional Officer
Ballard, Sales Director of SEA
Bladon Jets, VP Market Development
BSB Power Company, CTO
Caterpillar Asia Pte Limited, Sales Manager Energy Storage Asia Pacific
Coslight IndiaTelecom Pvt Ltd, VP Sales
Coslight IndiaTelecom Pvt Ltd, Head International Business
Cummins Power Generation, APAC Telecom Leader
Cummins Power Generation, General Manager, SEA & G-Drive
Eltek Power Pte Ltd, Executive Vice President – Business Development
Eltek Power Pte Ltd, Regional President – APAC
Enatel Energy, Sales & Marketing Manager
EnerSys, Regional Sales Manager
Ergos Energy, Managing Partner
FG Wilson, Sales Manager North & SE Asia
Flexenclosure, Regional Director, Asia
Flexenclosure, Director, eSite
GENPOWER ASIA, Managing Director
Greenpole PS, CEO
GS Yuasa, Asian Regional Manager
GS Yuasa, EMEA Regional Manager
H2, Inc., Chief Executive Officer
Heliocentris, GM APAC
Heliocentris, VP Sales and Marketing
IPT PowerTech Group, GM - Telecom Division
IPT PowerTech Group, VP & COO
LFPO Technology Sdn Bhd, Business Development Director
LFPO Technology Sdn Bhd, Managing Director
Lineage Power Pvt Ltd, Head of Engineering & R&D
Mahindra & Mahindra Limited, President & Chief Executive - Power Train Division
Mahindra & Mahindra Limited, Senior Vice President - Mahindra Powerol Business
NorthStar, Technical & Marketing Director – Asia Pacific
NorthStar, Vice President Asia Pacific
Perkins Engines Co Ltd, EAME & CIS Regional Director
Power Engineering / GENPOWER ASIA, President
Redflow, Global Sales Director
Sunco Energy SL, Director Utilities
TOTAL, Head of Energy Solutions Department
Voltalia, Advisor to CEO
Wind-it, General Manager
Zamil Infra, Vice President
Zamil Infra, Vice President - Sales
ZHEJIANG NARADA POWER SOURCE, Regional Director of Asia Pacific
ZHEJIANG NARADA POWER SOURCE, Managing Director
Managed Service Providers
ATM Tower A/S, Chief Executive Officer
ATM Towers Co. Ltd, Chief Executive Officer
Elektroskandia (Shanghai) Co., Ltd. (Sonepar group), Director, Sales & Business Development
Elektroskandia (Shanghai) Co., Ltd. (Sonepar group), Managing Director
ieng Group, Co-CEO
ieng Myanmar, Country Head
LeBLANC Communications, Program Manager - Infrastructure
Quanta TowerGen Private Limited, Director
Quippo Telecom Infrastructure Private Limited, President - International Business
R.S. INFRA PROJECTS. Pvt. Ltd, Director
R.S. INFRA PROJECTS. Pvt. Ltd, Director
Sagemcom, Deputy Sales Director
Sagemcom, Kenya Branch Manager
Salasar Techno Engineering Private Ltd, President
RMS & Site Management
Accruent, General Manager, APAC
AIO Systems, Executive VP Sales & Marketing
Invendis, CEO
Invendis, COO
Qowisio, Sales Director
Telemisis
Telemisis, Commercial Director
Inala Technologies, Group Executive: Telecoms
Infozech, Founder & CEO
Tarantula Global, CEO
Tarantula Global, Director of Global Sales
OEMs
Huawei Technologies Co., LTD.
Marketing Manager
Huawei Technologies Co., LTD
Marketing Manager
Huawei Technologies Co., LTD
Static Asset Manufacturers
CUE DEE AB, Business Development & Sales Director
EkiStruct, CEO
Ganges Internationale (P) Ltd., Director
Ganges Internationale (P) Ltd., GM - Exports
GSMtowers, CEO
GSMtowers, Supply Chain Manager
International Telco Poles Pty Ltd, Managing Director
Nanhua, Vice Director of Sales
Starky Poles Ltd., President
AVIALITE Sdn. Bhd., International marketing manager
Mecc Alte, General Manager
Other
Cisco, Consulting Systems Engineer
TAIPA, Director General
Unison Site Management, CEO and Chairman
Unison Site Management, Managing Director
Teleconsult Group, CEO and Chairman
edotco extends footprint into Myanmar with acquisition of majority stake in MTC

Exclusive interview with edotco CEO Suresh Sidhu

On 2 October 2015 edotco announced that it had reached agreement to acquire a 75% controlling stake in Digicel Myanmar Tower Company (MTC), subject to the approval of regulators and MTC’s minority shareholder YSH Finance. The transaction values MTC at an enterprise value of US$221mn. When closed, the deal will bring edotco’s tower count over 15,000 and extend their footprint to include Malaysia, Bangladesh, Cambodia, Sri Lanka, Pakistan and now Myanmar.

**Keywords:** Acquisition, Asia, Asia Insights, Business Case, Digicel MTC, edotco, Infrastructure Sharing, Lease Rates, Market Forecasts, Myanmar, New Market Entrant, News, Power As A Service, RMS, Strategic Acquisition, Towercos, Valuation

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Read this article to learn:
- What attracted edotco to invest in Myanmar
- MTC's highly sought after urban locations
- edotco's views on provision of energy and remote monitoring solutions
- TowerXchange’s commentary on the benchmark this transaction establishes for the value of a Myanmar tower

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TowerXchange: Congratulations on the announcement of edotco’s maiden transaction beyond the Axiata group! What has attracted edotco to invest in Myanmar?

**Suresh Sidhu, CEO, edotco:** Mobile penetration in Myanmar remains among the lowest in Southeast Asia; according to the Myanmar Ministry of Communication and Information Technology, mobile penetration stood at just over 50% in June 2015.

The outlook is positive as Myanmar’s three main telecommunications operators have already committed to cover circa 85% of the population by 2020. New Crossroads Asia (NCRA), the research branch of the Union of Myanmar, estimates that Myanmar will achieve 100% mobile penetration by 2021.

edotco expects to invest further into Myanmar as it plans to bring its full service offerings into the country. Through its proposed investment in Myanmar Tower Company (MTC), edotco will offer Myanmar its knowledge capital, especially in the realm of tower and infrastructure sharing, which we believe will greatly benefit its partners and customers.

TowerXchange: Can you share some insights into the characteristics of the portfolio you are acquiring from Digicel MTC?

**Suresh Sidhu, CEO, edotco:** MTC currently owns and leases out 1,250 towers (largely a ground-based portfolio) which support multiple customers and are located primarily in highly sought after urban locations.

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locations. MTC currently provides services to all three of Myanmar’s mobile operators: Ooredoo Myanmar, Telenor Myanmar and MPT.

TowerXchange: Will edotco provide just steel+grass, or tower+power in Myanmar at these newly acquired sites and/or at any new builds?

Suresh Sidhu, CEO, edotco: In Myanmar, towercos have different operating models with some providing both tower and energy as part of their solution, and others just providing the tower (where mobile network operators take care of their own energy needs).

The market is trending towards including energy as part of a towerco offering, primarily due to limited grid availability and reliability. To help operators run more efficient networks, edotco has regional competence to bring its best-in-class energy solutions (linked with our state-of-the-art real time remote monitoring service, echo) to Myanmar.

Within our existing operating markets, edotco provides end-to-end solutions in the tower services sector including co-locations, build-to-suit, energy, transmission and fibre as well as operations and maintenance; edotco is therefore well positioned to extend such capabilities in Myanmar as well. However, a final decision will be made after the transaction has closed and we have formally acquired the company.

TowerXchange: We understand around 7,410 towers have been erected to date in Myanmar, with a further 3,390 contracted in phase three of the rollout - how soon do edotco hope to start building additional towers in Myanmar?

Suresh Sidhu, CEO, edotco: edotco believes Myanmar has a strong growth potential in terms of new coverage and capacity, largely driven by increasing mobile penetration, operator license obligations, potential new entrants and new spectrum licensing. This will drive the need for new towers across all mobile operator networks; however, edotco expects infrastructure sharing will also become more prevalent. GSMA-IFC estimates there will be around 17,300 towers by 2017 in Myanmar, which is approximately 10,000 more towers than are currently in existence.

Developing the infrastructure Myanmar requires to meet demand will take investment by all key tower industry players, including edotco. We are well positioned with sufficient financial strength and firm backing from Axiata and we look forward to expanding our network and implementing our regional expertise in Myanmar for the benefit of all. Assuming the transaction closes as expected, we will hope to begin building new towers sometime in 2016.
**edotco 360: Driving organic and inorganic growth while developing best practices**

How edotco is implementing and adapting its execution strategy across its footprint

Continuing TowerXchange’s ‘edotco 360’ series, we spoke to CFO Thivanka Rangala about organic growth: new towers and tenants, inorganic growth including the acquisition of Digicel Myanmar Tower Company, and how their standardised solutions are improving service levels across edotco’s footprint.

**Keywords:** Anchor Tenant, Asia, Axiata Group, Bangladesh, Bankability, Build-to-Suit, C-level Perspective, Cambodia, Carve Out, Co-locations, edotco, Infrastructure Funds, Infrastructure Sharing, Investment, Malaysia, Market Overview, Myanmar, Procurement, RMS, ROI, Towercos

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**Read this article to learn:**
- edotco’s growth rate and tower deployments over the past year
- Best practices for standardising operations across a footprint
- The progress of edotco’s new Myanmar footprint
- edotco’s plans for future growth across the region

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**TowerXchange:** Can you give us an update on the progress of edotco over the past year from your perspective?

**Thivanka Rangala, CFO, edotco:** Last year we had just shy of 13,000 towers and now we have more than 15,000; this isn’t M&A activity either, it’s just pure growth, which has been amazing. Our tenancy ratios have also improved this year: the number of tenancies in the portfolio has increased from 17,000 to 21,000 in the year to date (this interview was conducted in Q4 2015).

August was a great month for us and we made some major advances, and all of this while improving the co-location ratio. We’re looking at our portfolios and moving a lot of operations into shared service structures and developing a standardised execution across our footprint which helps us to execute more seamlessly. We want to ensure that if a member of the team from Bangladesh comes to Malaysia there are no major differences in operations other than minor tweaks in the local environment; this includes IT systems and platforms supporting operations. Some systems require a bit more development in terms of security, and there is always room for improvement in streamlining deployment and getting new operations up and running. There has been a lot of activity focussed on this and it’s really helping to leverage the scale of the edotco group. We’ve also standardised procurement; our genset towers are now managed in a coordinated manner with common vendors and preferred suppliers. We have one RMS vendor that is growing along with us and this continues to
support our scale across our portfolio of 15,000+ towers and we get a good price point. The standard MNO footprint would normally be around 8,000 towers, so our scale really brings amazing benefits.

Having common infrastructure across the footprint acts as a foundation for our operations, and it's easier to work with our customers to deal with environmental solutions. Some of our footprints face difficult conditions that can lead to disruptions including power outages and landslides during monsoon season. We have achieved some tremendous improvements to uptime by pre-planning for incidents such as floods. These include having boats and portable generators ready to deploy and keeping equipment above the highest water mark. We've made impressive improvements in Bangladesh, one of our markets with the most challenging conditions, and we've focussed on key areas to deliver increased uptime. The lessons we've learned in Bangladesh can be used in Cambodia and Malaysia. We have a sequence of actions, tools to be had on standby, and partners that can supply generators, and this model can be deployed across our footprint.

TowerXchange: Can you share any details on the new acquisition in Myanmar and the recent sukuk that was announced?

Thivanka Rangala, CFO, edotco: Myanmar is an interesting addition to edotco; when the mobile licenses were first on offer it seems half the MNOs across the globe tried to come into this underserved market. We believe that there will still be significant growth for the next few years, and that the operational efficiencies that we've developed elsewhere at edotco can be brought into play and bring a lot of value.

As in other footprints, engineering solutions, RMS and logistical efficiencies are already being implemented and progress is very positive and on target to be a great addition to the portfolio.

The US$500mn sukuk was taken on by the Axiata Group, and some of the proceeds have been passed on to edotco; US$125mn has been earmarked for edotco in total to support new operations in Myanmar. We're excited to have a new footprint to add to the edotco group.

TowerXchange: Are there any other acquisitions planned in the near-term or are you more focussed on consolidating in Myanmar?

Thivanka Rangala, CFO, edotco: We will explore any opportunity, but at this stage we don't have anything confirmed to mention. Our focus will be on identifying opportunities in the countries where we already have a presence, and then identifying other complementary markets across the region that will merge well with our portfolio.

We're actively exploring to see the value of available assets, and definitely look more for quality rather than quantity. We have a few benchmarks that we use to choose markets and opportunities: these include location, financial feasibility, the standard of the towers, who the anchors would be, the quality of the MLA, and market maturity. The consolidation phase can be tricky; we have to bear in mind the macroeconomics of the footprint and be quite disciplined about identifying the real growth opportunity. It's complicated; it's not limited to the quality of the towers, there are a lot of drivers including regulations and licensing that need to factored in to ensure that we can operate without issues.

TowerXchange: Can you share some more details on the lessons learned by edotco about managing assets and manpower thus far?

Thivanka Rangala, CFO, edotco: When restructuring infrastructure from the operators in the Axiata Group, building new teams and operations is not an easy process; there is a tremendous amount of work
involved, and it also requires a culture shift from a human perspective.

Operators focus on their network, and on their customer facing operations trying to keep large numbers of subscribers happy. This is a very different mindset from towercos and passive infrastructure management. There is quite a difference in the level of granularity that MNOs and towercos use when looking at a portfolio. It’s also challenging when someone transfers over to a towerco and their former colleagues and friends at the MNO become clients and the relationships need to change. A lot comes into play in keeping assets separate; this requires a cultural shift that has to be managed as it requires a completely different mindset. Some people don’t grasp this idea completely at the start and it takes some time and a lot of work to get used to. Approaches to lifecycle management and other processes are significantly different from those in an MNO.

edotco is a subsidiary of the Axiata Group, but we operate in an extremely independent manner; we have a full board of independent directors and the relationship with the Axiata Group is well formulated. The management of the leases that edotco signs is more important than anything else, and we hold true to the contract that we hold with clients; these are kept completely separate from the Axiata Group operators. We walk the walk and it has earned us recognition in the markets that we operate in. We’re starting to see this in increase in actual orders coming in from operators, and a key element in this is the degree to which we have refined our operations.
Wan Zainal, CSCAO, edotco: From a sales and marketing perspective we have created a new tower product management division, which is instrumental in enhancing our services. Over the past year we have invested time and assets into new products to roll out in our various markets, and all of the new products tie back to our main aim of delivering optimal value to clients. The new products also reinforce and compliment our core build to suit (BTS) and co-location propositions.

One of these new products is our new RMS solution echo; we have productised it and are in the process of implementing it across our footprint of over 16,000 towers. This is a very challenging process on the ground, and we have different applications categorised by use case including locks and sites with cameras for security, environment management and energy and fuel consumption management through sensor monitoring.

Wan Zainal, CSCAO, edotco: echo is already starting to pay off. In Q4 there was an incident in Bangladesh where the system alerted us to a rapid drop in diesel levels at some sites. After engineers investigated we found that thieves had stolen approximately 360 litres of diesel. Thanks to the
early warning we were able to respond quickly, catch the thieves who worked for one of our suppliers, and fired the perpetrators through the proper channels.

We’re productising this service to the point where we can offer it to other MNOs and towercos, and the applications are not limited to towers; we currently have a trial on a non-edotco site with an ISP in Bangladesh.

**TowerXchange: What other products and services are you deploying across your footprint?**

**Wan Zainal, CSCAO, edotco:** We’re also investing in and developing new energy solutions including providing energy capex and opex recovery for pass-through services, providing full energy as a service, and providing green energy solutions.

Another interesting potential service is the use of UAVs (unmanned aerial vehicles) to inspect remote tower assets. We’re currently using this internally at edotco and we’re looking into opening it up to use by clients.

Our team is also starting to work with major landowners and property developers in some of our markets and signing exclusive deals, acting as telecommunication infrastructure partner for them. Traditionally MNOs would work with the major landowners, property developer to obtain permission to build towers individually which could result in parallel capacity. In this case what edotco does is plan out the telecommunication infrastructure need for the area or township, and help to market those sites to MNO and promote co-locations. We also work closely with the landowners on specific requirement for camouflage, special structure and in area that makes sense, BTS hotels to fully optimise space and resources. We’ve done this in Malaysia, and we’re trying to repeat this success in other markets like Bangladesh, Pakistan and Cambodia.

Our various products are starting to show results, particularly in Bangladesh where there has been a lot of focus on operations and internal projects to ensure delivery capabilities. The team in Bangladesh rolled out more than 2,000 towers in 2015, and that was up from 600 in 2014, which is amazing work.

**TowerXchange: How is your message to the market changing as edotco evolves?**

**Wan Zainal, CSCAO, edotco:** Our message to the market is consistent; we’re still focussed on increasing co-locations, and developing new products to enable connectivity.

We’re also standardising our sales methodology across the group and localising our services across different markets. We believe in standardisation to increase operational efficiency. The same principles apply across most markets with some tweaks to messaging and sales strategy in different markets; there are some differences between Malaysia, Cambodia, Bangladesh, Sri Lanka and Myanmar that need to be taken into account. For example, in Bangladesh we need to look into how pricing works and we need to be competitive. In Malaysia rates are standard across the whole market, and in this market we need to focus on value add products like echo. That’s how we get our propositions across; the strategy varies from market to market.
edotco 360: how edotco are operationalising the first Pan-Asian towerco

CEO Suresh Sidhu on the need to deliver real, transparent operational improvement, and to contribute toward Nation Building

By way of a preview of his keynote presentation at the second annual TowerXchange Meetup Asia we spoke with Suresh Sidhu, CEO of edotco for an update on the development of the first pan-Asian towerco. We discussed the progress of the company’s regional divisions, their efforts to evangelise the towerco model with regulators and other stakeholders across the region, their future M&A strategy, and the shape of things to come in the Asian tower industry.

Keywords: 3G, 4G, Asia, Asia Insights, Axiata, Bangladesh, Bankability, Business Model, Cambodia, Capex, edotco, Infrastructure Sharing, LTE, Malaysia, Market Forecasts, Market Overview, MNOs, Myanmar, New License, Pakistan, RMS, Regulations, Sri Lanka, Transfer Assets, Who’s Who

TowerXchange: Please bring us up to date on the progress of edotco since the last TowerXchange Meetup Asia - how has your footprint expanded, how has the business grown organically, how have the capabilities of the business crystalised?

Suresh Sidhu, CEO, edotco: There has been a lot going on; it’s still a huge task getting edotco established and operational and known in five, now six, markets in one go. There has been a lot of engagement with the regulators in each market; this engagement is something that edotco is pioneering in many of these countries. We’ve been doing a lot of employee engagement as we have to reassure employees and major brands in new markets that the independent tower business model is an opportunity, not a risk – I’ve been working on this personally.

In terms of operations we now have our 15,000th tower under management. We installed our echo remote monitoring solution in 5,000 sites in a year, and caught our first diesel thieves who were stealing 300L in Chittagong. The operational development of our sites is characterised by stories like this; they’re small but important examples of the difference we make.

By the latter part of 2015 we had become comfortable with our progress in our existing five markets such that we’ve advanced our M&A agenda to enter new markets. This has culminated in the acceptance of our offer to acquire MTC in Myanmar which is a great market which will add lustre to our growth potential. If all goes well and that

Read this article to learn:
- The progress of edotco’s operations in its six markets
- edotco’s engagement with regulators and other government stakeholders across the region
- edotco’s future M&A activity
- edotco’s definition of customer satisfaction beyond the achievement of SLAs
- edotco’s predictions for the future of the Asian tower industry
acquisition is approved, 2016 will be off to a good start and we will be close to our January target of owning and operating 16,500 towers.

TowerXchange: How are your different regional businesses progressing?

Suresh Sidhu, CEO, edotco: Our local offices are setup and our Country Managing Directors are in place and reporting in from their markets. Malaysia is fully licensed and fully operational. Bangladesh is fully operational, and operating under a no-action certificate from the regulator. In Cambodia we have a license in place and the team has transferred to the new entity; we're just awaiting tax authority approvals to make it a fully-owned subsidiary, hopefully within the next Quarter. It's being run as a managed service in the interim. In Pakistan we're awaiting approval of ownership for our entity there, which we expect this Quarter. In Sri Lanka there isn't a license framework yet, so we're operating as a managed service and launching edotco as a services company, so the staff report formally as a fully owned subsidiary.

There is a lot of buzz at the moment; the regional management are all flying back and forth between headquarters and their markets for Quarterly management meetings. They're working harder than ever toward their end-of-year bonus targets!

Myanmar adds another dimension; once we are fully operational there we can focus on becoming the largest independent towerco in Myanmar too.

We acquired a business in Myanmar, not just assets – the core management team from MTC is in place, and the current assumption is that we would like them to stay on. As for future builds, we anticipate being ready for the next rollout phase. We have a capital plan which includes future funding for Myanmar which was approved based on a certain expectation of growth in this market. We're hoping for quick approval to work on business development and capital plans so that we can push the button on this when the time comes.

TowerXchange: How are the local governments and regulators helping edotco to maximise the efficiencies of infrastructure sharing?

Suresh Sidhu, CEO, edotco: In every country there's a period of education and consultation in creating the right framework for the towerco model, and each market presents its own challenges. For example we had early success in Cambodia; we were there at the right time as they had noticed the benefits of the towerco model in other markets and were keen to proceed.

In other countries, our initial engagement typically consists of highlighting the benefits of the shared infrastructure model. Generally we find that government stakeholders are able to grasp the benefits quickly and they resonate with their aspirations for National development. The challenge is in creating a framework for towercos to operate. There are a myriad of taxation, import laws and land laws which make the complexities different from country to country. For example to operate as a towerco in Sri Lanka it's important to get a VAT exemption, as Sri Lankan MNOs run under a tax exempt license so they don't have any output tax to offset and therefore outsourcing towers becomes more expensive and a tax liability. This is a common issue across different markets; tax regimes are designed to incentivise telecoms networks under the assumption of an integrated telecoms model.

It's not just regulators that you need a dialogue with, but ICT and other Ministries as well. These are lessons we didn't understand when we started operating, but that we are integrating now. Typically a decision of this nature requires relationships with different government stakeholders in telecoms. The traditional approach is to take time talking to the regulatory authority, and in all of our countries the regulator is separate from the Ministries. The different government and regulatory stakeholders need to be aligned and you need to ensure that all levels of the government know what you're doing.

One of the key lessons we learned is that many emerging market countries have BOI (Board of Investment) structures which can be very helpful in ensuring the right environment as we're effectively bringing fresh capital into the country. We only discovered their importance later, since our first port of call had previously been the regulator.

We've put these lessons to use in creating a broad-based understanding with the government beyond a single regulatory authority, thus solving
issues linked to tax revenue which is a major consideration for business model viability. We need to help governments to trust that net tax revenues will always increase. The process is more complex than we believed at the beginning, and this was the main reason for the delay in getting things operational.

TowerXchange: Appreciating you can’t comment on specific ongoing processes, how would you generally characterise edotco’s appetite for further acquisitions within (or even beyond) Southeast Asia? Should we see your intent to acquire MTC as illustrative of an appetite to expand beyond the Axiata Group footprint?

Suresh Sidhu, CEO, edotco: We’re very open to new deals, and we’re largely focussing on opportunities within our Asian footprint, although not necessarily restricted to the Axiata footprint. In the meantime we’re focussed on consolidating our operating model and improving it, and there are some great opportunities on our doorstep.

There has been a shift in the last twelve to eighteen months and a surge in interest in infrastructure sharing and the spinoff of infrastructure sharing across Asia; it’s already eclipsed the African and European markets as we estimate the number of towers available for sale in Asia to be around 100,000. We’re not trying to buy them all, I hasten to add – we’ll leave the private equity backed guys to gobble up certain assets!

Thanks to this surge in the Asian market we’re in the right place at the right time and we’re better suited to focus on specific countries here that are close to home. We understand how to operate in this region, and we understand that operations and financial value creation are important for customers and for governments here. For example, people are excited by the fact that the cost of buying steel is a net outflow for most of these countries and this makes forex deficits decrease.

M&A will be a major part of our strategy, but naturally we will be selective; it all depends on which towers are available and what the terms are. In Pakistan, for example, we’re committed to an organic build-out, and we will also pursue any M&A opportunity that looks appropriate. Pakistan is a market that we’re keen on but again the deal has to be right as there are a lot of opportunities and challenges there, so any acquisition must be well thought through.

Decommissioning is also at play in Pakistan as unsightly parallel infrastructure is torn down to consolidate coverage. We’re looking at making offers to some parties, and even if we don’t acquire portfolios we can do more micro consolidations and put two to three parties together, then convert the opex to one lease. There is typically a 40% to 60% tower overlap in Pakistan; for example in a town square in the middle of Islamabad there are five rooftop structures next to each other. There is an opportunity to harmonise and make the place look much better. Increasingly the regulators and government are paying more attention to aesthetics as historically mobile infrastructure hasn’t been the prettiest, and now there is growing advocacy to improve this in both Pakistan and Malaysia.

TowerXchange: What does ‘customer satisfaction’ mean for edotco and your customers, beyond the achievement of SLAs?
Suresh Sidhu, CEO, edotco: Non-Axiata customers in markets where we have Axiata carve outs are increasingly excited about the benefits of infrastructure sharing. A number of non-Axiata operators now trust the independence of our operations and are signing substantial co-location deals.

Operationally it is a challenge to convert a vertically integrated business model to one that’s separated. Inefficiencies that were papered over in the past due to friendships between the local companies now have the potential to become flashpoints because people are paying for the service.

One of the keys is to manage expectations well and we’re in the process of training everyone on customer relationship management. Even if you’re a field engineer and an old friend at an operator who used to own the towers asks you to do something, sometimes you need to disagree. This is where clear communication and expectation management are especially important.

However, like in all businesses, customers are always happier if you go above and beyond expectations. One way we do this is crisis management, for example during the floods that regularly occur in some of our markets. In Bangladesh we had a dedicated team helping maintain uptime during monsoon season using makeshift boats and portable gensets!

The other way we exceed expectations is with innovation; in an industry as tectonic as towers, innovation, new ideas, being proactive about new locations that customers aren’t familiar with, and other new concepts make all the difference. For example our first twenty five BTS hotel sites are soon being launched in Malaysia; we’re acting ahead of the curve and helping our customers to get solutions in place.

Finally we’re also working on dealing with the real pain point: energy. We’re putting more attention on that this year, moving from energy as a service to implementing more sustainable solutions and thus reducing energy costs even if passed through.

We’ve rolled out echo remote monitoring and management systems on 5,000 sites already, and we’re already starting to see benefits. We identified some subcontractors who thought they’d make some money on the side stealing 300L of diesel in Chittagong; an alert was triggered which led to the Bangladesh team investigating. They found that two employees had been carrying out the theft together on an alternating basis. We’re seeing a lot of micro-wins like this on the ground and we can offer total transparency to customers. For example, our new BTS are all outdoors, but we have a substantial footprint in shelters in arctic boxes that can run at 30-35ºC yet are running at 18º. There is a potential US$40pcm average saving on each of these sites just from normalising the temperatures, depending on cabin insulation condition, air-conditioning efficiency and environmental factors. We also have a lot of insights like these into the demographics of the operational business which adds value to customer relationships.

TowerXchange: What does the future hold for the telecom tower industry in Asia?

Suresh Sidhu, CEO, edotco: We anticipate the acceleration of the unbundling of traditional MNO into dedicated infrastructure companies, but we’re also seeing small cells, IBS and BTS hotels appearing. Semi-active infrastructure is starting to appear in markets like Malaysia, but this will be the prevalent source of growth in other markets within five years.

The future is extremely bright for the towerco model, but there are some caveats; anyone participating in this needs to move away from the financial investor approach. There will be appropriate financial returns but there needs to be a focus on two important objectives. Firstly we must deliver real, transparent operational improvement, increasing uptime, and reducing TCO over the long-term; some customers are asking us to lock in benefits, even upon sister companies, so we have to deliver on this! Secondly, there needs to be engagement with regulatory and other relevant national bodies. They see fundamental infrastructure as critical to Nation Building; we have to participate and invest in this and become a true partner to the country, not just a foreign investor. In the past the tower model has been perceived as just a “good deal”, but now customer demand is shifting and governments are asking what we’re doing for the country.
Consolidation among towercos starts as rollout approaches halfway point

With the acquisition of MTC by edotco announced, Myanmar is now home to six tower companies, four of which are deeply engaged in the third phase of the rollout. New towers are going up by the dozen and the rollout remains broadly on track with GSMA forecasts suggesting 7,600 towers would be constructed by the end of 2015 and 17,300 by the end of 2017. The build rate may be impressive, but how are tenancy ratios progressing? TowerXchange’s Myanmar rollout FAQ summarises the latest market dynamics and baseline data.

Keywords: Research, Asia Research, TowerXchange Research, Tower Count, Who’s Who, Towercos, edotco, Construction, Market Overview, Investment, 3G, Capex, Lease Rates, Urban vs Rural, Tenancy Ratios, Market Forecasts, Network Rollout, Build-to-Suit, Bankability, New Market Entrant, Leasing & Permitting, ARPU, Regulation, SLA, Off-Grid, ESCOs, Solar, Fuel Cell, Greenfield, Dimensioning, Rooftop, Private Equity, Debt Finance, Customs, RMS, Site Management System, Infrastructure Sharing, Asia, Myanmar, MPT, KGSM, KDDI, Sumitomo, Ooredoo, Telenor, YTP, MECTel, Viettel, MCIT

Mobile market

1. Who are Myanmar’s operators?

State-backed incumbent operator, Myanmar Post and Telecommunications (MPT), now backed by KDDI-Sumitomo joint venture KGSM, remains the market leader, although their market share declined from 66.6% to 50.3% between Q4 2014 and Q2 2015.

International new licensees Ooredoo and Telenor launched services in August and September 2014 respectively, and both raced to a million subscribers within weeks. Telenor has more subscribers in total, Ooredoo has more 3G subscribers.

2. What is the latest on Myanmar’s prospective fourth operator?

At time of writing, Myanmar’s Ministry of Communications and Information Technology (MCIT) had postponed the allocation of the nation’s fourth mobile licence due to delays in selection from 17 local companies who applied to join a consortium with an international counterparty which would receive the coveted fourth license. Local ISP Yatanarpon Teleport (YTP), which was granted a limited private operator license in February 2015, remains a favorite.

Seeking to raise over US$1bn in international investment, YTP has been the subject of on-off partnership rumours, starting with Thailand’s True

Read this article to learn:
- Competitive dynamics between MPT, Telenor and Ooredoo, and the prospects for a fourth MNO
- How many towers have been built in phases one and two, and who has been awarded contracts to build phase three towers?
- edotco to acquire MTC - will further consolidation follow?
- How are lease rates and tenancy ratios affecting the investibility of Myanmar’s towercos?
- What you need to know about cell site electrification, energy equipment suppliers, importation and ownership in Myanmar

By Kieron Osmotherly, CEO, TowerXchange

www.towerxchange.com
and Malaysia’s Axiata, while more recently Reuters reported a prospective US$800mn partnership with Vietnam’s Viettel. While the talks with Viettel have not been formally discontinued (insofar as they were ever formally started!), in May 2015 the Myanmar Times quoted YTP CEO U Shane Thu Aung as saying: “We are founding a new consortium under the direction of a management committee, which includes the deputy minister of the Ministry of Communications and Information Technology… The second stage will be forming a joint venture with a foreign partner.” Aung went on to suggest that it had not yet been determined whether the Myanmar government would hold a majority stake.

3. Will the Myanmar military play a role in the telecoms rollout?

The precise role of MECTel, part of the military-owned Myanmar Economic Corporation which had been announced as a joint venture partner of MPT, remains unclear – they could become part of YTP’s consortium, they could yet emerge as a fifth operator.

Military participation in the Myanmar tower rollout has its advantages. For example, the assumption that many rural towers will need to be built with capacity for microwave backhaul may be incorrect as apparently there are thousands of military bunkers connected by fibre. In addition to possibly making this fibre available as a transmission network, the military continue to own a significant amount of land.

4. What spectrum has been allocated to Myanmar’s two new international MNOs, and have any LTE trials taken place?

According to Hardiman Telecommunications, Telenor and Ooredoo each received 2 X 5 MHz in the 900 MHz band, and 2 X 10 MHz in the 2100 MHz band. Both have suggested a future migration to LTE. Telenor acquired a further 5MHz of 2100 MHz spectrum in 2015 for US$75mn.” so it now reads “Both have suggested a future migration to LTE. Telenor acquired a further 5MHz of 2100 MHz spectrum in 2015 for US$75mn. MPT undertook trials of LTE using 20 MHz in the 1800 MHz band during the course of 2013. YTP currently operates WiMAX, and claims 40 MHz in the 2600 MHz band and has announced plans to migrate to LTE.

5. How have mobile subscriber numbers grown in Myanmar, and what mobile penetration does that represent?

There were 27.8mn mobile subscribers at the end of Q2 2015, representing 54% penetration. Subscriber numbers increased by almost 10mn since Q1 2015 when 18.1mn subscribers were reported, itself representing a 33% YOY increase from the 5.4mn subscribers reported a year earlier before the launch of Telenor and Ooredoo.
6. How many of those subscribers are on smartphones?

80% of Ooredoo subscribers are smartphone users, compared to around two thirds of Telenor’s. Bear in mind that mobile services and early adopters remain concentrated in Myanmar’s relatively affluent big cities, so that proportion is expected to fall as coverage is extended into rural areas with lower GDP per capital.

7. What was each operator’s market share at the end of Q2 2015?

Telenor continues to add over 3mn subscribers every quarter, concluding Q2 2015 with 9.5mn subscribers, 55% of which were active data users. This represented 34.2% market share. Around 1.5mn of Telenor’s subscribers are 3G users whereas all 4.3mn Ooredoo subscribers are 3G. Ooredoo added 1mn subscribers, finishing Q2 2015 on 15.5% market share, down from 18.2% the previous quarter.

MPT had seen subscriber numbers fall (by 2.6mn) for the first time in Q1 2015, but recovered to climb to 14mn in Q2, retaining market leadership with 50.3%.

8. What levels of ARPU are being reported?

Telenor reported higher than anticipated ARPU of US$6.4 in Q1 2015, impacted by early adopters with high usage, slipping to $5.7 in Q2 as lower ARPU generators in rural Myanmar were connected. Ooredoo’s 3G-only network continues to generate slightly higher ARPU of US$6.5. In their Q1 2015 conference call, Ooredoo CFO Ajay Bahri suggested “what you are seeing right now is the ARPU from the high-income and high-GDP areas. As we move to more semi-urban areas, I think you will obviously see an impact of that as well. And within the urban areas, as we move to the next segment of the customers, I think that one should expect some sort of an ARPU decline.”

9. Any sign of price wars breaking out?

In October 2015 MPT dropped Internet charges from 7 to 6 kyat per MB, with voice calls coming in at 23 kyat per minute. In comparison Ooredoo offered a lower rate of 4.5-5.5 kyat per MB.

10. How much capex is being deployed by the new licensees?

Telenor continues to deploy capex more aggressively into Myanmar. Telenor’s total capex deployed in Myanmar to date is US$692.1mn, including US$106.9mn deployed in Q2 2015.

Ooredoo deployed US$416.3mn capex in Myanmar, including US$54.7mn deployed in Q2 2015.

11. How many towers have been built to date?

- TPT / KDDI Summit: 2,400
- IGT for Telenor and Ooredoo: 2,900
- Apollo for Telenor: 1,827
- PAMEL for Ooredoo: 1,040
- MTC for Ooredoo – now edotco: 1,250
- EFT for Telenor: 1,220
- MIG for Ooredoo: 700
- EFT for Telenor: 503

Source: TowerXchange
Phases one and two of Telenor and Ooredoo’s rollout, which concentrated on Yangon, Mandalay, Naypyidaw and the transport links between these three largest cities, are now complete. Together with MPT / KGSM’s towers, TowerXchange estimate 7,410 towers have been built in Myanmar, although not all are on air.

Telenor added 718 new sites in Q1 and a further 536 sites in Q2 2015, bringing their total at the time to 2,308.

Ooredoo are less open about their tower count, which is believed to be approaching 2,000.

MPT has around 2,400 sites, with increasing use of co-location as well as continuing to build.

12. What does that translate to in terms of coverage?

MPT still has the widest coverage in Myanmar, but Telenor now connect to 113 townships which is roughly two-thirds of all townships in the country, while Ooredoo currently cover 35mn citizens, just under 70% population coverage.

13. What caused the phases one and two of the rollout to run approximately three months late?

Phases one and two of the rollout suffered operational delays for a variety of reasons, from the time taken to establish and train local construction resources, and the inability to complete certain tasks during the monsoon season, to bureaucratic delays, from importing equipment (at one point the rollout effectively ran out of steel!) and permitting sites, to the year-plus taken to grant licenses to Myanmar’s towercos. This has created knock-on financial delays, compounding the already challenging task of attracting investment into Myanmar's towercos.

It remains to be seen whether Myanmar's towercos can pick up the pace of rollout during phase three and enable Telenor and Ooredoo to meet the aggressive coverage obligations set out in their licenses.

14. What has been the progress to date of phase three of the rollout?

Phase three of the rollout is well under way with the four towercos involved, IGT, Apollo, EFT and MIG, building dozens of new towers per month. Priorities had to be shifted during the rainy season, when it became difficult to pour foundations in the Northern States, but site acquisition and equipment delivery continued, and build contractors focused on the drier Southern states.

“All that really distinguishes the first from the latest phase of the rollout is that there is a new Purchase Order (PO) for this next phase – in reality there is some overlap in terms of execution,” stated Apollo CEO Philippe Luxcey in a recent TowerXchange interview. “Our first phase build is all but complete, and we’ve already started building the 717 towers in the next phase.”

15. A-Z of Myanmar’s towercos: What did each towerco build in phase one and two, and what contracts have been secured in phase three?

Apollo Towers built around 1,100 towers for Telenor in phases one and two and have since secured a contract to build a further 700 towers for Telenor in phase three. Apollo Towers is Chaired by serial towerco entrepreneur Sanjiv Ahuja, who was the original Chairman of Eaton Towers in Africa and who is behind the new Staghorn Infrastructure venture in the US. Ahuja’s Tillman Global Holdings and Texas Pacific Group are the majority shareholders of Apollo Towers Myanmar, whose Managing Director is Philippe Luxcey. Apollo provides a ‘full service’ tower and power offering.

Digicel Myanmar Tower Company (MTC) built 1,250 towers for Ooredoo in phases one and two of the rollout. MTC’s portfolio featured some prime urban locations secured by Digicel’s site finders in advance of the company’s ultimately unsuccessful bid for an MNO license in Myanmar. Axiata-owned towerco edotco recently announced intent to acquire a majority stake in MTC from Digicel for US$221mn. edotco are believed to have beaten competition from PAMEL and American Tower to secure the assets. The acquisition remains subject to regulatory approval and the consent of minority shareholder Yoma Strategic Holdings, chaired and 37% owned by local tycoon Serge Pun. CEO Oliver Coughlan represented MTC at the most recent TowerXchange Meetup Asia. Digicel MTC provides a conventional ‘steel and grass’ offering – anchor tenant Ooredoo retains ownership of power assets.
Eco-Friendly Towers (EFT), a subsidiary of diversified Myanmar conglomerate Young Investment Group, is a new entrant towerco. EFT has secured an order for roughly 700 phase three towers from Telenor. EFT were initially the only towerco able to deploy and manage towers in several Northern Myanmar States, where security can be challenging, but TowerXchange sources have confirmed that EFT’s phase three contract is nationwide. Young Investment Group Chairman Thiha Aung represented EFT at the most recent TowerXchange Meetup Asia. EFT provides a ‘full service’ tower+power offering.

When we last checked in with Irrawaddy Green Towers (IGT), they had built 1,500 of 2,000 towers in phases one and two for Telenor, and have reportedly secured an order for a further 1,000 phase three towers, this time from Ooredoo. IGT was initially established as a partnership between Alcazar Capital Limited and Viom Quippo, whose former Group President Arun Kapur continues to serve as Executive Chairman and who, together with then CFO Karim Dakki, represented IGT at the most recent TowerXchange Meetup Asia. Today IGT’s sponsors still include Alcazar Capital, plus EPC Investors, M1 Group and Barons Telelink (a local Myanmar company). IGT provides a ‘full service’ tower+power offering.

Myanmar Infrastructure Group (MIG) is a joint venture between majority shareholder Singapore Myanmar Investco (SMI) and Golden Infrastructure Group (GIG), a venture involving Dan Ryan of Square1 Infrastructure. MIG had proved themselves building rooftops and poles in for both Telenor and Ooredoo in Yangon, as well as executing a substantial DAS project within Yangon’s airport, off the back of which they have secured a contract to build 503 towers in phase three of Ooredoo’s rollout. MIG has access to the capital markets via SMI’s Singapore stock exchange listing. MIG provides a full service tower+power proposition.

Pan Asia Majestic Eagle Limited (PAMEL, sometimes referred to as Pan Asia Towers or PAT) built 1,250 towers for Ooredoo in phases one and two. Along with Michael Gearon, PAMEL has management DNA in common with Indonesia’s ProteLindo, but remains a distinct entity. In 2014 PAMEL secured US$85mn in financing from a consortium of five banks: DBS, ING, OCBC, Standard Chartered and Sumitomo Mitsui. PAMEL has not yet announced any participation in the third phase of the rollout, and was reportedly engaged in intense negotiations with Ooredoo on lease rates.

The final picture of phase three of the rollout may not yet be complete. TowerXchange sources suggest that Telenor may have a couple of hundred additional phase three sites to award, Ooredoo perhaps as many as 1,000 (which could be an opportunity for PAMEL or edotco).

16. What is TowerXchange’s verdict on edotco’s...
edotco’s acquisition of a majority stake in MTC and their portfolio of 1,250 towers sets a benchmark price per tower of US$176,800 in Myanmar. While this is a considerably higher price than India, where towers changed hands for an average of US$114,301 between 2009 and 2015, lease rates in India are typically just US$600 whereas is Myanmar lease rates range from US$1,400 to US$1,700, driven by relatively high opex.

Another factor which justifies the price paid for MTC’s towers is that they were built in phase one of the rollout (which concentrated on Myanmar’s three biggest cities, Yangon, Mandalay and Naypyidaw), and built on highly desirable sites secured by Digicel in advance of their own ultimately unsuccessful bid for an operator license in Myanmar.

Whether US$176,800 remains a sustainable benchmark price for a Myanmar tower remains to be seen. But the premium paid by edotco to secure some of Myanmar’s most attractive towers, and to establish their maiden transaction beyond the Axiata footprint, seems justifiable to us.

17. Will phase three of the rollout draw towercos deeper into rural areas?

“Geographically the first round of towers was aimed at getting coverage up the central spine of Myanmar. Now it’s going to be much more spread out, mostly in rural areas, with fewer rooftop towers,” said Apollo Towers CEO Phillippe in a recent article in the Myanmar Times.

“It will become more difficult in terms of access roads as we begin to build in more remote places, and there’s still a lot of Myanmar to cover.”

18. Are Myanmar’s towercos finally licensed?

All four towercos (Apollo, IGT, MTC and PAMEL) who rolled out towers in phases one and two received “Network Facilities Service (Class)” or NFS(C) licenses on 3 February 2015, just over a year after Ooredoo and Telenor were granted their licenses.

MIG and EFT’s licenses have been applied for. Any delays to licensing MIG and EFT are unlikely to be problematic as a precedent has already been established by the MCIT to allow towercos to trade whilst license applications are progressed.

19. Is the regulatory regime around Myanmar’s towercos now complete?

“The Ministry of Communications and information Technologies has not yet issued all of the rules and regulations required to be issued under the Telecommunications Law, leading to continued regulatory uncertainty in key areas,” said Nicholas Towle of DFDL in a recent edition of NCRA’s “Myanmar: All That Matters.”

Mature tower markets are often characterised by regulation introducing a uniform approach to permitting, standardising processes across the various municipalities and authorities whose permission is required to build a site. However, in Myanmar permitting remains “a long process, and the government has so far not been able to arrange for a ‘blanket’ permit to override the need for individual permits in each case,” said DFDL’s Towle in the same publication. “Some tower companies have had to rely on letters of ‘no objection’ from village and town chiefs to give the go-ahead for construction and this is not a satisfactory legal basis for the future.”

Proving title within incomplete land registries, with many farmers having not yet applied for land use rights under the Farmland Act of 2012, complicates site acquisition for towercos. And even once they’ve secured a site, towerco’s exemption to the usual rule restricting foreign entities from leasing land for more than one year seems to not always be recognised by Myanmar’s Office of Registration.

20. What does a towerco’s “Network Facilities Service (Class)” or NFS(C) license cost in Myanmar?

The fees payable for an NFS(C) license in Myanmar are currently MMK 12.5mn per year (~US$12,000), plus 0.5% of relevant revenues and a MMK 2.5mn application / registration fee (~US$2,400).

21. What are prevailing lease rates in Myanmar?

Lease rates are seldom in the public domain, but TowerXchange research suggests that Telenor’s phase one and two lease rates were ~US$1,400pcm,
TowerXchange research suggests that Telenor’s phase one and two lease rates were ~US$1,400pcm, with Ooredoo’s a little over US$1,700. The difference is explained for by the heavier, more power hungry but ultimately efficient equipment mounted on Ooredoo’s towers.

Such lease rates are relatively high by Asian standards, but equipment and construction costs are much lower elsewhere on the continent, particularly in India, where local towercos benefit both from economies of scale and from certain tax breaks as a result of being conferred infrastructure status. A better benchmark might be some of the more challenging SSA tower markets, in which case Myanmar’s lease rates appear on the low side.

22. What has been the progress of tower sharing in Myanmar?

Telenor and Ooredoo continue to appoint different towercos and, to date, have shared few of the towers built during phases one and two of the rollout.

Initially it looked like a more co-ordinated approach might be taken for phase three, known as “Project Optima”, in which Telenor would be the anchor tenant and Ooredoo would co-locate, but the strategy floundered, owing to difficulties agreeing a uniform lease rate given the different load requirements of Telenor and Ooredoo’s equipment.

Ajay Bahri, CFO of Ooredoo, said in their Q1 2015 conf call: “In terms of tower sharing… it has been a little more challenging to come to a conclusion than we initially anticipated, which is not unusual in a highly competitive environment as well where each one is trying to launch earlier than the other. But as in all markets when a little stability comes in, which is what we assume we should be reaching through, a more higher percentage of sharing would be evident then.”

Petter Furberg, CEO of Telenor Myanmar said in an email to the Myanmar Times: “Telenor is focused on building a long term sustainable cost structure which will allow us to offer the most affordable services to the mass market in Myanmar and at the most remote places in Myanmar; tower sharing is an important element to make this happen.”

Tenancy ratios remain much nearer one than two, but Myanmar’s towercos remain bullish about the prospects for improved lease up rates as networks fill up with capacity and cell splitting is required, and as MPT and, eventually, YPT expand through co-location. YPT seem to be planning extensive co-location, quoting CEO U Shane Thu Aung in the Myanmar Times: “we will come in very fast and use the existing infrastructure,” going on to suggest YPT had ongoing discussions with tower companies, but had not yet commissioned any sites.

When TowerXchange visited Yangon last year, it was apparent that few of incumbent operator MPT’s then 1,800 cell sites, consisting primarily of guyed-masts, had the structural capacity for multiple tenants, and sure enough MPT has since confirmed that less than 100 of their towers are suitable for co-location.

23. How investible are Myanmar’s towercos?

There has been plenty of capital interested in tower investments in Myanmar, but CFOs report it has been tough to close financing, particularly debt.
Myanmar has an under-developed domestic bank market, until now host to only a handful of small local banks, with no foreign banks allowed until an imminent change in the law. Even when debt can be sourced through foreign banks, typically in Singapore, securing authorisation to draw down the debt from the Central Bank of Myanmar can cause further delays. With so little credit available, with the local currency the Kyat not readily convertible, and with minimal US$ reserves in Myanmar, the mechanics of servicing a debt deal have proved extremely challenging in Myanmar.

The investibility of Myanmar’s tower companies is inextricably linked with two critical factors – lease rates and tenancy ratios. Lease rates remain under pressure, particularly from Ooredoo who are seeking parity with the pricing secured by Telenor despite using heavier equipment. Meanwhile, since Telenor and Oordeoo continue to rollout largely independently of one another, tower sharing and tenancy ratios are not being maximised. We expect both lease rates and tenancy ratios to ‘shake out’ in the long term, but in the short term, Myanmar’s MNO’s are outsourcing the financing of their rollout to towercos who are less credit worthy counterparts than themselves, then squeezing those counterparts as if they were suppliers not partners.

“It’s important to make sure no shortage of capital holds back development,” said IFC representative Vikram Kumar in the Myanmar Times in May 2015. “The World Bank Group is fully committed that nothing holds back telecoms,” he added.

TowerXchange sources suggest an IFC investment into at least one of the Myanmar tower companies is imminent.

**24. Can the towercos acquire the land under the towers in Myanmar?**

No. All land belongs the government in Myanmar; citizens can only lease land. If foreign companies secure an investment permit they are allowed to enter into long term leases of up to fifty years, with two ten year term extensions.

**25. Who is building the towers in Myanmar?**

The towers being built for Telenor and Oordeoo will be owned by the towercos, but they are subcontracting the construction work to specialist managed service providers.

While most subcontractors employ substantial local workforces, it seems the lion’s share of the business to date has been won by proven international turnkey infrastructure firms such as Camusat, Leadcom, i engineering and GTL Infrastructure,
while firms like GSM Telecom Partners are being drawn up the value chain from tower manufacture into project management.

26. How many towers are needed in Myanmar in the next four years? And how many will be on-grid, how many on unreliable grid connections and how many off grid

Despite delays, the Myanmar tower rollout remains broadly on track with the growth projections contained within the excellent GSMA Green Power for Mobile forecast published a year ago (download it here!), which suggested a total tower count of 17,300 by 2017, up from 7,600 in 2015 (a reminder: TowerXchange estimate the current tower count in Myanmar to be around 7,410, and it seems perfectly plausible that a further 190 towers might be lit by year end). Therefore we continue to use the GSMA model as the benchmark, in which it was forecast that there would just be under 10,000 prospective green power sites in Myanmar in 2017 requiring an investment of US$388.5mn but yielding US$137.4mn in annual opex savings for a 2.83 year RoI period, based on reducing diesel consumption by 83%.

Power

27. Who owns the energy equipment at Myanmar’s cell sites?

A ‘Mexican standoff’ in tower power strategies took place in phases one and two of the rollout, as Telenor required their towercos to acquire and operate power systems, whilst Ooredoo retained ownership of their energy assets and did not include power in their SLAs. This made it very difficult for Telenor to co-locate on any Ooreedo phase one and two towers as they would have had to change their energy business model.

Thankfully, phase three of the rollout finally sees both Telenor and Ooredoo’s appointed towercos take on responsibility for acquiring and operating power systems. The dimensioning of a typical Telenor and a typical Ooredoo site remain fundamentally different however, primarily due to the large, power-hungry (but ultimately efficient) equipment Ooredoo is deploying.

28. What exactly is Ooredoo deploying that is so different from Telenor?

Ooredoo is using 4 way Rx diversity with a dual antenna configuration, an innovative approach that requires 30% less sites to generate the same coverage. This is a great approach from an holistic network planning perspective, but each site consumes ~20% more power than traditional solutions, so they are complex sites to dimension.

29. What will be done with those phase one and two power assets originally owned by Ooredoo?

Ooredoo appear increasingly inclined to outsource the management, or ultimately divest, the power systems they initially retained on their ~2,500 phase one and two sites.

Whilst various ESCO models and suppliers have been considered and rumoured, TowerXchange understands that at least a portion of Ooredoo’s Myanmar power assets have been outsourced to IPT PowerTech.

30. Why haven’t we seen the ESCO business model widely adopted in the Myanmar tower rollout?

One challenge is that ESCOs want to build distributed, micro-generation with telecom towers as anchor tenants. But ESCOs need permission to sell excess power to local communities and businesses, and to sell excess power back to the grid. That permission has not, to date, been forthcoming from Myanmar’s regulators.
Another challenge is identifying a kWh rate that Myanmar’s MNOs and towercos find digestible. In virgin territory like Myanmar, pricing is going to be a challenge. For example, few sites have yet been lit in the Northern States beyond the reach of the better roads, in an environment where unrest persists, so there is little data on the delivered cost of a litre of fuel to the country’s most difficult to operate sites. For an aspiring ESCO the risk is not just in the selection and installation of capital intensive hybrid power systems, it’s also in the Service Level Agreements that MNOs and towercos use to assess quality and consistency, and in the application of penalties when performance targets are not met.

ESCOs’ capital requirement and risk exposure is multiplied when one considers the scale required to make an ESCO a credible business partner in Myanmar – is 100 sites enough? 500? 1,000? Indeed, do any ESCOs have the balance sheet to finance power at the ~5,000 or so sites each MNO or towerco might have in Myanmar by 2018?

31. Whose energy equipment is being deployed to Myanmar’s cell sites?

Every energy equipment vendor in the world seems to have a Myanmar case study on their website! However the companies most often mentioned in TowerXchange’s conversations with the Myanmar towercos have been Flexenclosure (who have done a lot of work with Apollo), Heliocentris (IGT), Pace Power, Eltek, Cummins and EnerSys.

32. What is Myanmar’s electricity generation capacity?

According to informed estimates in the NCRA Energy Sector Brief, Myanmar had 3,495 MW of installed capacity in 2013. Because 76% of Myanmar’s power is generated by hydroelectricity, firm capacity (the amount of energy that can be guaranteed to be available) peaks at 1,958 MW during the monsoon season, dropping to 1,554 MW in the dry summer season.

Electrification stood at 26% of the population, dropping to an average of just 13% in rural areas. The cost per kWh was estimated at US$3.5-5 for household use, and US$10-15 for private industry.

33. How does the availability and reliability of grid power compare in Myanmar’s three largest cities compared with the rest of the country?

“...The national electricity grid currently covers the country’s central area from Mandalay to Yangon...
leaving other regions practically in the dark. Within the grid, only Nay Pyi Taw, Myanmar’s capital, gets a steady supply of electricity for 24 hours a day while people and businesses in most other cities including Yangon have to resort to the use of small generators which makes electricity very expensive.”

Source: the NCRA Energy Sector Brief, June 2014.

34. Is the climate in Myanmar conducive to solar and wind power?

Solar radiation is sufficient for solar power to be a viable option in all but the farthest Northern reaches of Myanmar, although wind resources are finite; seldom above the 5.5-6m/s generally held to make wind power a viable option.

35. How will power be provided at rooftop sites?

Rooftop sites represent a challenge for backup power – even if the landlord has a backup generator, is he allowed to sell power to the owners of a rooftop installation? With the structural capacity and permissions limiting the number of rooftop sites suitable for DG backed up power, fuel cells may be an option for many sites.

36. How do Myanmar’s operators figure the TCO compares between solar hybrid and CDC hybrids?

One Myanmar operator revealed that their TCO comparisons, inclusive of the cost of installation, suggested that at a low power 1.5kW site, the TCO crossover between solar hybrid and CDC hybrid was after two and a half years, pushed out over five years with a 2.5kW load and over six years with 4.5kW multi-tenant loads.

37. How important is vendor finance?

Given the multi-tenant, higher load environment likely to evolve in Myanmar, MNOS and towercos will find justifying the funding of renewables difficult, particularly with so many other demands on their finite capex. With debt and equity capital raising still a challenge, vendor finance is critical. For example, Flexenclosure’s access to European export credit agencies provides good interest rates for opex models, which has helped them secure their largest order to date from Myanmar.

One Myanmar operator summed it up succinctly: “we’ve got to ensure alignment between technical requirements and financial realities to ensure the best TCO solution is adopted – not simply cheapest capex solution. If we can’t get funding, we can’t do it.”

38. What are the opportunities for RMS and site intelligence solutions in Myanmar?

Data on grid availability and quality is practically non-existent in Myanmar, and is necessary to inform the selection and configuration of power solutions. RMS also provides important data on which to base the optimisation of fuel usage (and reduction of fuel theft, although few instances of theft have been reported in Myanmar to date); DG start/stop and runtime; battery charge, discharge and replacement; and the efficient use of any renewables. Integrating and aggregating data from different suppliers is key, based on which performance metrics can be generated for the comparison of sites and the evaluation of equipment and service providers.

Tarantula has announced that IGT is using their system, while iTower, by Infozech Software, is being deployed by another of Myanmar’s towercos. Ooredoo is using NeXsysOne to project manage their Myanmar rollout.

Other pertinent facts about Myanmar

39. What is the population of Myanmar?

In 2014 Myanmar’s first census for 30 years revealed a population of 51,419,420, concentrated in the Yangon (14.3%), Irrawaddy (12%) and Mandalay Regions (12%). 29% of citizens of Myanmar live in urban areas.

40. What is the local currency and how has it been performing against the US$?

In the last year, the Myanmar Kyat, or MMK, has fallen a little over 10% against the US$ from a high of around K 960 to a low of around K1,100 to the US$ (at time of writing).

Forex risk remains the first challenge cited by most towercos and their subcontractors working in emerging markets, and Myanmar is no exception. Towercos and MNOS in Myanmar are spending US$ and earning Kyat, so are exposed to fluctuations in the valuation of the Kyat, and US$ are increasingly hard to come by.
Recommended further reading

Third party research
- The GSMA’s Green Power for Mobile’s excellent “Sizing the Opportunity: Green Telecoms in Myanmar – Market Analysis”
- Myanmar Census, May 2014
- Assessing the potential for Green Power for Mobile: Telenor Myanmar
- NCRA’s Myanmar: All That Matters
- NCRA Myanmar Energy Sector Brief

MNO interviews
- TowerXchange’s Interview with Ole Martin Gunhildsbu, COO, Telenor Myanmar

Towerco interviews
- TowerXchange’s Interview with Ayad Chammas, new CEO of Irrawaddy Green Towers
- TowerXchange’s interview with Oliver Coughlan, CEO, Digicel Myanmar Tower Company
- TowerXchange’s interview with Philippe Luxcey, CEO, Apollo Towers Myanmar

Legal and regulatory resources
- Myanmar licensing rules from the MCIT
- Local law firm Polastri Wint & Partners on the legal and regulatory environment and site acquisition challenges in Myanmar

Profiles of Myanmar’s tower builders
- Camusat’s perspective from the front line of the Myanmar tower rollout
- i engineering: surveying, building and strengthening towers for the era of infrastructure sharing
- Leadcom’s experience building 83 sites (concurrently!) in Myanmar for Apollo

Power and site management system provider perspectives
- Flexenclosure secures $multi-million deal to rollout eSite for Apollo Towers
- Infozech’s footprint in India and Myanmar
- Tarantula’s successful move to Southeast Asia
- Eltek on the challenges and opportunities of green solutions in Asia
- EnerSys supplies over 600 sites in first entry phase of installation in Myanmar

Selected TowerXchange editorials on Myanmar
- Commentary on the abandonment of the joint rollout in phase three
- How to resolve the ‘Mexican standoff’ on tower power in Myanmar

Finally, latest Asian tower market data to contextualize Myanmar tower rollout
- TowerXchange’s analysis of the independent tower market in Asia

Meet the key stakeholders in the Myanmar tower rollout at the next TowerXchange Meetup Asia – for dates and details, visit our website at: www.towerxchange.com/meetups/asia!

41. When is Myanmar’s rainy season and what are average precipitation levels?

Monsoon season runs through June, July and August with shoulder months in May, September and October. During the rains, a lot of rural tracks become impassable, and it can be impossible to lay foundations in sodden ground.

42. What do companies need to know about importing telecoms equipment into Myanmar?

Quoting local law firm Polastri Wint & Partners in their 2014 TowerXchange interview: “Until recently, private telecommunications operators and contractors were not permitted in Myanmar. Only Government-owned enterprises had the right to import telecommunications equipment – the market has only just liberalised. With an investment permit issued by the Myanmar Investment Commission and an import permit, issued by the Ministry of Commerce, foreign towercos and their suppliers can import telecommunications equipment, with the recommendation of the Ministry of Communications and Information Technology, and where relevant, with the issuance of a telecommunications equipment license issued by the Posts and Telecommunications Department (which list of equipment will be formalised once the Telecommunications Rules have been enacted). Importers will be required to provide detailed information on the equipment proposed to be imported including the volume and specifications of such equipment, as part of the application for an investment permit.”
Suresh Sidhu, CEO, edotco

Suresh Sidhu, visionary CEO of edotco, was once again the opening keynote speaker at the second TowerXchange Meetup Asia, hosted at the prestigious Marina Bay Sands Hotel on November 24 and 25, 2015.

Sidhu emphasised that the mobile industry was being shaped by multiple forces:

- **Infrastructure**: tower asset divestitures and shared networks
- **Technology**: spectrum scarcity and the rise of unlicensed spectrum; as well as data growth driving demand for cell site densification and infill sites across Asia
- **Commercial pressures**: declining operator profitability compounded by the need to invest in network expansion to meet demand
- **Regulatory**: increased scrutiny on QoS, with telecoms seen as a critical source of revenue

MNOs are up against major challenges. Long term growth in demand for mobile data has surpassed the capacity traditionally available from spectrum in many markets. MNOs are reusing spectrum at smaller and more targeted sites to mitigate the shortage. Key challenges with deploying smaller sites include access to locations (which have very specific requirements), power and backhaul – each of which can be addressed by sharing.

MNO’s subscribers are seemingly more loyal to OTT providers like Google and Facebook than to their carrier. Meanwhile, regulations continue to shape
the industry: the old approach to providing access is essentially gone and operators face challenging QoS issues targets. At the same time many developing countries need access to funds and the mobile industry is often the single biggest industrial contributor the GDP; tax revenue expectations are high. There are even some markets where the regulator has revenue targets.

How can the MNOs respond to this pressure? One answer lies in the financial re-engineering offered by partnerships with the tower industry.

The tower industry also faces new challenges including consolidation of MNOs and regulatory hurdles in their newer markets. Towercos need to redefine what makes them successful. Increasingly

“To date there have been over 400,000 towers transferred from MNOs to towercos around Asia, and there may be as many as another 100,000 for sale as the towerco model is established in new countries” – Suresh Sidhu

The discussion at a customer level is moving from pure economics to instead focus on the real value delivered to clients and their end-users – this is becoming a significant part of sale and leaseback discussions.

“The towerco business appears to be extremely stable but it pays to be a little paranoid in spite of this,” said edotco’s Sidhu. Forward-thinking CXOs at towercos worry about sustainability of the existing build to suit and colocation focused tower model and increasingly consider a range of potential enhanced services, from energy solutions, tower monitoring, fibre resale, and passive and active O&M, to developing new solutions such as IBS, small cells and BTS hotels.

To date there have been over 400,000 towers transferred from MNOs to towercos around Asia, and there may be as many as another 100,000 for
sale as the towerco model is established in new countries. As this process continues there will be a sea change in how the industry operates as operators embrace the model and start focussing resources away from infrastructure management. Towercos will take on this role and structure the focus on infrastructure to provide the best end-user experience.

The requirements of infrastructure sharing are huge, and demand for solutions is increasing faster than the capability to meet it. The industry needs to respond; MNOs that have divested their assets will be happy to start building their own towers again if they feel that we aren’t keeping up with market demand. While some towerco executives are preoccupied with delivering 85% margins, others are more focused on meeting their clients’ desire for end-to-end solutions; our tenants want the most efficient assets possible and are more interested in solutions for the specific challenges they face. Increasingly MNOs don’t feel the need to own the towers.

There will be continued consolidation, and edotco also predicts increasing involvement in active infrastructure sharing. RAN sharing is prevalent in Europe, where some towercos have seen their share of tenancies fall by 20-35% as a result of network sharing. RAN sharing is coming to Asia and has been launched in Malaysia and Indonesia. Meanwhile, what role could innovations like Google Loon and Facebook Aquila play in extending rural connectivity? Innovations often start by addressing opportunities nobody else appears to want to address, like marginal rural markets, but if successful these solutions could extend from rural to core network coverage.

In the traditional model, towercos are more inwardly focused on assets as opposed to services, on the conversion of capex to opex, and tend to focus of rental of space on traditional ground based towers. Suresh suggested eight refinements to make towercos successful in tomorrow’s world:

1. Scale within country but also scale across multiple footprints
2. Delivery of operational improvements made transparent through uptime, SLA and low TCO metrics
3. The ability the structure strategic deals, leveraging balance sheets beyond a pure focus on co-locations
4. Embracing new technologies such as small cells, BTS hotels and camouflage sites
5. Enhancing the scope of towerco services to include RMS, O&M and power where appropriate
6. Standardising processes to propagate best practice
7. Engaging regulators and other national stakeholders to position towercos as a true partner to the country, and to position telecom infrastructure as fundamental to Nation Building
8. And finally to drive the development of human resources across the region, building capabilities and enhancing skill sets

Gupta’s keynote began with an examination of the origins and the future of the tower industry, reminding the audience that it is still young, and the concept is still controversial to many MNOs who consider their towers a source of tremendous competitive advantage. It is interesting to note that zoning restrictions played a part in the birth of the towerco model as they forced some of the initial cases of infrastructure sharing. After this came the development of monetisation and financial engineering for tower portfolio management, and the first instances of the sale and leaseback model. The real tower industry had its birth in Asia in India between 2007 and 2008; when astonishingly the three largest competitor MNOs agreed to cooperate and create Indus Towers, still the world’s largest
towerco outside China. Operators found that while they competed on the front end they could work together on the back end.

The tower business model started to win over major stakeholders and many MNOs were convinced that it was the right thing for their business to transfer towers their towers into this emerging new class of infrastructure company. Operators are mainly focussed on sales and marketing and developing new services for their end users; however maintaining uptime is the main focus of towercos and it is a thankless, low tech, time consuming, 24x7x365 job. In some cases there were huge problems with MNO captive towers in a huge mess, poorly maintained, with “band-aid” solutions being used.

India had and still has low ARPUs, and the MNOs and realised that the opex savings could be immense when adopting the towerco model. Indian telecoms was and is experiencing huge growth, and before the advent of the towercos two thirds of capex went into passive infrastructure. Faced with all of these factors, MNOs found that the easiest solution was to relieve themselves of the capex requirement, and focus their time and resources on what they do best. In spite of their objections the operators could not continue to oppose this shift and in the end only delayed the inevitable.

There was a great need for improvement considering it was common to see four towers in one 50 square foot plot; the tower industry emerged from this. If the operators were going to spend millions of dollars why not spend it on batteries and generators instead of towers and give the money to towercos? Instead of spending US$20,000+ to get a new tower up and running why not just lease a spot on an existing tower? This was the main idea behind the leap of faith that was taken; it became imperative to come up with a solution that was win-win-win for the incumbent, the towerco and the new tenants, and this is the basis of the Indian towerco model. Incumbents could have an automatic reduction of 20 - 22% on energy charge and rental for every new tenant that joined the tower. For the towerco a tower becomes profitable as soon as the second tenant is added, and their speed to market is the same as the incumbent; there is no discrimination. How many industries can say they make money when an existing customer pays less? But that’s how it works; the success of Indian tower companies depends on clients paying less and not more.

Towercos have two main objectives; first they are focused in the disarmament of operators – seeking to disarm their manpower and make it economically unfeasible for them to build their own towers. Secondly, towercos need to promote non-discriminatory sharing so that all tenants feel comfortable. Towercos can’t have single tenant sites as they are unprofitable, and every time operators perform a cost benefit analysis of build versus lease, building a new tower is never justified, and the same with loading new equipment on towers themselves. The towerco MSA is the same for all tenants, except if they are a large customer with larger tower portfolios they receive a larger discount. The result of this model in India is that practically no operators build their own towers and many towercos have all of the operators on their towers. Over the last six years our co-locations have increased at a CAGR of 8%, revenues at a CAGR of 11%. EBITDA margins have been increased to 42.9%.

How many industries can say they make money when an existing customer pays less? But that’s how it works; the success of Indian tower companies depends on clients paying less and not more

– Akhil Gupta
and profit after tax has grown at a CAGR over 50%. The beauty of the model is that it doesn’t require more towers, it requires more tenants.

There is a lot of discussion about what the future holds for the tower industry; the demand for data is great while there will continue to be a strong need for more coverage. Towercos are definitely benefiting from technology; every time a base station gets loaded with traffic the radius changes; the moment traffic comes this starts shrinking and it makes network planning go haywire. Towercos allow clients to install 3G equipment and then 4G equipment; it’s like opium and the speed to market we provide encourages them to rollout quickly. The increase in traffic determines when they will be forced to put up new towers, and, as long as they maintain the number of tenancies, the industry will continue to grow.

Towercos need to keep the operators disarmed of all things tower related, and need to do this as our clients’ requirements change. We are seeing an increase in the number of indoor DAS sites; it was Gupta’s view that some towercos may start deploying their own infrastructure to enter this market, but this could cause a problem for the tower industry. It is important for towercos to remember that they should not compete with their own customers on Wi-Fi or DAS; whatever they do it should be based on the model of open sharing, and on a white label basis.

Transmission is also critical, and with the growth of data more towers will require a fibre connection, and once they can be connected to a transport network the most efficient service can be delivered. Long distance fibre like towers is part of the infrastructure and the MNOs should not concern themselves with it. High capacity microwave links are another possibility, and at some stage submarine cables for international connectivity; all of these should become a focus of towercos.

The government of India is also promoting the creation of smart cities and these come with substantial capacity requirements which will need shared infrastructure. This will be a huge project and towercos are in a great position to play a part. It represents a great opportunity to get involved in managed services that are agnostic to operators. There will be a new market for infrastructure and this is a wonderful opportunity for towercos. Towercos do, however, need to avoid irrational pricing wars like those that have happened between operators, citing regulations and the government’s involvement. Towercos can’t get too greedy and try to make profit at the cost of customers. It is positive to have many operators, but it’s good to have a few that are strong and financially stable and can respond quickly to market changes and adopt innovative new technologies.

The tower industry is stable compared with other technology-related industries with more unpredictable revenue models, falling margins, irrational pricing, currency fluctuations, and the risk of technological obsolescence. Infrastructure management may not be as exciting as founding or investing in a dotcom, but it’s good to be in an industry that has solid, profitable cash flows. The tower industry has an important role to play and
a potentially bright future, but success or failure depends on our behaviour. Towercos can’t afford to get involved in wasteful competition, or become too greedy; if operators were to suffer while towercos make money it would be disastrous; there is a need to resist temptation and work together on this going forward.

**Amit Sharma, Executive Vice President, President - Asia, American Tower Corporation**

According to Amit Sharma, the growth rate of the Indian market is now arriving at “the sweet spot;” 3G hasn’t really taken off, 4G is being launched, and the entrance of a greenfield operator (Reliance Jio) is prompting incumbent operators to significantly upgrade their networks. Capex is expected to increase between 30-50%, but MNOs don’t want to invest most of that in steel and cement – and that’s where towercos can help. At the same time ARPs remain quite low in this market; this is somewhat offset by rural mobile penetration which is at 20% currently and is expected to treble over the next five years. With smartphones using five to ten times more data than non-smartphones it’s plain to see where the increase in demand will come from. MNOs across India are putting US$15bn into network upgrades and spectrum auctions.

Currently the prevailing tenancy ratio in India is around two, and this is expected to increase to 2.5 in the next five years; meaning there will be approximately 225,000 new tenancies, representing huge room for growth. Amit Sharma predicts that this period of growth should last between three and five years.

However the tower industry also faces challenges, not least of which being regulation. To date it seems that some regulators want us one day, and don’t want towercos the next day; regulators are of two minds about the role of the tower industry. Regulations can put restrictions on what towercos can and can’t do, limiting the amount and flavour of equity available, and sometimes limiting the scope of their business. In the long term this is not sustainable, but in the short term it doesn’t seem that regulatory restrictions are going away.

Licensing, license fees and royalties are another aspect; many countries treat the tower sector as a goose that lays golden eggs, but they don’t apply much creativity into promoting its growth; instead they focus on how they can wring more out of the industry, as we have seen in markets where they are attempting to introduce licensing for towercos. This is happening both in Africa and Asia. In some cases every municipality wants a piece of the towerco pie and this can lead to one time fees for tower deployments, and in some cases ongoing fees which can add 10, 15 or even 20% on to the cost.

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<th>Revenue (INR Mn)</th>
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<th>FY 11</th>
<th>FY 12</th>
<th>FY 13</th>
<th>FY 14</th>
<th>FY 15</th>
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<th>FY 12</th>
<th>FY 13</th>
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<th>FY 13</th>
<th>FY 14</th>
<th>FY 15</th>
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<td></td>
<td>2,530</td>
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<td>7,491</td>
<td>10,025</td>
<td>15,179</td>
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CAGR 10.6% for 10.6%
CAGR 15.7% for 15.7%
CAGR 51.1% for 51.1%

(1) Revenue and EBITDA are excluding Other Income  (2) EBITDA margin % has been calculated on Sharing revenue
of a tower which is passed on to the towerco and its clients. Regulators don’t see this as an issue as they are charging a proportion but this goes against the grain in some countries where the regulators are also trying to develop and make connectivity ubiquitous.

As operator margins are increasingly getting squeezed, MNOs are looking at every element of the ecosystem and seeking more efficiency. In many cases the cost of capital is very high, which puts the tower industry between a rock and a hard place: the customer expects their lease costs and opex to decline but the towerco model needs escalators to absorb these additional levies and taxes. The towerco model works: financial investors gravitate toward the predictable returns we generate, so we need to find a solution to these additional costs before the model is compromised.

To address this, the tower industry needs to think about its role in the ecosystem in three, five, and ten years from now. MNOs are becoming consumer facing, service delivery focused organisations. This leaves the tower industry to run both passive and perhaps active infrastructure on a massive scale, and we must evolve further and become an even more efficient business. The cost per megabyte needs to decrease. The dividing line between MNOs and towerco needs to go. It makes no sense for the MNO to send a technician to visit a site to confirm the base station, then three days later for the towerco to send a technician to service the diesel genset: these jobs can be done much more efficiently by one or other stakeholder. There are still efficiencies to be achieved and redundancies to be eliminated, and towercos are often better at identifying and acting on these than MNOs.

Towercos need to widen their scope; provide maintenance of backhaul and active infrastructure; they need to identify opportunities to offer white label services such as Wi-Fi. Services like this can be deployed by operators, but they will require more DAS small cells; again the neutral host, sharing model will work best to achieve this.

Finally, we have to run our operations even more efficiently. There is still room for improvement. Choosing the right energy solutions can make a difference; there are challenges such as pilferage that need to be overcome, and above all issues related to uptime and operational efficiency that escalate customers costs need to be eliminated. Towercos should extend the scope of what we do, but do so in partnership with our customers, not as a land grab.

The tower industry needs to act together to achieve enhanced industry-wide best practices; no towerco is a standalone business, and events like the TowerXchange Meetup can play a critical role in facilitating this. India and Southeast Asia are on a roll and many are making the move from voice to data; we have to work together on robust network quality and coverage, increase the number of tenancies to deal with the challenges presented by cost pressures, regulatory limitations and license fees.

The tower industry needs to act together to achieve enhanced industry-wide best practices; no towerco is a standalone business – Amit Sharma

“...”
The unique structure of the Malaysian tower market

4G rollout accelerates migration to shared infrastructure in Malaysia

A culture of infrastructure sharing has existed in Malaysia since the turn of the millennium when the MCMC licensed over a dozen State-backed towercos, one stop agencies to permit and build towers in their respective States. Fast forward to 2014, after the consolidation of Malaysia’s MNOs from five the three, and Malaysia was host to the first carve out within Axiata’s edotco empire. edotco now operates 3,600 of Malaysia’s 22,000 towers, while the State-backed towercos operate a further 3,200. Drawing on insights gleaned from the Malaysia roundtable at the TowerXchange Meetup Asia 2015, let’s take a closer look at the unique structure of Malaysia’s tower and mobile market.

Keywords: 4G, Active InfraSharing, Asia, Asia Space, Axiata, Build-to-Suit, Carve Out, Celcom, Common Tower, DAS, Decommissioning, Densification, Desabina, DiGi, D’harmoni, edotco, Hybrid Power, Infra Quest, Infrastructure Sharing, KJS, LTE, Leasing & Permitting, Lithium, Malaysia, Market Overview, Maxis, Melaka ICT, Network Rollout, OCK, Off-Grid, PDC Telecommunications, Pass-Through, Perak Integrated Networks, Perlis Comm, Premium Radius, RMS, Rangkaian Minang, Sacofa, Solar, Special Structures, State-Backed Towerco, Telekom Malaysia, The Naza Group, Touch Matrix, Towercos, U Mobile, YTL, Yikedbina

Read this article to learn:
- Who owns the towers in Malaysia’s competitive, mature mobile market?
- How many new towers are being built in Malaysia and by whom?
- The increasing role of ‘special structures’, DAS and BTS hotels in fulfilling demand for urban infill sites
- Are Malaysia’s State-backed towercos acquirable?
- The status of fibre and LTE rollouts and forecast demand for new towers needed for 4G

Malaysia’s mobile market

Malaysia is home to a mature, fiercely competitive mobile market led by listed entities Celcom, Maxis and DiGi each with between 11.5 and 12.5mn subscribers, with fourth operator U Mobile claiming around 4mn subscribers. Eight LTE operators have been newly licensed.

Among a population of 30.49mn, mobile penetration declined to 144.8% in Q2 2015 from 145.8% a year earlier (Source: MCMC Pocket Book of Statistics), indicating the maturity of the mobile market. The battle among Malaysia’s operators is now concentrated on capturing 4G customers.

Malaysia’s tower market

There are around 22,000 towers now in Malaysia, representing almost exactly 2,000 mobile subscribers per tower.

Around 1,000 new towers were erected in Malaysia in 2015, where a new ground based tower (GBT) can cost in excess of RM300,000 (US$69,000). All of Celcom’s new build went through edotco, while Maxis and DiGi continued to build their own towers in 2015 – that may change in the latter’s case in 2016.

Much of Malaysia’s growth has come not from new GBTs but from ‘special structures’ like lamp posts, billboards, flagpoles, clock towers, minarets and water tanks which are easier to permit and harmonise with the skyline in dense urban areas where there is substantial demand for infill sites. The problem with permitting is particularly acute in...
Malaysia’s administrative capital Putrajaya, where it is reportedly almost impossible to permit a macro tower. In response to such challenges, edotco are soon to erect Asia’s first space-saving carbon fibre tower.

There are a substantial number of multi-tenant DAS solutions in Malaysia, including several hundred in edotco’s portfolio. edotco is also working on the first of several BTS hotels for the Malaysian market, wherein each site in a cluster would be equipped with a neutral antenna, with MNOs’ equipment hosted in a centralised equipment room.

An estimated 30-40% of Malaysia’s GBTs are in overlapping locations, but to date we’ve seen relatively little decommissioning.

DiGi and Maxis each have a similar sized tower network (an estimated 3,400 and 3,800 respectively), while Telekom Malaysia retained around 1,000 towers. There is substantial bi-lateral sharing of MNO-captive towers in Malaysia, although there are less tenants on the 5,000 towers owned by YTL, a Malaysian integrated infrastructure developer with investments in communications, utilities, construction, property, hospitality and IT. U Mobile owns a negligible number of towers, and has

Figure one: Malaysia’s mature, competitive mobile market: subscriber numbers (in 000s)

![Graph showing subscriber numbers for Celcom, Maxis, and DiGi from Q3 2014 to Q3 2015.]

Figure two: Estimated tower counts for Malaysia

<table>
<thead>
<tr>
<th>Tower Operator</th>
<th>Tower Count</th>
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<tbody>
<tr>
<td>edotco</td>
<td>3,600</td>
</tr>
<tr>
<td>DiGi</td>
<td>3,400</td>
</tr>
<tr>
<td>Maxis</td>
<td>3,800</td>
</tr>
<tr>
<td>Telekom Malaysia</td>
<td>1,000</td>
</tr>
<tr>
<td>State backed towercos</td>
<td>3,200</td>
</tr>
<tr>
<td>YTL</td>
<td>5,000</td>
</tr>
<tr>
<td>Unaccounted for</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Source: TowerXchange, Q4 2015

Figure three: Estimated tower counts for Malaysia’s State-backed and other independent towercos

<table>
<thead>
<tr>
<th>Towercos</th>
<th>Tower Count</th>
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</thead>
<tbody>
<tr>
<td>Sacofa</td>
<td>765</td>
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<tr>
<td>Touch Matrix</td>
<td>460</td>
</tr>
<tr>
<td>D’harmoni</td>
<td>346</td>
</tr>
<tr>
<td>KJS</td>
<td>309</td>
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<tr>
<td>Common Tower</td>
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<tr>
<td>Infra Quest</td>
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<tr>
<td>Yikedbina</td>
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<tr>
<td>Asia Space</td>
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<tr>
<td>Perak Integrated Networks</td>
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<tr>
<td>Desabina</td>
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<tr>
<td>Melaka ICT</td>
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<td>Rangkaian Minang</td>
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</tr>
<tr>
<td>PDC Telecommunications</td>
<td>43</td>
</tr>
<tr>
<td>Perlis Comm</td>
<td>23</td>
</tr>
</tbody>
</table>

Source: TowerXchange, Q4 2014
leveraged co-location to accelerate time to market.

Towercos own 31% of Malaysia’s towers, led by edotco’s 3,600 towers carved out of Celcom / Axiata. edotco aims to increase their Malaysian tower count by around 1,000 in 2016. A further 3,200 towers are owned by 14 different State-backed and other independent towercos. State backed towercos have a monopoly on new builds in four or five States as “One Stop Agencies” (they do the permitting as well as the building), but edotco has been able to negotiate rights to build in most other States.

YTL acquired KJS, a state-backed towerco which then owned 309 towers, for US$15mn in 2014. Multiple parties have appetite to acquire further State backed towercos, although it may not be an easy process given political and personal vested interests.

Another potential stakeholder in Malaysian towers is OCK, a leading turnkey service provider operating across Asia with a strong presence in Malaysia, where they received a Network Facilities Provider license in 2011. In December 2014 OCK incorporated a wholly owned subsidiary in Singapore, OCK Telco Infra Pte. Ltd. to act as their platform in invest in the tower leasing business. OCK has since secured a contract to build 900 towers for Telenor Myanmar. While the company has unsuccessfully bid to build and operate some of the MCMC’s rural towers, OCK do not appear to have yet commenced operation as a towerco in Malaysia.

The Naza Group, a diversified engineering business, also has a registered Network Facilities Provider known as Premium Radius, which is Kedah state’s exclusive partner for telecom structures. Premium Radius claims to have an order book for 235 telestructures and an exclusive contract for microcell coverage with Kuala Lumpur City Hall.

Universal Service Provision fund deploying rural towers

As in many telecom markets, Malaysia’s MNOs are required to contribute 6% of their earnings toward a Universal Service Provision Fund. This fund has been active deploying RM3bn (US$700mn) to commission rural towers based on a RAN sharing business model. According to Malaysian publication The Star, 699 towers had been built by 2013 by the so-called Time 3 Phase 3 (T3E) project, while a tender for a further 400 towers was released in April 2014, with a further 1,000 being commissioned in 2015.

Progress of LTE and fibre rollouts

Around 3,000-4,000 LTE nodes have been deployed by each of Malaysia’s three leading MNOs, totalling around 13,000 LTE nodes to date. As usual, these are concentrated mostly in the major cities, but rollout is moving to secondary cities and is primarily using existing sites.

At the Malaysia roundtable at the TowerXchange Meetup Asia 2015, it was estimated than an additional 8,000 towers could be needed for 4G. However with local authorities reluctant to permit macro sites, most of that demand will be met by microcells, lamp-poles, DAS and IBS.

Malaysia’s eight newly licensed LTE operators are subject to license conditions requiring 10% coverage within the first year, and few have the time or capital to build their own towers. Some of their demand for points of service will be fulfilled by co-location, some by active infrastructure sharing.

Fibre availability is reasonably widespread in Malaysia and, although there are several fibrecos, it still sometimes feels like Telekom Malaysia has monopoly status. Their nearest competitor is City.

Power and RMS on Malaysian cell sites

There aren’t a lot of off grid sites in Malaysia, but edotco are looking at various off-grid power solutions including lithium-ion battery and solar hybrids. Power is a pass through at almost all Malaysia’s cell sites.

RMS is not widely used by MNOs but is being considered by some State backed towercos. At time of press edotco’s Echo RMS solution was deployed on 2,800 of edotco’s 3,600 Malaysian sites.

Conclusion

The innovation and acquisitiveness of edotco makes Axiata’s carve-out towerco the most influential change agent in the mature Malaysian mobile and tower market. In 2016 and beyond, we expect the majority of new towers and special structures in the country to be built by edotco, which could also join YTL in a drive to rollup selected State-backed and independent towercos.■
Evaluating tower transactions and deal flow in India

A report from the TowerXchange Meetup Asia 2015 roundtable, hosted by Nomura’s Pankaj Suri

American Tower’s acquisition of Viom Networks, a strong portfolio of 42,200 towers with a tenancy ratio of 2.4, at an enterprise value of US$3.23bn, may soon be followed by the acquisition of Reliance Infratel by Tillman Global Holdings and TPG for a reported US$3.3bn. Viom Networks realised a valuation of US$76,540 per tower. While Reliance Infratel’s tower count and final valuation remains unclear, the cost per tower will be comparable to the new benchmark established by the AMT-Viom deal.

Why have recent Indian tower M&A apparently attracted lower valuations than recent global comparisons, with towers changing hands in Indonesia for US$300,000+ and the recent sale of Verizon towers in the U.S. coming in at over US$400,000 per tower? One explanation is that the replacement cost of an Indian tower (as low as US$25,000) is significantly lower than a tower in, for example, Indonesia at around US$100,000 or in the U.S. where a tower can cost upwards of US$250,000. Similarly, lease revenues in India are lower, typically around US$600 pcm compared to approximately US$1,150 in Indonesia, and around US$1,800 in the U.S. The proportion of opex spent on 15-20 year ground leases (currently around 50%) is increasing in India. Compared to their international counterparts, many Indian towercos have a limited capacity to generate amendment revenue from the exchange of conventional antennae for multi-band antennae. Indian towercos, and their investors and analysts, called for pricing based on radio signals not on numbers of antennae.


Read this article to learn:
- How to measure the value of a tower
- New benchmarks for the value of an Indian telecom tower
- Are there many zero tenant towers in India?
- Value drivers for BSNL’s towers
- Potential tower transaction deal flow in India
A hypothetical perfect evaluation of a tower portfolio or tower transaction would require an understanding of the structural capacity and demand for capacity of each tower in the portfolio. What excess wind load capacity is available on a given tower? How readily and cost efficiently could the structure be updated? More importantly, is there demand for additional space on the tower? A proactively marketed tower portfolio like Viom Networks’ with India’s highest tenancy ratio at 2.4 might have already leased up space to the most obvious tenants, whereas should BSNL’s portfolio of 65,000 towers come to market, the current tenancy ratio of around 1.1 to 1.2 suggests there could be pent up demand for their many towers in sought-after locations. “Towers with low tenancy ratios are more marketable provided they’re in right location,” concluded one analyst.

Data growth in India is currently focused on urban areas, with a second stage to come in semi-urban and suburban India. With currently around 800,000 BTS and 400,000 towers in India, and a BTS needed approximately every 500m in a high data usage environment, some analysts have suggested India needs 50% more BTSs in the coming years. Many of those BTSs need to be smaller. The height and weight of towers in India is coming down, making structures easier to relocate. The spectrum now being acquired demands antenna located lower on structures, shifting market dynamics from a coverage to a capacity play. Analysts estimated 30% of India’s 400,000 new BTS would be IBS and iDAS, 35% being tenancies on existing towers, 35% requiring new towers.

How to measure the value of a towerco or a tower transaction

The financial analysts at the “India tower valuations and deal flow” roundtable used a variety of tools to value towercos and to evaluate tower transactions. The oft quoted, oft critiqued cost per tower, or valuation per tower, was recognised as a flawed metric given the dynamic relationship between the price paid and rental fees: some sellers seek to maximise revenue from the sale, others seek to minimise opex. Conventional financial performance valuations, such as P/E (price to earnings ratio), leverage ratios and EBITDA margins; or financial performance valuations adapted to basic tower industry metrics, such as EBITDA per tower or EV (Enterprise Value) per tower, were felt to be more informative.

Tenancy ratios remain a critical and relatively stable performance indicator, although analysts warned that different towercos have different definitions of a tenancy, particularly affected by their ability to generate ‘amendment revenue’ (revenues from existing tenants adding supplementary technologies). Multi technology BTS and multiband antennas make it difficult to understand whether the tenant concerned is running 2G, 3G or 4G and, while contractual language in markets like the U.S. often defines the cost of ‘amendments’, in markets like India it has proved more difficult to monetise an existing MNO tenant running a supplementary technology.

Networks’ with India’s highest tenancy ratio at 2.4 might have already leased up space to the most obvious tenants, whereas should BSNL’s portfolio of 65,000 towers come to market, the current tenancy ratio of around 1.1 to 1.2 suggests there could be pent up demand for their many towers in sought-after locations. “Towers with low tenancy ratios are more marketable provided they’re in right location,” concluded one analyst.

Deal flow in India

Deal flow returned to the Indian tower market with...
a vengeance in H2 2015. With the acquisition of Viom Networks by American Tower announced but not yet closed, and with Tillman and TPG having entered exclusive, non-binding negotiations to acquire Reliance Infratel, two of India’s largest tower portfolios may soon be ‘off the table’. Ascend Telecom, the last of India’s ‘big little’ towercos, with 4,843 towers and a tenancy ratio of 1.8, is being restructured with an investment by ROI Acquisition Corp creating an enterprise value of US$308mn (10.8x projected 2016 EBITDA or US$63,597 per tower).

What’s left?

GTL has sold many assets to alleviate debts, but retains almost 30,000 towers – a potential acquisition target for anyone with appetite for a turnaround play. Tower Vision and their 8,600 towers have been rumored to be on the block in the past.

Tower transaction deal flow in India, or in any market, is ultimately driven by MNOs’ appetite to monetise their towers. This in turn is a function of pressure to restructure balance sheets from investors, from bond rating agencies, and from the debt market. With substantial capital being spent on spectrum and 4G rollout in India, many MNOs are increasingly inclined toward a view that they would rather have cash in hand to focus on their core business, rather than the steady flow of cash that comes from retaining their towers or a captive towerco. ‘Professionalising’ towers frees up the towerco to strengthen and increase the shareability of towers, thus maximising their value.

Tens of thousands of towers remain operator captive in India: Vodafone are believed to have around 10,000 outside of Indus Towers, while Idea Cellular has a captive portfolio of 8,600 towers with a tenancy ratio over 1.6 which could be monetised.

However, analysts were most excited about the prospects of BSNL’s ~65,000 towers coming to market. With many of their POSs on high quality towers in fantastic locations, and with very little lease up to date, the Telecom Ministry has increased pressure on BSNL to hive off the towers, perhaps as a 100%-owned subsidiary, perhaps with a tender for a third party towerco to market the towers and manage operations.

Participants all agreed that the scale and attractiveness of locations in the prospective BSNL towerco would make it a formidable competitor for new tenants with the likes of Indus, Bharti Infratel, the new owners of Reliance Infratel and the combined ATC India + Viom Networks.

Conclusions

There is no standard metric for the evaluation of towers and tower transactions, but the most widely quoted metric, cost per tower, is fundamentally flawed.

When comparing Indian towers and Indian tower transactions with international deals, one must be cognizant of the wide variation in cost structures and lease prices.

With deal flow returning to the Indian market, with almost 100,000 towers worth almost US$7bn in the process of changing hands, attention remains focused on the world’s second largest tower market, with analyst interest particularly piqued by the future of BSNL’s highly desirable ~65,000 towers.
Market update on Cambodia

A summary of the discussion from the Cambodia roundtable, and the tale of 1,000 orphaned towers

The 2015 TowerXchange Meetup Asia featured a host of insightful panels and roundtables providing in-depth insights into tower markets across the region. We took the opportunity to sit in on the Cambodia roundtable, led by Phillip Wong, Managing Director of edotco to find out more detail on a Cambodian market that we have recently started to cover. We found out that Cambodia has its challenges including some difficult conditions on the ground and limited profitability, but has a regulator that is willing to encourage foreign investment to promote telecoms development. TowerXchange has also been tracking a portfolio of towers formerly owned by Mfone which went bankrupt in 2013 to learn about the fate of “orphaned towers”.

Keywords: 3G, 4G, ARPU, Asia, Asia Insights, Cambodia, Camtower Link, Cootel, edotco, Energy Storage, First Mover Advantage, Grid, Hybrid Power, IFC, Investment, Khmer Unicom, Leasing & Permitting, Malaysia, Market Overview, Mfone, Network Rollout, Off-Grid, Regulation, Roaming, Singapore, Site Level Profitability, Solar, Unreliable Grid, Urban, Vietnam, Xinwei Beijing

Highlights from the Cambodia Round Table

Cambodia has seen a lot of consolidation over the past few years; the market went from nine operators down to five due to intense competition and price wars. The latest trend is the emergence of Chinese operators in the Cambodian market; in fact Cambodia has the most Chinese operators outside of China itself.

Cambodia has a population of 14.5mn, much smaller than many neighboring markets, and the ARPU is quite low at around US$3 which has meant that it hasn’t attracted too much interest from foreign investors.

In terms of on the ground conditions the energy situation in Cambodia is challenging; about 25% of the country is off-grid. Of course this means that there are opportunities for energy solution providers offering hybrid and renewable off-grid solutions. Even connected to the grid, power is unstable and is can be unavailable for a couple of hours per day even in the capital Phnom Penh – with is a drop off in power once or twice a day necessitating batteries for backup. Some companies are looking into solar solutions. To deal with the grid issues, some companies are looking into solar energy systems. Hybrid solutions need to be scalable and capable of powering at least two tenants. With the strong Chinese presence in Cambodia it’s no surprise that Huawei dominates this market and its energy solutions.

Deployment can also be challenging due to

Read this article to learn:

- On the ground conditions in Cambodia including grid and environmental risks
- The regulatory conditions for foreign investors in Cambodia
- Comparing the cost of tower rentals in urban and rural areas
- What happens to towers that are left idle due to bankruptcy?
environmental conditions; during the rainy season flooding can cause a water level increase of up to three metres. Other challenges in Cambodia include landmines, although this situation seems to be improving everywhere except the most remote areas and incidents are becoming fewer and farther between. There are also some issues with older towers that have never been assessed and have been poorly maintained that eventually are at risk of collapsing. Some of the MNOs have historically not maintained their tower assets adequately, and there was a tower collapse as recently as six months ago. Increasingly the towercos have been given a directive to ensure the safety of towers.

The regulatory regime is relatively advanced; not every country in Asia has towerco licenses. A new local telecoms law is expected to be put into place in Q1 2016; this was in the draft stage a year ago but no-one has seen the final version and the regulator has kept it quiet. However in general regulations for MNOs, towercos and infrastructure providers are moving in the right direction. Foreign investment in Cambodia is encouraged and there are no restrictions on foreign ownership. This is different from other markets in the region such as Vietnam where foreign investors are limited to 49% ownership of companies. There is still no regulation on green energy or carbon reduction, but this is a work in progress.

With new operators from China appearing in this market, there have been some slow rollouts and the regulator takes a progressive view towards commercialisation so this is an advantage for towercos. Currently there are two towercos: edotco and Camtower Link. edotco is encouraging MNOs to hand over tower and power management to them. The incumbents have been offering services for over five years and have taken responsibility for power themselves, but the new Chinese operators and investors entering in 2016 should be open to infrastructure sharing and a hybrid power sharing solution as it will help them get up and running quicker at a lower cost.

The IFC has been involved in financing MNOs in Cambodia, while local banks have been providing increasingly competitive local financing. Previously operators have suffered from the cost local financing; the interest rates are lower than before but still at 8-12%. Cambodia is that does not require business to be undertaken in the local currency, and US dollars are widely used. Cambodia never suffered from currency protections, and the cost of tower rentals vary from US$300-350 per month for rooftops in Phnom Penh all the way down to less than US$100 the further outside of the capital you go. This is even cheaper than the US$600 average in India. The challenge for towercos is to make these assets profitable to achieve some ROI; towercos need to decide whether to choose a pure tower model or a service including energy. Ground rentals are a key component in the construction of a tower, and ground rent varies significantly in different areas of the country. edotco are prepared to pay a sensible premium to have the first site in a given area as this confers a big advantage as it can be challenging to find another site.

Regulations make Cambodia open to any foreign investment, not only Chinese, but the Chinese have definitely gained a foothold. Xinwei Beijing (Cootel) is a Chinese MNO founded in 2013 in Cambodia that brought in their own equipment and have leapfrogged to 4G to provide more data-centric services. The spectrum for their particular service is in the lower 400MHz range and the license is free to apply for.

It remains to be seen exactly what the strategy and objectives of these companies are in this small and not overly profitable market. Perhaps they have been attracted by the open regulations and have come in full force with more money than other countries to capture first mover advantage in 4G.

**A tale of 1,000 towers**

Due to a history of poor maintenance in some cases, the challenges associated with small, low revenue telecoms markets and the resulting financial woes, there have been cases of telecoms infrastructure sitting idle in Cambodia, as in other markets across Asia, as a result of MNO bankruptcies. Take for example the portfolio of 1,000 towers in Cambodia that were originally owned by Cambodia Shinawatra or Camshin. Camshin had its license extended from 15 years to 35 years in 1997, and was also given a license to provide mobile services under the brand Mfone the same year. By the time it launched 3G services in 2007, Mfone was already
struggling due to the intense competition and low ARPU\text's in the Cambodian market. Price wars became so intense that the government intervened in Q4 2009 with a minimum tariff edict, but the damage was done and Mfone continued to lose subscribers.

By Q4 2012 Mfone was starting to have legal troubles over unpaid bills. Eltek Valere won a court injunction against Mfone that year over failure to pay US$3.73mn in service charges. Mfone was required to provide an assessment of its inventory and was banned from selling off any assets until the situation was resolved. Mfone was also threatened with legal action by Hello Axiata and Smart Mobile over unpaid interconnection fees. Thaicom attempted to sell Mfone to a local investor, INT Management Service, but the deal fell through and in January 2013 Mfone filed for insolvency. Mfone signed an agreement with Mobitel to migrate its subscribers on to their network with a roaming agreement. This agreement was then disputed by Huawei claiming it was in violation of an injunction to freeze Mfone’s assets. This injunction was lifted by April of 2013 so that the sale of Mfone’s assets could commence.

Telecoms towers can prove to be a hard sell unless conditions are just right. In this case interest in the Mfone towers was low with 30\% of them located in urban areas where competitors already had their own assets and tower coverage was overlapping. The remaining 70\% of the towers in rural areas could be a different story as some may be located in areas with patchy coverage. In addition to this many sites came with unfavourable leases with local landowners, some of which were renegotiated at higher rates in latter years as Mfone came under increased financial pressure. In the end Mfone’s remaining assets were sold to Khmer Unified Network Communication (Khmer Unicom) for US$10mn, less than 11\% of their estimated value.

In the end Mfone’s remaining assets were sold to Khmer Unified Network Communication (Khmer Unicom) for US$10mn, less than 11\% of their estimated value.

It remains to be seen how long it will take for the Mfone towers and power equipment to be repaired and upgraded given this long period of inactivity; but the story of Mfone’s 1,000 towers raises several questions: how many other tower portfolios are there like this in other markets around Asia with similar conditions? Are there other neglected assets that could represent an opportunity? Does there come a point when towers should just be decommissioned and dismantled for the safety of the local community? Perhaps there is a role for towercos to play in preventing similar cases like this in the future in Cambodia and other markets across Asia.
Interest in the Chinese tower market is of great interest thanks to the recent creation of the world’s largest towerco, China Tower Company. There is also a lesser known independent tower market in China spread across the country. We caught up with George Zhu, Vice General Manager of Miteno, one of China’s largest independent towercos, to learn about his company and gain some more insight into the Chinese tower market.

Miteno was founded in 2004; we own approximately 1,000 towers in China by the end of 2015 and we have two factories there as well. Miteno also provides other services including mobile internet and mobile payments, online marketing which are part of a separate division. We have more than 1,000 staff almost two thirds of whom are dealing with the tower business. We started off just producing and building towers, then moved on to running as a towerco, and now finally we provide value added services such as RMS.

3G and 4G are having an impact on demand for power, and CTC needs to provide uptime sustainability. Miteno will provide a turnkey solution to support this, including the ability to switch to different parts of the grid and access to backup generators. In general the grid in China provides very comprehensive coverage and is very reliable. China may be looking into some renewable energy solutions for the more remote towers in the north west of the country, but most of the towers in the other regions have grid access.

Miteno plans to own around 10,000 towers to maintain balance in our portfolio. Our strategy is to keep the towers in the region where we have
the best relationships and suitable partners. We will also seek support from the government to expand in different regions within China, and we are looking into expanding abroad. We are already investigating opportunities in the US, Laos, Myanmar, Vietnam and some countries in the Middle East. The US market is very high end but the number of opportunities there has decreased, but Miteno is looking for potential purchases. The Asian and European tower markets also have strong growth potential so we are interested in potential opportunities there, and we will seek support from the Chinese government to help with our international investments according to the One Belt, One Road strategy.

We also offer an asset management system that can monitor a whole portfolio of towers. We have also provided this as a SaaS product to the railway, including to monitor the deployment of towers beside the rail line.

The only potential telecoms clients really are the three incumbents as there are almost no other alternative operators or MVNOs. We have a research team with 50 people working on product innovation. We’re also looking into getting involved in fibre networks.

TowerXchange: How many independent tower companies are there in China?

George Zhu, Vice General Manager, Miteno: There are a large number of independent tower companies across China in every major city, perhaps thousands of them, and many of them own fewer than 100 towers. Some even have as few as 30 - 40 towers. Miteno has acquired some of these smaller companies in the past. Including these towers, we estimate that there are approximately two million towers in China in total.

It is impossible to buy land in China as all land belongs to the country, and it generally requires local relationships and support from the government. All operators are listed companies and their assets cannot be easily transferred to non-listed companies; this greatly restricts any tower transactions involving the top three operators.

TowerXchange: What can you tell us about the impact of the creation of China Tower Company (CTC)?

George Zhu, Vice General Manager, Miteno: China is a dynamic market and innovation is needed from zone to zone; it can be a challenge to keep up with the changes. We couldn’t imagine that CTC would be created so quickly but now it’s already here and we have to accept the change and adopt the new policies. Manufacturing has become less straightforward and it’s harder to add value.

The creation of China Tower Company should lead to a lot of new opportunities, but it is state-owned and there are a lot of restrictions for foreign companies in dealing in the Chinese telecom
Infrastructure market. The transfer of over one million towers will be followed by a further transfer of nearly 500,000 towers in 2016. Miteno is running as a complementary telecom service towerco to CTC in some ways, and we’re also a vendor and will be supplying them as well. We’re also providing them with supporting infrastructure including street poles designed to hold street lights, cameras and provide Wi-Fi access. China is promoting the development of the Internet of Things and Miteno is involved in supporting this. We’re also planning on taking this model of street posts to Europe and the Middle East, and we’re actively looking for partners.

George Zhu, Vice General Manager, Miteno: There may be some opportunities for international companies to provide consultations as CTC consolidates its new assets and develops a strategy for upgrades to support future service development. There are some assets that have been transferred to CTC that have no documentation and were deployed ten years ago that may need to be decommissioned and rebuilt. In some cases the database of tower assets is a huge mess but this represents a potential business opportunity to introduce a model for analysis. At this point the average tenancy on CTC’s towers is 2.2. Miteno’s goal is to have at least three platforms on each of our towers which could make as many as six to nine tenants possible, and in the future we will aim for a tenancy ratio of 1.7 to 1.8.

It will be difficult for foreign companies to do business with CTC; they seldom attend events and since they are state-owned they can’t say much without the approval of the government. They have to be much more careful than other companies. Miteno may be able to partner with international companies and propose projects with the CTC, as well as providing financing for new projects too. Ultimately most assets are controlled by the state and any foreign company wishing to enter the market will require a local partner. That being said CTC will need support to complete the consolidation of its assets and there may well be opportunities to be found.
China Tower Company absorbs 1mn towers

Tower companies now own two in three of the world’s telecom towers

Shareholders in China Tower Company

- China Mobile 38%
- China Telecom 27.9%
- China Unicom 28.1%
- China Reform Corporation 6%
- China Reform Corporation 6%

China has become the latest telecom market to adopt the tower company business model, unlocking capex and opex savings through infrastructure sharing. With the injection of around a million legacy tower assets into China Tower Company (CTC), towercos now own 2,025,946 of the world’s ~3mn towers. MNOs who retain their towers are now in the minority – this transaction marks a new landmark in the separation of telecom real estate from retail telecommunications, a process many accredit as having been started by SBA Communications, Crown Castle and American Tower in the U.S. back in the mid nineties. CTC now owns ten times as many towers as American Tower, but analysts value CTC around 10% less than AMT.

It remains unclear just how big China Tower Company is. Bernstein reported a tower count as low as 765,000. Local press reports suggest CTC may have as many as 1.5mn towers on their balance sheet. The reality is probably somewhere in between – TowerXchange estimates CTC will have a tower count of 1.16mn, based on local sources in the tower industry, who also suggest that a layer of local independent developers own a further ~20,000 Chinese towers.

The reality is that the usual issues of inaccurate asset registers, MNOs continuing hesitance to reveal the full extent of their networks, and the pace of network expansion, mean it's unlikely anyone knows precisely how many legacy towers are being injected into CTC and, while the financial terms of the deal to inject China Mobile, China Unicom and China Telecom’s towers into CTC were announced in October 2015, no actual asset counts could be found in local or international coverage.

The exact pace of Chinese tower network expansion also remains unclear. When launched, CTC had an initial contract to build 120,000 new towers, with local reports suggesting many of the delivered sites were sourced by subcontracting to or buying from local independent developers. More recent reports suggest CTC has an order book of 409,000 towers, of which 271,000 have been delivered – take those numbers with a pinch of salt. Infrastructure sharing is believed to have reduced China’s new tower requirement by as much as 33%, but the numbers are still huge: various reports suggest CTC could build a further million towers in the next two years, driven by 4G rollout and associated network densification.

Keywords: 4G, Asia, Asia News, Asset Register, Build-to-Suit, CTC, Carve Out, China, China Tower Company, Exit Strategy, Infrastructure Sharing, Lease Rates, Masts & Towers, News, Power as a Service, Stakeholder Buy-In, Towercos, Transfer Assets, Valuation, Who's Who

Read this article to learn:
- Reports of the scale of CTC and of their BTS programme
- Breakdown of the ownership of CTC
- The valuation of the towers transferred to CTC
- The implications of the creation of CTC for the penetration of the towerco business model worldwide
What is clear is that CTC will operate any backup power solutions at their sites, providing a full power service, and that China’s MNOs will no longer build their own towers. All three MNOs announcements make statements to similar effect, here quoting from China Unicom: “The Sellers have undertaken to the Tower Company that they, together with their subsidiaries, shall in principle cease to construct any infrastructure facilities (including telecommunications towers) as well as indoor distribution systems for main public transportation venues (including subway, railway, highway, airport and transport terminal), large venues and key buildings (including commercial and residential buildings used by multiple owners and government buildings) from 1 January 2015.”

The creation of CTC has already stimulated infrastructure sharing in China; China Telecom Chairman and Chief Executive Wang Xiaochu disclosed that about 70 per cent of an initial pool of 60,000 towers provided by CTC were put to use in the first half of 2015.

Various analysts ascribe an initial valuation of CTC at CNY214-230bn (US$34-36bn). The transfer of China Mobile, China Unicom and China Telecom’s towers to CTC reportedly yielded an average of just US$22,000 per site, significantly below replacement cost and below the US$80,000 per tower CTC was offering to acquire independent developers’ towers. The low acquisition cost reflects the depreciation of an inventory of ten plus year old towers, towers which were built to gain market share and with less of a view toward longevity and structural capacity, so significant improvement capex will be required. The low price point also reflects the mixed bag of assets being transferred, inclusive of everything from substantial ground based towers, a great many monopoles, rooftops, and even small Wi-Fi offload sites. Few of China’s sites are camouflaged, which also reduces their valuation. With the leaseback rate still under negotiation, the low acquisition cost also suggests lease rates in China may be below the current independent tower average of around US$650-1,000, depending whether the site is rural or urban.

Behind the public façade of the creation of CTC, and the focus on efficiencies and resource sharing, the reality is that China’s carriers have been cautious about spinning off their towers to CTC, which in part explains the participation of China Reform Corporation in bringing some central government strength and capital to push this critical infrastructure venture to full fruition. The involvement of China Reform Corporation, a kind of sovereign wealth fund with a particular focus on reforming state-owned enterprises, also hints at a potential future IPO of China Tower Company in Hong Kong, which many analysts forecast taking place as soon as 2017.

Comparing towerco penetration worldwide

<table>
<thead>
<tr>
<th>Region</th>
<th>Own %</th>
<th>Towerco %</th>
<th>Sources: TowerXchange, RBC, Delta Partners, Mott MacDonald</th>
</tr>
</thead>
<tbody>
<tr>
<td>China 1,180,000 / 1,180,000 towers</td>
<td>100%</td>
<td>0%</td>
<td></td>
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<tr>
<td>Europe 158,911 / 600,000 towers*</td>
<td>27%</td>
<td>73%</td>
<td></td>
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<tr>
<td>India 305,355 / 450,000 towers</td>
<td>68%</td>
<td>32%</td>
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<tr>
<td>S &amp; SE Asia exc India 84,996 / 317,208 towers</td>
<td>27%</td>
<td>73%</td>
<td></td>
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<tr>
<td>N &amp; East Asia exc China 69,975 / 160,000 towers</td>
<td>0%</td>
<td>100%</td>
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<tr>
<td>CALA 114,139 / 140,000 towers</td>
<td>44%</td>
<td>56%</td>
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<tr>
<td>USA 2,040 / 139,800 towers</td>
<td>82%</td>
<td>18%</td>
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<tr>
<td>MENA 49,149 / 122,739 towers</td>
<td>40%</td>
<td>60%</td>
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<tr>
<td>SSA 2,692 / 14,900 towers</td>
<td>1.4%</td>
<td>98.6%</td>
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</tr>
<tr>
<td>Oceania</td>
<td>18%</td>
<td>82%</td>
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</table>

* Europe includes JV infracos as towercos. Independent towercos own 9%

2,058,123 of the world's 3,368,247 telecom towers are now owned by towercos

Sources: TowerXchange
Analysys Mason take the MNO perspective on infrastructure sharing

Understanding what motivates tower divestments, and what the main obstacles are

With the pace of tower transaction deal flow continuing to pick up in Asia, it can be challenging to predict where and when the next transactions or portfolio divestments will occur. We recently spoke with Lim Chuan Wei, Partner at Analysys Mason, to get an MNO perspective on infrastructure sharing, and find out what motivates the decision to sell assets, and what stops them from making the leap as well.

Keywords: 3G, 4G, Analysys Mason, Asia, Asia Insights, Australia, Capex, China, Deal Flow, Divesting, EBITDA, Infrastructure Sharing, MNOs, Opex, Regulation, SLAs, STP, Thailand, US, Vietnam, XL Axiata

TowerXchange: What can you tell us about the development of the tower industry from an MNO perspective?

Lim Chuan Wei, Partner, Analysys Mason: With margins continuing to decline and competition increasing, MNOs are looking at how they can reduce their capex, and many have begun divesting towers and reallocating resources into active equipment, especially when bidding on spectrum and rolling out 4G services. This has had definite benefits for some of the early adopters of the tower sharing model, but there are some potential pitfalls that make some MNOs think twice about divesting infrastructure.

TowerXchange: What would you say are the biggest obstacles for MNOs considering divesting their infrastructure?

Lim Chuan Wei, Partner, Analysys Mason: One of the main potential challenges is future-proofing agreements with towercos. In many cases it’s hard to predict how technology will change and what the new demands on the infrastructure will be. As wireless technology continues to evolve, more space is often required on towers for active equipment, and this can have an unforeseen impact on sharing agreements, requiring an increase in cost. MNOs looking into divesting want to avoid being limited in how much space they have on towers, and being stuck with unforeseen costs.

Read this article to learn:
- MNO perspective on tower agreements and the importance of future-proofing
- Avoiding over-reliance on one service provider
- Regulatory considerations for MNOs
- Which Asian markets will see the next tower transactions?
TowerXchange: What’s your perspective on the MNO approach to tower agreements?

Lim Chuan Wei, Partner, Analysys Mason: A lot of MNOs make a compromise between getting more up front, and being willing to pay more in perpetuity, but this impacts EBITDA. Putting forward less cash up front makes the EBITDA less effective, and being charged US$1,000 vs. US$500 per month makes a big difference. Paying more up front also leads to lower margins in the future.

This is less of an issue than it used to be, and now many top MNOs are looking into divesting assets to towercos, but there is still resistance. By selling their towers MNOs lose control of who the tenants are, and in some cases their competitors can become tenants. MNOs divesting assets need to make sure that the SLAs are sufficient. Another consideration is whether some key staff responsible for maintaining the towers are included in the deal; this doesn’t always happen but when it does it can be tricky to negotiate. There are many different objectives, alignments and other factors to consider. Valuation is another point; buyers will have a higher valuation because there are more tenants and both the MNO and the buyer share the upside. No matter what, extra tenants will always increase the value of the towers.

TowerXchange: What is the impact of regulation?

Lim Chuan Wei, Partner, Analysys Mason: Regulatory issues also have to be taken into account; current examples of this can be found in Bangladesh where they are looking at licensing tower companies, and in China all of the towers of the incumbent MNOs are being consolidated into one huge tower company controlled by the government.

The balance of power can vary a great deal, and the influence on regulation of MNOs and towercos is different. It’s more difficult for a government or regulator to tell an MNO that a tower is not built to spec than it is to say it to a towerco responsible for a new rollout. Governments and regulators can’t afford to have legacy towers torn down and risk losing coverage in certain areas, but in some cases towerco towers can be decommissioned.

In general MNOs don’t want to be over-reliant on any one supplier; in China, for example, the consolidation into one huge tower company is likely to lead to the rise of an independent tower company market as mobile companies choose to reduce their dependence on one single towerco. And in Indonesia a lot of MNOs are trying to sell their assets; XL sold their first batch to STP but that probably won’t happen again as they want to reduce their exposure to risk. When an MNO has only one towerco meeting its needs it can cause big problems if there are issues with that company down the road. MNOs can’t afford leave everything 100% in the hands of another company. With a 5-10 year contract there is always the potential that prices will increase and MNOs don’t want to have all their infrastructure in one basket.

Ultimately, MNOs can benefit from towerco expertise in building, contract and leasing management. When an MNO needs new towers quickly towercos can have them up and running in short order. If the contract is carefully planned, the skill of towerco infrastructure management can definitely lower future capex.

TowerXchange: Which markets do you expect to see the next transactions or tower divestments?

Lim Chuan Wei, Partner, Analysys Mason: At this point there are some very developed tower markets in Asia including India and Indonesia, but there are others that still have some way to go. When the time comes for the lesser-developed markets they will have to consider these points. Making the right choices in the early stages can avoid the higher costs that we see now in markets like the U.S. and Australia.

Thailand and Vietnam are poised on the adoption of the towerco model, but there are still regulatory hurdles, and the local MNOs aren’t completely sold yet. It will also be interesting to watch the Myanmar market as this is one of the last greenfield telecoms deployments and companies like Telenor have extensive experience with towercos and the towerco model. There are likely to be a lot of lessons for other MNOs and towercos in other Asian markets to learn.
The MNO matrix was created to provide a visual representation of MNOs, their footprints in Asia, and the partnerships, JVs and tower sales that they have engaged in to date. The matrix also highlights which tower markets are the most active and where the tower model has yet to take root.

To maintain visual simplicity, only Asian countries where tower transactions or substantial tower inventories are held have been included.

India and Indonesia jump out as particularly active tower markets with multiple tower sales and carve-outs. We can also see markets that are on the verge of their first tower deals such as Pakistan and Thailand. The less active markets appear predominantly in red including Japan, the Philippines and South Korea. Finally, we can also look from an MNO perspective to see which operators have been the most progressive in divesting tower assets based on completed or rumoured deals. The clear leader from this view is the Axiata Group which has carved out its towers to subsidiary towerco edotco. Other operators active in sale and leasebacks and towerco partnerships include Hutchison Whampoa, Ooredoo, Telenor, and Vimpelcom.

For more information on tower transactions from an MNO perspective, don’t miss our interview with Analysys Mason, also in this month’s journal. And for a history of Asia’s tower transactions, and other baseline data, check out “TowerXchange’s analysis of the independent tower market in Asia”
### Matrix of Asian MNO tower strategies

<table>
<thead>
<tr>
<th>MNO</th>
<th>Afghanistan</th>
<th>Australia</th>
<th>Bangladesh</th>
<th>Cambodia</th>
<th>China</th>
<th>India</th>
<th>Indonesia</th>
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<td>Axiata Group</td>
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<td>Bharti Airtel</td>
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**Legend:**
- **Red:** Present but haven’t sold
- **Orange:** Potential tower deal
- **Yellow:** Partnering with towerco
- **Blue:** Carved out towerco
- **Green:** Sold to towerco

Source: TowerXchange research
Matrix of Asian MNO tower strategies (cont)

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Legend:  
- **Present but haven’t sold**  
- **Potential tower deal**  
- **Partnering with towerco**  
- **Carved out towerco**  
- **Sold to towerco**

Source: TowerXchange research
Welcome to the TowerXchange who's who!

Welcome to the TowerXchange who's who, a kind of vendor directory with personality! Over the last three years we've interviewed over 150 business leaders from innovative passive infrastructure equipment and service providers. By popular demand, here we categorise those profiles, with each company name hyperlinked to our exclusive interviews.

New this month:
- 324 Accruent’s SaaS site management solution
- 327 Cue Dee tried and tested
- 329 Feel the FieldForce!
- 333 Flexenclosure eSite rolled out in Myanmar
- 335 Reflexions on fuel monitoring for hybrids
- 337 Gen Power’s variable speed DC generators
- 339 GSMTOWERS transitions to full turnkey
- 342 Infozech advocate ‘Discipline of Action’
- 346 Redflow’s innovative flow battery
- 348 Tarantula optimises towerco processes
- 352 ZTE’s award winning green energy
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Is your company not included in our Who’s who? Would you like to suggest additions? Please email amayhew@towerxchange.com
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Accruent’s SaaS site management solution delivers for towercos

Siterra helps optimise key tower management tasks, and the service is constantly evolving to meet client needs

Accruent’s Siterra provides a platform much like a dedicated ERP for towercos and MNOs - they are experts in helping clients clean up their data, making the solution ideal as companies scale their operations across multiple regions and countries. In this latest in a series of interviews exploring the capabilities of Siterra, TowerXchange focuses on the merits of using a native SaaS platform, and on data accuracy and standardisation, critical to accelerating time to market for tenants, and critical to driving tenancy ratio and valuation growth for the towerco or MNO.

Keywords: Accruent, Asset Lifecycle Platform, Asset Register, Capacity Enhancements, Infrastructure Lifecycle Management, Infrastructure Sharing, Job ticketing, KPIs, Monitoring & Management, Multi-country Partner, NOC, O&M, Operational Excellence, RMS, Site Level Profitability, Site Management System, Siterra, Transfer Assets, Who’s Who

Read this article to learn:
- Accruent’s position in the telecom ecosystem and global footprint
- How Siterra helps manage the full tower site life cycle
- How Siterra enables working with subcontractors
- The benefits of a SaaS site management platform

TowerXchange: Please introduce your company – where do you fit in the telecoms infrastructure ecosystem?

Kevin Reichle, General Manager of Telecom, Accruent: We have developed an enterprise Software as a Service (SaaS) product for tower companies which encompasses life cycle management tasks like site construction, help with co-location and the decommissioning of towers. Our software facilitates efficient operations and drives strong revenue growth for tower operators and managed service providers.

Think of us as an Enterprise Resource Planning (ERP) provider for tower companies and Mobile Network Operators (MNOs). We have the capacity to manage the entire ecosystem that surrounds tower infrastructure. Co-location is one area we have a special focus on; most tower companies want to increase their co-location. What makes our company unique is that it has the capacity to manage the entire process from marketing through to fulfilment and management.

TowerXchange: The first question our readers will want to know is ‘how proven is your solution in the field?’ Can you please tell us about the performance of your solution the field – who is using it and what results have been achieved?

Kevin Reichle, General Manager of Telecom, Accruent: Our solution has strong credibility in the market. Thirteen of the top 121 tower companies...
listed by Tower Xchange are already current Accruent customers. At present, we operate in 12 countries across five continents and have a particularly strong focus for 2016 in the Asia Pacific region. One of our largest strategic customers is based in Australia and we are actively prospecting in other Asian markets including China. We are constantly adding new portfolios for our current customers and carrying out implementations in multiple countries.

At first, many of our clients purchase the solution to use it in a particular territory. However, once they have the solution installed, they realise that they can achieve operational efficiencies by rolling it out across all of their countries and portfolios, and we can support them in this endeavour. If a company wants to roll out our solution to multiple countries, we can help them standardise processes including reporting, colocation, license management, project management, vendor management, and site-centric systems.

One of the selling points of our solution is that it cleans up and standardises data. It puts data into a much more efficient site-centric format, which makes it easier for MNOs and tower companies to buy, integrate and market assets. What’s more, by handling data in a digestible manner, tower companies and MNOs can make towers available on the market faster and more cost efficiently, thereby increasing tenancy ratios.

**TowerXchange: How does your solution help manage different stakeholders within the tower supply chain from tenants to subcontractors?**

Kevin Reichle, General Manager of Telecom, Accruent: The solution can help tower companies handle leads and administration models. In addition, the asset register and customer portal integration that sits at the heart of Siterra’s colocation solution can be used to provide up-to-date information on colocation. For example, a customer may want to get information on the amount of available space on a tower, or they may wish to inform tower companies of exactly what’s available on a tower in a particular city or region. They will be able to do all of this through our portal.

Our solution can also be used to support contract and service provider management – in fact, it has practically unlimited uses.

Siterra uses a permissions-based model. If an operator or tower company wants to give a contractor or service provider access to the system it can do so very easily. The contractor or service provider can then carry out a task and post a photo to show that it has completed its operation. Siterra offers sophisticated tools for project managers to efficiently review work submitted for accuracy and quality. What’s more, the system has built in security features so that each contractor’s access and visibility is limited to only the assets, tasks, and sites that are necessary for their work.

**TowerXchange: How can your SaaS platform be configured to adapt to different towercos’ unique business processes and workflows?**

Kevin Reichle, General Manager of Telecom, Accruent: We are constantly developing and upgrading our platform to suit the needs of tower companies. As things currently stand, Siterra provides for more than 90% of tower companies’ needs straight out of the box. The platform is also fully configurable so customers can adapt it to meet their specific requirements.

In fact, we’ve developed many feature requests in partnership with our clients. A client will typically come to us with a request for a particular feature. Once we have developed that feature we will incorporate it into later versions of our platform so
that other customers can take advantage of it.

Thanks to our focus on long term partnerships and successful product co-development, we’ve been able to create a stable platform for tower portfolios. However, we notice that many companies in the market continue to invest in custom software. We feel that this is a failed strategy because, over the long term, companies end up wasting IT resources and limiting the potential to make long term efficiency gains.

TowerXchange: How can a robust approach to asset registers and asset lifecycle management improve the valuation of tower assets?

Kevin Reichle, General Manager of Telecom, Accruent: The main benefit comes in being able to understand the condition of the assets. Being able to keep track of inventory is another benefit, particularly for large, international tower companies. Smaller companies, on the other hand, are looking to maximise their tower valuation for strategic buyers so that is where the site-centric focus of our software comes into play.

Our platform can provide complete access to maintenance records, site information and pictures of site equipment. This makes it extremely useful for strategic buyers and companies that are seeking to sell their equipment.

For example, it isn’t really feasible for a strategic buyer to use manpower to inspect four thousand towers when purchasing a portfolio. By using Siterra, buyers and sellers can perform clean searches without digging through files and records to get access to the right information. We find that most buyers and sellers prefer to use Siterra to carry out the portfolio valuation process – at the end of the day our system reduces acquisition risk for acquirers and improves return on investment for sellers.

TowerXchange: Please sum up how you would differentiate your solution from your competitors?

Kevin Reichle, General Manager of Telecom, Accruent: Our annual product investment is larger than most of our competitors’ revenues – that in itself differentiates us from our competitors.

On top of this, Siterra is a SaaS platform, so we have benefited from the shift towards cloud applications. Unlike many other solutions on the market, our SaaS application was not built from scratch based on an on-premises application – all of our incremental investments have been to enhance its functionality. Total costs for the customer can escalate quickly if a solution needs to be re-built over time or requires extensive support. That’s why it makes much more sense to purchase a proven SaaS solution like Siterra.

With some solutions on the market, users tend to become beholden to professional service teams after deployment. That’s not the case with Siterra. Once a customer has bought the solution and implemented it, they’re up and running. They don’t need to constantly check in with our professional services department.

There’s also a huge amount of functionality built into Siterra that allows customer system administrators to modify workflows, create new reports and manipulate site data on a large scale within the administration console. Users don’t need to receive any code or help from Accruent to make these changes.
Cue Dee brings tried and tested features and functionality to the field
Leveraging 20+ years of experience in telecoms infrastructure to develop a versatile and cost-effective solution

TowerXchange asked Patrick Hedlund, Business Development & Key Account Manager at Cue Dee, to explain the quality differentiators of their flagship product, the X-Tower, and the benefits of standardised solutions versus custom-built towers.

Keywords: Africa, Alcatel Lucent, Al Madar, Asia, Asset Lifecycle, Capacity Enhancements, Ericsson, Globe, Huawei, Infrastructure, Sharing, Installation, Loading, Masts & Towers, Méditel, Procurement, Retrofitting, Steelwork, Tower Design, Tower Manufacture, Who’s Who

TowerXchange: Please tell us about your company.

Patrick Hedlund, Business Development & Key Account Manager, Cue Dee: Cue Dee is a manufacturer of telecoms towers including guide posts, antenna brackets, and wind measurement devices. We were acquired in April 2015 by the Lagercrantz Group, which is active in seven countries in Europe and in China and the US. The Group has more than 1,200 employees and revenue of approximately US$375mn. The company has been listed on Nasdaq Stockholm since 2001.

TowerXchange: Please tell us about where you fit in the telecoms ecosystem?

Patrick Hedlund, Business Development & Key Account Manager, Cue Dee: We mainly work with Mobile Network Operators or systems integrators like Ericsson, Nokia, Huawei and Alcatel Lucent.

During 2013 CUE DEE and Elektroskandia decided to take the existing cooperation to the next level. Elektroskandia Shanghai has taken over production of CUE DEE’s popular X-Tower system. This was a natural step since the big markets today are in Asia and Africa where Elektroskandia has a strong presence. CUE DEE has retained ownership of the X-Tower system and will still develop and market it, but the production will be handled by Elektroskandia Shanghai.

We hope that this intensified cooperation will bear fruit and that we will be able to better support our

Read this article to learn:
- Cue Dee’s background, global footprint and partner ecosystem
- Cue Dee’s past deployments and plans for the future
- How the X-Tower delivers a versatile and cost-effective solution
- Cue Dee’s approach to custom tower design and manufacture
customers. Our sourcing plant in China has a high capacity and they also have supply brackets. We also have access to a local logistics company that has a 95% equity in deliveries.

**TowerXchange:** Can you give us some examples of successful deployments? Which markets were they in and who were you working with?

Patrick Hedlund, Business Development & Key Account Manager, Cue Dee: We have done a lot of work in Africa; for starters we supplied Al Madar the largest operator in Libya with towers for 1,100 sites over a period of eight years with integration undertaken by local companies. In Morocco we provided 238 towers to Méditel. In total we supplied to over 80 countries globally. These towers were adapted to the individual markets and demands of the sites, and they were all greenfield developments. In Asia some projects have included providing towers to Ericsson for Globe in the Philippines and some projects in Taiwan as well.

**TowerXchange:** What are some of the key differentiators of Cue Dee’s towers?

Patrick Hedlund, Business Development & Key Account Manager, Cue Dee: We use an optimised design, the X-Tower system, which incorporates a wide range of features and specifications that meet most Mobile Network Operator and towerco requirements.

The towers range in size from 20m to 60m, and they come in 4m segments so they can be scaled to meet the needs of the site. We use high quality galvanised steel, and only solid material instead of tubes to prevent corrosion. The towers are stable and resilient, and optimised to withstand winds of up to 200km/h. Our standard model will hold one tenant with an area from 5 to 15 square metres; they are lightweight, easy to install without a crane or helicopter, and have a small footprint. The X-Tower can also be outfitted with other features such as climbing barriers, lightning rods, booms, top spires, fall arrest system, obstruction lights, brackets, etc.

Offering standardised towers enables us to deliver the most cost-effective solution for most instances, and they can be rapidly deployed, reducing time to market. We also have some other types of smaller-scale standardised towers including rapid-deployment units (RDUs) and cell sites on wheels (COWs) for specific scenarios such as live events.

**TowerXchange:** Do you also offer customised solutions for scenarios where the standard model doesn’t work?

Patrick Hedlund, Business Development & Key Account Manager, Cue Dee: Yes, we also provide custom-built towers in cases where the tower needs to carry heavier loads, when they need to hold more than one tenant, or when a backbone tower is required. Customised towers are generally for smaller projects, for example a special order from an MNO when they have a specific requirement. We start off with a brief and calculate the materials required, the cost and the time requirements and what kind of time to market can be expected. We design everything from the base up and optimise it using TNX and RSTAB, analysis software for 3D steel structure calculations.

**TowerXchange:** What can we expect next from Cue Dee and the X-Tower?

Patrick Hedlund, Business Development & Key Account Manager, Cue Dee: As we continue to leverage our 20+ years of experience in telecoms infrastructure, we’re constantly looking at new ways to adapt our products. As we expand our global presence we’re moving beyond the remote sites in less developed markets. Now we’re looking at some of the more dense markets in Asia and developing new models that incorporate features like multiple tenancies as standard to meet their unique requirements.
Feel the FieldForce!
New field workforce management system delivers powerful analytics with flexible pricing and no deployment or integration costs!

Basit Malik, Founder, FieldForce:
I am the Founder of FieldForce. Before starting the company, I led PWC’s Middle Eastern telecom practice. Prior to that, I worked with Sprint and Nextel in the US.

Between 2009 and 2014 it became clear to me that a great deal of MNO and tower company expense was coming from field operations – both in-house and outsourced.

We felt as a company that the time was ripe to change the whole way in which field maintenance is carried out. A lot of companies rely on cumbersome spreadsheets and paper-based checklists to carry out their maintenance. We wanted to use technology to disrupt all of this.

In the past, thousands of data points per site were analogue. We took the same data and built an analytics platform around it to provide much greater visibility into workflow.

Once you have visibility into workflow, you can then move from scheduled to predictive maintenance.

Now we serve three key segments of the telecoms ecosystem – MNOs, tower companies and managed service providers – and help them get much more visibility into their data.

Keywords: Asset Register, FieldForce, Job Ticketing, KPIs, Monitoring & Management, NOC, O&M, Operational Excellence, Opex Reduction, Site Management System, Site Visits, Skilled Workforces, Who’s Who

Telecom service providers are continuously working to maximise the efficiency of their field operations and maintenance teams and subcontractors in order to reduce opex and improve margins. It doesn’t help that they still have to rely on old tools: spreadsheets and home-grown fragmented databases are still widely used for analysis. FieldForce has developed a ground-breaking and highly customisable solution which leverages the latest technology to significantly improve the efficiency of field operations. In this interview, Basit Malik, Founder of FieldForce, explains why he started the company and describes how his solution is shaking up the tower industry.

Read this article to learn:
- How FieldForce has delivered 15% opex savings in a 500 site trial
- How to move from 30-60-90 day scheduled maintenance to predictive maintenance
- Creating improved visibility into asset and managed service provider performance
- FieldForce’s proprietary scoring algorithm
- How to integrate legacy spreadsheets
want to know is how proven is your solution in the field?

Basit Malik, Founder, FieldForce: We are a very young start up. In the past six to 12 months we’ve done several trials with MNOs in the Middle East and Asia. We’ve also trialled our solution at over 500 locations within a network of over 10,000 sites.

The experience that we have gained from these trials has been invaluable. We’ve been able to reduce field operation costs by up to 15% in some cases. As a result, the market is taking considerable interest in our solution – we are already in negotiations to sign commercial agreements with a number of companies.

TowerXchange: What are the KPIs for field workforce and tower network management?

Basit Malik, Founder, FieldForce: The KPIs for field workforce and tower network performance are focused on two metrics – network availability and site maintenance. Our goal as a company is to help businesses improve and balance these metrics.

Site maintenance is particularly important as it can save companies a great deal of money over the long term. Let me give a simple example. Every tower will have an antenna clamped on the top of it. It is in the interest of every MNO and tower company to ensure that their antennas are properly tightened and aligned. If the antenna comes loose for any reason it can cause a significant amount of network degradation over time.

Many companies react to these issues by building new sites at a cost of hundreds of thousands of dollars. In fact, these problems can be solved much more easily – and cost-effectively – if the problem is identified well in advance. That’s where our solution comes into play.

TowerXchange: How can MNOs, tower companies and their subcontractors move from scheduled maintenance to predictive maintenance?

Basit Malik, Founder, FieldForce: Currently field maintenance is carried out in a ‘one size fits all’ manner. Most companies carry out scheduled maintenance every 30, 60 or 90 days. However, the actual maintenance requirements may vary depending on geography, primary power availability and weather conditions.

FieldForce customers tend to handle maintenance differently. After a customer has carried out one or two scheduled visits using our solution, the system starts predicting when the customer will next need to visit their site. The customer might need to return to the site again within 30 days, but that may not necessarily be the case. As a result, our system can help customers save a great deal of time and money.

TowerXchange: Tell us about the FieldForce user interface and how the solution manages workflows.

Basit Malik, Founder, FieldForce: We provide a fully customisable user interface that can be modified
at a component level. Our solution provides them with real transparency into their networks. For example, a CTO may discover that his company has a certain number of major radio outdoor issues across a tower estate. They can then drill down into these issues in more detail and look at associated pictures from individual sites. What’s more, our solution is unique in that it can provide CTOs with highly granular information about workforces, vendors and fixed assets on the ground (generators, batteries, antennas et cetera) for individual sites. What’s more, FieldForce packages all of this information into easily accessible spreadsheets and word documents that can be reviewed quickly and intuitively.

To summarise, our solution brings all tower insights together in one place. It allows COOs, managers and technicians to identify issues, schedule remedial initiatives, and track progress in real time.

TowerXchange: How do you compare the performance of one site or tower to another?

Basit Malik, Founder, FieldForce: We have a proprietary scoring algorithm that users can customise to their infrastructure. When a maintenance engineer visits a site they assign a score to every key performance indicator (KPI). The data is then fed back into our solution, allowing managers to compare the performance of one site to another.

TowerXchange: How is data entered into the system depending on the user’s requirements. This allows users to allocate different profiles to field engineers, managers and executives.

For example, if a technician logs into the system they can schedule maintenance tasks based on the condition of the site in question. Managers can then log-in to the solution, review the work of their technicians and re-assign projects to technicians if they feel that their work is inadequate. They can also use the solution to assess the work of suppliers. Let’s say a manager sends a monthly purchase order to a supplier for maintenance work on 5,000 sites. Using our solution, the manager may discover that the supplier has visited only 4,000 sites and done a fraction of the work required on 1,000. They can then feed back this information to the supplier and request a revised invoice.

Currently, CTOs have limited visibility into what their assets actually look like. They find it difficult to visualise their sites and locate issues at a component level.
system and how is data integrity ensured?

Basit Malik, Founder, FieldForce: We use another piece of proprietary technology to import spreadsheets into the system. The technology is very effective – we can import hundreds of spreadsheets from different departments in the space of an hour.

It is worth mentioning that our customers don’t actually pay for the solution until they start using it. Our solution can be launched in 30 days without any integration or deployment costs.

TowerXchange: Does the system include access management and time attendance monitoring?

Basit Malik, Founder, FieldForce: The identity access management space already has good suppliers; we prefer to integrate with them rather than compete against them.

TowerXchange: What is unique about your analytics platform?

Basit Malik, Founder, FieldForce: Most of the enterprise software that is available on the market takes minutes to generate reports. Users expect faster results than that. Take Google, for example. When someone types a question into Google, a series of results will appear on the screen instantly. Our software works in exactly the same way – we harness the power of cloud computing to give customers answers much faster.

TowerXchange: How do you ensure that FieldForce is affordable for MNOs and Managed Service Providers who might be operating on tight margins or startup tower companies with little capital?

Basit Malik, Founder, FieldForce: As I mentioned previously, there are no deployment and integration costs with our software. Secondly, we charge a monthly fee per site for our services so there are no hardware costs. Nor do customers need to buy any servers.

We’re also very fast at deploying our software. We can deploy the solution in only 30 days and you only have to start paying for it when you start using it. Plus, you can cancel your subscription at any point.

TowerXchange: Do you see as your competition?

Basit Malik, Founder, FieldForce: Microsoft Excel is our biggest competitor – that’s why we’ve created a solution to automate and consolidate its spreadsheets into our system. We also face competition from home grown solutions and competitors like Nokia, Ericsson and Huawei.

TowerXchange: TowerXchange readers will be familiar with a number of other analytics platforms – namely Tarantula, azeti, nexsysone and Accruent. What makes FieldForce different?

Basit Malik, Founder, FieldForce: Unlike these other products, we’re not trying to address multiple problems. We have a laser beam focus on addressing issues that arise from preventative and corrective maintenance. In fact, our solution is unique because it is the first integrated end to end field maintenance system in the world. Besides optimising workflow, we consolidate all data in one place with a best in class analytics platform to provide more actionable intelligence.
Case Study: Apollo Towers rolls out national tower network in Myanmar with Flexenclosure’s eSite
A look at how Flexenclosure rolled out new infrastructure under challenging conditions in one of the world’s biggest greenfield deployments

Early last year we spoke with Flexenclosure about their largest eSite order to date: a challenging deployment for Apollo Towers in Myanmar. We caught up with Shalini Lagrutta for an update on this rollout, and to hear about its success and the strategies that helped them to deliver within a tight deadline.

Keywords: Apollo Towers, Asia, Flexenclosure, Hybrid Energy, Myanmar, RMS, Solar, Telenor, Who’s Who

Read this article to learn:
- How Flexenclosure powered hundreds of new base stations in Myanmar
- How the rollout was kept financially viable in spite of low ARPU
- How Flexenclosure met the tight time constraints for the Telenor rollout
- The benefits of 24/7 uptime, scalability, and remote site monitoring

TowerXchange: Please give us some background on this project and the rollout in Myanmar.

Shalini Lagrutta, Regional Director, Asia, Flexenclosure: In 2013, after decades without competition or technology investment, Myanmar announced it would be opening its telecommunications market to companies interested in investing in and establishing new mobile telephony networks.

Norway’s Telenor won one of the new licences and chose Apollo Towers to host many of its cellular base stations in its new national network. With absolutely no infrastructure already in place and a goal of increasing network coverage from just 10% of the population to over 80% by 2018, this was to be the largest green-field network rollout in history.

TowerXchange: Myanmar is considered to be one of the most challenging work environments; what were some of the biggest obstacles you came up against?

Shalini Lagrutta, Regional Director, Asia, Flexenclosure: Telenor had extremely high network uptime expectations so one of the biggest issues that Apollo Towers faced was how to dependably power hundreds of new base station sites across the country given that grid power was, in most places, either highly unreliable or completely non-existent.

The economics of deploying an entirely new mobile network were also extremely challenging in a country with very low average revenue per user.
Rolling out a new network on this scale would therefore be prohibitively expensive if using diesel generators alone to power the base stations, so a state-of-the-art green power solution would be needed that could reduce diesel-related costs and thus make this initiative financially viable and environmentally acceptable.

Further, Apollo had an extremely short time window to establish its tower sites if Telenor was going to be able to launch Phase 1 of its new national cellular service on time. And the problems didn’t end there, with extreme environmental issues and an often-inadequate road infrastructure seriously hampering access to many of the sites.

These challenges were certainly not for the faint-hearted.

TowerXchange: Can you give us some insight into the eSite hybrid power system and how it performed under these difficult conditions?

Shalini Lagrutta, Regional Director, Asia, Flexenclosure: Flexenclosure’s green eSite hybrid power system was selected by Apollo to tackle the problem, with Flexenclosure taking on full turnkey project responsibility for all site power-related equipment and installation.

eSite’s single product versatility allows it to be deployed in any site scenario. Upgradable to harvest solar energy if needed, eSite is also multi-tenant capable, thus allowing Apollo to host additional mobile operators over time.

With all product assembly and testing being done in Flexenclosure’s factory in Sweden prior to shipping, installation time was reduced to less than a day for each tower site, thus maximising the efficiency of the rollout teams across the country.

In this way eSite was successfully deployed at hundreds of Apollo’s tower sites in both urban and remote rural areas, enabling Apollo to meet Telenor’s strict target launch date requirement.

TowerXchange: What are some of the main differentiators of the eSite solution?

Shalini Lagrutta, Regional Director, Asia, Flexenclosure: By working with Flexenclosure, Apollo Towers was able to capitalise on a number of significant eSite differentiators.

eSite delivers 24/7 network uptime and market-leading diesel-related cost savings and emissions reductions. It’s a “one size fits all” solution, flexible enough to be used across all site scenarios – no grid, bad grid, good grid, with and without solar, etc. eSite is also fully modular, enabling a tower company to start small and expand their business easily and simply as more mobile operator tenants are added.

With many of Apollo’s sites not easily accessible, eSite’s fully integrated eManager application suite allows remote monitoring, system upgrades and control of the eSite, generator, fuel logistics and other site assets from any PC anywhere, thereby saving significant time and resources through not having to cover such a huge nationwide network manually. eManager also enables reliable collection of the site data needed for Apollo to accurately charge Telenor (and other hosted operators) for site power.

TowerXchange: What other measures did Flexenclosure take to ensure the success of the project, on-going maintenance, and other future builds?

Shalini Lagrutta, Regional Director, Asia, Flexenclosure: We have established a local office and team of over 40 fully trained and certified personnel to manage every aspect of the rollout and Apollo’s on-going service and support requirements. In terms of backing, we worked closely with EKN (the Swedish Export Credit Agency) to arrange vital EKN-backed financing for Apollo’s power network rollout.

These are just some of the ways that eSite has been a critical enabler in Apollo’s establishment as one of the leading tower companies in Myanmar and the rollout and provision of new and affordable mobile services across the country.
The importance of reliable fuel monitoring for hybrid power systems

Five factors to consider when selecting a fuel monitoring system

With generators powering most of the telecom sites in Africa, diesel is the number one factor driving operational cost. Obvious questions result: How much diesel is any given site actually consuming? When is it time to refill? Is fuel consumption in line with the expected performance of your installed power solution? Is there an issue with theft? And are you benefiting from your investment in hybrid power systems in terms of overall fuel consumption?

Keywords: Africa, DG Runtime, Energy, Energy Efficiency, Flexenclosure, Fuel Security, Hybrid Power, Monitoring & Management, Off-Grid, Operational Excellence, Opex Reduction, RMS, Site Visits, Unreliable Grid, Who's Who

Read this article to learn:
- Five factors to consider when selecting a fuel monitoring system: design of fuel tank and the ability to distinguish between legitimate use, leaks and theft
- Ease of installation and maintenance
- The ability to accurately measure how many days' worth of diesel is left in the tank
- Reliability such that one can distinguish between priority alarms and sensor malfunctions
- The ability to monitor remotely

These are clearly critical questions. But fuel monitoring is a complex process with a great number of factors affecting performance, reliability and accuracy and until recently diesel consumption has been the single most difficult factor to accurately measure at telecom sites. The good news is that reliable fuel monitoring systems are now available, but before you invest here are some key areas to discuss with any potential vendor...

1. Design
Any fuel monitoring system should be able to detect what's actually happening to the diesel, but without careful design it's almost impossible to distinguish between legitimate fuel use or whether diesel is being stolen or if the tank is leaking. The system should be able to identify when a sensor is faulty or has been tampered with. Beyond the monitoring system itself, the design of the fuel tank setup on site can also introduce complications if, for example, fuel is moved between multiple tanks. And the design should also be able to make allowances for local temperature variations that will impact fuel measurements.

2. Installation and maintenance
Even the most advanced system in the world will not provide useful or accurate data if it has not been installed correctly. The greater the installation complexity or sensor calibrations required, the greater the risk of errors and unreliable data, so the installation process needs to be as simple and straightforward as possible – especially as most telecom sites requiring a hybrid power system will
likely be in remote and/or extreme environments. Post-installation maintenance requirements also need to be kept to a minimum as tampering with sensors or cables – even if it hasn’t been done maliciously – can result in data inaccuracies on an on-going basis.

3. Accuracy
A competent fuel monitoring system clearly needs to be accurate, but accurate about what? Is it necessary to know exactly how many decilitres there are in the tank? Is that even feasible given that fluctuations in tank dimensions, external temperature and diesel density will all significantly affect a fuel reading? Rather than knowing the volume of diesel in a tank at any given moment in time, it’s far more important to accurately know how much diesel has been consumed over time; how much has been refilled; whether any has been stolen; and most importantly – how many days’ worth of diesel is left at each site so that refuelling trips can be scheduled appropriately.

4. Reliability
Of course it goes without saying that any remote monitoring system needs to be reliable. Ideally though there should be an additional level of intelligence in the system, with smart software that is able to recognise patterns of behaviour at each site, such that educated decisions can be made as to whether an anomalous reading is a result of a real issue or whether it’s more likely a sensor malfunction. In this way alarms can be prioritised and responded to with a greater measure of efficiency and control.

5. Remote Monitoring
There are obvious impracticalities in a system that requires local data collection by an engineer, especially when there are tens, hundreds or perhaps even thousands of sites involved. And with fuel planning in particular, any system which only allows sensor interrogation at a local level will obviously not be able to inform on issues that require immediate response such as increased diesel use due to a fuel leak or generator fault. The ability to remotely monitor each and every site is therefore a given and hybrid power systems such as Flexenclosure’s eSite have a fully integrated eManager tools suite which enables an engineer sitting in the NOC to compile accurate data and create real-time reports to make sense of fuel consumption (and a myriad other data points) from an unlimited number of sites. For an in-depth analysis of the importance of being able to remotely monitor your hybrid power systems, see our article on gathering data you can trust from your telecom sites in order to enable fully informed business analysis and decision-making (see issue 11 of the TowerXchange Journal).

With a well-designed, accurate and reliable fuel monitoring system in place, meaningful performance improvements and operational cost reductions can be achieved. Network outages due to lack of fuel can be entirely eliminated. Site refuelling and generator maintenance can be scheduled far more efficiently. The analysis of fuel consumption versus generated electricity will allow the detection of low-performing genset and provide the required data for a repair/replacement decision. And rather than being limited to simply evaluating site performance based on genset runtime, the overall efficiency of your hybrid power systems can be evaluated against the ROI originally promised by the system vendor.

The benefits of understanding fuel use on a site-by-site basis are therefore clear. When multiplying those benefits across an entire network of hundreds or even thousands of telecom sites, the operational improvements and cost savings can be transformative to a business.
Gen Power’s variable speed DC generators deliver 30-40% fuel savings

High quality, reliable components and variable speed capabilities combine to save energy opex, improve autonomy and extend equipment lifecycles

TowerXchange recently caught up with Bahadir Celim, Managing Director of the genset manufacturer Gen Power to learn some background on their company and current projects. Established in 2000, Gen Power provides diesel gensets to the telecoms industry both for towers and data service stations in a bigger power range. They are active in multiple countries in the Middle East, as well as in India, Turkey, Russia, all of the Turkic Republics, Myanmar and Bangladesh.

Keywords: Asia, Bangladesh, Battery, Comap, DG Runtime, DC Genset, Dimensioning, Energy, Fuel Efficiency, India, Le Roy Somer, Lombardini-Kohler, Middle East, Myanmar, Off-Grid, Opex, Reduction, Rectifiers, RoI, Russia, Site Visits, Turkey, Variable Speed DG, Who’s Who

Read this article to learn:
- The benefits of DC variable speed generators
- Achieving a low RIPPLE rate and fuel savings
- The lifecycle of DC variable speed gensets
- How to better secure gensets

TowerXchange: The first question our readers will want to know is ‘how proven is the solution in the field’ – please tell us about the performance of your solution in the field – who is using it and what results have been achieved?

Bahadir Celim, Managing Director, Gen Power: This product and concept is very new in the genset industry. The idea of DC Variable Speed Diesel Generators was introduced about a year ago with the target of achieving substantial cost savings for the telecom tower industry. We have worked jointly for almost seven months with Le Roy Somer, Lombardini-Kohler and Comap to develop this product, and have tested the product for 400 hours in real tower conditions. We have achieved very good results, as demonstrated on our data sheets.

TowerXchange: What’s the sweet spot for your solutions in terms of grid availability and the load your solutions can support?

Bahadir Celim, Managing Director, Gen Power: Our product provides Direct DC power at 12 KW+ through its alternator; because of this there is no need to convert AC to DC as there is in 95% of the gensets used in the tower industry today. Our product has a very low RIPPLE rate compared to other gensets, and we can confidently say that the fuel savings are in the 35-40% range compared to normal fixed speed AC Gensets.

TowerXchange: How has your solution been
designed to maximise autonomy and minimise the number of site visits required?

Bahadir Celim, Managing Director, Gen Power: The product can be operated fully on remote mode and connected via an internet bridge to a smart phone, tablet or computer depending on the end user's preferences. Due to the variable speed operation concept, the fuel savings compared to fixed speed AC gensets (90% of the market) is approximately 40%. Thanks to this, a fuel tank with the same capacity can last almost twice the time and reduce the number of site visits required for re-fuelling by half. It also has a single lifting point and is a very compact size so it is easy to deliver and install.

TowerXchange: SLAs often demand 99.5% or higher uptime – tell us about the reliability and autonomy of your solution.

Bahadir Celim, Managing Director, Gen Power: We work with world class equipment manufacturers; our engine, alternator, controller and other components are made by very well known, high quality brands. These are tested components that have proven to be reliable throughout the years.

TowerXchange: How is your solution scalable to accommodate the increasing power requirements as multiple tenants are added to a site?

Bahadir Celim, Managing Director, Gen Power: As of now we have primarily worked on towers that require 12 KW, which represents a big percentage of the towers used in the industry. Should there be a need to increase the power we can either install another one with the same power and synchronise it or replace it with a bigger genset.

TowerXchange: How has your solution been ‘hardened’ to protect against fuel and equipment theft?

Bahadir Celim, Managing Director, Gen Power: Our fuel cap is locked and placed inside of the genset, the doors have sensors, and the unit also has a sensor so if it is lifted it will trigger an alarm. We can install a GPS in the set and as long as the controller is connected to the battery we can provide exact coordinates for it.

TowerXchange: What is the typical asset life cycle of your solutions and how can it be maximised?

Bahadir Celim, Managing Director, Gen Power: The lifecycle of our generators is longer than the current standard fixed speed diesel generators due to the fact that ours work fewer hours. There is no data to prove it yet due to the technology being very new, but if we calculate the 40% fuel saving, I estimate that a minimum 35% increase in life cycle would be accurate.

TowerXchange: What warranty and after sales support do you offer?

Bahadir Celim, Managing Director, Gen Power: We have local agents that service the sets based on annual or multi-annual contracts in the countries that our sets are operating. We also have the full service support of the engine manufacturer and the alternator manufacturer. Our warranty is the same as the engine supplier’s, which is 12 months.

TowerXchange: Please sum up how you would differentiate your solution from your competitors?

Bahadir Celim, Managing Director, Gen Power: We use top quality branded components, and we have chosen one of the best and most proven engines with low fuel burn for the application. We have cooperated with one of the best alternator manufacturers in the world to obtain the best RIPPLE rate and greatest reliability. Also we have chosen to develop the best controllers with one of the best controller manufacturers.

TowerXchange: How is your solution scalable to accommodate the increasing power requirements as multiple tenants are added to a site?

Bahadir Celim, Managing Director, Gen Power: We are manufacturing all of these components at the supply source country which gives us a competitive edge on price as well as many logistical advantages; this enables us to make on-time deliveries to customers.

Finally, our head office is in Singapore so we can also offer financial benefits to our customers, which we discuss on a case-by-case basis directly with our potential buyers.
GSMTOWERS transition from tower manufacturer to full turnkey solution provider

GSMTOWERS evolves designs and business model to meet client requirements in Myanmar

Back in February 2014, we spoke to Christian Strømme, Managing Director, GSMTOWERS, about his company’s activities in Myanmar. We thought that we would get back in touch with him to review progress. Since our last interview, GSMTOWERS has rolled out almost 400 towers across Myanmar and is now offering a full turnkey solution to the local tower company Irrawaddy Green Towers (IGT). But the company also has ambitious plans for the future which include renovating and upgrading MPT’s legacy infrastructure.

**Keywords:** Asia, Capacity Enhancements, Construction, Customs, Greenfield, GSM Telecom Products, GSMTOWERS, How to Guide, IGT, Infrastructure Sharing, KSGM, Logistics, Masts & Towers, MPT, Myanmar, Network, Rollout, New license, Ooredoo, Passive Equipment, Southeast Asia, Spare Parts, Steelwork, Telenor Myanmar, Warehousing, Who’s Who

Read this article to learn:
- GSMTOWERS’s progress over the three phases of the Myanmar telecoms rollout
- Recent changes in importation and telecoms regulations in Myanmar
- Improvements in infrastructure in Myanmar
- Strategies for loss prevention in Myanmar

TowerXchange: We last spoke with you about your work in Myanmar in early 2014. Could you give us an update on how your projects have proceeded?

Christian Strømme, Managing Director, GSMTOWERS: We’ve been working with the local tower company Irrawaddy Green Towers (IGT) right from the beginning. In fact, our partnership dates back to the time when they received their very first tower order and they had to go through the whole state approval process. In 2014, we rolled out 300 towers across Myanmar, and did 121 structural surveys and analyses for KSGM and this year we expect to add an additional 100 towers and will do tower strengthening on another 65 sites.

Our partnership with IGT has evolved over time. There was a development six months ago that provides a good illustration of how things have changed. Up to 2014, we were working in a supply only role. Now we offer a turnkey solution that involves everything from site acquisition through construction to RFI.

TowerXchange: How have the telecoms and import regulations changed?

Christian Strømme, Managing Director, GSMTOWERS: There have been a lot of changes in terms of import regulations. When we started operating in Myanmar, the new telecoms laws were shrouded in mystery – no one knew exactly what was happening. Getting an import license was an issue so we had to find alternative routes to market. Now the import system is well established and all MNOs
have import licenses. As a result, everything is now imported by the MNOs or towercos directly.

When we first started out we had to send product descriptions with each shipment. But now we just have to include a packing list and bill of lading. There’s much less hassle, which is a big plus. Last year we had to get towers approved by Yangon City Development Committee (YCDC) and the regional state governments, which was at the time a big issue, as it was a first time for them as well. Now all is much easier as the processes are known, and well tried. However, I should mention that buildings and local permits are still issued separately. So when we buy land we have to get approval from municipalities and villages.

We also find it is harder to buy land on behalf of Ooredoo Myanmar than Telenor. Sometimes, local monastic institutions raise objections to Ooredoo plans, which can cause problems. But we’re still making progress.

TowerXchange: Conditions on the ground including weather and infrastructure have been a problem from the start in Myanmar. Have there been any changes or improvements?

Christian Strømme, Managing Director, GSMTOWERS: We’re now moving deeper into rural areas so transport infrastructure has become an issue. We’ve had to contend with a tough rainy season which is only coming to an end now. The rain removed a lot of the existing infrastructure as it does every year so we are having to contend with considerable environmental challenges. On the positive side, it is now possible for us to move more around and get to sites by car.

There are cases when we have to improvise to get items on site. For example, we recently had to build an elevated track over a wetland to move a diesel generator. To accomplish this, we asked a sub-contractor to build a track along the wetland. We then built a simple train track and used an old train wagon to move it. Because the terrain was so difficult we also had to build a small bridge to move the item along the track.

That gives you an idea of some of the problems that we encounter out in the field. That’s why it’s vital to have a good local logistical partner in Myanmar.

Talking about infrastructure generally, it’s clear that there have been some improvements over the past two years. You can see lots of road building activity in and around Yangon. There are more small vehicles on the road and the government seems to be putting a concerted effort into building slide bridges. In the rural areas, villages are insisting that their roads be rebuilt as part of a site acquisition agreement. We often find that when we buy land for a customer, the local chief will insist on road repairs as part of the deal.

The overall pace of the rollout hasn’t slowed, although admittedly there have been some quiet periods between the three phases. Last year, for example, there was a dip in activity around Christmas when the Optima project (Editor: Optima was the proposed shared rollout between Telenor and Ooredoo) fell through. But after that plans went back into high gear.

TowerXchange: How have your operations in Myanmar changed? What have been the main lessons learned so far?

Christian Strømme, Managing Director, GSMTOWERS: We have made some changes to the way in which we supply towers. We now have heavier pieces that come in fewer parts. At the start of the year we decided to adapt our original design — we went from having more lightweight pieces in a four legged model to a three legged tubular model, to reduce the number of pieces in the tower. This was due to feedback from our clients, that they kept losing pieces. A total of ten tonnes of steel went missing. We came to the conclusion that our design had too many small parts in it which meant that parts could go missing or be stolen. As a result, we’ve adapted our original design (easier to hand carry)
to one that it is more easily manageable. We've also cut down on any redundancies to ensure that there are no lost pieces. On the whole, we're happy with the decision. Although we have fewer options for upgrades later, and it is more difficult to hand carry, we've been able to reduce our risk exposure. We can also rollout parts much faster.

Since making the decision to change the design of our product we've also acquired our own warehouse. It's allowed us to better monitor and store stock. It's also helped us to realise our goal of becoming more of a full service, turnkey provider. Nowadays, we look after the stock to ensure that there isn't any mismanagement.

**TowerXchange: What does the future hold for GSMTOWERS in Myanmar?**

Christian Strømme, Managing Director, GSMTOWERS: We got our first contract as a turnkey service provider in August 2015. Since then we’ve completed our site acquisition and are finalising the first towers on air.

In addition, we’re also involved in providing upgrades to the legacy infrastructure in Myanmar owned by MPT. As part of this project, we’re working with KSGM to repair these towers and make them shareable. Typically, they tend to be old structures that pre-date the recent rollout.

We started servicing these structures last year and will begin repairing them this year. It’s all part of our soft move into full turnkey status.

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**Meetup Europe 2016**

12-13 April, London

**Meetup Americas 2016**

16-17 June, Florida

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19-20 October, Johannesburg

**Meetup Asia 2016**

13-14 December, Singapore
Improving profitability through ‘Discipline of Action’ leveraging automation

How to overcome operational challenges such as financial asset register accuracy, maintenance task management and theft prevention

The telecom tower industry is growing extensively with an ever increasing customer base to cater to operators across the world. Tower operators need to ensure 99.9% uptime for their sites and maintaining this figure is becoming a challenging task. To attain this uptime, 24 X 7 monitoring of tower sites is required. The need for real-time tracking of passive infrastructure, including people, assets and energy, has created a demand for a comprehensive tower management tool which can help to synchronise this data monitoring as well as generate meaningful actionable events to improve and keep up the agreed service levels.

Keywords: Access Control, Asset Lifecycle Platform, Asset Register, Batteries, Infozech, KPIs, Monitoring & Management, Operational Excellence, RMS, Site Management System, Site Visits, Who’s Who

Read this article to learn:

- How ‘Discipline of Action’ enables MNOs and towercos to synchronise RMS with other critical data enabling financial gains and reduced opex
- How Infozech enables the creation of a Remote Operating Centre (iROC)
- Capabilities in energy tracking, billing, battery, access, maintenance and asset management
- Online analytical processing: an automated analytics platform

TowerXchange: What are the key issues faced by tower companies in terms of operational management?

Ankur Lal, CEO, Infozech: Tower operators face several issues in terms of operation management. These issues begin right from site acquisition and continue through the lifecycle of tower operations.

At the time of site acquisition, tower operators do maintain a financial asset register but what they lack is operational data registers such as AMC renewal, the vendor associated with AMC, warranty of assets etc. CFOs are finding it difficult to map the actual operational cost with financial cost. There is a lack of automated process to validate specifications of the assets deployed at various remote sites.

It is becoming more and more difficult for tower companies to perform preventive and corrective maintenance at tower site in a timely manner to ensure 99.9% uptime. In the present scenario, maintenance activities are tracked through inefficient manual processes. There is urgent need of a solution that helps the maintenance team to manage their tasks and also offers real time tracking of all preventive and corrective activity at the sites. This would enable tower operators to reduce their revenue losses and penalties.

The biggest issue faced by tower operators is that tower sites are prone to theft. Most of the time thefts are reported as a legal issue but no knowledge base is maintained for such thefts for future reference. In order to derive pattern and meaningful intelligence
to avoid theft, one needs to analyse theft related data. Once the tower companies have identified and analysed the assets that are susceptible to theft in each region, they can easily take proactive actions to protect the assets from being stolen.

Infozech precisely addresses these issues by implementing “Discipline of Action” with its iTower product suite.

TowerXchange: How does consolidated RMS data from various vendor ecosystems help in effective decision making?

Ankur Lal, CEO, Infozech: Monitoring of tower sites is a tedious task. Operators have several sites with thousands of alarms being triggered every month. Decision makers are often overwhelmed with the huge amount of monitoring data. It’s easy enough to get distracted when you’re working with too much data. RMS data collected from sites contains noise. In order to efficiently utilise this data, it becomes vital to filter out the noise. This in turn enables tower operators to perform intelligent actions and take better management decisions. Noise can be eradicated by the 80:20 rule. Once the unwanted data has been filtered out it becomes easier to analyse desired outcomes, business challenges, best case scenarios, and worst case scenarios. It also enables tower operators to perform comparative analysis of various vendors.

Infozech’s iTower represents effective data into organised reports, monitoring screens and dashboards which enable tower operators to identify pain points and plan operational activities efficiently.

TowerXchange: What does the iTower suite consist of and how will it help customers to implement “Discipline of Action”?

Ankur Lal, CEO, Infozech: iTower has nine core modules through which “Discipline of Action” can be implemented.

iROC (Infozech’s Remote Operating Centre): iTower has a comprehensive module to remotely monitor the tower operations, called iROC. It provides an end-to-end solution, from data fetching, tracking, monitoring to controlling and reporting. With the help of iROC, tower operators can manage day-to-day activities from a remote location and control the critical events through real-time dashboards and reporting tools. iROC can integrate, aggregate and correlate alarms from different power or RMS
vendors on a single platform. Thus, the user can save a lot of time and resources to track and monitor the site and improve their uptime. All site alarms are tracked from generation to closure using this module. For some of our customers, iROC is the main operational dashboard for 24X7 monitoring of the sites for SLAs of uptime and help them to take actions on a real time basis.

**iETS (Infozech’s Energy Tracking Service):** The majority — about 30-40% of total operational cost—of running a tower’s operations is its energy costs. iETS helps passive infrastructure providers to get access to real time information about electricity usage and the movement of fuel. iETS offering is closely supported by experts that train and encourage the field staff to adhere to the company’s processes of fuel supply uptake and usage. Tower companies can further enhance their portfolio’s carbon footprints with the help of iETS. Through this module, energy sources can be tracked effectively, thus extra money spend on managing energy resources can be saved.

One of our customers uses iETS to track daily variances in budgets (or P&F costs). iETS provides them an Executive Dashboard, which the senior management team reviews with regional heads on a weekly basis to track past progress, and create plan for upcoming week – both the past deviances and the future plan can be seamlessly recorded and accessed in iETS. Over time, this culture of data based accountability helped our customer to win a prestigious recognition from a third party audit firm.

**iMaintain (Infozech’s Maintenance Management):** iTower always keeps a check on maintenance activities happening on the site through this module. iMaintain helps operators to address the asset maintenance issues effectively and efficiently by scheduling different maintenance (Preventive / Corrective / Predictive) activities and resolving critical events through the incidence and theft management feature. Users can manage the site and can opt for preventive maintenance rather going for corrective maintenance, thus reducing operational cost. Tracking the maintenance leads to a higher ROI on the assets on site.
One of our customers use this to enable operations teams to undertake corrective maintenance on time thereby increasing the uptime for the site. By maintaining the matrix for roles and responsibilities for maintenance, the efficiency of the operation is tracked and improved month by month.

**iBill** (Infozech’s Billing Module): To run a tower optimally, there are a high number of consumable items such as electricity, diesel and other energy sources. iTower has a module called iBill to ensure that all the consumption related data can be integrated for reliable billing. iBill helps tower operators to automate their billing process by integrating all vendors/telecom operators thereby reducing billing conflicts. Tower operators can easily access the power and fuel consumption data from a centralised location along with the recovery of energy usage. Using iBill, tracking of fuel and energy consumption is easy and transparent, so that the user gets billed only for the exact amount of their consumption. Users can manage billing for various operators in a single go.

One of our customers uses iBill to generate bills for all their tenants on time thus meeting the SLA to ensure service continuity, quality and timely output. Various types of agreements between towercos and operators are catered to e.g. fixed cost, pass through, retrospective and supplementary billing. Another customer generates bills based on data from varied sources (e.g. RMS, average data, and fuel bills) to then compares and analyses these before deciding which one should be sent to the operator. A workflow which allows customer to view and approve site level data of the bills ensures a reduction in payment delays due to billing disputes.

**iAnalytics Energy** (Infozech’s Energy Analytics module): Passive infrastructure providers can now address their specific questions and improve their operational performance by taking the right decisions enabled by online analytical processing. The data captured across various automated modes can be easily correlated and aggregated into the Infozech’s Analytics platform where it can be further processed for real-time action and delivery. Future analysis for various sites infrastructure and operations can be done using this module, and in doing so, the user can save both time and resources by planning events in advance.

**iAnalytics Battery** (Infozech’s Battery Analytics Module): This module helps in improving performance and life of a battery through continuous tracking, monitoring and control. It includes reporting and analysis of various battery parameters which are crucial for the functioning of a battery. Based on the operating conditions, the remaining life of the battery can be predicted and recommendations can be made on controllable parameters like depth of discharge so that overall life of battery is increased.

**iAsset** (Infozech’s Asset Management): iAsset enables tower companies to understand the location and type of asset present at the site. With the integration of site assets into a master database, iAsset allows users to keep a check and audit the site. Asset movement activity can also be captured to keep tracking of assets in a real-time. Health reports are generated to monitor the utilisation of remote assets.

**iAccess** (Infozech’s Access Management): Infozech’s belief in providing secure solutions for this industry has resulted in the development of the iAccess module. iAccess provides a platform for tower operators to securely access their sites and monitor the site accessibility as well as the performance of guards and field personnel. This module works seamlessly when integrated with access control devices for time/duration based access codes. This contributes to enhancing the life of different equipment located at the tower sites.

**TowerXchange**: Finally, please sum up the role of Infozech in improving the profitability of the international tower industry.

Ankur Lal, CEO, Infozech: Infozech has played a major role in developing products and applications that are helping Indian and International tower industry to build a culture of data based accountability, leading to DISCIPLINE of ACTION. The tower industry faces huge challenges such as inefficient tracking of assets and resources, unavailability of relevant and integrated data, accuracy of the bills generated and the lag time between getting the billing data and generating the final bill. Moreover inability to make sense of collected data to take the right business decisions. iTower addresses all these challenges with its suite of products thus helping tower operators find the right ways to improve their bottom line.
Redflow’s innovative application of flow battery technology for telecoms infrastructure shows great potential

Zinc-bromide flow batteries are making waves

TowerXchange caught up with Simon Hackett, Chairman of Redflow Limited and a champion of a innovative new commercial application of zinc-bromide flow batteries. Redflow’s ZBM battery is a good fit for emerging market telecoms. The ZBM supports a ten+ year lifespan of daily cycles that is insensitive to depth-of-discharge. It can be fully charged and totally discharged every cycle without damage. Accordingly - and unlike other battery types - 100% of the battery capacity can be utilised to supply energy to a telecommunications load without needing to ‘oversize’ the battery capacity (as is required with other battery chemistries). Zinc - bromide batteries have generally been considered too large and high capacity for deployment on telecoms sites to date, but Redflow are in the process of changing this.

TowerXchange: Please give us an introduction to your company.

Simon Hackett, Chairman, Redflow: Our Head office and research and development centre is in Brisbane, Australia. Our global presence also incorporates offices in the USA and Europe. Our batteries are manufactured by Flextronics in North America to be sold to the world market. This network provides us with the capacity to sell, integrate and maintain our products internationally. Our batteries are already installed in a range of industries, including telecommunications, agriculture and power distribution, in Australia, Central America, Asia and Africa.

TowerXchange: Tell us about your solution and where it fits in the telecom tower ecosystem.

Simon Hackett, Chairman, Redflow: Redflow has spent the last decade designing and perfecting the world’s smallest flow battery. Most people in the telecoms industry are familiar with the other batteries more commonly associated with tower sites such as lead acid or lithium-ion. Redflow’s ZBM is the first flow battery product that is the right physical size and capacity to serve the needs of the tower ecosystem. The ZBM module has an 8kWh or 10kWh storage capacity, supplying 48 Volts DC at 60-70A typical (120A Max) per module. Multiple modules can be clustered to develop any required energy storage size. This means the ZBM is the first flow battery that can scale up to a 600...
kwh shipping-container form-factor module (60 ZBM’s), and that can scale down to 10-20kWh (1-2 ZBM’s) for telecoms towers, small commercial and residential applications.

**TowerXchange: Please tell us about your partners and global footprint.**

Simon Hackett, Chairman, Redflow: We work with energy integration providers such as Emerson, Blue Sky Energy and Jaladri (amongst others). We currently have ongoing trials on tower sites in several markets including Australia, Central America, Asia and Africa, giving us an opportunity to build on our operational experience globally. These trials are progressing well and now we're sitting on the cusp of some large scale deployments.

**TowerXchange: Batteries are typically deployed in remote sites in developing markets. What are the specific benefits of flow batteries in these environments?**

Simon Hackett, Chairman, Redflow: Flow batteries are particularly suited to use in remote areas where the grid is unreliable. They will perform well over a very long lifetime in harsh conditions and will and suffer no damage if completely depleted. By contrast, lead acid batteries can be damaged or suffer reduced operating life if they are allowed to become fully depleted or if they are disconnected for a long period.

**TowerXchange: What kind of life span do flow batteries have?**

Simon Hackett, Chairman, Redflow: Redflow ZBM batteries have a warranted ten year life span based on daily full cycles (and insensitive to cycle depth variation). A 10 kWh ZBM battery can store and recover up to 36,000 kWh over this period. Lithium-ion battery lifespan (by comparison) is a complex function of charge cycle depth and charge cycle energy intensity, with significant ‘reserved capacity’ being needed to avoid the potential for battery pack damage. The lifetime of the ZBM is independent of cycle depth and cycle intensity and are not damaged by full-charge or full-discharge events, even if they occur every single day.

**TowerXchange: Are there any other key differentiators between flow batteries and other types of batteries used on tower sites?**

Simon Hackett, Chairman, Redflow: Flow batteries are real workhorses; the are hardy and will run consistently, require less maintenance, with the on-board control system providing proactive battery management and protection. They’re safer too as the electrolyte is actually a fire retardant. The majority of the battery (even the electrode stack) is made of fully recyclable plastic.

**TowerXchange: Do you envision any other applications for these batteries in the future?**

Simon Hackett, Chairman, Redflow: Currently our primary telecoms/ICT focus is telecom tower sites as our battery is an ideal energy storage solution for that market. They can also be deployed in data centre applications, as well as other non-telco power support roles (such as water pumping stations in weak-grid or no-grid environments). We have seen increasing interest in deployment of these batteries in residential environments, and we expect to have a residential reference energy system design available to system integrators in the first quarter of 2016.
How Tarantula adapts to optimise the operational and commercial processes of towercos with different business models

Udhay Mathialagan discusses how Tarantula is helping towercos perform in new markets

Tarantula, the leading telecom site portfolio management solution provider, has been consolidating its global growth and now has a presence in 19 countries across the globe, including nine in Asia. Drawing on the know-how of its management team, each with over ten years of hands-on telecoms tower industry experience, Tarantula is continuously developing its set of 29 default processes to deliver a flexible solution to help towercos deal with a variety of physical and commercial challenges in different markets.

**Keywords:** Asia, C-level Perspective, Due diligence, India, Indonesia, M&A, Malaysia, Myanmar, Revenue assurance, SaaS, Security, Site Management System, South Asia, Southeast Asia, Tarantula, Tax, TCO, Tower transactions, VIOM Networks, Who’s Who

Read this article to learn:
- How Tarantula supports clients operating in various Asian markets
- Overcoming physical and commercial challenges
- Optimising tower management in the Asian market

TowerXchange: When we last spoke Tarantula had just entered the South East Asian market, can you give us an update on the past year’s developments?

Udhay Mathialagan, CEO, Tarantula: Over the past year we’ve been moving deeper into the Southeast Asian market and we have built a significant presence in the region from our global headquarters in Singapore and our development and delivery centre in India.

We’ve expanded our operations in Indonesia, Myanmar and Malaysia where we have been focused on deployments for business that we won last year with a range of tower players in these markets. We’ve gained a great deal of insight into issues on the ground in a variety of markets across Asia, and our true local presence has enabled us to work closely with clients and build our relationships.

From a product perspective, we have utilised the lessons about the nuances of the towerco model as it’s practiced in different countries. We’ve integrated this knowledge and experience into the development of our platform and we now have 29 out-of-the-box processes or default processes that are highly relevant to towercos operating internationally. This offers our customers greater choice about how to implement our tool when building a quality business management software platform.

One thing we’ve learned is that one size certainly
doesn’t fit all when it comes to the tower business – it’s presumptuous to assume a pre-determined, cookie-cutter type solution can handle all processes. The towerco model has evolved in different ways in different countries from the original American model; we have observed its evolution over the past fifteen years and respectful of the market differences and thoughtful about how we engage with it.

**TowerXchange: How has your product evolved over the past year and what differentiates it from others on the market?**

**Udhay Mathialagan, CEO, Tarantula:** The tower business operates on two planes: the physical plane with towers, antennae, power systems, property management, et cetera, and the commercial plane including contracts, financing and accounting. Most companies operating in the tower software space don’t necessarily bring the physical and commercial elements together. The industry has made a lot of progress solving physical and commercial challenges in developed markets, but applying the same solutions in emerging markets like Myanmar comes with new challenges. Everything changes, over time, from the master lease agreements to the actual structures and equipment being deployed, and these are the scenarios that we aim to provide solutions for.

We have an out-of-the-box product; we don’t customise each deployment. However we’re focusing on creating ‘best practice’ processes based on our observations across multiple markets, and anything that we can automate we do automate. We listen closely to the market and try not to tell companies how they should operate, but how we can best help them to operate. Our aim is to arrive at the best possible outcome, to learn how our users adopt our services, and we stay in close contact with the commercial people.

One of our key differentiators goes back to essence of our company: we’re run by tower experts for the tower industry. Our focus is undiluted; we’re not involved in general real estate or other industries, nothing outside of the tower and telecoms space. All four of our top managers have more than ten years direct experience in telecoms including towercos and MNOs. This makes us very different from typical software tech firms; we know the pains and joys of the towerco experience first hand.

**TowerXchange: How is Tarantula supporting towercos that operate in different markets across Asia?**

**Udhay Mathialagan, CEO, Tarantula:** We’ve learned that in this part of the world, implementations are not easy. We need to work with our clients to understand their business processes, and what the specific challenges they face on the ground are. It’s important for towerco partners to have empathy for the towerco business model, to speak their language, and collaborate with them fully. And the challenges faced in different markets vary considerably; in the US and Europe there is a lot of standardisation; in Asia the markets are
more fragmented, the geographies are varied and in some cases there are less established business processes. Our aim is to understand our customers, understand how they can benefit from our default processes, and how to adapt these to get the optimal business outcome for them. This is an ongoing process; we have to work closely with clients, absorb their feedback and then work with it.

In terms of product development our philosophy is to be nimble and adapt to the different markets our clients operate in as quickly as possible. We don’t park customer requests into a development process that may take up to 18 months. Instead we’re constantly developing our product and applying lessons learned on the ground into new default processes with the expertise of our dedicated development team in India.

TowerXchange: Is your solution purely out-of-the-box or do you also provide support?

Udhay Mathialagan, CEO, Tarantula: We do have a professional services group, but we use it judiciously. We believe the right type of professional services is important to help customers polish and shape business processes.

We don’t just offer our clients a tool and send them off, and in many cases the perfect solution doesn’t exist; but we work with them to get as close to that as possible. This is different from working with a general enterprise software vendor that typically requires lengthy development time with vendors who don’t have an instinctive grasp of the issues at hand. We work closely with C-level executives, division heads and operational heads to share best practices and sharpen business processes; the improvement phase is a collaborative effort. We focus on TCO as opposed to list prices, and often a specific scenario will need a particular element for it to work and we will see this through to implementation so the customer gets as close to an end-to-end solution as possible.

In some markets there are issues with data hosting, and this is another area that requires flexibility. As a result we don’t limit our services to SaaS implementations, and can deploy our solution in other robust ways if required by local regulation.

TowerXchange: What are some of the specific challenges that your solution can help with in these variable market conditions?

Udhay Mathialagan, CEO, Tarantula: The main issues are broadly around energy, predictability of the workforce and communications, and all these require a new approach to data management. In the more developed markets energy is taken for granted, but it’s not a given in parts of Asia like Myanmar, India and a few other countries in Southeast Asia. Towercos need data that comes from different energy systems; they need to bring the physical data into the commercial layer and produce reports and outputs that can help them manage their business.

For those not familiar with this part of the world, there are also often issues around security, in Myanmar and Indonesia for example, and getting the supervision of assets right is important. In terms of workforce there are more “moving parts” and activities done on tower sites on a regular basis compared to countries like the U.S. or Australia where sites are often visited once or twice a year. In several Asian markets the sites need regular physical inspections, fuel checks, tower load checks, and a general higher level of activity optimisation. Towercos need to be sure that the deployed assets on their towers are actually there and therefore a different approach to maintenance management and security are required. Our software enables towercos to manage operations and maintenance of their assets, including those related to energy.
management, in a proactive and comprehensive manner.

Communications infrastructure can be another challenge in some markets; as the industry increasingly relies on connectivity for reporting from field staff, companies need to develop methods to continue building up data when offline. The towerco model as it’s known in the U.S. is quite different; for example ‘right of use’ of space is well managed there. Some Asian markets are less prescriptive than the U.S. regarding space on towers. In some cases there is a greater number of variations in contracts or terms in different markets. Our towerco management experience and efforts to develop better processes have created the ability to manage master lease agreements to key terms linked directly to asset management. Towercos can better manage pricing for different customers and integrate automated processes to reduce revenue leakage caused by discrepancies between what’s on the contract and what’s on the towers. These gaps can have a noticeable impact on tower cash flows.

Due to our sharp focus on the bridge between the physical and commercial aspects of the tower business our clients can access granular financial information that enables compliance and management of different tax situations. They can integrate a high level of automation in handling local and national taxes and in handling master contracts. We understand the need to be aware of local situations to develop the most flexible solutions.

Our solutions are also designed to assist with M&A activity, and this continues to be a hot topic in the Asian tower industry. Buyers can now benefit from a tower acquisition module – a recently launched product feature - enabling rapid assimilation of assets which is one of our default processes. From a sellers’ perspective this tool can give an accurate picture of assets at a country level and group level and can help to substantiate their valuation, provide access to quality data and current contracts, which helps with the due diligence process.

TowerXchange: Do you anticipate a lot of tower industry M&A in Asia in the near future?

Udhay Mathialagan, CEO, Tarantula: Yes, while the ongoing requirements for new builds support the formation of greenfield towercos in a few Asian markets, the market is moving into a phase of consolidation with larger players and regional players executing a roll-up strategy by buying up smaller players or stranded assets. Telcos still own the vast majority of the towers in this part of the world, these assets will make their way into more independent structures progressively, over time.

Buyers can now benefit from a tower acquisition module – a recently launched product feature - enabling rapid assimilation of assets which is one of our default processes. From a sellers’ perspective this tool can give an accurate picture of assets at a country level and group level and can help to substantiate their valuation.
ZTE’s award winning green energy experts deploy solutions in 160 countries
How ZTE has co-operated with MTN, Telefónica and IHS

An introduction to ZTE’s energy department and their range of solutions including DC power systems, hybrid and renewable energy and their network energy management system. This interview also highlights ZTE’s appetite to provide project finance, as well as some of their customer deployment success stories and award-winning innovations.

Keywords: Africa, Americas, Batteries, China, DG Runtime, ESCOs, Energy, Energy Efficiency, Hybrid Power, IHS, Infrastructure Sharing, MTN, Monitoring & Management, Multi-Country Partner, O&M, Opex Reduction, Outdoor Equipment, Project Finance, RMS, Rectifiers, Renewables, Site Level Profitability, Site Management System, Solar, Telefónica, Who’s Who, Wind, ZTE

Read this article to learn:
- How to reduce energy opex in the context of tower companies’ sensitivity to capex
- How ZTE’s Power Master solution smoothes the upgrade path as additional tenants are added
- ZTE’s approach to monitoring and optimising cell site efficiency: ZTE iEnergy
- ZTE’s appetite to arrange project finance and provide zero capex models
- Cell site energy solutions in China and the impact of the creation of CTC

TowerXchange: Please introduce yourself and introduce ZTE’s Energy Solution Planning team and vision.

Weibo Li, Director of Energy Solution Planning, ZTE: Founded in 1994, ZTE’s energy department has 21 years of experience in the AC/DC power field and 13 years of experience in the green energy field.

Now, the ZTE energy department has become the most successful Chinese enterprise in the global communication energy field. We have more than 1,000 employees, most of whom are senior engineers and subject matter experts. This department aims to be a “Green energy expert, your best partner”, making continuous innovations to meet market and customer requirements, and providing customers with competitive energy products and solutions.

ZTE energy department can supply a wide range of energy solutions and products, including DC power systems, hybrid power systems, solar plants and our network management system.

TowerXchange: Please tell us about some of your energy solution planning success stories from around the world.

Weibo Li, Director of Energy Solution Planning, ZTE: In the telecom field, ZTE energy solutions have been adopted by operators in over 160 countries, and are used widely by mainstream operators such as Telefónica, Telenor, América Móvil, MTN, Teliasonera and Etisalat.
I will share two success stories with TowerXchange readers.

ZTE enjoys high level cooperation with MTN. Since ZTE cooperated with MTN in 2008, more than 4,500 sets of DC power systems, 6,500 sets of hybrid power solutions and over 20 sets of large capacity UPS have been providing stable power for different branches, especially within MTN’s networks in Nigeria and South Africa. ZTE has become the main supplier of MTN, providing network transformation support, network quality improvement and TCO reduction services which have reduced fuel consumption.

ZTE’s energy department has also become one of the most important partners of Telefónica, offering power supply systems and solutions to 11 branches of the group, especially in Latin America. Over 20,000 sets of our DC power systems are providing service for Telefónica.

Besides the telecom field, ZTE’s energy department have also been providing service in more than 30 countries for government and enterprise communications.

TowerXchange: According to statistics from Detecon quoted in a ZTE white paper, 36% of MNO’s network opex comes from site leases, 30% from O&M and 10% from energy - given that all these services are provided by a towerco when they acquire towers from an MNO, how do the strategies of towercos differ from the strategies of MNOs when it comes to investments in opex efficiency programmes?

Weibo Li, Director of Energy Solution Planning, ZTE: On one hand, tower companies have an urgent need to reduce O&M and energy costs in order to make more profit from tenants. On the other hand, tower companies do not want to invest too much money into energy solution upgrades because they have already invested huge sums to acquire towers from MNOs. However energy and operating costs must be lower than before while the service to MNOs must improve. So tower companies will be more sensitive to capex and O&M costs compared with MNOs. As a leading energy solution supplier, ZTE focuses on:

1) A smooth energy upgrade path when tower companies are ready to transform their existing network or when they have new tenants come in
2) Intelligent network energy management to help save more O&M cost
For example, ZTE has several projects under way with IHS in Africa and other projects with America Tower in LatAm where we are minimising O&M costs without investing huge capex.

TowerXchange: How should towercos and MNOs balance the need to customise energy solutions to meet the specific needs of a complex and distributed network of cell sites, with the need to standardise to drive volume efficiencies in procurement?

Weibo Li, Director of Energy Solution Planning, ZTE: This is a complex and important problem faced by towercos and MNOs. Through unified multi energy control platforms, modular design, integrated structure, ZTE Power Master solution can satisfy different customised requirements which help solve the challenge.

For the energy generation part, it not only supports renewable energy, solar and wind power, but also supports traditional generator and grid power. For the energy conversion and control part, all components adopt modular design and are integrated into one cabinet, including the rectifier, solar PU, wind controller, inverter, dc/dc convertor, and so on. For the energy storage part, various batteries are provided for different scenarios. There are many highlights of the ZTE Power Master solution, such as unified management, integrated system, comprehensive monitoring, and a smooth upgrade path to integrate different solutions and additional capacity.

All these features can help towercos and MNOs balance the need to customise energy solutions with the need to standardise to drive volume efficiencies in procurement.

TowerXchange: Please introduce us to ZTE’s energy consumption management platform; what role does remote monitoring and management play in visualising and optimising network energy?

Weibo Li, Director of Energy Solution Planning, ZTE: With rising telecom requirements in this internet era, more and more telecom sites are deployed to satisfy voice/data/video requirements even in some developing countries. As the heart of telecom sites, the telecom energy solution supplies stable power supply to equipment. But, the three biggest challenges faced by operators include:

1) How to monitor and understand energy status of the whole network
2) How to know the bottleneck of network energy and reduce high energy cost
3) How to accomplish site security management, maintenance management and asset management

In order to help overcome these challenges,
ZTE developed our iEnergy solution which can accomplish the following functions: whole network monitoring, visible working status, energy efficiency optimisation, network O&M efficiency improvement, site security management, and asset management. The ZTE iEnergy solution can provide customers with a user-friendly internet interface, intelligent, integrated energy management and reduce their TCO to the maximum extent.

TowerXchange: What role can ZTE play in helping to raise project finance for network energy investments?

Weibo Li, Director of Energy Solution Planning, ZTE: As a global company, ZTE have established co-operative partnerships with international and Chinese banks, such as the IMF, China Development Bank, and The Export-Import Bank of China.

ZTE also have our own finance platform and have 30 years of experience in this field, which can help a lot to raise project finance for network energy investments.

ZTE are increasingly co-operating with towercos to supply the equipment that will unlock energy efficiencies and substantial opex savings. A new means of co-operating is zero capex models in which the towerco pays nothing up front instead paying over the following years.

TowerXchange: What role can ZTE play in helping to raise project finance for network energy investments?

Weibo Li, Director of Energy Solution Planning, ZTE: As you mentioned, the grid power is very good in China. So a grid + DC power system + battery solution is most commonly used. In recent years, we proposed our customer to replace their old rectifiers with high efficiency rectifiers, to transform indoor site to outdoor sites which highly improved the PUE performance of network.

After the creation of China Tower Company, honestly, our domestic market will be smaller than before due to infrastructure sharing. On the other hand, tower company will raise higher technical, commercial, engineering, and deployment requirements to suppliers. This will make it harder for small companies to survive in this market. The Matthew Effect will be obvious in market share.

While many sites will be transferred to China Tower Company, we feel MNOs will retain key hub sites and repeater sites.

ZTE have already started receiving power equipment orders from China Tower Company.

TowerXchange: Please summarise the benefits of partnering with ZTE on Energy Solution Planning.

Weibo Li, Director of Energy Solution Planning, ZTE: Working with ZTE provides three important benefits to our customers:

1) Powerful R&D to provide leading solutions and products

With about 1,000 engineers and 10% revenue investment in R&D annually, ZTE ensures its technical superiority in products and solutions. The ZTE Energy Department owns 525 patents worldwide on energy systems and telecom power systems. ZTE leads or is involved in the setting and revision of more than ten national and industrial standards.

2) Proven delivery capabilities to make fast deployment

Leveraging our global sales and service platform, ZTE has powerful logistics and delivery capabilities to support local projects.

3) Worldwide successful cases illustrating ZTE’s ability to help customers save energy opex

In 2013 ZTE won the “Best Cost Efficiency Initiative Award” from AfricaCom.

In 2014 ZTE won the “African ICT Green Power Solution Technology Leadership Award” from Frost & Sullivan.