TowerXchange Africa and the Middle East:
- Interviews with CEO, Airtel Africa and COO, Eaton
- Analysis of HTN Towers’ partnership with SWAP
- A closer look at the tower sales in KSA and Kuwait

TowerXchange Asia:
- Interviews with IGT, Apollo, Q Towers and Miteno
- Thailand and Cambodia market studies
- Demand forecasts for passive infrastructure in Asia

TowerXchange Europe:
- Who owns Europe’s towers?
- The real costs of decommissioning towers
- France market study including FPS interview

TowerXchange CALA:
- Holistic view of the Nicaraguan tower market
- Latest on Mexico, including MTP interview
- Growth stories: PTI, NMS and TORRESEC

Hal Hess explains the guiding principles of American Tower’s international strategy

Don’t miss TowerXchange Meetups for Africa (1 and 2 October) and Asia (24 and 25 November)!
With special thanks to the TowerXchange “Inner Circle”

Our informal network of advisers:

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</tr>
</thead>
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<td>(Chairman) Daniel Lee</td>
<td>Managing Director, Intrepid Advisory Partners</td>
</tr>
<tr>
<td>Akhil Gupta</td>
<td>Chairman, Bharti Infratel</td>
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<tr>
<td>Michel Faivre</td>
<td>Directeur Programme Partage d'Infrastructure AMEA, Orange</td>
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<tr>
<td>Terry Rhodes</td>
<td>Acting CEO, Eaton Towers</td>
</tr>
<tr>
<td>Marc Ganzi</td>
<td>President, Digital Bridge &amp; Mexico Tower Partners</td>
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<tr>
<td>Arun Kapur</td>
<td>Executive Chairman, Irrawaddy Green Towers</td>
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<td>formerly CEO, edotco</td>
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</tr>
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</tr>
<tr>
<td>Dagan Kasavana</td>
<td>CEO, Phoenix Tower International</td>
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<tr>
<td>Malcolm Collins</td>
<td>Chief Executive, CTIL</td>
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<tr>
<td>Chuck Green</td>
<td>Executive Chairman, Helios Towers Africa</td>
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<td>Suresh Sidhu</td>
<td>CEO, edotco</td>
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<tr>
<td>Hal Hess</td>
<td>EVP, International Operations and President, EMEA and Latin America, American Tower</td>
</tr>
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<td>Nobel Tanihaha</td>
<td>President Director, PT SOLUSI TUNAS PRATAMA (STP)</td>
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<td>CEO, Torrecom</td>
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<td>Founder and COO, Acsys</td>
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<td>Gary Staunton</td>
<td>CEO, Likusasa Group</td>
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<td>Tilak Raj Dua</td>
<td>Director General, TAIPA</td>
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<tr>
<td>Nina Triantis</td>
<td>Managing Director, Global, Head of Telecoms &amp; Media, Standard Bank</td>
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<tr>
<td>Peter Owen Edmunds</td>
<td>Co-founder and Chairman, Russian Towers</td>
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<tr>
<td>Kurt Bagwell</td>
<td>President International, SBA Communications</td>
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<tr>
<td>Jim Eisenstein</td>
<td>Chairman &amp; CEO, Grupo TorreSur</td>
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<td>Riana Donaldson</td>
<td>Manager, International Network Operations Support, Vodacom</td>
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<tr>
<td>Bimal Dayal</td>
<td>COO, Indus Towers</td>
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<tr>
<td>Inder Bajaj</td>
<td>CEO, HTN Towers</td>
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<tr>
<td>Tunde Titiayo</td>
<td>Vice Chairman, SWAP International</td>
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<tr>
<td>Thorsten Schaefer</td>
<td>CEO, azeti Networks</td>
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<td>Enda Hardiman</td>
<td>Managing Partner, Hardiman Telecommunications Ltd.</td>
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</tr>
<tr>
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<td>CEO, Wireless Infrastructure Group</td>
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About TowerXchange

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 monetizes 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 organizer with 16 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 Meetup Asia, November 24-25, 2015
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Africa’s leading, independent, telecom tower company

HTA acquires, builds and manages wireless telecom infrastructure, leasing it to mobile network operators across Ghana, Tanzania and the Democratic Republic of Congo.

HTA’s model of shared telecoms infrastructure, and its scale, helps to deliver improved efficiency and network quality and reliability for operators, reduced costs for users and increased accessibility.

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TowerXchange’s analysis of the independent tower market in Africa and the Middle East

Integration, acquisition and the drive toward efficiency

In Q3 2015, Africa’s towercos own or operate 47,746 towers, or 29% of the towers in SSA, plus a further 2,040 towers in MENA, representing 1.5% of MENA’s towers. TowerXchange forecast that by this time next year, towercos will own or operate 70,000 towers in SSA (just under 40%), with towerco penetration in MENA rising to 13.5% by Q3 2016, based on towercos acquiring and operating 20,200 towers in MENA by Q3 2016. While the pace of towers coming to market in SSA may have slowed, the pipeline of opportunities remains substantial, and the MENA market is poised to open up. However, more than half of the towers owned by independent towercos have closed since this time last year, meaning the key theme for Africa’s towercos in 2015, continuing into 2016, will be the integration of over 25,000 newly acquired towers, and strategic investment in improvement capex and efficiency programmes.

Integration: Nigeria, Airtel deals close

If you’re trying to understand when Africa’s towercos will begin integrating tower assets, then you need to pay strict attention to which deals have been announced, which have actually closed and when.

IHS has closed transactions with MTN in Nigeria for a total of 8,850 towers (closed in two tranches: an initial 4,154 closed on 24 December 2014 followed by a further 4,696 closed on 1 July 2015). IHS has also closed deals with Etisalat Nigeria for a total of 2,691 towers (2,136 transferred on 7 August 2014 followed by a further 555 on 10 August 2015). American Tower closed their deal to acquire 4,700 towers from Airtel Nigeria on July 1 2015. So all the newly acquired Nigerian towers are now on towerco balance sheets.

The other Airtel African tower sales continue to drag on; in addition to Nigeria, deals in four more countries have closed during Q2 2015: Congo B to HTA, Rwanda to IHS and Uganda and Ghana to Eaton. Deals in a further three countries have lapsed and stand cancelled: HTA’s deals in Tanzania, Chad and DRC. Airtel continue to make bullish statements about the prospects of tower deals in five further countries closing (Burkina Faso, Kenya, Malawi and Niger – all expected to go to Eaton – plus Zambia to IHS). In his recent exclusive interview with TowerXchange, Christian De Faria Airtel’s Africa
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Enabling connectivity for the future
Figure 2: MEA's middle market and prospective new entrant towercos

TowerXchange are tracking several towercos who are active in or targeting Africa (there are a couple more, but we’re not at liberty to disclose them!):

- Atlas Towers (South Africa)
- BCTEK (Nigeria)
- Communication Towers Nigeria
- Frontier Tower Solutions (targeting Burundi)
- HOI MEA (Egypt)
- Hotspot Network Limited (Nigeria)
- Infratel (South Africa)
- Pro High Site Communication (South Africa)

- Shared Networks Tanzania (active infrastructure sharing)
- Square1 Infrastructure (Nigeria and South Africa)
- TASC (targeting MENA)
- Tower share (targeting MENA)

TowerXchange estimate that these towercos own or operate a total of around 1,300 MEA towers.

The drive toward efficiency

When towercos acquire a new portfolio of assets, it doesn’t happen at the click of a button. Asset registers are audited, leases are novated (transferred / extended – terms adjusted as necessary). After that, an inevitable degree of pent up maintenance has to be caught up, while other near term measures are undertaken to ensure SLAs can be met and H&S standards complied with. Only after that point can the real investment begin in improvement capex, including tower strengthening, and ultimately in efficiency programmes. If you’re trying to model a towerco’s appetite to invest in any given passive infrastructure equipment or service, the timelines would be well-served to consider the timelines for asset audits and novations, the time required for equipment and materials to be delivered, and the time required to plan, procure, and install new infrastructure.
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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>Egypt</td>
<td>MobiNil</td>
<td>Eaton</td>
<td>2,000</td>
<td>$131,150,000</td>
<td>$65,575</td>
<td>SLB</td>
</tr>
<tr>
<td>2014</td>
<td>Rwanda &amp; Zambia</td>
<td>Airtel</td>
<td>IHS</td>
<td>1,113</td>
<td>$181,000,000</td>
<td>$162,624</td>
<td>SLB</td>
</tr>
<tr>
<td>2014</td>
<td>Nigeria</td>
<td>Airtel</td>
<td>American Tower</td>
<td>4,800</td>
<td>$1,050,000,000</td>
<td>$218,750</td>
<td>SLB</td>
</tr>
<tr>
<td>2014</td>
<td>Ghana, Niger, Burkina Faso, Kenya, Uganda &amp; Malawi (tbc)</td>
<td>Airtel</td>
<td>Eaton</td>
<td>3,500</td>
<td>$612,500,000</td>
<td>$175,000</td>
<td>SLB</td>
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<tr>
<td>2014</td>
<td>Nigeria</td>
<td>MTN</td>
<td>IHS</td>
<td>9,151</td>
<td>$882,000,000</td>
<td>$196,700</td>
<td>Joint venture (IHS 49%, MTN 51%)</td>
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<tr>
<td>2014</td>
<td>Nigeria</td>
<td>Etisalat</td>
<td>IHS</td>
<td>2,136</td>
<td>$485,000,000</td>
<td>$227,060</td>
<td>SLB</td>
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<tr>
<td>2014</td>
<td>Congo B</td>
<td>Airtel</td>
<td>HTA</td>
<td>394</td>
<td></td>
<td></td>
<td>SLB</td>
</tr>
<tr>
<td>2014</td>
<td>Rwanda &amp; Zambia</td>
<td>MTN</td>
<td>IHS</td>
<td>1,269</td>
<td></td>
<td></td>
<td>SLB</td>
</tr>
<tr>
<td>2013</td>
<td>Tanzania</td>
<td>Vodafone</td>
<td>HTA</td>
<td>1,149</td>
<td>$75,000,000</td>
<td>$87,616</td>
<td>SLB with direct investment in HTT *****</td>
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<tr>
<td>2013</td>
<td>Kenya ***</td>
<td>Telkom Kenya</td>
<td>Eaton</td>
<td>1,000</td>
<td></td>
<td></td>
<td>MLL (Contract since cancelled)</td>
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<tr>
<td>2013</td>
<td>Cameroon &amp; Cote d’Ivoire</td>
<td>Orange</td>
<td>IHS</td>
<td>2,000</td>
<td></td>
<td></td>
<td>MLL</td>
</tr>
<tr>
<td>2012</td>
<td>Cote d’Ivoire</td>
<td>MTN</td>
<td>IHS</td>
<td>931</td>
<td>$141,000,000</td>
<td>$151,450</td>
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<td>2012</td>
<td>Cameroon</td>
<td>MTN</td>
<td>IHS</td>
<td>827</td>
<td>$143,000,000</td>
<td>$172,914</td>
<td>SLB</td>
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<td>2012</td>
<td>Uganda</td>
<td>Warid</td>
<td>Eaton</td>
<td>400</td>
<td></td>
<td></td>
<td>SLB</td>
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<td>2012</td>
<td>Uganda</td>
<td>Orange</td>
<td>Eaton</td>
<td>300</td>
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<td>2011</td>
<td>Uganda</td>
<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>2010</td>
<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%, Milicom 40%)</td>
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<tr>
<td>2010</td>
<td>DRC</td>
<td>Millicom/Tigo</td>
<td>HTA</td>
<td>729</td>
<td>$45,000,000</td>
<td>$102,881</td>
<td>Joint venture (HTA 60%, Milicom 40%)</td>
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<tr>
<td>2010</td>
<td>Ghana</td>
<td>MTN</td>
<td>American Tower</td>
<td>1,876</td>
<td>$21,850,000</td>
<td>$228,375</td>
<td>Joint venture (AMT 51%, MTN 49%)</td>
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<tr>
<td>2010</td>
<td>South Africa *</td>
<td>Cell C</td>
<td>American Tower</td>
<td>1,400</td>
<td>$200,000,000</td>
<td>$142,857</td>
<td>SLB with right to acquire 1800 more</td>
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<td>2010</td>
<td>Nigeria</td>
<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>
<td>Ghana</td>
<td>Vodafone</td>
<td>Eaton</td>
<td>750</td>
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<td></td>
<td>MLL</td>
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<td>2010</td>
<td>Nigeria</td>
<td>Visafone</td>
<td>IHS</td>
<td>800</td>
<td>$67,000,000</td>
<td>$83,750</td>
<td>SLB</td>
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<td>2010</td>
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<td>Multilinks</td>
<td>HTN</td>
<td>400</td>
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<td>MLL</td>
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<tr>
<td>2010</td>
<td>Ghana</td>
<td>Millicom/Tigo</td>
<td>HTA</td>
<td>750</td>
<td>$54,000,000</td>
<td>$120,000</td>
<td>Joint venture (HTA 60%, Milicom 40%)</td>
</tr>
</tbody>
</table>

Totals / average 40002 $4,378,500,000 $130,744

* 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
*****Vodacom sold 100% of equity in towers but subscribed to acquire a 24.5% interest in HTT

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\[ \sum_{i=1}^{n} = \text{Diagram of network across the globe} \]

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vary not just by towerco but within towerco portfolios according to the vintage of the tower assets concerned, the free cash flow they generate as a function of improving tenancy ratios, and the specific appetite of the towerco concerned to either rapidly replace inefficient legacy power assets or first install RMS to evaluate what they’ve acquired and where the capital can best be spent. The latter approach can see some more capitally intensive energy efficiency investments deferred 18-24 months after the deal closes, subject to availability of capital to deploy in such a manner.

The fact remains that Africa’s towercos have started what could be a long run toward their next liquidity event. And that means they are going to want to see investments in efficiency pay off in 18-24 months. The mindset of Africa’s maturing towercos is shifting from a focus on procurement of towers to procurement of equipment – a drive toward operational efficiency that will improve site level profitability, margins and valuations in anticipation of liquidity events within an 18-36 month timescale.

**Acquisition: pipeline slows in H1 2015, but another raft of tower deals imminent**

TowerXchange are tracking 18,100 more towers coming to market in SSA, with opportunities in the pipeline in Guinea B, Guinea C, Mali, Mozambique, Senegal, South Africa and South Sudan, however we don’t expect any of these tower transactions to close in 2015. The aforementioned as yet unclosed Airtel Africa deals may be more imminent. Meanwhile, TowerXchange is also tracking 20,200 towers coming to market in MENA – specifically in Algeria, KSA and...
Kuwait, plus the possibility of knock-on transactions triggered in Egypt.

Let’s check in with the current state of the most active or newsworthy tower markets in MEA.

Algeria: TowerXchange are tracking the possibility 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 experience. The formula is further complicated in the case of Djezzy, recently reorganised so that the government owns a controlling stake.

Burkina Faso: When the deal to sell Airtel’s towers in the country finally closes, Eaton Towers will be introducing the independent towerco business model to Burkina Faso, where Telemob (Onatel) and Airtel vie for market leadership, with Telecel (Planor Afrique) not far behind. 3G was launched in 2013 but mobile broadband penetration remains just 4%*. SIM penetration is just 72%* in Burkina Faso. Burkina Faso is one of four countries where Airtel has confirmed that they have entered into exclusive negotiations with Orange to sell their entire opco in Burkina Faso.

Cameroon: Viettel’s Nexxtel finally 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. 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 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 just 72%* and mobile broadband penetration at 1%* in Cameroon in Q4 2014.

Chad: Airtel cancelled their sale of passive infrastructure in Chad to Helios Towers Africa, who had until that point seemed poised to roll Airtel’s towers together with Tigo’s to create a substantial...
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base of ~1,400 towers 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. 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 next year, Airtel or Orange may be motivated to re-open dialogue (presumably with Helios Towers Africa) and resume the process of transferring assets. The growth potential of Chad is evidenced by the fact that SIM penetration stood at just 47%* in Q4 2014. While 3G has been launched by Airtel and Tigo, there were a negligible number of mobile broadband subscribers in the country in Q4 2014.

**Congo Brazzaville:** Helios Towers Africa’s deal to acquire Airtel’s towers in Congo Brazzaville closed despite the revelation that the country was one of four being discussed with a view to a prospective for sale to Orange. 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 reached 100%* and mobile broadband penetration had reached 7%* in Congo in Q4 2014.

**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 provides a full tower+power service in Cote d’Ivoire. 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 shortcutting our 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.”

BMI forecast that mobile penetration in Cote d’Ivoire will rise from 92.4% at the end of 2013 to 101.4% in 2018, with 3G and 4G subscriptions accounting for nearly 24% of total mobile subscriptions by 2018.

**DRC:** It was particularly disappointing to see the cancellation of the sale of Airtel’s DRC network, reputed to be the most widespread in the country, to Helios Towers Africa. HTA 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, less reliable in Lubumbashi and Goma, while almost all sites outside these three cities are off-grid.

With around 4,200 towers serving 41.5mn connections, DRC has one of the highest number of SIMs per tower in the world at 9,881, 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 59%* and although 3G was launched in 2012, mobile broadband penetration remained at 8%* in DRC in Q4 2014.

**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 just over 10% of the ~19,000 towers in the country. The towers Eaton will acquire are concentrated in the Delta, Upper Egypt and Red Sea regions.
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In an exclusive interview with TowerXchange, Mobinil CFO Kais Ben Hamida said: “The upfront cash was an important element of the transaction however we didn’t want to sacrifice the opex so since the beginning of the process we looked for a deal which would represent a balance between upfront cash and impact on opex. We really wanted the impact on opex to be largely neutral.”

With SIM penetration of 114%* and mobile broadband penetration of 33%*, 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 (5,000 versus the regional average of 2,597), 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 now not happen until 2016.

Local tower manufacturer / service provider HOI-MEA also operates a network of around 40 towers in Egypt, with a vision to scale to 500 by 2017. HOI-MEA’s tenancy ratio is already approaching 1.5.

Ghana: Eaton will add 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 2,067 Ghanaian towers, representing around a third of the country’s tower stock). All of Ghana’s towercos now provide a full service tower+power. Tenancy ratios in Ghana are reportedly around two in urban areas, closer to 1.5 in rural Ghana.

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

The big story in the Ghanaian tower industry has been the devaluation of the Cedi, which has triggered a power crisis, and which has put pressure on lease rates – pressure Ghana’s towercos have not yet yielded to.

Oil and Gas wealth partly accounts for Gabon’s soaring 169%* SIM penetration rate.

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 be 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.

Figure 6: Estimated number of towers in MENA

Source: Delta Partners data, TowerXchange presentation

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SIM penetration stood at 113%* and mobile broadband penetration at 24%* in Ghana in Q4 2014.

Kenya: It seems like Eaton have been holding their breath for a proper shot at selling co-locations in Kenya. After a false start with a cancelled MLL deal with Orange, Eaton are in pole position to secure Airtel’s Kenyan towers. 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 67.1% market share. Airrtel has 20.2%, Telkom (Orange) 10.8% and new entrant Equitel 1.9%, according to CAK statistics for Q1 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 73%* with plenty of room for mobile broadband growth, at 15%* penetration at Q4 2014. Safaricom launched LTE at the end of 2014.

Kingdom of Saudi Arabia: Zain is divesting ~5,000 towers, while Etisalat is divesting ~9,200 towers in KSA. Expressions of interest have been received in both portfolios, with several parties informed of their progress to the second round. TowerXchange has been unable to confirm that at least one of the two processes is subject to a delay of several weeks.

Grid power is extensive and reliable in KSA, suggesting entering towercos may provide a ‘steel and grass’ only business model.

STC leads the subscriber market and has around 16,400 towers in KSA. KSA’s 3G network is mature and the rollout of LTE is well under way. SIM penetration was at 183%* with mobile broadband penetration at 67%* in Q4 2014.

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 215%* with mobile broadband penetration at 74%* in Q4 2014.

Madagascar: TowerCo of Madagascar (ToM), initially spun out of TELMA but now an independent towerco in its 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 feint 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 30%* and mobile broadband penetration 15%* in Q4 2014.

Malawi: Eaton’s pending acquisition of Airtel’s towers in Malawi will mark the debut of the independent towerco business model in one of Africa’s most under-developed telecom markets. SIM penetration is just 30%* in Malawi, and mobile broadband penetration 10%*. Airtel lead a dupoloy with TNM. Efforts to inaugurate a third operator have floundered with Expresso and Celcom failing to launch – the regulator’s latest pony to back is Lacell. Athonet is deploying an LTE service. There are around 800 towers in the country.

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. We understand there are around 3,000 fixed towers in Mozambique, plus 1,500-1,800 guyed mast towers erected by discount 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).

Figure 7: Estimated SIMs per tower in selected SSA tower markets

<table>
<thead>
<tr>
<th>Country</th>
<th>SIMs per Tower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mozambique</td>
<td>3,229</td>
</tr>
<tr>
<td>South Africa</td>
<td>3,545</td>
</tr>
<tr>
<td>Nigeria</td>
<td>4,458</td>
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<tr>
<td>Senegal</td>
<td>4,828</td>
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<tr>
<td>Ghana</td>
<td>5,069</td>
</tr>
<tr>
<td>Kenya</td>
<td>5,091</td>
</tr>
<tr>
<td>Tanzania</td>
<td>5,800</td>
</tr>
<tr>
<td>Uganda</td>
<td>7,620</td>
</tr>
<tr>
<td>DRC</td>
<td>9,881</td>
</tr>
</tbody>
</table>

Source: TowerXchange

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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 32%* in Niger, and mobile broadband penetration 1%*.

Nigeria: ATC Nigeria is up and running under the leadership of former ATC Uganda and Ghana CEO Gordon Porter and primed with the US$1.09bn acquisition of 4,700 towers from Airtel giving ATC 15% of Nigeria’s towers. The Nigerian tower market is dominated by IHS which owns 16,541 towers, or 53% of Nigeria’s 30,941 towers. Nigeria is home to several smaller towercos including HTN Towers, SWAP (who seem to be in the first phase of a merger), BCTek and Hotspot Network Towers, more than one of which is actively seeking strategic investment. Operators retain 21% of Nigeria’s towers, most of which are Globacom’s, which Mike Adenuga seems reluctant to sell, plus 500-600 NATCOM towers which could come to market. Although Nigeria is Africa’s most profitable and largest mobile market, with 139.2mn* connections, SIM penetration is just 77%* and multi-SIMing is rife. Mobile broadband penetration is at 17%*.

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.

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 is around 61%* with mobile broadband at 28%*.

Senegal: Sonatel, in which Orange is a controlling stakeholder, have been rumoured to be investigating the sale of their 1,600 structures in Senegal, to be bundled with a further 1,200 structures in Mali and Guineas B and C. Sonatel now appear to now be looking for a managed services provider, albeit supported by some further build to suit requirements in the market. Sonatel is the market leader with 56.8% market share, followed by Millicom-Tigo on 23.4% and Expresso on 19.8% (according to statistics from ARTP for June 2015). Expresso may also have an appetite to partner with a towerco.

There are around 2,900 towers in Senegal with SIM penetration at 95%* and mobile broadband penetration on 9%*.

South Africa: Current and prospective new African towercos are jockeying for position as South Africa seems poised to be the latest SSA market convert to an independent towerco-driven structure. Only 10% of South Africa’s estimated 22,888 towers are

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**Estimated tower ownership in Nigeria**

- IHS own and BTS towers: 6,000
- IHS towers acquired from MTN: 5,000
- IHS towers acquired from Etisalat: 2,691
- American Tower assets acquired from Airtel: 1,905
- HTN Towers + SWAP: 4,700
- Hotspot Network Towers: 2,691
- BCTek: 1,905
- Other small Nigerian towerco towers: 1,905
- Globacom: 700
- NATCOM: 550

Source: TowerXchange

**South Africa**

- Current and prospective new African towercos are jockeying for position as South Africa seems poised to be the latest SSA market convert to an independent towerco-driven structure. Only 10% of South Africa’s estimated 22,888 towers are
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ALGERIA
BURKINA Faso
GHANA
MYANMAR
NIGERIA
CAMEROON
CONGO
ETHIOPIA
UGANDA
RWANDA
TANZANIA
DR CONGO
of towers – with a prevailing tenancy ratio as high as 1.8 in South Africa, and taking into account rooftops, TowerXchange reckon MTN’s South African tower count is nearer 9,000. 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. Whether the process opens up to a competitive auction, or whether any MTN South African tower transaction is essentially a ‘done deal’ as a function of MTN’s deep relationship with IHS, remains to be seen.

Meanwhile, the status of Telkom’s stop-start tower monetisation programme remains unclear. Telkom asked for expressions of interest in a portfolio of around 6,000 shareable structures in South Africa, but that seems likely to now be a portfolio of just 500 sites for sale, with the operator looking for a managed services partner to run the rest of their infrastructure.

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 tower respectively. Both Vodacom and Millicom retain equity in HTT. 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 will launch on October 15 2015 under the Halotel brand. Zantel (being 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.

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 1,380 towers. TowerXchange estimate there are a little over 4,000 tenancies on 3,485 towers in Uganda, suggesting an average tenancy ratio just under 1.15. SIM penetration is just 64%* in Uganda, with multi-SIMing meaning actual penetration is under 50%, with mobile broadband penetration at 11%*.

Zambia: IHS are likely to acquire Airtel’s Zambian assets to supplement their 2014 acquisition of MTN’s Zambian 719 towers. SIM penetration is 73%* in Zambia, and mobile broadband penetration 10%* where Airtel lead the market joined by MTN and Zamtel.

*Statistics courtesy of GSMA Intelligence, Q4 2014.

Figure 8: Estimated SIMs per tower in MENA tower markets

<table>
<thead>
<tr>
<th>Country</th>
<th>SIMs per Tower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>1,412</td>
</tr>
<tr>
<td>Kuwait</td>
<td>1,490</td>
</tr>
<tr>
<td>Jordan</td>
<td>1,644</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>1,722</td>
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<tr>
<td>UAE</td>
<td>1,929</td>
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<tr>
<td>Oman</td>
<td>1,938</td>
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<tr>
<td>Lebanon</td>
<td>2,000</td>
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<tr>
<td>Libya</td>
<td>2,080</td>
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<tr>
<td>Tunisia</td>
<td>2,271</td>
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<tr>
<td>Algeria</td>
<td>2,491</td>
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<tr>
<td>Morocco</td>
<td>2,594</td>
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<tr>
<td>Iraq</td>
<td>2,740</td>
</tr>
<tr>
<td>Qatar</td>
<td>3,818</td>
</tr>
<tr>
<td>Yemen</td>
<td>4,385</td>
</tr>
<tr>
<td>Egypt</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Source: TowerXchange

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Africa & Middle East News

A roundup of tower news across SSA and MENA

KSA

Mobily tower sale slows

Having shortlisted bidders in August, multiple sources have suggested that KSA operator Mobily has slowed the timetable for the divestiture of ~9,200 towers, although the process has not been halted. Zain’s parallel process to sell their ~5,000 towers in KSA continues apace. Lebanon's M1 Group and UAE-based Towershare are believed to be among the bidders.

Nigeria

IHS and Etisalat close second tranche of tower deal

Following on from the transfer of 2,136 towers from Etisalat to IHS in August 2014, IHS has completed the transfer of a second tranche of 555 towers from the UAE-owned MNO. This transaction means IHS will operate over 15,500 towers in the busy Nigerian market and over 23,100 towers on the African continent and allows Etisalat to focus on network performance and their 2G, 3G and 4G rollout in Nigeria.

Nigeria

Helios Towers Nigeria rebrands to HTN Towers, partners with SWAP

Helios Towers Nigeria has announced a rebrand, including a name change to HTN Towers. In a press release, the company also announced its interest in an initial public offering (IPO) of its shares. HTN Towers hopes to leverage their portfolio of over 1,200 sites in Nigeria to become Africa’s ‘leader in providing best-in-class telecom infrastructure services’. In a bid to further their reach in the country, HTN Towers has also signed a Managed Services and Co-Location Agreement with SWAP Technologies, giving HTN Towers the rights to manage up to 702 of SWAP’s sites in 32 of 36 Nigerian regions.

Senegal

Market keen to introduce towercos

Sonatel and Expresso Telecom are believed to be seeking towerco partners in the 3,000+ tower Senegalese market. Market leading Sonatel’s rumored SLB opportunity seems likely to become a managed services deal, but the company’s footprint across Senegal, Mali and the Guineas makes them an attractive counterpart. Expresso are believed to be seeking a BTS partner, while number two operator Millicom may also consider partnering with a towerco in Senegal.

South Africa

No confirmation of MTN SA tower sale

In a ‘no news news story’, there appears to have been no formal process commenced for the sale of MTN’s South African towers. TowerXchange has spoken to at least four credible would-be bidders interested in the assets, but rumor continues to suggest the opportunity may effectively be a ‘done deal’ given the close relationship between MTN and IHS.

Tanzania

Airtel’s cancelled tower transactions could yet come back to market

Airtel’s cancelled tower deals in Tanzania and DRC could yet come back to market, but not before the Indian MNO has concluded negotiations to sell their opcos in Burkina Faso, Chad, Sierra Leone and Congo B.

Zambia

IHS and Airtel close tower deal

IHS Africa has closed a deal with Airtel in Zambia for the sale and leaseback of 949 telecoms towers. The deal, which was agreed in December 2014, is believed to cover a 10 year renewable period and will allow Airtel Africa to focus on its core business and customers.

Zimbabwe

Compulsory infrastructure sharing draws closer

POTRAZ, the Postal and Telecommunications Regulatory Authority of Zimbabwe, has issued draft requirements for compulsory infrastructure sharing, demanding that all operators submit existing sharing arrangements for approval within six months of implementation. POTRAZ also specifies that the quality of service offered to an ‘Infrastructure Seeker’ must be of the same standard as that enjoyed by the infrastructure owner themselves, and to do otherwise would be considered an offence.

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  - Rectifier

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  - Cameras
  - Door Access

- **Grid Power**
  - Generator
    - Generator Controller
    - AC Power
    - Gen Battery
    - Gen Safety

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TowerXchange’s analysis of the independent tower market in Asia

Selected Asian tower market size comparisons, Q3 2015

- **China**: 1,180,000
- **India**: 450,000
- **Indonesia**: 66,690
- **Vietnam**: 55,000
- **Pakistan**: 28,000
- **Malaysia**: 20,000
- **Sri Lanka**: 9,000
- **Cambodia**: 9,000
- **Bangladesh**: 27,000
- **Thailand**: 47,483
- **Myanmar**: 7,238
- **Vietnam**: 55,000
- **Indonesia**: 66,690
- **China**: 1,180,000

Source: TowerXchange

**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 it’s 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.

Bharti Infratel has also expressed an interest in entering the Bangladeshi market, perhaps on the back of an acquisition of Airtel Bangladesh’s 3,800 towers, but their appetite remains limited by the regulator the BTRC’s policies. 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. Some challenges still remain including 20% of sites being off-grid and mines in the more remote areas. edotco operates a portfolio of 1,700 towers in Cambodia. Local tower builder Camtower Link also operates a small independent portfolio. For further insights into the Cambodian tower market, don’t miss our special feature later in this issue.

**China**: Timelines for the injection of ~1.1mn legacy China Mobile, China Unicom and China Telecom towers into China Tower Company (CTC) remain unclear. Initial reports suggested an August 2015 date, later moved to September / October, but no
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## 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>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>India</td>
<td>KEC International</td>
<td>American Tower</td>
<td>381</td>
<td>$13,000,000</td>
<td>$34,121</td>
<td>Company acquisition</td>
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<td>2014</td>
<td>Indonesia</td>
<td>PT Telkom</td>
<td>Tower Bersama</td>
<td>4000</td>
<td>$904,000,000</td>
<td>$226,000</td>
<td>Equity swap</td>
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<td>2014</td>
<td>Malaysia</td>
<td>KJS</td>
<td>YTL Power Int'l</td>
<td>309</td>
<td>$15,000,000</td>
<td>$48,544</td>
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<td>2014</td>
<td>Indonesia</td>
<td>XL Axiata</td>
<td>STP</td>
<td>3500</td>
<td>$460,000,000</td>
<td>$131,429</td>
<td>SLB</td>
</tr>
<tr>
<td>2013</td>
<td>Indonesia</td>
<td>Hutchison</td>
<td>STP</td>
<td>300</td>
<td>$68,000,000</td>
<td>$226,667</td>
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</tr>
<tr>
<td>2012</td>
<td>Indonesia</td>
<td>Hutchison</td>
<td>Protelindo</td>
<td>503</td>
<td></td>
<td></td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>Indonesia</td>
<td>PT Central Investindo</td>
<td>Protelindo</td>
<td>152</td>
<td></td>
<td></td>
<td>Company acquisition</td>
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<td>2012</td>
<td>Indonesia</td>
<td>Indosat</td>
<td>Tower Bersama</td>
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<td>SLB</td>
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<tr>
<td>2011</td>
<td>Indonesia</td>
<td>Infratel</td>
<td>Tower Bersama</td>
<td>595</td>
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<tr>
<td>2010</td>
<td>India</td>
<td>Essar Telecom Infrastructure</td>
<td>American Tower</td>
<td>4450</td>
<td>$432,000,000</td>
<td>$97,079</td>
<td>SLB</td>
</tr>
<tr>
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<td>Hutchison</td>
<td>Protelindo</td>
<td>1482</td>
<td>$165,900,000</td>
<td>$111,943</td>
<td>SLB</td>
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<td>2010</td>
<td>India</td>
<td>Aircel</td>
<td>GTL Infrastructure</td>
<td>17500</td>
<td>$1,800,000,000</td>
<td>$102,857</td>
<td>SLB</td>
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<tr>
<td>2009</td>
<td>India</td>
<td>Viom Networks</td>
<td>QTL</td>
<td>18000</td>
<td>$2,407,000,000</td>
<td>$133,722</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2009</td>
<td>India</td>
<td>Transcend Infrastructure</td>
<td>American Tower</td>
<td>327</td>
<td>$23,000,000</td>
<td>$70,336</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2009</td>
<td>India</td>
<td>XCEL Telecom</td>
<td>American Tower</td>
<td>1730</td>
<td>$170,000,000</td>
<td>$98,266</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2008</td>
<td>Indonesia</td>
<td>Bakrie</td>
<td>STP</td>
<td>543</td>
<td>$34,000,000</td>
<td>$62,615</td>
<td>SLB</td>
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<tr>
<td>2008</td>
<td>Indonesia</td>
<td>Hutchison</td>
<td>Protelindo</td>
<td>3692</td>
<td>$500,000,000</td>
<td>$135,428</td>
<td>SLB</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals / average</strong></td>
<td></td>
<td></td>
<td></td>
<td>59964</td>
<td><strong>$7,510,900,000</strong></td>
<td><strong>$125,257</strong></td>
<td></td>
</tr>
</tbody>
</table>
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sign of an asset transfer yet. Local commentators expect the process to continue into 2016. However, the intent remains clear: all China’s SOE towers will be transferred to CTC, through which 120,000 new BTS are supposedly already being conducted - 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. For more insights, checkout the interviews with Q Towers and Miteno in TowerXchange!

**India:** 70% 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 longevity and second only to China in terms of scale. The market was adversely affected by the restructuring of MNO licenses in 2012, but has fully recovered and been boosted by ongoing waves of spectrum auctions. Tower transaction deal flow continues to pick up as companies look around at their options for acquisitions and divestments, and deals totalling up to 200,000 towers at a value of approximately US$10.2bn may be in the works.

American Tower are rumored to be in the final stages of negotiating acquisitions of Reliance Infratel (~52,000 towers, tenancy ratio 1.6) and/or Viom Networks (~42,000 towers, tenancy ratio 2.4). It remains to be seen whether American Tower would acquire both. In the event of the Viom deal being consummated, the Tata Group will likely retain a minority share, and the SREI Group will exit completely. Alongside American Tower, other bidders for Bharti Infratel’s assets are reportedly

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**Estimated tower count for Bangladesh**

- Grameenphone 7,800
- Banglalink 6,000
- edotco 5,300
- Airtel 3,800
- Teletalk, CityCell and non-traditional MNOS

Sources: TowerXchange research, edotco, Hardiman Telecommunications

**Estimated breakdown of towers owned by Indian towercos**

![Diagram showing estimated tower count by company](https://www.towerxchange.com)

<table>
<thead>
<tr>
<th>Towercos</th>
<th>Estimated Count</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indus Towers</td>
<td>116,454</td>
<td>TowerXchange research, quarterly filings, site lists</td>
</tr>
<tr>
<td>Bharti Infratel</td>
<td>37,486</td>
<td></td>
</tr>
<tr>
<td>Reliance Infratel</td>
<td>52,000</td>
<td></td>
</tr>
<tr>
<td>Viom Networks</td>
<td>42,000</td>
<td></td>
</tr>
<tr>
<td>GTL Infrastructure</td>
<td>29,432</td>
<td></td>
</tr>
<tr>
<td>American Tower</td>
<td>13,883</td>
<td></td>
</tr>
<tr>
<td>Tower Vision</td>
<td>8,400</td>
<td></td>
</tr>
<tr>
<td>Ascend</td>
<td>4,500</td>
<td></td>
</tr>
</tbody>
</table>

State owned MNOs Bharat Sanchar Nigam Ltd and Mahanagar Telephone Nigam retain 70,000 towers

Sources: TowerXchange research, quarterly filings, site lists

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www.towerxchange.com | TowerXchange Issue 14 | 31
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investment firms Farallon Capital, Carlyle, and Tillman Capital.

Bharti Infratel’s share price has fallen from its mid-year high, but the company still has plans for expansion, and is looking at the potential acquisition of 11,000-12,000 towers from Vodafone, and 9,000 towers from Idea Cellular.

BSNL has received “in-principle” approval to carve out its estimated 65,000 towers into a separate towerco which could be valued up to US$3bn. A government working group has been formed to develop a capital and organisational structure for the new entity.

GTL Infrastructure, with just under 30,000 towers, Tower Vision with 8,400 and Ascend Telecom with ~4,500 complete the Indian towerco market. Ascend are in the process of raising US$100mn through IPO.

**Indonesia**: Indonesia remains one of the most mature tower markets in the world, with solid tenancy ratios and strong market caps boasted by three major towercos; Protelindo (11,675 towers), Tower Bersama (11,154) and STP (6,690). IBS Tower, KIN and Retower all also have some scale in Indonesia.

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. Both Indosat and XL Axiata may have an appetite to divest their remaining towers, totalling ~5,800 and ~6,500 respectively, although none of these opportunities are expected to close in 2015.

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.

Malaysia: edotco has carved out 3,500 towers from Celcom in Malaysia. A further 3,200 towers are owned and operated by a diverse group of State-backed independent towercos. Malaysian commentators felt that the recent 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.

Myanmar: The Myanmar tower count reached 7,470 by Q3 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.
Phase three has seen a re-alignment of towerco-MNO partnerships, with IGT now building for Ooredoo - they have lit 1,500 of 2,900 contracted towers, making IGT Myanmar’s leading towerco. Apollo will be number two, with around 1,100 of 1,827 contracted towers for Telenor built to date. PAMEL appears to be sitting out phase three of the rollout, perhaps in negotiations to acquire MTC from Digicel, a transaction which seems to have slowed, perhaps as a result of the Digicel IPO process and/or a gap between Denis O’Brien’s valuation of MTC’s 1,220 towers and the valuation of prospective acquirers such as PAMEL or edotco. Eco-Friendly Towers, a subsidiary of Young Investment Group, has a contract to build 700 towers in phase three for Telenor. 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.

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 the aforementioned PAMEL and Digicel MTC, may be excellent targets for ESCOs.

A culture of infrastructure has yet to fully take root in Myanmar - Telenor and Oordeoo 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 1.1-1.2 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; the government reported 17 local companies were interested in joining a consortium, to which international partners will subsequently be added.

Pakistan: TowerXchange estimate there are 28,000 towers in Pakistan, of which 4,500 belonging to #5 MNO Warid are reportedly in the process of being sold to Towershare. Mobile market leaders Mobilink are believed to have progressed their tower sale process to the point of shortlisting
prospective partners. We have been unable to confirm speculation that #2 MNO Telenor may bring their Pakistani towers to market too.

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

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, which would seem to narrow the field to Asian and Middle Eastern based towercos and investors; recently licensed edotco, which operates a 13,000km fibre network in Pakistan, and Towershare remain favorites to acquire Pakistani towers.

**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 BTO (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. A prospective 12,000 tower JV towerco between AIS and TOT, which ran the 900 MHZ concession, may also be in the pipeline.

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

---

**Estimated tower count for Vietnam**

<table>
<thead>
<tr>
<th>Towercos</th>
<th>MobiFone</th>
<th>VinaPhone</th>
<th>Viettel</th>
<th>Vietnamobile + GTEL Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,000</td>
<td>9,000</td>
<td>4,750</td>
<td>20,250</td>
<td>10,000</td>
</tr>
</tbody>
</table>

Source: TowerXchange Research
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.

**Legend**

- 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.

Meet 250 leaders of the Asian tower industry at the TowerXchange Meetup Asia, taking place on November 24 and 25 at the Marina Bay Sands in Singapore. [www.towerxchange.com/meetups/asia](http://www.towerxchange.com/meetups/asia).

Note: Russia is covered under Europe; we estimate it to have a 5% towerco penetration and we expect it to be a growth market.
Asia News
A roundup of tower news across China, Southern and Southeast Asia

Bangladesh

New draft regulation in Bangladesh may adversely affect emerging tower industry

edotco may restructure its operations in Bangladesh if a drafted guideline for tower sharing licenses is introduced. The draft guideline states that shareholders of mobile phone operators licensed by the BTRC, local or foreign, are not eligible for a license to share towers. Many stakeholders in telecom towers have been lobbying against this proposed new law, which would adversely affect the development of the tower industry in the country.
edotco owns and operates more than 6,000 tower sites across the country and continues expanding operations. edotco is the market leader in Bangladesh with 11 customers including six mobile phone operators. Suresh Sidhu, edotco Group CEO, said: “We want to do business in Bangladesh abiding by the existing laws; if the new guideline comes into effect and prevents us from getting a licence, we will transfer our ownership from Robi to edotco.” Both Robi and Banglalink, owned by Vimpelcom, have asked that the guideline be changed so that licensed operators can continue to apply for tower sharing licenses with the aim of increasing the development and efficiency of telecoms in Bangladesh.

China

Transfer of over one million to China Tower Company to be completed soon

Analysts have said the final transfer of assets from China Mobile, China Telecom and China Unicom to the new China Tower Company, and release of the financial details, is likely to be completed by October 2015. China Tower Company will be 40 per cent owned by China Mobile, and 30 per cent each by China Telecom and China Unicom. China Tower Company is reportedly planning to sell shares to investors with the goal of financing RMB 60bil (US$9.7bil). The company reportedly also wants to sell 20% of shares through private equity financing, and then prepare to apply for an IPO in 2017.

India

BSNL receives cabinet approval to create a new tower company

Bharat Sanchar Nigam Ltd. (BSNL) has “in-principle” approval to spin its tower assets into a separate company, according to the Economic Times of India. BSNL is the second largest telecoms company in India and is thought to have an estimated 65,000 towers valued at Rs. 20,000 crore (US$3 billion) and is working with the Department of Telecommunications to establish a working group to organise the capital and organisational structure of the new company.

India

Bharti Infratel is looking into the acquisition of towers from Vodafone India and Idea Cellular

Bharti Infratel is reportedly in advanced talks with Vodafone India and Idea Cellular to acquire a number of tower assets for a total of US$1.6bn. According to the Business Standard Vodafone may be selling as many as 11,000-12,000 towers and Idea Cellular may be looking to divest approximately 9,000 towers. Other companies that have expressed interest in Idea Cellular’s assets include Axiata (edotco?) and American Tower Corporation.

India

Reliance Communications nearing completion of Reliance Infratel sale

RCom is in the final stages of the sale of Reliance Infratel with four bidders reportedly remaining: Farallon Capital, Carlyle, Tillman Capital and American Tower Corporation. RCom are believed to favor bids for 100% of the equity in Reliance Infratel which would enable them to make a complete exit from the tower business and to use the funds to reduce its debt. It is reported that due diligence should be completed by the first week of October and the deal should be finalised by late October.

India

Ascend Telecom plans to raise nearly US$100mn in the US

Ascend Telecom intends to raise US$100mn to fund the expansion of its footprint through a listing in the US. Ascend has approximately 4,500 towers and
a tenancy ratio of 1.77. New Silk Route reportedly holds a 68% stake in Ascend Telecom while the balance is held by IL&FS and TVS Interconnect Systems, a TVS Group company.

American Tower Corporation expected to finalise acquisition of Viom Networks

American Tower Corporation’s on-off bid to acquire a majority stake in Viom Networks could be finalised shortly, according to reports all over the Indian press which, it should be said, has prematurely reported this deal many times before! The deal reportedly includes retention of a minority stake for the Tata Group, while The SREI Group is to exit completely. Talks on the deal began again in May 2015 after a six month pause due to issues with the valuation of Viom Network’s assets. American Tower Corporation has renewed its planned expansion in the Indian market in the wake of successful spectrum auctions in February.

Telkom scraps share-swap deal with PT Tower Bersama Infrastructure

PT Telekomunikasi Indonesia (Telkom) Tbk has called off a deal that would have given PT Tower Bersama an initial 49% stake in the state-owned company. The deal would also have given Tower Bersama shares in Telkom’s towerco PT Dayamitra Telekomunikasi (Mitratel). Telkom stated that it was terminating the transaction in response to the commissioner’s request.

MPT market share slips below 50%

MPT, the state-owned operator, which prior to 2014 had a monopoly on the telecoms market as its only player, has seen its market share eroded by the entry of Telenor and Ooredoo. At the end of July 2015, MPT reportedly had 14mn, with Telenor on over 10mn and Ooredoo reporting 4.3mn subscribers in Myanmar at the end of June.

Myanmar Investments International buys a stake in Apollo Towers

Apollo Towers raised US$30 million in equity from Myanmar Investments International Limited (MIL). Apollo has built 1,100 towers for Telenor since the rollout began in July last year, and is contracted to build a total of 1,827 so far.

Telenor’s Myanmar footprint has reached 50% coverage

Telenor has expanded its network footprint to more than 2,700 sites, covering over 50% of populated areas across Myanmar, including Dawei in the Tanintharyi Division, giving the MNO coverage of 13 major areas. The Norwegian-backed operator now offers mobile connectivity in Mandalay, Yangon, Sagaing, Bago, Magway, Ayeyawaddy, Kayin, Mon, Kachin, Shan, Kayah, Nay Pyi Taw and Tanintharyi. The company is expected to rollout between 3,500 and 4,000 towers by the end of 2015.

Seventeen Myanmar firms interested in joining fourth license consortium

Seventeen local Myanmar firms have applied to join a consortium to operate the country’s fourth mobile network, according to the Ministry of Communication and Information Technology. Candidate companies must have 3 billion kyat (US$2.4mn) in capital and need to have been in operation for at least three months. The successful candidates were announced in September. After the local firms are selected, a foreign partner will be selected for the joint venture.

VimpelCom tower sales in Pakistan and Bangladesh progress

The first round of bidding on ~6,000 towers belonging to VimpelCom’s Bangladeshi opco Bangalink is complete. Bangalink owns around 22% of Bangaldesh’s ~27,000 towers, and has just over 25% mobile market share. Meanwhile, VimpelCom’s tower divestiture in Pakistan is more advanced, with shortlisted bidders being informed. VimpelCom’s Mobilink is the mobile market leader in Pakistan, a country with around 28,000 towers.

Google to deploy high-speed internet by balloon in Sri Lanka

Sri Lanka is the first country to register for Google’s Project Loon, which will deploy high-altitude balloons to provide affordable high-speed internet across the whole island. Ranil Wickremesinghe, Prime Minister of Sri Lanka met with Project Loon head Michael Cassidy in Sri Lanka, and stated that
the balloons are expected to be launched by March 2016.

**Sri Lanka & Bangladesh**

**Bharti Airtel weighing options in Sri Lanka and Bangladesh**

There has been speculation that Bharti Airtel is looking at selling its 2,500 towers in Sri Lanka and 4,000 towers in Bangladesh to cut down on less productive operations. Bharti Airtel maintains that they are evaluating opportunities and there is nothing to report at this time.

**Thailand**

**Infrastructure sharing agreement reached between DTAC and AIS**

Digital Total Access Communication (DTAC) and Advanced Info Service (AIS) have agreed to share 2,000 towers this year to cut costs and expand network coverage to keep up with demand for mobile broadband. DTAC has also reached agreement with CAT Telecom to create a joint venture to manage shared telecoms towers and fibre. DTAC and CAT Telecom will have a 51% and 49% stake in both Tower JV Co and Fibre JV Co.

**Thailand**

**Auction of two 900MHz licenses set to take place on 15 December 2015**

Thailand’s National Broadcasting and Telecommunications Commission (NBTC) has approved the auction of two technology-neutral 900MHz licenses. This auction was originally going to be postponed to avoid clashing with an upcoming 1800MHz 4G auction scheduled for 11 November but will continue as planned. Successful candidates will be required to deploy 4G networks and achieve 50% coverage of the population by the end of 2019.
MCRB: ICT is transforming Myanmar, but gaps need filling to protect human rights

The Myanmar Centre for Responsible Business (MCRB) published a sector-wide impact assessment (SWIA) on the information and communication technology (ICT) sector in late September, just prior to the publication of this edition of the TowerXchange Journal. This assessment highlights some of the actual and potential positive and negative human rights impacts that the rapid growth of mobile telecoms, internet and other ICTs can have on Myanmar, and the policy gaps that need to be filled. It makes recommendations to government, companies and other stakeholders.

Five main themes emerge from the ICT SWIA:

- Gaps in the policy, legal and regulatory framework: Modern laws do not exist for most of human rights risks posed by the ICT sector in Myanmar, and in particular lawful interception, data privacy, access to information, certification bodies, cybersecurity, data protection and cybercrime.

- Access: The Ministry’s welcome transparent and technocratic approach to liberalisation since 2013 is already supporting a rapid extension of access and effective competition to bring down prices. This is a good basis for further work to achieve universal accessibility of ICTs, including local language content and standardised Unicode fonts that allow full searchability and access to information.

- Online “Digital Dangers”: These include risks to data privacy, various forms of cybercrime, including child sexual abuse images and revenge porn, cyberbullying and stalking, and “hate speech”. Other digital dangers include the wider consequences of Government-ordered mobile and Internet network shutdowns and the selective blocking of websites.

- “Offline” human rights issues: As fibre and telecoms masts are rolled out rapidly across the country, there is inconsistent respect for labour rights and safety by multiple layers of subcontractors. This comes at a time when Myanmar labour law is rapidly changing and neither workers nor employers are well informed about basic labour rights protections. Other ‘offline’ challenges include inadequate stakeholder engagement and management of land acquisition.

Will ICT exacerbate or address divisions in society? ICT has the potential to be used to impact positively or negatively on the rights of groups at risk. For example, people with disabilities can access new services or income generation opportunities from which they were previously excluded. However minorities can also suffer from ICT misuse. For example, the SWIA and other reports have identified disturbing patterns of anti-Muslim “hate speech” on social media.

Speaking at the launch of the assessment in Yangon, Vicky Bowman, Director of MCRB said: “The ICT sector is connecting and transforming Myanmar. It brings with it many opportunities for the enjoyment of human rights, such as the right to education, health and information, and the right to participate in cultural life and government. But the headlong rush to roll out network countrywide brings challenges, particularly in the absence of effective enforcement labour and safety laws, or adequate policy and legal frameworks. Those gaps are compounded by most users’ lack of ICT experience—‘digital literacy’ - which can put themselves and others at risk’.

The report contains several important insights and recommendations pertinent to tower companies, addressing issues such as tower construction employee rights, contracts and remuneration; health and safety; employment of ethnic minorities by towercos and their subcontractors; processes to secure leases and variations in rental rates and terms; and community consultation and engagement.

You can download the full ICT Sector Wide Impact Assessment at: [http://www.myanmarresponsiblebusiness.org/swia/ict.html](http://www.myanmarresponsiblebusiness.org/swia/ict.html).
Unsurprisingly, European deal flow has cooled over the summer with no substantial tower transactions taking place in July, August or September. However, there is some indication that new deals are in the pipeline and that further activity will take place before the end of 2015.

A small but notable deal which did take place over the summer was Coillte’s sale of 298 towers to French investors InfraVia Capital Partners for around €70mn. On the back of this deal, InfraVia has created a new entity, Cignal, which will manage a total of 413 sites across Ireland and offer services to all three of Ireland’s MNOs.

In Germany, Telefonica has agreed to transfer around 7,700 sites (most of which are believed to be rooftops) to national towerco Deutsche Funkturm. These sites are believed to largely represent duplicated coverage for Telefonica following their acquisition of E-Plus in October 2014, and the transfer to the Deutsche Telekom owned towerco will allow them to manage capital expenditure and reduce opex. With a stable economy, three well established operators and a national towerco which owns extensive infrastructure but doesn’t operate on purely commercial lines, TowerXchange believes there is still huge potential for the independent towerco market in Germany and we believe there may be more tower activity in the country in the coming months.

Rumour has it that a portfolio of around 8,000 towers will soon be coming to market in Russia. Although speculation about VimpelCom’s appetite for divestment in Russia has waxed and waned over the last few years, TowerXchange believes that the success of the sale of VimpelCom’s Wind portfolio in Italy may well drive this deal to market. Russian Towers, the largest and most well established towerco in Russia, has a proven track record in the country and, barring any significant currency or political fluctuations, is well positioned to raise the capital needed to galvanise the tower market in this vast country. ESN had previously been interested in acquiring a Russian tower portfolio, while TowerXchange are tracking a couple of other potentially interested bidders should a substantial sale and leaseback come to market.

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Cellnex and Inwit continue to perform well since their IPO debuts earlier this year. Cellnex’s first half results since their IPO exceeded targets, giving rise to a positive atmosphere on their recent investor roadshow. For Cellnex in particular, who we know are examining opportunities across the continent, the pressure to prove they can continue to deliver inorganic growth is increasing and we expect the announcement of another tower deal in the coming months. Inwit are yet to show their hand in terms of acquisitions outside of parent company TIM but their activity in the next few months will certainly set the tone for their future plans, particularly with more rumours (since refuted) of a Cellnex takeover in the industry press.

Over the last seven years more than ten deals of scale have taken place in the European market, transferring around 18,000 towers and 25,000 rooftops and other points of service from operator-captive to independent ownership. Of this, 11,654 of the towers (65%) have been bought in the last two years by the highly acquisitive Abertis (whose tower business has now been spun out as Cellnex via IPO) at a cost of €1.17bn.

TowerXchange has identified over 20 independent towercos who own and manage towers in Europe. Of these, ten are members of the new European Wireless Industry Association: Cellnex (Spain and Italy), Arqiva (UK), Axion (Spain), EI Towers (Italy), FPS Towers (France), Open Tower Company (Netherlands), TowerCom (Ireland), American Tower Germany, Protelindo (Netherlands) and Wireless Infrastructure Group (UK and Netherlands). In addition, a further ten towercos manage in excess of 250 towers across their portfolios; Shere Group (UK and Netherlands), TDF (France and Germany), Itas Tim (France), Russian Towers (Russia), UKRTower (Ukraine), Emitel (Poland), and ESB, Towercom and Cignal (Ireland). In total these towercos manage over 54,000 towers across Europe and Russia, 9% of the total towers on the continent. TowerXchange is also tracking three operator-captive towercos, including Global Tower (Turkey), Deutsche Funkturm (Germany) and Europe’s newest towerco Inwit, the tower arm of Telecom Italia which has recently listed on the Milan stock exchange, is also the second biggest, leapfrogging many of the more established players and proving a force to be reckoned with in Italy.

Finally, TowerXchange is also engaging with ten different infrastructure sharing joint venture ‘infracos’, primarily found in the UK, Ireland and Scandinavia but also in Greece, Poland and Azerbaijan. Between them, these infracos own or operate 58,500 towers, or just under 10% of Europe’s ~600,000 towers.
Europeans tower deals since 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Towerco</th>
<th>Operator</th>
<th>#Towers</th>
<th>Deal terms</th>
<th>Deal value</th>
<th>Cost per tower</th>
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<tr>
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<td>KPN</td>
<td>101</td>
<td>SLB</td>
<td>Unavailable</td>
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<td>KPN</td>
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<td>Unavailable</td>
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<tr>
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<td>Spain</td>
<td>Abertis</td>
<td>Telefonica</td>
<td>500</td>
<td>SLB</td>
<td>€45 million</td>
<td>€90,000</td>
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<td>KPN</td>
<td>460</td>
<td>SLB</td>
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<td>€250,000</td>
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<td>Protelindo</td>
<td>KPN</td>
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<td>SLB</td>
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<td>€287,000</td>
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<tr>
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<td>Germany</td>
<td>American Tower</td>
<td>KPN</td>
<td>2031</td>
<td>SLB</td>
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<td>€193,500</td>
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<td>2012</td>
<td>France</td>
<td>FTP</td>
<td>Bouygues Telecom</td>
<td>2166</td>
<td>SLB with 15% equity</td>
<td>€185 million</td>
<td>€100,400</td>
</tr>
<tr>
<td>2014</td>
<td>Spain</td>
<td>Abertis</td>
<td>Telefonica/Yoigo</td>
<td>4277</td>
<td>SLB</td>
<td>€385 million</td>
<td>€90,000</td>
</tr>
<tr>
<td>2015</td>
<td>Italy</td>
<td>Abertis</td>
<td>TowerCo</td>
<td>212 (plus 94 points in tunnels)</td>
<td>Trade sale</td>
<td>€94.6 million</td>
<td>€309,000 per site</td>
</tr>
<tr>
<td>2015</td>
<td>Italy</td>
<td>Abertis</td>
<td>Wind</td>
<td>7377</td>
<td>SLB with 10% equity</td>
<td>€693 million</td>
<td>€104,400</td>
</tr>
</tbody>
</table>

European tower activity - the headlines

**Azerbaijan:** Infraco Azerconnect active in the country
**Czech Republic:** Infraco formed by PPF and T-Mobile
**Denmark:** TT- Network formed by Telia and Telenor
**Finland:** Digita sold to First State Investments in 2012
**France:** Towerco FPS active after acquiring towers from Bouygues Telecom and 20,000 rooftops from Loxel. TDF lead the market, ITAS TIM and Towercast also active
**Germany:** Towercos Deutsche Funkturm and American Tower active in the market, ATC’s towers bought from KPN
**Greece:** Infraco VICTUS Networks run by Vodafone Greece and Wind Hellas
**Hungary:** Antenna Hungaria acquired by the state from TDF in 2014
**Ireland:** Towercom, ESB and HIGHPOINT active. Coillte sold 298 towers to InfraVia Capital Partners creating new towerco Cignal.
**Italy:** Towerco Cellnex have made two recent acquisitions. Inwit undertaken IPO to form new towerco. EI under investigation – all their potential acquisitions on hold
**Latvia:** Bite Group brought towers to market in 2013 but no agreement reached
**Netherlands:** Protelindo, Shere Group and Open Tower acquired a total of 1,322 towers from KPN
**Poland:** Emitel (towerco) and NetWorkS! (infraco) active in the market
**Portugal:** Portugal Telecom sold to Altice – no developments in tower sale rumour
**Russia:** Towercos Russian Tower and Link Development active in the market, rumour that Vimpelcom towers may be first to come to market
**Spain:** 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
**UK:** Towercos active in the market include Arqiva, WIG and Shere Group, MBNL and CTIL sizable infracos
**Ukraine:** Towerco UKRTower active in the market
TowerXchange research has not revealed any infracos or towercos to date. No recent transactions have taken place and none rumoured to take place soon. 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. Rumours of deals confirmed in the market. Deals of significant size have taken place in the last 5 years. Deals have taken place in the last year and more imminent deals rumoured.

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.
Europe News

A summary of industry news from the Old Continent

Spain

Spain: Axión for sale?

TowerXchange understands that Paris-based Antin Infrastructure Partners, which owns 100% of broadcast and telecom tower operator Axión, may be considering divesting some or all of the equity it acquired from TDF in 2011. Axión is the market leader in Andalusia, where close to 70 per cent of its 580 site portfolio is located.

UK

Implications of MNO consolidation remain unclear for UK’s tower operators

The UK’s Competition & Markets Authority (CMA) continues to investigate BT’s proposed GBE12.5bn acquisition of mobile market leader EE from Orange and Deutsche Telecom, and may also look at the proposed merger of O2 UK with Three UK. Consolidation among UK MNOs could force a realignment of partnerships within CTIL, an O2-Vodafone joint venture, and MBNL, a joint venture between EE and Three UK.

Italy

Cellnex denies placing firm bid for Inwit stake

Cellnex and Inwit’s will-they-won’t-they relationship continues, this time with reports that Cellnex was planning to purchase 30% of Telecom Italia’s tower unit. Inwit shares jumped as much as 9.7% on the back of rumours that Cellnex and Inwit executives were holding secret meetings to discuss a deal, dropping a further 1.2% after Cellnex’s rebuttal a few days later. A Cellnex representative stated that it was their duty to study all growth opportunities in Europe but ‘at this moment we are not working on a concrete deal’.

Russia

Vimpelcom tower divestiture back on the cards

Vimpelcom is rumoured to have engaged Merrill Lynch ahead of the divestiture of their towers in Russia and the CIS. According to Russian journal ‘Useful to Know’ (Polezno Znat’), the operator is already in advanced discussions with the leading Russian towerco Russian Towers and could be closed before the end of 2015.

Russia

Russian Towers appoints Alexander Chub as President

Russian Towers, the market leading towerco, reflecting the shareholders’ confidence in the market has supplemented their proven executional capability and fiscal firepower by deepening their management expertise. Recently appointed Russian Towers President Alexander Chub has 25 years experience in IT in Russia and the CIS. Chub previously served as General Director of the Russian national satnav company NIS GLONASS, prior to which he oversaw the turnaround of 3com’s Russian business, increasing shareholder value 2.5x before the business was sold to HP. Previously, as General Manager, Chub had pioneered Dell’s entry into Russia.

Ireland

Coillte’s towers purchased by French investment fund

Coillte has announced the sale of its Irish towers to InfraVia Capital partners, a French investment fund. The package includes 298 sites including a number build specifically by Coillte in the last few years which include optical fibre connectivity. According to Coillte, the deal will allow them to strengthen their balance sheet and invest €59mn in infrastructure projects outside of telecommunications.

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Antin acquire remaining 15% stake in FPS towers from Bouygues Telecom

FPS have confirmed that Antin has acquired the remaining 15% stake in FPS from Bouygues Telecom, making Antin 100% owner of the towerco. Bouygues Telecom will remain a client of FPS, with Frederic Zimmer, CEO of FPS commenting ‘Bouygues Telecom remains an important client to FPS Towers, and the sale of their residual stake reinforces the position of neutrality that we have always had towards our clients’. This is good news for FPS and towercos in general and confirms their independence, the investability of the class and the continuing appetite for investment in Europe.

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TowerXchange’s analysis of the independent tower market in CALA

Estimated number of towers owned or managed by towercos in CALA

Source: TowerXchange research, quarterly filings, site lists

<table>
<thead>
<tr>
<th>Towerco</th>
<th>Brazil</th>
<th>Colombia</th>
<th>Chile</th>
<th>Peru</th>
<th>Panama</th>
<th>Costa Rica</th>
<th>Nicaragua</th>
<th>Guatemala</th>
<th>Mexico</th>
<th>El Salvador</th>
<th>Dominican Republic</th>
<th>Ecuador</th>
<th>Unknown</th>
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<tbody>
<tr>
<td><em>American Tower</em></td>
<td>18,851</td>
<td>3,677</td>
<td>8,717</td>
<td>579</td>
<td>464</td>
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<tr>
<td><em>Telesites</em></td>
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<td>527</td>
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<td>196</td>
<td>130</td>
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<tr>
<td>SBA Communications</td>
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<td>125</td>
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<tr>
<td>Grupo TorreSur</td>
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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 Rica.
## Major tower transactions in Latin America 2011/2015

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Deal structure</th>
<th>Tower count</th>
<th>Deal value US$</th>
<th>Cost per tower US$</th>
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</thead>
<tbody>
<tr>
<td>2015</td>
<td>Ecuador</td>
<td>Torresec</td>
<td>SBA Communications</td>
<td>Portfolio acquisition</td>
<td>130</td>
<td>$8,800,000,000</td>
<td>$67,692</td>
</tr>
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<td>2015</td>
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<td>$887,378</td>
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</table>

Totals / average | 42,822 | $8,288,000,000 | $200,130 |

---

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*
Colombia, Dominican Republic and Brazil, while Torres Andinas has expanded beyond their Colombia base and now has 40 towers in Peru. 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 – the date and venue of which will be announced shortly – will certainly be an interesting gathering! Note that the TowerXchange Meetup Americas will be hosted in Florida in 2016, not in Texas 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 crystallised into a formal process. With Brazil and Mexico approaching saturation, in terms of sale and 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.

### 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 13,700 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 49,829 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

### Dramatic CALA portfolio growth

<table>
<thead>
<tr>
<th>Towerco</th>
<th>Q3 2014 count</th>
<th>Q3 2015 count</th>
<th>Growth</th>
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<tr>
<td>Phoenix Tower International*</td>
<td>58</td>
<td>989</td>
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<td>CSS</td>
<td>341</td>
<td>1203</td>
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<td>300</td>
<td>753</td>
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<td>Mexico Tower Partners</td>
<td>600</td>
<td>1278</td>
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<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>
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</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.

Source: TowerXchange
LatAm towerco breakdown by country

<table>
<thead>
<tr>
<th>AMT</th>
<th>Andinas</th>
<th>Continental</th>
<th>Innovatel</th>
<th>QMC</th>
<th>SBA</th>
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Towercos focusing on a single country

**Brazil:** GTS, Highline, CSS, SkySites, Telecom Torres, Torre Online  
**Mexico:** MTP, IIMT, Intelli Site Solutions, Telesites  
**Panama:** Torres de Panama  
**Uruguay:** Uruguay Torres  
**Costa Rica:** Catalina Inc., Tocsa  

‘sold out’ in terms of SLBs, so the next transactions 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 10,971 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
Who owns Brazil’s 49,829 towers?

- **AMT**: 300
- **SBA**: 1,720
- **GTS**: 18,851
- **Independent developers**: 8,500
- **América Móvil (Claro, Net and Embratel)**: 6,300
- **Vivo**: 4,043
- **TIM**: 7,000
- **Oi**: 4,000
- **Nextel**: 1,750
- **Other small and non-traditional operators, including Sky Brasil, Algar Telecom, Sercomtel and ON Telecom**: 1,720

Source: TowerXchange

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 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.

### Estimated breakdown of tower ownership in Mexico

- **Telesites**: 10,800
- **American Tower**: 8,716
- **Mexico Tower Partners**: 2,000
- **Centennial**: 1,278
- **IIMT**: 400
- **Torrecom**: 250
- **Other independent towercos, including Conex (QMC) and NMS Towers**: 146
- **Estimated remaining MNO-captive towers**: 250

**Source**: TowerXchange
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 579 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

### Breakdown of ownership of CALA’s 160,000 telecom towers, Q3 2015

- **American Tower**: 33,453
- **Telesites**: 10,800
- **SBA Communications**: 9,217
- **Grupo TorreSur**: 6,300
- **Other independent towercos**: 10,201
- **Operator-captive**: 90,029

**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.

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**Latin America Heatmap**

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
**Nextel Chile, now WOM, launches services**

Eight months after being acquired by the UK-based fund Novator, Nextel Chile, now known as WOM, is announcing the launch of its voice and data wireless services across Chile. 4G LTE is expected to launch before the end of 2015.

**SBA acquires 130 towers in Ecuador from Torresec**

SBA Communications has formally commenced operations in Ecuador with the acquisition of around 130 towers from Torresec Ecuador.

**Telesites likely to build Claro’s Costa Rican sites**

América Móvil’s Telesites is expected to build 300 build-to-suit sites for Claro in Costa Rica. The project is the first one outside of Mexico for the newly formed towerco which is still waiting for IFT’s approval of the transfer of 10,800 from Telcel.

**Telefónica in talks to lease towers from América Móvil’s Telesites**

Telefónica has joined AT&T in talks with América Móvil’s Telesites about the possibility of leasing sites within their 10,800 tower portfolio.

**IFT to make 2.5GHz band spectrum available**

IFT has agreed to release spectrum in the 2.5GHz band from 2016 in order to allow the deployment of broadband technologies using (FDD)-LTE or (TDD)-LTE methods. The decision follows a recommendation from the International Telecommunication Union (ITU) as well as the Comisión Interamericana de Telecomunicaciones (CITEL).

**Xinwei starts rolling out its network**

Xinwei is currently rolling out its mobile network in Managua. Governmental representatives noted that the network should be launched before the end of 2015.

**BTS towercos pile into Peru**

Having secured investment from Cartesian and the IFC, BTS Torres - the local towerco of Tatum Martin and Mariano Gomez’s NMS, has launched in Peru. Several other towercos, including Centennial, Torres Andinas and Manuel Aviles’ Innovattel / Torresec have also piled in to Peru, attracted by the tower building frenzy driven by the expansiveness of Entel. Torres Unidas has around 600 towers in Peru, American Tower 579. The country has a little over 9,000 towers but the Ministry of Transport and Communications has called for an increase to 22,000 over the next two and a half years.

**Vivendi is the major shareholder in Telecom Italia**

Vivendi is now the largest shareholder in Telecom Italia following the raise in its stake to 14.9%. Italian newspaper Corriere della Sera quoted the company’s CEO Arnaud de Puyfontaine saying that Vivendi could raise its stake further in the future.

**NII Holdings reorganised, focuses on Brazil**

NII Holdings has recently stated that it has completed its Chapter 11 reorganisation proceedings. The company’s CEO, Steve Shindler, recently stated that NII Holdings has emerged “as a more streamlined and focused organisation with a strong balance sheet and a healthy liquidity position.” He added that their focus is now on strengthen their position in Brazil and didn’t comment on their position in Argentina.
Global telecom tower market overview

How many telecom towers are there in the world? And what proportion are owned by towercos?

Towercos own around one in three of the world’s ~3mn telecom towers. When China’s legacy towers are injected into CTC, that proportion will rise to two in three; MNO-captive towers will be in the minority. One struggles to imagine a parallel wherein an infrastructure asset class has been so radically transformed in such a short space of time.

TowerXchange estimate that the tower industry currently owns 971,696 towers worldwide, assets worth ~US$100bn, but if smartly managed the aggregate market cap of companies in this asset class could be in excess of US$200bn.

After three years of studying the telecom tower markets on every continent except North America (which TowerXchange intend to start covering in Q2-3 2016), we can now make an educated estimate that there are around 3mn telecom towers worldwide. We’ve seen very few forecasts that low, which gives us even more confidence in the number – in every market we study, the actual number of sticks in the ground is usually significantly less than most assume – distorted by the more common count of base stations, and by the grey area separating a tower from a rooftops.

We call them ‘tower counts’ but what TowerXchange actually endeavors to count are shareable / investible structures – thus a robust rooftop suitable for co-location is more interesting than a lightweight pole.
mounted on a building which lacks the structural capacity to mount anything heavier up there. The imprecision of the differentiation serves to illustrate the approximate nature of ours and anyone else’s tower count: when is a tower not a tower? With MNO asset registers seldom accurate, and towerco asset registers subject to occasional inflation by sales teams keen to advertise tenancies on towers that are not quite finished, counting towers is an imprecise science.

Those caveats notwithstanding, as we roll up tower counts in each region, we see the ‘old growth’ tower markets of USA (initiated in the mid 1990s) and India (initiated over a decade later) approaching saturation with towercos owning 82% and 76% of the towers in each market respectively. One effect of this is that investors who achieved good returns from the asset class, particularly from the U.S., are seeking new investible platforms in less penetrated tower markets. Thus one seldom hears of a tower auction with less then ten well capitalised bidders. Capital is no longer scarce in this asset class – proven management teams are less common!

I’ve undertaken a crude comparison of average cost per tower in figure two. While cost per tower is a horribly inaccurate measure of valuation, lease rates are seldom in the public domains so multiples of tower cash flow (TCF), which would be far more useful, are not accessible. While flawed, this analysis still reveals the premium necessary to pay to participate in two of the next most penetrated tower markets; CALA and Indonesia, reflecting the increasing scarcity of remaining investible assets, the competitiveness of tower auctions, and the reduced risk of investing in markets with embedded cultures of infrastructure sharing.

As an increasing proportion of the world’s most investible towers have been acquired, towercos and their investors may find themselves having to deviate further from the established business model to extend their growth narrative. We have already seen the likes of American Tower extending beyond the limit of the ‘steel and grass’ business model to offer ‘power as a service’ in emerging markets - indeed, the more operationally complex the market, the deeper the service proposition should be; just look at the end to end services edotco is providing in parts of Asia as an example.

The ‘rules’ governing deal structure may have to be rewritten too, if the tower industry is to penetrate beyond owning two in three of the world’s towers. We’ve seen the likes of IHS deviating from established wisdom which dictates that towercos must own at least 51% equity - MTN retained 51% in Nigeria. There are countries where foreign direct investment is limited to 49% - if the international tower industry wanted to participate in opportunities which could come to market in the near term in Algeria or Thailand, for example, then investors would have to content themselves with a 49% stake. Such restrictions have not prevented Tower Bersama and Protelindo from prospering in Indonesia! A different flavor of deal structure predicated on shared risk partnerships may be required if towercos are to absorb tier two operators’ assets onto their balance sheets.

Finally, the macro network-centric tower industry of today may evolve substantially in the heterogeneous network era. We have already seen the likes of Crown Castle, Protelindo and STP investing in small cells and micro cells, while an increasing proportion of conversations TowerXchange is having in Europe acknowledge that towercos on that continent may have to manage active as well as passive equipment.

<table>
<thead>
<tr>
<th>Region</th>
<th>Timeframe studied</th>
<th>Total sold*</th>
<th>Capital deployed US$</th>
<th>Average cost per tower</th>
</tr>
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<tbody>
<tr>
<td>CALA</td>
<td>2011-15</td>
<td>41,413</td>
<td>$8.3bn</td>
<td>$200,130</td>
</tr>
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<td>Indonesia</td>
<td>2008-15</td>
<td>13,267</td>
<td>$1.7bn</td>
<td>$145,369</td>
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<tr>
<td>Africa</td>
<td>2010-15</td>
<td>39,908</td>
<td>$4.4bn</td>
<td>$130,744</td>
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<tr>
<td>Europe</td>
<td>2012-15</td>
<td>17,072</td>
<td>$2.1bn</td>
<td>$123,560</td>
</tr>
<tr>
<td>India</td>
<td>2009-15</td>
<td>42,388</td>
<td>$4.8bn</td>
<td>$114,301</td>
</tr>
</tbody>
</table>

*Total sold includes transactions where the quantity was disclosed but the deal value was not disclosed to TowerXchange, capital deployed includes only known deal values, the tower counts from which are excluded from the formula to calculate average cost per tower.
Top 149 towercos and infracos worldwide, by estimated tower count

Where possible, the tower counts that follow have been verified through site lists and direct conversation with management between Q3 2014 and Q2 2015. In some cases, counts represent our best estimate. We cannot provide even an estimate for some towercos and infracos, which are listed at the foot of this table. If you would like to suggest an amendment to any of these figures, please email kosmotherly@towerxchange.com.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Towerco</th>
<th>Count</th>
<th>Countries</th>
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<tbody>
<tr>
<td>1</td>
<td>China Tower Company*</td>
<td>120,000</td>
<td>China</td>
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<td>2</td>
<td>Indus Towers</td>
<td>116,454</td>
<td>India</td>
</tr>
<tr>
<td>3</td>
<td>American Tower</td>
<td>99,501</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Costa Rica, Germany, India, Ghana, South</td>
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<td></td>
<td></td>
<td></td>
<td>Africa, Uganda, Nigeria</td>
</tr>
<tr>
<td>4</td>
<td>Reliance Infratel</td>
<td>52,000</td>
<td>India</td>
</tr>
<tr>
<td>5</td>
<td>Viom Networks</td>
<td>42,200</td>
<td>India</td>
</tr>
<tr>
<td>6</td>
<td>Crown Castle</td>
<td>39,667</td>
<td>USA</td>
</tr>
<tr>
<td>7</td>
<td>Bharti Infratel**</td>
<td>37,486</td>
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</tr>
<tr>
<td>8</td>
<td>GTL Infrastructure</td>
<td>29,432</td>
<td>India</td>
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<tr>
<td>9</td>
<td>Deutsche Funkturm***</td>
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<td>Germany</td>
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<td>10</td>
<td>SBA Communications</td>
<td>25,777</td>
<td>USA, Canada, Brazil, Panama, Costa Rica,</td>
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<td></td>
<td></td>
<td></td>
<td>Nicaragua, Guatemala, El Salvador, Ecuador</td>
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<td>IHS Towers</td>
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<td>CTIL</td>
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<td>13</td>
<td>MBNL</td>
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<td>Cellnex</td>
<td>15,140</td>
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<td>15</td>
<td>edotco</td>
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<td>Pakistan</td>
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<tr>
<td>16</td>
<td>DIF (formerly TRUEGIF)</td>
<td>12,138</td>
<td>Thailand</td>
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<td>17</td>
<td>Protelindo</td>
<td>11,675</td>
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<td>Inwit</td>
<td>11,519</td>
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<td>19</td>
<td>Tower Bersama</td>
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<td>20</td>
<td>TDF</td>
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<td>21</td>
<td>Telesites</td>
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<td>Arqiva</td>
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<td>Tower Vision</td>
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<td>Global Tower</td>
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<td>Eaton Towers</td>
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<td></td>
<td></td>
<td></td>
<td>Burkina Faso, Malawi, Egypt</td>
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<tr>
<td>27</td>
<td>Grupo TorreSur</td>
<td>6,300</td>
<td>Brazil</td>
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<td>28</td>
<td>Helios Towers Africa</td>
<td>5,606</td>
<td>Tanzania, DRC, Congo B, Ghana</td>
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<td>29</td>
<td>Mitratel</td>
<td>5,500</td>
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<tr>
<td>30</td>
<td>AT&amp;T Towers</td>
<td>5,059</td>
<td>USA</td>
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</tbody>
</table>

* China Tower Company count includes contracted BTS, but excludes the 1mn+ towers to be integrated from China’s three MNOs  ** Bharti Infratel also owns 42% of Indus Towers, making their portfolio 48,911 towers larger, excluded here to avoid double counting  *** Deutsche Funkturm: our sources suggest this portfolio consists of ~8,500 towers and ~18,500 rooftops
<table>
<thead>
<tr>
<th>Rank</th>
<th>Towerco</th>
<th>Count</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>Towershare</td>
<td>5,000</td>
<td>Pakistan</td>
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<tr>
<td>32</td>
<td>Ascend Telecom</td>
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</tr>
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<td>33</td>
<td>US Cellular Towers</td>
<td>4,281</td>
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<tr>
<td>34</td>
<td>EI Towers</td>
<td>2,700</td>
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<tr>
<td>35</td>
<td>TT-Network</td>
<td>2,500</td>
<td>Denmark</td>
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<tr>
<td>36</td>
<td>Digital Bridge</td>
<td>2,300</td>
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<td>37</td>
<td>IBS Tower</td>
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<td>38</td>
<td>T-Mobile Towers</td>
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<td>39</td>
<td>FPS</td>
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<td>France</td>
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<td>41</td>
<td>Wireless Infrastructure Group</td>
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<td>42</td>
<td>SEATH (VinaCapital / VNI)</td>
<td>1,930</td>
<td>Vietnam</td>
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<td>43</td>
<td>ASEAN Towers (IGT + Golden Towers)*</td>
<td>1,822</td>
<td>Myanmar, Vietnam</td>
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<tr>
<td>44</td>
<td>CCA (now owned by MIRA-headed consortium)</td>
<td>1,772</td>
<td>Australia</td>
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<td>45</td>
<td>Phoenix Tower International</td>
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<td>Brazil, Dominican Republic, Costa Rica, Panama, USA, Colombia</td>
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<td>Russian Towers</td>
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<td>Frontier Tower Solutions</td>
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<td>Varsity Wireless</td>
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<td>Mexico Tower Partners</td>
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<td>Pan Asia Majestic Eagle</td>
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<td>Digicel MTC</td>
<td>1,220</td>
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<td>Cell Site Solutions</td>
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<td>InSite Wireless Group</td>
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<tr>
<td>55</td>
<td>Message Centre Management/ Torrecom</td>
<td>1,131</td>
<td>USA, Mexico, Guatemala, Nicaragua</td>
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</tbody>
</table>

* ASEAN 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
<table>
<thead>
<tr>
<th>Rank</th>
<th>Towerco</th>
<th>Count</th>
<th>Count</th>
<th>Countries</th>
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<td>Towercom</td>
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<td>82</td>
<td>ESB Telecos</td>
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<td>83</td>
<td>Highline do Brasil</td>
<td>400</td>
<td></td>
<td>Brazil</td>
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<td>84</td>
<td>Emitel</td>
<td>377</td>
<td></td>
<td>Poland</td>
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<td>85</td>
<td>Innovavatel (Torresec)</td>
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<td>86</td>
<td>D’harmoni</td>
<td>346</td>
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<td>KJS</td>
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<td>Subcarrier Communications</td>
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<td>Common Tower</td>
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<td>Skyway Towers</td>
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<td>IIMT</td>
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<td>Torres Andinas</td>
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<td>Colombia, Peru</td>
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<td>Branch Communication</td>
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<td>Batitowers</td>
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<td>Link Development</td>
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<td>Grain Management</td>
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<td>Pegasus Tower</td>
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<td>Perak Integrated Networks</td>
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<td>HIGHPOINT (obelisk)</td>
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<td>Intelli Site Solutions</td>
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<td>Hibernian / Britannia Towers</td>
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<td>UK, Ireland</td>
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<td>Asia Space</td>
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<td>Communication Enhancement</td>
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**Undisclosed counts**

3GIS, Sweden
Antenna Hungaria, Hungary
Atlas Tower, USA, South Africa
AWAL Telecom, Pakistan
Azerconnect, Azerbaijan
Catalina Inc, Costa Rica
Communication Towers Nigeria, Nigeria
Digita, Finland
Eco-Friendly Towers*, Myanmar
EuroTower, Pan-European remit
Infratel, South Africa
ITAS TIM, France
Mosaic, Ireland
Myanmar Infrastructure Group**, Myanmar
NetWorkSI, Poland
Net4Mobility, Sweden
Secured Towers, Nigeria
* Eco-Friendly Towers contracted to build 700 towers for Telenor in Myanmar
** Myanmar Infrastructure Group contracted to build 503 towers for Ooredoo in Myanmar
Hal Hess explains American Tower’s investment criteria, and how the towerco business model has evolved in EMEA and LatAm

Hal Hess, EVP International and President, EMEA and LatAm, American Tower generously granted TowerXchange an hour to pick his brain about American Tower’s international market evaluation criteria, the evolution of the emerging market towerco business model toward provision of power as a service, and his views on growth opportunities in SSA, MENA, Latin America and Europe.

**Keywords:** Africa & Middle East, Anchor Tenant, Best Of TowerXchange, Build-To-Suit, C-Level Perspective, Country Risk, DAS, Decommissioning, Energy Efficiency, ESCOs, Europe, Insights, Investment, Market Entry, Pass-Through, Sale & Leaseback, SLA, Small Cells, South America, Tenancy Ratios, Towercos, Uptime, Valuation, Who’s Who

Read this article to learn:
- American Tower’s three pronged threshold test which guides international investment
- Africa: The full turnkey power value proposition as a competitive differentiator
- LatAm: Growth opportunities in Brazil, Peru, Columbia and Mexico, where the impact of Telesites, AT&T and the 700MHz wholesale LTE network are discussed
- Europe: perspectives on deal flow, broadcast towers and decommissioning economics

TowerXchange: What have been the guiding principles of American Tower’s International expansion?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: When we initially launched our International business in 1999-2000 in Mexico and Brazil it was largely exploratory. Mexico was a natural extension beyond our domestic business, and Brazil was the largest economy in Latin America. With the recession in 2000-1 everyone retrenched. We still had our businesses in Mexico and Brazil but we didn’t invest further in new international markets.

Following our SpectraSite merger in 2005, we made a strategic decision to pursue international expansion to complement our U.S. business. We felt there were certain, predominantly developing, international markets that were especially attractive. These markets were in much earlier stages of wireless development than the U.S at the time, but we felt strongly they were poised to replicate a similar growth path over the long term. As a result, we made the decision to start deploying capital in these markets in order to position ourselves to be key beneficiaries.

In terms of guiding principles of international expansion, we have a three pronged threshold test:

1. We’re looking for markets with a relatively stable political and macro-economic environment. No emerging market is as stable as the U.S., so we’re...
looking for environments in which we can operate with a degree of certainty when it comes to rule of law, enforceability of contracts, land rights, and certain other factors.

2. We’re seeking markets with robust wireless sectors. Multiple operators, strong, but rational competition, and attractive metrics such as growing wireless penetration, long term subscriber growth, and an accelerating pace of wireless adoption and data growth are all things that we look for.

3. Finally, we look for a compelling transaction opportunity. This includes a high quality counterparty, well-located, structurally sound assets, and an attractive valuation. We also need to ensure that we have sufficient internal operational capacity to effectively execute on the opportunity.

Passing all these threshold tests is necessary for us to be confident in our ability to deliver our business plans and meet the risk adjusted return thresholds for each market.

For example, while American Tower has invested in South Africa, Ghana, Uganda and Nigeria, in other African tower markets we have yet to be able to find opportunities which satisfy the aforementioned threshold tests. In some instances we declined to participate in processes because of concerns about political or macro-economic environments. In other instances we declined to participate because of timing; a new market entry on top of multiple recent acquisitions posed too much organisational risk on our capacity to execute. However, in most cases it was simply a function of valuation – we weren't able to get comfortable with the price necessary to emerge as the successful bidder, while still meeting our return criteria.

TowerXchange: It’s notable that almost all of the tower transactions to date in Africa have been with tier one MNOs. Is there a market for tier two MNOs to monetise their towers in Africa?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: There is an opportunity, but since tier two MNOs typically have smaller portfolios, we become more sensitive to how compelling the market and transactions are. In Nigeria, for example, MTN, Airtel and Etisalat recently divested tower portfolios of thousands of assets, whereas the tier two MNOs’ portfolios number in the hundreds.

Second, although acquiring assets from a tier two MNO may result in heightened credit risk, this can be partially offset as it probably means a greater proportion of future leaseup will come from tier one MNOs.

Finally, it’s easier to roll-up tier two MNOs’ assets in an existing market where it’s an incremental add

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### Percentage of tower gross margin by country, Q215*

<table>
<thead>
<tr>
<th>Country</th>
<th>Gross Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>73.6%</td>
</tr>
<tr>
<td>Brazil</td>
<td>8.2%</td>
</tr>
<tr>
<td>Mexico</td>
<td>7%</td>
</tr>
<tr>
<td>India</td>
<td>3.4%</td>
</tr>
<tr>
<td>South Africa</td>
<td>1.8%</td>
</tr>
<tr>
<td>Ghana</td>
<td>1.6%</td>
</tr>
<tr>
<td>Colombia</td>
<td>1.3%</td>
</tr>
<tr>
<td>Germany</td>
<td>1.3%</td>
</tr>
<tr>
<td>Uganda</td>
<td>0.8%</td>
</tr>
<tr>
<td>Chile</td>
<td>0.4%</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.4%</td>
</tr>
<tr>
<td>Peru</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

*Excludes the impact of American Tower’s recent Airtel Nigeria transaction, which closed on July 1, 2015
on. It will be more difficult to justify the investment to enter a new market on the back of an acquisition from a tier two MNO as we need a minimum scale to justify the investment and the commitment of resources. One way to address that would be to operate several smaller markets through a central location – for example in Latin America, our Chile, Peru and Costa Rica businesses have the majority of operational back office functions run centrally.

TowerXchange: How are the capabilities of American Tower’s operations enhanced when operating in a market like Uganda or Nigeria where DC power service is provided in addition to ‘steel and grass’? Is the full service power model adopted out of necessity in Africa and India, or are American Tower open to providing power+tower in other emerging markets?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: While the full service power model was initially adopted out of necessity, the emerging market tower industry has evolved in a way such that people have realised the full service power model can be a competitive differentiator if you can do it well. We have found that it can also be a way to generate additional revenue and profit.

Whilst we were closing our transaction with MTN in Ghana it became obvious that, given the power challenges in SSA, you cannot have a successful tower business unless you can provide power to meet SLAs. When you appreciate that in emerging markets our MNO customers’ subscribers are primarily prepaid, the economic cost of downtime quickly becomes apparent.

We feel that we have put together the leading power solutions team in Africa, supplemented by power solutions proven in India. So our full turnkey power value proposition in Africa has moved from a necessity to the delivery of market leading capabilities over the last four years, and we now see it as a source of competitive advantage. Ensuring that our customers’ uptime SLAs are achieved frees them to focus on their core business.

American Tower has also assembled a cross regional power team, comprised of representatives from our Africa, India and Americas businesses, to monitor best practices to improve efficiency and to create additional opportunities to provide power as a service.

The opportunity for us to provide power as a service declines as the reliability and consistency of the local grid increases – for example in Mexico the grid is reliable enough that power is not an issue, and is largely provided by our customers.

TowerXchange: What is American Tower’s philosophy for investments in energy efficiency? For example, when acquiring a new portfolio of towers in a market where you’re providing power as a service – such as Nigeria – is your preference to squeeze every last runtime hour out of legacy energy systems, or is your preference to upgrade equipment and optimise energy efficiency as soon as possible?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: We’re in the latter category, but you can’t replace everything on day one after an acquisition closes. However, investing in energy efficiency is very much part of our business plan in Nigeria. We plan to upgrade power management systems on most sites to maximise efficiency in the long term, a few remote sites perhaps notwithstanding.

At the end of the day it’s about meeting the expectations of our customers and being able to get comfortable with our investment thesis. The entry into any new market is a function of an opportunity matching our return targets, and if
The business model assumes a level of investment in power infrastructure, that impacts valuation. Indeed, that may be one of the reasons we couldn’t justify reaching the valuation thresholds necessary to secure the assets in certain emerging markets.

**TowerXchange:** Given American Tower’s lower cost of capital than private equity backed towercos, are you more inclined to invest your own capital in energy efficiency or are you open to partnering with ESCOs?

**Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower:** We are comfortable investing our own capital in energy if we see a long term return, but we’d look at any possible partnering solution where the economics and value proposition were compelling. So our appetite to partner with ESCOs depends on market specifics and service costs.

**TowerXchange:** It seems like the independent towerco business model is penetrating into MENA, with the maiden transaction in Egypt recently and further opportunities in KSA, Kuwait and, potentially, Algeria. Do you see MENA towers as a growth play or as more of an infrastructure-play, given that many markets are host to only two or three carriers?

**Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower:** We believe there could be an opportunity in MENA, and we will look at each opportunity and market but look through the lens of those three threshold tests I mentioned earlier. For example, the political environment remains of concern in certain MENA markets.

We’re active in other markets with only three MNOs, so that factor alone would not preclude our participation in MENA towers, although this is indicative of the finite potential for long term leaseup, which will influence our appetite for, and valuation of, MENA towers.

**TowerXchange:** Moving on to LatAm and one of your maiden international markets: with the creation of Telesites, ~91% of Mexico’s towers are now owned and operated by towercos. What impact do you feel this will have on the market?

**Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower:** We see it as an affirmation of the opportunity for the towerco business model in Mexico, signaling the growth potential of the market over the next five to ten years. Telesites will make the market more competitive, but there are several unanswered questions about their operating behavior, so the specific impact of the creation of Telesites remains

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**Tenants per tower in selected American Tower international markets**

<table>
<thead>
<tr>
<th>Country</th>
<th>Tenants per Tower</th>
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</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>~1.5</td>
</tr>
<tr>
<td>Mexico</td>
<td>~1.5</td>
</tr>
<tr>
<td>Colombia</td>
<td>~1.6</td>
</tr>
<tr>
<td>South Africa</td>
<td>~1.9</td>
</tr>
<tr>
<td>Germany</td>
<td>~1.8</td>
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</tbody>
</table>

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unclear. Telesites maintains heavy ownership connections to América Móvil and in our experience operator controlled towercos typically do not match the third party revenue potential of true independent towercos.

TowerXchange: Some of the other key stakeholders we’ve spoken to about the Mexican tower market had suggested that the market’s true growth potential was stymied by uncertainty concerning how the regulator would address the preponderance of Telcel. Do you therefore feel the full organic growth potential of the Mexican tower market could now be realised?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: Until Telesites is fully up and running and until the preponderance issue is resolved (for example, we still don’t know whether there might be a new market entrant or one or more MVNOs), there is still uncertainty in Mexico so it’s not yet ‘business as usual’.

However, with AT&T’s acquisitions of Iusacell and Nextel, they have publicly said they’ll start investing in Mexico, so we do expect this to partially unlock pent up demand.

TowerXchange: Will Mexico’s 700 MHz wholesale LTE network present another significant opportunity for tower market growth, if so when?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: Most of Brazil’s towers owned by tier one operators have been sold. Carriers typically retain some towers for strategic reasons or because the legal characteristics of those sites are so complex that they were initially not saleable. Eventually the internal view of the strategic importance or the legal characteristics of those towers change and they come to market, but there are not significant numbers left in Brazil other than with Claro. That said, based on the demographics and current subscriber per cell site density, we believe Brazil still needs a significant number of additional sites. We see a long term opportunity to build more sites and, frankly, for smaller companies to build sites and sell them to larger towercos.

When evaluating strategic acquisitions, our fundamental framework doesn’t change – the valuation must yield projected returns above specific market and transaction thresholds. When acquiring an existing towerco a proportion of growth potential has inevitably been realised and priced in.
consolidation, but our appetite remains transaction-specific.

**TowerXchange: Is it a reasonable generalisation to suggest a hierarchy in which American Tower would prefer to deploy capital into organic growth, followed by sale and leasebacks to acquire assets with greater leaseup growth potential, then strategic acquisitions where much of the growth has been realised and priced in?**

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: It is a generalisation, but it’s generally true. On an asset level basis there may be more upside in build to suit, but it obviously takes less time to buy than build 5,000 towers. The acquisition of carrier-owned assets, or the strategic acquisition of a towerco, gives us the ability to accelerate the realisation of a market’s economic potential. But at the end of the day it all comes down to valuation.

**TowerXchange: How much appetite does American Tower have for further inorganic growth in CALA beyond Brazil and Mexico - within countries on the West Coast for example?**

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: As a company one of our highest inorganic growth priorities is to expand within our existing markets. We’re already in Chile, Peru and Colombia where, if the valuation makes sense, we definitely have an appetite to expand and enjoy more benefits of scale and increasing relevance to our customers.

We have a healthy appetite for new markets but I wouldn’t say we’re aggressively pursuing any specific new markets in Latin America right now.

We feel Argentina could become interesting in the long term depending, among other things, on the outcome of upcoming elections.

Our relationships with Telefónica and Millicom also could give us the opportunity to expand into other South American markets, but wherever they are, new markets and smaller add on acquisitions would have to provide incremental value in order for us to pursue them.

**TowerXchange: Is there an optimal time, perhaps in terms of country risk and the maturity of a tower market, for American Tower to enter a new market?**

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: The optimal time depends on the size of the market and our appetite for risk. I personally am not opposed to looking at virgin markets like Myanmar and Cuba, but from a shareholder value perspective it is a challenge to invest in the early stage of an evolving tower market when the pace of development remains unclear – that can be a tough threshold for us to overcome.

**TowerXchange: American Tower has a foothold in Europe with 2,031 towers in Germany - what do you like about Germany that made it your maiden market, and what is your appetite for further acquisition opportunities in Germany?**

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: 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. 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. We feel it may make sense for an independent towerco to be involved in the consolidation and rationalisation of the other national tower portfolios.

We also bought into Germany so we could see how the European tower market evolves from the inside, and figure out the right long term plays to create shareholder value.

**TowerXchange: Given the maturity of the European tower market and the amount of parallel infrastructure, many of the European towerco business plans we’ve seen feature...**
there is no certainty that the upfront capital you’re betting on the cost saving potential of decommissioning will yield returns within your forecast timescale

a significant decommissioning play – how convinced are you as to the potential to create value by rationalising tower networks?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: I think the decommissioning play, which I interpret more about cost management and EBITDA growth, theoretically makes a lot of sense in mature markets. The challenge is to understand the economics of decommissioning as it represents another layer of risk and uncertainty. On top of forecasting future leaseup growth, you now have rationalisation risk – there is no certainty that the upfront capital you’re committing and the cost saving potential of decommissioning you are counting on will yield returns within your forecast timescale. The cost of taking assets out of the ground, and extricating oneself from leases (which is where most of the cost resides) is seldom clear until you start executing. If you’re committing capital to decommissioning, your return on remaining assets has to compensate.

Our understanding is that in some markets decommissioning is proving significantly more challenging than anticipated: costs are higher than estimated, which typically results in projects taking much longer than expected to complete and to realise savings.

That said, there will be decommissioning processes in many European tower markets, and that will have to be taken into account in our valuation modeling. Decommissioning could be a legitimate extension of our historical business model – if we can get comfortable with the economics, we’re interested in participating in the process.

TowerXchange: How do you see the broader European tower market evolving?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: The European tower market is very dynamic right now. Historically we had seen very few pure wireless towercos: Arqiva, TDF and Abertis had hybrid wireless, broadcast and transmission business models. But, given the recent acquisition of the Wind assets by Cellnex and the successful Inwit and Cellnex IPOs, everyone in European wireless is rethinking their long term opportunities.

I think the European MNOs increasingly recognise their tower assets as something they can divest or IPO, so we may see more M&A and public listings of telecom infrastructure assets over the next few years, generating public currency to use for expansion.

TowerXchange: Do you see broadcast towers as natural bedfellows with telecom towers, or will the latter remain American Tower’s focus for the foreseeable future?

Hal Hess, EVP, International Operations and President, EMEA and Latin America, American Tower: We don’t necessarily see international broadcast towers as a natural bedfellow. The broadcast and transmission business operates on lower margins than telecom towers. We have some broadcast towers in our portfolio, but telecom tower assets, and extensions like indoor DAS, will remain our primary focus.

By the end of this year, we will have more than 125 iDAS systems in our International portfolio and, while oDAS and other small cell installations have not historically been a significant component of our international business, we will continue to explore such opportunities in order remain the primary infrastructure provider to our customers.

Hal Hess in a member of the TowerXchange Informal ‘Inner Circle’ Advisory Board. Hal is scheduled to speak on the towerco CXO panel session at the 3rd Annual TowerXchange Meetup Africa, taking place on October 1 and 2 at the Sandton Convention Centre, Johannesburg. For more details visit our website at: www.towerxchange.com/meetups/africa
Will we see the same tower transaction deal flow in Europe which we’ve seen in Africa?

Citi contrasts tower market maturity in Europe, SSA and MENA

Citi’s TMT team in New York and London is renowned for its work advising on global telecom infrastructure transactions, including FSS and MSS (Fixed and Mobile Satellite Services), fibre and data centres. However, the majority of their work has been on telecom and broadcasting towers, initially driven by the three U.S. publics’ consolidation of their domestic market in the early part of the millennium, later extending into LatAm, Africa, Asia and most recently Europe. Citi’s Gaurav (“Guri”) Bath leads their coverage of Global Telecom Infrastructure and has spent a lot of time in Europe recently so TowerXchange asked him to contrast the European tower market with those Citi has served, and continues to serve, in MEA.

Keywords: Africa, Africa & ME Insights, Asset Register, Citi, Country Risk, Decommissioning, Egypt, Europe, Europe Insights, First Mover Advantage, France, Infrastructure Funds, Infrastructure Sharing, Insights, Investment, Italy, Lawyers & Advisors, MENA, Market Forecasts, Market Overview, Regulation, Rooftop, Sale & Leaseback, Saudi Arabia, Spain, UK, Valuation

Read this article to learn:
- The implications of blending broadcast service provision and decommissioning with the ‘pureplay’ telecom site hosting business
- Why European MNOs need to divest assets to deploy more capital into their networks
- The prospective tower deal flow in Europe and the impact of the current low cost of borrowing
- Is the SSA tower market ‘sold out’?
- Parties interested in MENA towers

TowerXchange: How would you characterise the maturity of the European tower industry?

Guri Bath, Director, TMT, Citi: From an independent multi country tower operator perspective I would say that the industry is in its early stages. However, significant developments have taken place over the recent past with the emergence of a publicly listed Cellnex in Spain and Inwit in Italy.

Previously the European tower market was very localised within each country – TDF in France, Arqiva in the UK, EIT and Raiway in Italy et cetera – and the European market has evolved in a different fashion from US tower market. Many European towercos started as broadcast service providers and later expanded into telecom site hosting. Unlike the US towercos that generate 90+% of their revenues from telecom site hosting the Europeans still generate a significant portion of their revenue from the provision of broadcasting and other services. For example over 60% of TDF’s revenues come from broadcasting and media services, a slightly higher percentage for Arqiva and circa 37% for Cellnex.

From a telecom site hosting point of view, we’re seeing and expect to continue seeing more transaction activity in Europe especially with Cellnex having gone public with a stated intention to create a pan-European telecom site hosting business.

The public market’s reaction to the Cellnex and Inwit issuances has been very positive and their valuation levels should support transaction activity;
as we speak Cellnex is trading at a 17.2x EBITDA multiple relative to U.S. towercos at 16.5-19.5x – so Cellnex, which is a tax payer, is close to the average of U.S. comps which are either REITs or have substantial NOLs.

Investor sentiment, needless to say is enhanced by the fact that until Cellnex there was almost no opportunity to invest in telecom infrastructure in Europe from a public market perspective and participate in the opportunity for inorganic growth across the continent.

For some time, the view of the investment community has been that European MNOs need to divest non core assets to deploy more capital into their networks. According to GSMA statistics, over recent years capex per subscriber has been around US$80-90 in the U.S., whereas Western Europe has lagged at US$40-50 per subscriber. Network capacity in Europe needs to keep up with the exponential growth in demand for data all of which bodes well for the telecom infrastructure sector in Europe.

TowerXchange: Could we see the volume of tower transactions pick up in Europe like we saw in Africa over the last 18 months?

Guri Bath, Director, TMT, Citi: The prospects for deal flow vary by market. I would put the UK and France in a different bucket than the rest of Europe: Arqiva and TDF have been established a long time and, apart from a handful of interesting smaller independent towercos, the UK and France tower markets are relatively mature. Excluding those markets, it feels like early days for European towers, with MNOs still evaluating the impact of tower divestiture on their competitive position: European operators are still trying to get comfortable with the idea that their tower network may no longer be a strategic differentiator.

Appetite also varies by operator. Some who have done a number of tower transactions in other markets be it LatAm, Africa or even Europe, clearly see the advantage of divesting towers and could take a leading approach in Europe as well.

One of the factors that could impact the pace of transaction activity in some European markets is that the incumbent operator doesn't necessarily need cash from tower monetisations to improve their capital structure. In addition, many of the European operators have access to long term unsecured debt at very attractive rates – so tower divestitures would have to be at a fairly high multiple to be a compelling option given the low cost of borrowing.

The Cellnex-Wind deal in Italy will be a benchmark: operators will see how that does over the next 12-24 months. That may provide the proof of concept for other MNOs in similar positions.

TowerXchange: How does the structure of the tower market, and the opportunity to create capital value, differ given the decommissioning and broadcast elements of the business in Europe?

Guri Bath, Director, TMT, Citi: Investors in Europe’s big four towercos, Cellnex, TDF, Inwit and Arqiva, are cognisant that they provide a different risk
Decommissioning gets priced into M&A through location by location analysis, and here the first entrant has an advantage as they can be more selective about what they buy based on how much intel they have

profile and investment opportunity compared to a pureplay telecom towerco.

Existing towercos coming into Europe are more likely to favour a traditional telecom site hosting business model and will be less keen on broadcast infrastructure, which will likely remain in the hands of operators such as EIT, Raiway, Axion, Towercast, Towercom et cetera. The US publics will be inclined to sustain their focus on the pure play telecom site hosting business model – this is their core competency and it’s what their investors understand. The broadcast business is different in terms of uptime, headcount-heavy operations to actively manage assets, and it’s a more regulated market.

Traditional telecom site hosting companies might buy broadcast assets to enter a market – for example Cellnex made a small acquisition of broadcast assets to get into Italy prior to the Wind deal – but I don’t see that as basis of growth. I don’t foresee towercos trying to consolidate European broadcast infrastructure – it’s a different animal in each country, each with it’s own unique regulatory environment.

The significance of the decommissioning play also varies by market. Markets that have had third party tower operators like the UK and France have a lower decommissioning need than in Italy or Spain, for example, where there is more parallel infrastructure. Decommissioning gets priced into M&A through location by location analysis, and here the first entrant has an advantage as they can be more selective about what they buy based on how much intel they have. Once a towerco is on the ground, they quickly build their own databases.

The other difference is higher preponderance of rooftops in European markets, which enables unique business models. There are parties out there for whom a significant proportion of their success will come from actively looking to make the rooftop business look like the greenfield tower business based on the ability to add additional tenants.

TowerXchange: Are there enough prospective buyers of European towers for MNOs to feel they can get full value?

Guri Bath, Director, TMT, Citi: I think there are enough buyers to create healthy competition for towers in Europe. Cellnex has changed the equation, Inwit may add more competition, the Americans have dipped their toes into the market, although internationally they remain more LatAm focused than Europe, and there are several private tower companies of scale with strong financial backers who are also likely to participate.

There are also a lot of infrastructure players active on the broadcast side of the market who are expanding their interest to bid for traditional telecom tower assets. For example, we’re running a process in the Middle East in which we are seeing strong interest from strategics, private equity, SWFs, and infrastructure funds.

TowerXchange: How do the challenges involved in getting a tower deal done in Europe compare to those in Africa?

Guri Bath, Director, TMT, Citi: The European
regulatory environment is more developed than in some emerging markets, so the parameters of documentation and approvals you need are fairly well defined. Ground leases and licenses are much simpler in Europe than in Africa.

But the challenges around how much detail MNOs have on their tower portfolio are still present in both markets. In most cases the assets are still not managed independently, so there’s the same challenge for the prospective acquirer to get the necessary site by site detail.

Europe presents a less complex operating environment, with the majority of towers on grid, which provides a degree of management comfort for the seller.

Finally, it generally takes less time to get a tower transaction from start to finish in Europe than in Africa or even LatAm, again thanks to the clarity around regulations and the relative ease of managing information.

TowerXchange: Changing topics to Africa - have Africa’s ‘Big Four’ towercos now reached scale? Have they bought most of the assets they want, South Africa notwithstanding?

Guri Bath, Director, TMT, Citi: Africa’s ‘Big Four’ towercos have definitely reached scale – each is a viable independent towerco now. Based on TowerXchange’s last report IHS has over 20,000 towers, AMT over 10,000 and Eaton and Helios Towers Africa over 5,000 each. But I don’t think the level of tower transaction activity in Africa will slow down materially – there are still significant markets where MNOs have not yet divested towers. Given the performance and operational successes to date – some isolated glitches notwithstanding – MNOs have confidence in Africa’s towercos to deliver on SLAs and will continue to divest assets and to allocate build to suit programmes.

I expect tower transactions to continue from SSA’s other MNOs. In fact, TowerXchange did a great piece showing the markets that have and have not seen tower activity in Africa (Editor: see “Contrasting the appetite to divest towers among the top African and Middle Eastern MNOs”).

TowerXchange: Since 2012, we’ve seen tower transactions in Africa focusing on the assets of the so-called tier one operators: Airtel, Etisalat, Millicom, MTN and Orange. Is there much prospect for tier two operators to partner with towercos, albeit presumably on different terms?

Guri Bath, Director, TMT, Citi: In markets where we’ve seen transactions with market leaders, it will be easier for tier two operators to find a towerco partner. It will remain difficult to monetise a tier two operator’s towers in markets where independent towercos have not yet emerged particularly given the availability of assets from the bigger MNOs; I think the opportunity to buy assets from tier one operators will remain the focus of Africa’s towercos in the near term.

TowerXchange: How does MENA fit into this ecosystem, a region which has just seen its first tower transaction in Egypt between Eaton and MobiNil. Are there a number of advisors and bidders in common, or is it effectively a distinct market with its own drivers and benchmarks?

Guri Bath, Director, TMT, Citi: Even though the Egypt transaction was relatively small, we believe it is a harbinger of increased transaction activity in MEA and the opportunity for the creation of an independent tower business in MENA. The success of the first sizable transaction should drive others to consider divesting assets.

In terms of overlap with SSA, there is a significant amount of overlap in advisory work – it’s critical to use experienced advisors in markets where many tower processes have started, but few have concluded successfully. In terms of buyers, I’d say the initial interest probably comes from existing emerging and frontier market tower companies that have mandates which do not limit them geographically – some of the Asian towercos also have MENA in their sights. Given the availability of assets within their existing footprints developed market towercos may take longer to move into MENA, but there is still a large group of strategic buyers and financial investors very keen to invest in MENA towers.

As a lot of the economies in MENA are oil driven, there is a lot of US$ exposure or indeed the currency may be US$ linked, which helps buyers manage one of bigger risks to the tower business.
Fibre from the sky: the missing link in rural connectivity?

O3b Networks proposes an innovative solution to providing high quality mobile broadband experiences beyond the economic reach of fibre networks

O3b Networks was created with a vision to connect the other three billion (hence O3b) potential mobile subscribers who currently lack mobile broadband access. Their vision is to leverage a growing constellation of Medium Earth Orbit (MEO) satellites set a little over 8,000km above the Earth, enabling O3b to offer the global reach of satellite with the speed of fiber. They have set out to overcome the dual challenges of satellite connectivity: high cost and poor performance. To find out whether the O3b business model is complimentary or competitive to traditional networks of ground based telecom towers, TowerXchange spoke to CEO Steve Collar.

Keywords: Africa, Asia, Backhaul, Backhaul & FTTT, Beyond Passive Infrastructure, Core Network, Digicel, DRC, Insights, Masts & Towers, Next Billion, O3b Networks, Operational Excellence, QoS, Raga Sat

Read this article to learn:

- Leveraging MEO satellites to cut latency by 80%, to provide a voice service with undetectable delays and 12GB/second data anywhere in the world
- Connecting to core networks to provide connectivity to landlocked and islands nations
- Enabling 3-4x network traffic growth within 6-12 months: customer experiences from Digicel and Raga Sat (DRC)
- The opportunity for towercos to expand beyond passive infrastructure to provide aggregated backhaul services in partnership with O3b

TowerXchange: Please introduce the business model of O3b Networks for readers and investors who are unfamiliar with the concept of using MEO satellites to deliver connectivity.

Steve Collar, CEO, O3b Networks: Our value proposition is pretty simple, and is not so dissimilar to terrestrial based connectivity. We use a constellation of Medium Earth Orbit (MEO) satellites to provide MNOs, towercos, ISPs, government and enterprise customers with high capacity, low latency bandwidth at a fraction of the cost of traditional satellite solutions. O3b enables high quality mobile broadband connectivity in places that are harder to reach due to challenging geographies where traditional satellite backhaul has been prohibitively expensive. Our objective is to drive high performance connectivity further and further out into the network.

We enable MNOs and towercos to economically extend their reach while providing an outstanding customer experience. O3b and our investors see untapped demand for connectivity and for mobile data in remote areas, island communities and landlocked countries which lack subsea cable or substantial underground fibre connectivity.

O3b Networks has raised US$1.4bn to date, with another round of fund raising imminent. Our investors wanted to expose themselves to high growth emerging markets where networks expand and grow.

TowerXchange: How many satellites do you have
in MEO now and what does that mean about the capacity of O3b Networks to deliver services to more customers in more countries?

Steve Collar, CEO, O3b Networks: We’ve got 12 satellites in MEO. With our constellation at a height of 8,062km, compared to traditional satellites at a height of 36,000km, we have been able to cut latency to around a fifth of what it was. That is huge for data network performance – it’s typically a 600 milliseconds round trip delay with traditional satellite compared to 120 milliseconds with O3b – in a mobile context that’s 60 milliseconds voice to ear, which means the delay is undetectable. The data network is a key performance driver – with a throughput of 12GB/second, we enable a fantastic Quality of Experience (QoE) for mobile subscribers anywhere in the world, albeit our focus is on emerging markets and expanding networks.

TowerXchange: Is this a solution for remote areas, island nations and offshore connectivity, or does it have more widespread applications?

Steve Collar, CEO, O3b Networks: It’s both and much depends on the way in which O3b is deployed within an operators’ network.

Connected into the core, O3b is a great solution for places where there is either no submarine cable or underground fibre available or where fibre performance is poor. Landlocked countries like the DRC and South Sudan are great opportunities for us. There are large areas of the Amazon we can serve. We’re connecting into core networks for island nations like PNG, East Timor and the Cook Islands, and using O3b to deliver a different level of mobile broadband service, replacing traditional satellite backhaul with a solution that offers significantly more bandwidth.

But we also provide connectivity to the tower network, providing backhaul in markets and regions that don’t need core connectivity, such as Brazil, Indonesia, Pakistan and Malaysia. For example we’re working in Malaysia where, within 700km of Kuala Lumpur, there are still a significant number of towers backhauled by satellite or by poor performing microwave links with extremely thin route connections. This represents a huge opportunity for O3b, the MNOs and for towercos to offer a new service proposition.

TowerXchange: Is O3b Networks value proposition complimentary or competitive to that of independent tower companies?

Steve Collar, CEO, O3b Networks: O3b is highly complimentary to the towerco business model. As MNOs are looking to outsource more and more, towercos are considering opportunities to expand their service proposition beyond passive infrastructure. Towercos have a massive
TowerXchange: How does Quality of Experience (QoE) compare with delivering service from a conventional ground based network?

Steve Collar, CEO, O3b Networks: O3b is very comparable to the performance of a ground based network – that was our target from the outset. Given the previous issues of cost and performance, satellite was seen as a solution of last resort, so we wanted to give MNOs and towercos a different option.

O3b has been deployed for over a year now, and our customers say we’re delivering performance comparable with terrestrial backhaul technology. This in turn is enabling tremendous network opportunity to aggregate backhaul, and O3b represents an interesting means to do that, quickly and more easily than with ground based fibre.

O3bCell provides a more flexible way to connect cell towers and the core mobile network, supporting 2G, 3G and 4G voice and data services. We are very interested in the ongoing development of the towerco’s in Africa and see ourselves as a good fit for companies like Helios Towers Africa and Eaton Towers as they look to consolidate and grow their offering. As their businesses mature and move beyond building their core business

and aggregating towers, towercos are uniquely positioned to upgrade backhaul capability. To reduce the complexity of their own businesses, they can work with a neutral party like O3b to provide a managed, smartly aggregated backhaul network, creating a new service and revenue stream, creating a competitive differentiator, and deepening their customer relationships.

A number of the new tower markets created by Airtel’s African tower sale are very much in the sweet spot for O3b as many lack subsea cable connections, and there is limited fibre.

towercos are uniquely positioned to upgrade backhaul capability. To reduce the complexity of their own businesses, they can work with a neutral party like O3b to provide a managed, smartly aggregated backhaul network
growth – for example one of our key customers Digicel have seen backhaul demand growth of 3-4x within 6-12 months! Improved QoE results not just in increasing customer numbers, but also increasing demand from existing customers, as a new range of apps are enabled by that change in performance.

TowerXchange: How does O3b’s turnaround time to provide connectivity compare to traditional ground based networks?

Steve Collar, CEO, O3b Networks: We can deploy anywhere very quickly. Typically within 30 days we can provide anything from 10MB to GBs of connectivity. You can architect backhaul very much like a microwave network – exactly like you would think about ground based connectivity, only without the barriers of geography, time and cost.

Much of the backhaul from SSA towers is still carried over traditional satellite, which makes the economics of transitioning from 2G to 3G difficult, and which makes it tough to deliver the desired network performance. O3b Networks can help. For example, Raga Sat is a neutral provider to Orange, Afrinet and some of the major enterprises and NGOs in Kinshasa, DRC. They built a local fibre ring and use O3b as their core international connection. When we started they took couple of hundred MB, but that’s risen to over one GB and is looking at doubling again in the near future.

TowerXchange: What is O3b Networks’ vision of the future of connectivity?

Steve Collar, CEO, O3b Networks: Demand for mobile data continues to grow, and we see untapped demand in a significant number of emerging markets where O3b can provide service. The most successful MNOs, towercos and ISPs will leverage a growing range of connectivity technologies to expand their networks and deliver superior QoE. O3b Networks’ vision is a complimentary alternative to traditional ground based networks, offering MNOs and towercos the ability to expand beyond their current geographical and affordability limits.

Our business is incredibly scalable. We have another series of satellites planned, and have an ambition to grow to a TB/second in orbit by 2020 – roughly a tenfold expansion in capacity over what we have today.

We are very proud to be the first African provider to be up on the O3b network. This technology is absolutely mind-boggling, far better than anything else available in the market. The service we can offer to customers such as Orange has been vastly improved overnight. After years of disappointment, DRC consumers and businesses can now genuinely look forward to the prospect of proper connectivity – Philippe Israel, Managing Director, Raga Sat
Special feature:

The TowerXchange who’s who: Debt and equity for towercos

TowerXchange is read by 511 banks, DFIs, private equity firms, infrastructure funds, sovereign wealth firms and investment management advisors – every kind of investor and advisor you might need whether you’re looking for US$1mn-1bn in capital.

We thought it would be useful to share a limited snapshot of this segment of the ecosystem by highlighting some of the investors who have put capital to work in telecom towers, including some detailed coverage of leading sources of debt for towercos. We also present interviews with the IFC and ING to contrast the philosophies of two of the most active DFI and bank debt providers to emerging market towercos.

In this special feature:
XX Index of investors with an appetite to invest in towercos
XX TowerXchange who’s who: International debt providers to towercos
XX Why development finance is a great fit for towercos in frontier markets
XX How banks evaluate and price risk when lending to towercos
## The TowerXchange investor index

A sample of investors active or interested in the telecom tower industry asset class

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<td>ECP</td>
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<td>Wood Creek Capital Management</td>
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“How do I scale from 100 towers to 1,000 when the loan I need is greater than the National banks in my country will provide?” Asked one towerco CEO.

“It’s tough to compete with publicly listed towercos with their low cost of capital when we can’t get bank debt at interest rates less than in the teens,” said another.

Accessing affordable debt is a critical challenge for small to medium sized towercos.

TowerXchange has encountered a relatively shallow pool of financial institutions with a track record of investment in the telecom tower industry outside North America. Securing debt at reasonable interest rates, particularly in markets with perceived medium to high levels of country risk, remains one of the principle inhibitors to international tower industry growth. In this feature, TowerXchange present a simple list of the institutions we recognise as having provided or arranged international debt for the tower industry, plus part one of a matrix defining those institutions’ appetite for towers – and the contacts towercos and their advisors need to accelerate the process.

Over the next few editions of TowerXchange, we intend to build out this special feature into a comprehensive who’s who of banks and DFIs with experience of financing towercos outside of the U.S. including a brief profile of selected institutions’ appetite for towers and track record in towers plus, crucially, the contacts you need if you want to approach that institution for a loan.

If you represent a financial institution which should be included in the TowerXchange who’s who but isn’t, please email Kieron Osmotherly at kosmotherly@towerxchange.com. And if you’re a towercos seeking affordable debt – feel free to drop me a line too!

TowerXchange is not an advisory firm, we do not intend this article to be ‘advice’ and you should undertake your own research – this is simply an anecdotal summary of some of our known contacts in this segment of the ecosystem.


Read this article to learn:
- Which institutions have an appetite to provide capital to telecom towercos?
- How does their appetite for country risk compare?
- What is the minimum cheque size or tower count they are typically interested in?
- Who should you contact to find out more?
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<tr>
<th>Institution</th>
<th>To which continents has your company provided credit to towercos and which other continents would you consider providing credit?</th>
<th>How would describe your appetite to provide credit in markets with perceived higher country risk?</th>
<th>If permitted, can you name some of the towercos you have worked with?</th>
<th>Can you give us an idea of the minimum scale of a towerco venture you would consider financing, in terms of minimum approximate tower count?</th>
<th>Who should towerco business leaders contact at your company if they are interested in raising debt?</th>
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<td>Goldman Sachs</td>
<td>Goldman Sachs has provided debt and/or equity in tower companies in North America, Latin America, Asia, and Africa. We are actively pursuing opportunities to lend and invest in each of the major continents.</td>
<td>Given our extensive experience lending and investing in the tower sector, and our worldwide market presence, we are open to evaluating opportunities in countries with varying risk profiles.</td>
<td>We are unable to identify specific companies that we have worked with; however, our experience lending to and investing in the sector has included over 20 different tower companies in the last ten years, totaling over US$2bn in aggregate (loans and investments), with individual transaction sizes as low as US$15mn.</td>
<td>We often initiate discussions with tower companies that have as few as 20 towers and as little as US$1mn of run rate tower cash flow. We are able to finance tower growth driven by acquisitions and/or development.</td>
<td>For North America and CALA: Ryan Flanagan; <a href="mailto:ryan.flanagan@gs.com">ryan.flanagan@gs.com</a> For Europe and Africa: Greg Olafson; <a href="mailto:greg.olafson@gs.com">greg.olafson@gs.com</a> For Asia: David Chou; <a href="mailto:david.t.chou@gs.com">david.t.chou@gs.com</a> or Willie Wong; <a href="mailto:willie.wong@gs.com">willie.wong@gs.com</a></td>
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<td>IFC</td>
<td>To date, IFC has invested in towers in Africa, Indonesia, Russia, Central and South America.</td>
<td>We are increasingly geared toward frontier markets, or underserved markets, and this pushes our institutions into riskier markets and more longer term risk in financing structures.</td>
<td>IFC has invested in BTS Towers, Continental Towers, Eaton Uganda, Helios Towers Africa, Helios Towers Nigeria, IHS, Protelindo and Russian Towers.</td>
<td>There are no formal lower limits to the size of IFC’s investments. For equity investments, we prefer to invest at least US$10mn, although we have made smaller initial investments that have considerable scope for expansion. For debt investments we prefer cheque size to be at least US$15mn.</td>
<td>Eric Crabtree has a global remit for towers and can be contacted at <a href="mailto:ecrabtree@ifc.org">ecrabtree@ifc.org</a>.</td>
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<td>ING</td>
<td>ING is active in and has provided credit to towercos across Asia, Europe, Africa and North America.</td>
<td>For markets with perceived higher country risk, we have a selective approach. For example, in Myanmar, it would a case by case evaluation with a focus on the strength of the MLAs and the business case. In Africa also we have a selective approach, focusing on the larger and more stable telecom markets together with the leading towercos.</td>
<td>Would not like to mention names, but have worked with leading towercos in markets like Indonesia, India, Australia, Myanmar, France, Italy, Spain, The Netherlands, UK, Nigeria, US/Canada and Latin America.</td>
<td>Nothing prescriptive, but generally speaking about 1,000 towers or more is preferable in terms of scale.</td>
<td>Contact Nina Triantis in the first instance: <a href="mailto:nina.triantis@standardbank.com">nina.triantis@standardbank.com</a> For Asia: Ranesh Verma / Krishna Suryanarayanan <a href="mailto:Ranesh.verma@asia.ing.com">Ranesh.verma@asia.ing.com</a> / <a href="mailto:krishna.suryanarayanan@asia.ing.com">krishna.suryanarayanan@asia.ing.com</a> For EMEA: Stefan Piotrowsky <a href="mailto:Stefan.piotrowsky@ing.com">Stefan.piotrowsky@ing.com</a> For: North America / CALA: Stephen Nettler / Chris Moon <a href="mailto:Stephen.nettler@ing.com">Stephen.nettler@ing.com</a> / <a href="mailto:chris.moon@ing.com">chris.moon@ing.com</a></td>
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<td>Standard Bank</td>
<td>Historically we have provided financing in the emerging markets generally, but we currently only fund projects in Sub-Saharan Africa.</td>
<td>It depends on the market – within SSA we have presence in 20 markets as Standard Bank and these are the ones we have the highest appetite for.</td>
<td>All of the major towercos active in Africa; IHS, Helios Towers Africa, Eaton Towers and American Tower. We have been the most active financier of tower projects in Africa.</td>
<td>We probably would not consider a project value less than US$20mn or so and generally prefer situations where there is scope for further financing in future.</td>
<td>Contact Nina Triantis in the first instance: <a href="mailto:nina.triantis@standardbank.com">nina.triantis@standardbank.com</a></td>
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### Banks and DFIs potentially interested providing or arranging finance for towers

- Asian Development Bank
- BAML
- Barclays
- BNP Paribas
- Credit Suisse
- DEG
- FMO
- Goldman Sachs
- HSBC
- IFC
- ING Bank
- JP Morgan
- KFW
- Macquarie
- Morgan Stanley
- Nomura
- OPIC
- Societe Generale
- Standard Bank
- Standard Chartered
- Sumitomo Mitsui Banking Corporation
- UBS
- United Overseas Bank

Source: TowerXchange
Why development finance is a great fit for towercos in frontier markets

Where have the IFC invested in towers? Why have they invested? How much have they invested – and how much more do they have to invest?

TowerXchange have spoken to many tower entrepreneurs who are struggling to access capital to scale their business. Perhaps the portfolio is too small to attract the commercial banks. Perhaps there is too much country risk. Sometimes development finance can bridge that gap. DFIs can also be a long term business partner for towercos small and large. Of the plethora of DFIs with an appetite for towers, the IFC are perhaps the most experienced. In this interview, TowerXchange spoke to IFC’s “tower guy” Eric Crabtree to understand their appetite for this asset class.


Read this article to learn:
- The IFC’s eight investments in towercos to date, and their appetite for more
- How the IFC can support the evolution of a towerco’s capital structure
- Are there lower limits for the scale of the IFC’s debt and equity investments?
- The benefits of ‘patient capital’

TowerXchange: Please introduce our readers to the IFC and specifically to your engagements with the telecom tower industry.

Eric Crabtree, Chief Investment Officer, IFC: The International Finance Corporation (“IFC”), a member of the World Bank Group, is the largest global development institution focused on the private sector in developing countries. IFC has an invested portfolio of approximately US$52bn, US$2bn of which is in telecommunications and technology. Since 2009, IFC has committed approximately US$500mn in equity (40%) and debt in eight telecom tower companies across all major emerging market regions. See figure one.

IFC strategy in the sector is to build our portfolio in the towers segment to approximately US$1bn by end of Fiscal Year 2018. We seek to fund independent (not controlled by operators) tower companies in growth markets serving multiple viable MNOs and in markets with few competing tower companies.

We see four broad areas of opportunity:
(i) Equity and associated debt for tower companies entering new markets, typically through the first/second divestiture of existing MNO tower assets;
(ii) Equity and associated debt investments in smaller firms in maturing tower markets who have strong build expertise;
(iii) Large tower market consolidations that promote an independent and efficient sector; and
(iv) Debt and some second/third round equity investments in mid-tier tower companies seeking
moderate portfolio acquisitions combined with build to suit.

**TowerXchange: Please could you introduce the ecosystem of development finance, again particularly in relation to DFI’s engagement with the tower industry.**

Eric Crabtree, Chief Investment Officer, IFC: Development Finance Institutions (“DFIs”) have been very active in the tower sector in emerging markets, including FMO, DEG, CDC, Proparco, OPIC, BIO and OFID. DFIs in recent years have developed common approaches to their requirements, streamlining joint investments. For example, a common terms agreement has been developed that simplifies documentation. It is also true that it is the common mission of the DFIs to serve underserved markets, and this pushes our institutions into riskier markets and more longer term risk in financing structures. The tower industry, given its ability to extend communications access, has a strong development impact, and thus is a priority for development institutions.

**TowerXchange: Can you talk about the evolution of a towerco finance from a towerco’s first couple of hundred towers to scaling the business (whether in one market or several) – how does the capital structure evolve and how can the IFC support that evolution?**

Eric Crabtree, Chief Investment Officer, IFC: As tower companies grow in scale, increasing amounts of longer term debt finance can be used for expansion. For the smallest firms, we have supported equity only investments, for mid-sized firms undertaking scaled acquisitions or build to suit, we have supported 50/50 debt to equity. As it is the common mission of the DFIs to serve underserved markets, and this pushes our institutions into riskier markets and more longer term risk in financing structures. The tower industry, given its ability to extend communications access, has a strong development impact, and thus is a priority for development institutions.
firms mature, debt can become the dominant form of capitalisation and capitalisation structures can become a bit more aggressive than the less mature tower companies. This is because mature tower companies have demonstrated the strength of stable lease rates and long term contracts. We also find that for younger firms, mezzanine finance that has favorable repayment profiles and a performance based return, can be attractive for clients with limited equity capital but are seeking to scale up quickly.

**TowerXchange: How would you characterise the IFC’s appetite for country risk?**

Eric Crabtree, Chief Investment Officer, IFC: IFC is increasingly geared toward what we call “frontier” markets where access to patient capital is limited. In a sector such as towers, capital investments are significant and payback periods are relatively long. In many markets, such long term capital is very limited.

**TowerXchange: The perception is that development finance takes a lot longer to secure because of the extensive due diligence undertaken and ethical and environmental obligations which aren’t in themselves necessarily onerous, just time consuming to prove compliance. Is that a fair perception?**

Eric Crabtree, Chief Investment Officer, IFC: It is true that development institutions such as IFC have high ethical and environmental standards. The approach we take on our requirements is constructive, and we allow firms the necessary time to come into compliance, with for example, environmental standards. We also believe that our clients benefit from these standards in terms of their reputation and the efficiency of their operations. At exit, for example, our presence can assure buyers of the firm’s standards.

In terms of the other elements of the financing, I have found that IFC works at the same pace as other commercial parties, sometimes outpacing them. For example, if the client is ready, information is available and negotiations don’t take long, we have been able to close transactions from mandate letter to commitment in three months.

**TowerXchange: Are there taxation advantages to working with development finance?**

Eric Crabtree, Chief Investment Officer, IFC: Yes, these advantages can be important to our clients. For example, interest and dividends payable to IFC are exempt from withholding taxes under our treaties with member governments. In any countries such withholding taxes can range from 10-20%.

**TowerXchange: Please summarise the difference between the IFC and commercial banks/private equity firms as a debt/equity partner.**

Eric Crabtree, Chief Investment Officer, IFC: There are several key differences of importance to our clients. First, we can provide the full range of financial instruments, from debt to equity, providing maximum flexibility to tailor financing packages to client needs. Second, most commercial financial institutions have a regional focus for their tower investments – we invest globally and this experience can be valuable in bringing best practice to our clients. Third, we are patient capital. Unlike private equity firms for example, IFC does not come under pressure to exit its equity investments by a certain date.
How banks evaluate and price risk when lending to towercos
An interview with Krishna Suryanarayanan, Managing Director at ING

One of the principal growing pains facing tower companies, particularly in emerging markets, is the difficult raising affordable debt to finance construction and acquisitions. To learn about some of the criteria commercial banks use when evaluating and pricing provision of credit to towercos, TowerXchange spoke to Krishna Suryanarayanan, Managing Director, Structured Finance at ING Bank NV in Singapore. Krishna has considerable experience of financing towercos in the Asia Pacific region from developed markets like Australia to developing markets like Indonesia, India and Myanmar.


Read this article to learn:
- How banks evaluate country risk and price accordingly
- What is the minimum scale required for a towerco to be investible?
- The contractual terms which enhance bankability and the impact of providing energy
- How long it takes banks to evaluate and approve credit applications from towercos
- The evolution of towerco financing: from startup to scale – from VC to debt and the capital markets

TowerXchange: The independent tower company business model has been described as highly leveragable - how does it look from the lender’s perspective?

Krishna Suryanarayanan, Managing Director, Structured Finance, ING: Generally speaking that’s a correct statement. The tower business model is one in which you can inherently put on a fair amount of leverage. These are infrastructure assets generating long term recurring Free Cash Flow (FCF), so the business lends itself well to leverage.

However, there can be specific circumstances which determine the extent of leverage. The first is the market itself. It’s easier to raise debt for towercos in countries that are perceived as more stable, with a good regulatory and legal framework. For other countries, such as Myanmar, commercial bank appetite may be limited at this stage because of the nascent regulatory and legal framework and evolving market.

The second factor that can limit leverage is scale. If a towerco is too small, for example if it has built a handful of towers and has a contract for say, 300-500 towers that can be too small for many commercial banks. Ideally if a towerco has a portfolio of 1,000+ towers, then we can talk.

The third factor concerns the bankability of the towerco’s customers and contracts. An opportunity is more bankable if the towerco has substantial contract(s) with high quality, credit worthy anchor tenant MNO(s), well negotiated Master Lease

Agreement(s) (MLAs) with protection against inflation, long tenor, and acceptable termination and early cancellation provisions. Of course the pricing provisions in the MLA which determine profitability are also critical.

Other factors include the competitive dynamics in the market and existing / potential co-location on the towers.

In some emerging markets like Myanmar the requirement for some tower operators to also provide power makes the case for investment more challenging as it exposes the towerco to various liabilities concerning Service Level Agreements (SLAs) relating to power supply; the penalties can be substantial, which makes bankers wary.

**TowerXchange: How do banks like ING determine the eligibility to receive credit, and the interest rate to be offered, of a given tower venture in a given country?**

**Krishna Suryanarayanan, Managing Director, Structured Finance, ING:** The spread in the interest margin that the bank would charge depend on the same factors described above which go into overall credit valuation.

There are macro drivers: providing credit to a towerco from a developed market may mean a lower premium for country risk (although this may sometimes be offset by specific liquidity/market characteristics in the relevant loan markets). As the towerco business model extends into developing markets, there is more country risk and more operating risk. Again, much depends on the credit quality of the MNO tenants, structure of the contracts, and the extent of leverage that the operator intends to put on which determines our internal credit assessment of the towerco, and these together with the structure of the financing and liquidity in the market determine the spread we charge them. So factors like whether a towerco is at 3x or 5x EBITDA leverage, structural features including security and covenant package all affect how we would price the loan.

**TowerXchange: What special provisions have to be undertaken to provide debt into a market with perceived higher country risk, and with a less mature banking ecosystem, such as Myanmar?**

**Krishna Suryanarayanan, Managing Director, Structured Finance, ING:** It varies according to the specifics of the market. For example, there is a small subset of commercial banks which have credit appetite for Myanmar and who are prepared to lend into the country – we did that for a client last year in Myanmar which we financed with four other banks.

To mitigate country risk, sometimes banks may choose to buy political risk insurance, which is available from private insurers and multilateral institutions. Other steps which can be taken to mitigate country risk include receipt of certain revenue streams in offshore accounts in acceptable jurisdictions and security over such offshore accounts.

**TowerXchange: Does the raising of debt and equity often happen simultaneously because the two communities lean on each others' expertise to validate an investment?**

**Krishna Suryanarayanan, Managing Director, Structured Finance, ING:** That’s true to an extent. We look to equity investors as a secondary means of validating a business model, which means that equity investors with a track record and experience of the asset class provide more comfort, particularly strategic equity investors led by people with solid towers experience across multiple geographies – people who have successfully executed and exited tower investments. We give a lot of credibility to the fact that they are putting money behind their assumptions and business model.

We have come into some opportunities alongside pure financial investors with no experience or track record, in such instances the solidity and experience of the towerco management team becomes even more important.

**TowerXchange: What is a reasonable timescale from a credit application arriving on your desk from a towerco to that being approved?**

**Krishna Suryanarayanan, Managing Director, Structured Finance, ING:** A lot depends a lot on what stage the towerco is at. With startups and greenfield implementations we need to do a lot more due diligence to get comfortable with the construction risk, execution and market risk. We need to study the MLA and underlying site lease
agreements in detail. We need to study the legal and regulatory environment. All that can take anywhere from three to six months from start to finish. Specific market requirements like central bank and other legal/regulatory requirements need to be worked into the timeframe as well. Therefore in such cases, additional lead time is needed when raising debt and equity.

Within more established tower markets, with existing towercos with proven cash flows, providing credit to finance expansion or an acquisition can be a lot faster. We’ve turned around deals in less than one month in Indonesia, and under three weeks in Australia for existing operations. Under such circumstances there is simply more information readily available – their track record has been established.

**TowerXchange: I understand ING played a pivotal role in helping to raise a vendor finance deal worth tens of millions of dollars. Can you talk a little about vendor finance both as an option for towercos and as an option for credible suppliers to the tower industry?**

Krishna Suryanarayanan, Managing Director, Structured Finance, ING: In general, we see the early phase of growth to a towerco’s first 1,000 towers as more or an equity, VC play – management and early stage strategic investors need to take the risk, get over the hump of the initial 1,000 or so towers, after which the next set of orders is where you can more readily tap the commercial bank market.

International commercial banks will shy away from opportunities where the scale is too small unless the towerco has a firm, well-structured contract with a PO for few thousand towers from an established MNO. We’ve done a greenfield in Myanmar with no existing cash flows but with a solid contract based on which the towerco could attract project finance.

As a towerco scales beyond 1,000 towers and secures its next set of build to suit orders and co-locations, bank debt becomes more easily accessible. If there is a local debt market available, that might be an option, alongside any international banks present in the market or willing to lend into that market. Local and international debt should be equally accessible depending on individual banks’ appetite and criteria.

In the towerco’s growth phase it’s probably still a good idea to retain debt with a smaller group of banks because bank debt is inherently flexible and bespoke.

As a tower company matures and increases to a portfolio of several thousand towers, it’s often time to evaluate what the capital markets have to offer. For example Indonesian towercos have made extensive use of the bond markets, often coinciding with major acquisitions. Existing bank debt could then be partly or fully refinanced in the bond market, which has the benefit of diversifying sources of finance in the capital structure. In addition, bonds can be a good option as towercos mature as they are raised with less covenants and are sometimes unsecured.

A key benefit of bank loans is that they usually provide a free prepayment option which can be used if towercos find cheaper sources of debt. Towercos can also take on additional bank debt to recapitalise if equity investors want to take money off the table prior to exit. With the benefit of steady FCF generation, a tower company has the ability to deleverage relatively quickly even after taking on such additional debt.
Meetup Africa 2015

The 3rd annual retreat for 250 leaders of the African telecom tower community

To discuss your participation, contact Annabelle on +44 7423 512588 or email amayhew@towerxchange.com
TowerXchange Meetup Africa
Sandton Convention Centre, Johannesburg | 1-2 October 2015

Day One | Thursday 1 October

From 8:00 Registration and coffee

9:00 Welcome and opening remarks

9:10 Presentation: TowerXchange’s market analysis and latest forecasts for the growth of African tower industry
Kieron Osmotherly, Founder & CEO, TowerXchange

9:40 Keynote panel: CXOs of Africa’s leading towercos
- Chuck Green, Executive Chairman, Helios Towers Africa
- Terry Rhodes, Acting CEO, Eaton Towers
- Hal Hess, Executive Vice President, International Operations and President, Latin America and EMEA, American Tower Corporation*
- Ray Hassan, CEO, Towershare

10:40 Introducing the leading turnkey infrastructure providers in Africa

11:00 Morning coffee and networking

11:20 Round table breakouts

1:00 Networking lunch

2:00 Round table breakouts

3:20 Afternoon coffee and networking

3:40 Keynote panel: Investors – what next for African towercos?
- Moderator: Marco Cordoni, Partner, Analysys Mason
- Eric Crabtree, CIO, IFC
- Nina Triantis, Managing Director, Global Head of Telecoms & Media, Standard Bank
- Gilles Tre-Hardy, Head of Telecom Infrastructure Practice, Lazard
- Frederik van Pallandt, Senior Investment Officer, FMO

4:40 Introducing the leaders in innovative energy equipment and energy storage solutions

5:00 Close of day one

Drinks reception and TowerXchange networking dinner at Butcher’s Shop (advance registration required)

* Subject to final travel plans
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<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speakers</th>
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<tr>
<td>8.30</td>
<td>Coffee and registration</td>
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<tr>
<td>9:20</td>
<td>Keynote panel: Mobile Network Operator tower strategists</td>
<td>Martin Edge, Non-Executive Director, Econet</td>
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<td>Samuel Tanon, Infrastructure Manager - Network Sharing - Power and Civil Works Procurement, Millicom</td>
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<td>Introducing the leading players in access control in Africa</td>
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<td>Introducing the RMS and site surveillance service providers in Africa</td>
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<td>Afternoon coffee and networking</td>
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<td>3:20</td>
<td>Middle market towercos making rural networks profitable</td>
<td>Jules Degila, Head of Business Development, AMN</td>
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<td>Dion Jerling, Managing Director, Connect Africa</td>
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<td>Sibusiso Mvelase, CEO, Infratel</td>
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<td>Introducing the leading ESCO providers in Africa</td>
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<td>4.15</td>
<td>A new breed of towercos: Middle market players finding opportunity in the market</td>
<td>Morenikeji Aniye, MD/CEO, Hotspot Network</td>
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<td>Nathan Foster, CEO, Atlas Tower</td>
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<td>Gilles Kuntz, CEO, Towerco of Madagascar</td>
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<td>Daniel Ryan, CEO and Founder, Square1 Infrastructure</td>
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<td>5:00</td>
<td>Closing remarks and close of event</td>
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* = subject to final confirmation. All other speakers confirmed
**Roundtable Session One: 11.20am October 1**

1. Country focus: Tanzania
   - Chuck Green, Executive Chairman, Helios Towers Africa
2. Identifying and tackling the security issues faced in owning and running towers
   - Jonas Thessen, CTO, Towershare
3. Selling towers in South Africa
   - Enda Hardiman, Managing Partner, Hardiman Telecommunications
4. How to put capital to work in African towers
   - Dan Lee, Managing Director, Intrepid Advisory Services
5. Redefining the way we manage SLAs and KPIs managing system performance rather than site performance
   - Paul Carpenter, Consultant, Hardiman Telecommunications
6. Outsourcing power - the challenges that delay adoption
   - Chris Luckhurst, Managing Director, CCE Africa
7. Achieving acceptable MLA terms for operators, towercos and their lenders
   - Daniel Metcalfe, Partner, Norton Rose
8. Evaluating the best power options for sites across Africa
   - Samuel Tannon, Infrastructure Manager, Millicom
9. Driving quality, on-time work performed on your towers: managing and measuring results
   - Kyle Baer, Market Strategy Director, Accruent
10. How towercos can meet MNO requirements
    - Wan Zainal, Chief Sales & Corporate Affairs Officer, edotco
11. Country focus: Senegal
    - Abdalla Saeed, CEO, Expresso
12. How to optimise your energy efficiency, select the right storage solution
    - Vincent Baudelet, Business Director, EnerSys
13. Recruiting and managing an effective workforce in Africa
    - Olivier Meganck, Sales Director Africa, Acsys
14. Country focus: Zambia and Rwanda
    - Enda Hardiman, Managing Partner, Hardiman Telecommunications

**Roundtable Session Two: 2.00pm October 1**

15. Optimising the capital structure of African tower companies
    - Nina Triantis, Managing Director, Global Head of Telecoms and Media, Standard Bank
16. Leveraging ‘green’ criteria to access a wider investor base
    - Frederik van Pallandt, Senior Investment Officer, FMO
17. What are telecom towers worth?
    - Marco Somalvico, Director Business Planning & Valuation, Etisalat
18. Build to flip - how to build towers with maximum future sale value
    - Bill Bates, VP Business Development, SBA
19. How can towercos help MNOs in countries with low ARPU?
    - Nawar Atassi, Director of Sales, Towershare
20. How hybrid technology can cut costs for off-grid sites
    - Rob Salbego, Technical Director, Helios Towers Africa
21. Country focus: Egypt
    - Terry Rhodes, Acting CEO, Eaton Towers
22. Best practices to establish the rights, responsibilities and obligations around site upgrades
    - Doug Dimitroff, Partner, Philips Lytle
23. Using international experience to build a tower business in South Africa
    - Nathan Foster, CEO, Atlas
24. Country focus: Madagascar
    - Gilles Kuntz, CEO, Towerco of Madagascar
25. Country focus: Nigeria
    - Lawrence Onyema, CMO, SWAP
26. A unified approach to the management of remote towers
    - Lin Junhai, Huawei
27. Reducing fuel supply chain risk through diesel reduction or replacement
    - Tom Tipple, Regional Vice President, Imergy Power Systems
28. Is there a market to buy / sell tier two MNOs towers?
    - Dan Lee, Managing Director, Intrepid Advisory Services
TowerXchange round table topics and expert hosts

Roundtable Session Three: 11.20am October 2

29. Country focus: Uganda
   - Eric Crabtree, CIO, IFC
30. Impact of spectrum regulation and technology policy on towerco tenancies
   - Marco Cordoni, Partner, Analysys Mason
31. Measuring and mitigating the effect of forex fluctuations
   - Chris Grundberg, Head of Equity Research, UBS
32. How to start up a towerco
   - Dan Ryan, CEO, Square1 Infrastructure
33. Selecting the right RMS solution for a diverse portfolio of sites in Africa
   - Rob Salbego, Technical Director, Helios Towers Africa
34. Connecting the unconnected in a changing landscape
   - Dion Jerling, Managing Director, Connect Africa
35. Driving off grid telecom energy projects to scale
   - Sibusiso Mvelase, CEO, Infratel
36. How to maximise the TCO benefits of hybrid power
   - Ouyang Mingzhi, Huawei
37. Creating a sustainable energy mix in Africa
   - Sebastien Martin, COO Africa, Camusat
38. Country focus: DRC
   - Speaker TBC, Helios Towers Africa
39. Country focus: Pakistan
   - Jonas Thessen, CTO, Towershare

Roundtable Session Four: 1.40pm October 2

40. Reviewing the financing options for towercos over the next 24 months
   - Martin Edge, Non-Executive Director, Econet
41. How to reduce energy waste and improve OPEX through RMS
   - Bartek Candell, Global Key Account Manager, HMS Industrial Networks
42. How to make your cell sites last longer
   - Speaker TBC, Likusasa
43. How towercos make money and create capital value
   - Dan Lee, Managing Director, Intrepid Advisory Services
44. How and what Helios buys
   - Alex Leigh, Commercial Director, Helios Towers Africa
45. Reducing capex and opex in rural operations
   - Jules Degila, Business Development Director, AMN
46. Heterogeneous network solutions as a form of collocation
   - Morenikeji Aniye, CEO, Hotspot
47. The challenges and opportunities posed when building towers in Egypt
   - Sherif Darwish, COO, HOI-MEA
48. Improve the efficiency of site operations through data transparency between towerco and telco
   - Ankur Lal, CEO & Founder, Infozech Software
49. Weighing the benefits of hybrid power for African telecoms sites
   - Johan Terblanche, Regional Manager SSA, Eltek
Latest attendee list for TowerXchange Meetup Africa 2015 to 16.9.15

Mobile Network Operators

Cell C, Executive: Technical Facilities
Econet Wireless, GCTO
Econet Wireless, Head - Network Construction
Econet Wireless Zimbabwe, Director
Etisalat, Head of M&A
Expresso Senegal, Chief Executive Officer
Expresso Telecom, Group Chief Executive Officer
Millicom, Business Development Manager
Millicom, Infrastructure Manager
MTN, General Manager, Strategy
MTN, GM Capital Projects
MTN, Senior Manager M&A
MTN, Senior Manager M&A
MTN, M&A Executive
SIGFOX, Director, Networks & Operators
Tigo, Head of Operations
Tigo, Head of Procurement & Supply Chain
Vodacom, Manager, Strategic Technologies
Vodacom, National Network Property Manager
Vodacom, Executive Head: Field Force Maintenance & Network Property
Vodacom, National Network Property Manager
Vodafone, Network Supply Chain
Vodafone, Head of Network Supply Chain

Towercos

American Tower Corporation, EVP, International Operations
American Tower Corporation, CFO, International Operations
ATC Ghana, Chief Executive Officer
ATC Uganda, Chief Executive Officer
Atlas Tower, CEO
Eaton Towers, Acting CEO
edotco, Chief Sales & Marketing Officer
Helios Towers Africa, CEO
Helios Towers Africa, Executive Chairman
Helios Towers Africa, Technical Manager
Helios Towers Africa, Senior Representative

Helios Towers Africa, Senior Representative
Helios Towers Africa, Senior Representative
Helios Towers Africa, Senior Representative
Helios Towers Africa, Senior Representative
Helios Towers Africa, Senior Representative
Helios Towers Africa, Senior Representative
HTN Towers, CEO
Hotspot Network, MD/CEO
SBA Communications, VP, Business Development
Square1 Infrastructure, Founder & CEO
SWAP, CEO
SWAP, CMO
SWAP, Country Manager (Ghana & Cote d’Ivoire)
TASC, CEO
Towerco of Madagascar, CEO
Towershare, CEO
Towershare, Strategy & Portfolio Manager
Towershare, CTO
Towershare, Director Sales
Towershare, General Counsel

Rural Network Operators

AMN, Managing Director
Connect Africa, Managing Director
Connect Africa, Senior Representative
Infratel, Chairman

Investors & Investment Advisors

Access Bank, Senior Representative
Capital Group Private Markets, Associate
Capital International SARL, Partner
FMO, Senior Investment Officer
IFC, CIO
IFC, Head of Africa, Asia and Latin America TMT Group
IFC, Head of Telecoms, Media & Technology Group
ING Bank NV, Director
Mubadala Infrastructure Partners Limited, General Counsel
Standard Bank, Managing Director, Global Head of

Telecoms & Media
Sumitomo Mitsui Banking Corporation, Manager
WENDEL AFRICA, Managing Director, CEO

Managed Service Providers

Alkan CIT, Chief Executive Officer, Africa
Alkan CIT, West Africa GM
Anchor Telecoms, Chief Executive Officer
ASCOT Industrial, CTO
ASCOT Industrial, President
Camusat, COO Africa
Camusat, Group CTO
Camusat, TCO Developer Officer
Eurico Ferrier, Country Director
GreenX Group Inc., Chief Executive Officer
HOI-MEA, COO
HOI-MEA, Business Development Manager
ieng Group, COO
ieng Group, Group Business Development Head
ieng Group, Head of Managed Services
Infratel, CEO
Leadcom, Head of NTSS sales Africa region
Leadcom, Head of NTSS Delivery Africa region
Leadcom, Business Development
Likusasa, Business Manager - Products and Solutions
Likusasa, Divisional Director
Mer Group Telecom Division, VP Sales Africa-Asia
Mer Group Telecom Division, Deputy CEO, C. Mer industries Ltd.
Netis Ghana, Chief Executive Officer
Netis Group, Managing Director
NEWL, Head of Business
NEWL, Director of Operations
QTE, CEO
QTE, CCO
Ramboll, Project Director
Ramboll, Global Sales Manager
R.S. INFRA PROJECTS, Director
R.S. INFRA PROJECTS, Telecom Head
Sagemcom, Deputy Sales Director
Sagemcom, Kenya Branch Manager
Sagemcom Senegal, Managing Director

Access Control Systems

Abloy, Vice President Sales - Africa
ACSYS, COO
ACSYS, Sales Director Southern Africa
ACSYS, Sales Director
ACSYS, Sales Director Africa
ACSYS, CEO and Founder

Advisory Firms

Analysys Mason, Partner
Citi, Head of Telecoms MENA
Detecon International, Managing Consultant
Hardiman Telecommunications, Founder
Hardiman Telecommunications, Senior Consultant
Intrepid Advisory Services, Managing Director
Lazard, Head of Telecom Infrastructure Practice
Philips Lytle, Partner
UBS, Head of Research
Vinson & Elkins, Partner

Energy Equipment

3Tech, Regional Manager
AMARAJA BATTERIES, Chief Marketing Officer (ISBU)
AKD Solar, CEO
Apollo Solar, CEO
Ausonia, Export Dept Area Manager
Ausonia, CEO
Ballard Power Systems, Sales Director EMEA
Bladon Jets, VP Market Development
Bladon Jets, VP Market Development
Cambridge Clean Energy (CCE), Managing Director, Africa
Caterpillar, Regional Sales Manager
China Shotu, President
China Shotu, CTO
China Shotu, President’s Assistant
COSLIGHT INDIA TELECOM, VP
COSLIGHT INDIA TELECOM, Head International Business
Cummins Power Generation, Business Director
Cummins Power Generation, Regional Sales Director

Eltek, Managing Director MEA
Eltek, Key Account Manager
Emerson Network Power, Managing Director: Sales, Sub Sahara Africa
Emerson Network Power, Vice President, Global Accounts
Enatel Energy, Director of Sales and Marketing
Energy Vision, Executive Chairman
Energy Vision, CFO
EnerSys, Telecom Market Director EMEA
Ennera, Chief Executive Officer
Ennera, CFO - Telecom
Flexenclosure, Sales Director Southern Africa
Flexenclosure, VP eSite
Generator Logic, Senior Representative
GS Yuasa, Regional Manager - EMEA
GS Yuasa, Manager
Heliocentris, Senior Representative
Heliocentris, Senior Representative
Imergy Power Systems, Regional VP EMEA
IPI Group Holding, Chief Executive Officer
IPT PowerTech, VP & COO
IPT PowerTech, GM - Power Division
Lineage power Pvt. Ltd, Head - R&D
NorthStar, Regional Sales Manager Africa
NorthStar, VP Marketing NorthStar Group
Planetary Power, VP Business Development
Powertech South Africa, Managing Director
SUNCO Clean Energy Solutions, Business Development Director
TOTAL, Head of Energy Solutions Development
UNATRAC, Power Systems Segment Manager - Africa
UNATRAC, Power Systems Segment Manager – Telecommunications

IML / Site Management Systems

Accruent, Market Development Director
Accruent, Market Strategy Director
Infozech, Head Africa
Infozech, Business Manager - Africa
nexsysone, CEO

OEMs

Huawei, Senior Representative

RMS

AIO Systems, VP Sales
HMS Industrial Networks, Senior Representative
HMS Industrial Networks, Senior Representative
Inala Technologies, Operations Manager
Inala Technologies, Group Executive, Telecoms
Invendis, CEO
Invendis, COO
nandi Powertronics, Director
Qowisio, Sales Director
Tarantula, Sales Director Europe
Telemisis, Commercial Director
ZNV, Chairman & CEO
ZNV, Managing Director

Tower Manufacturers

Ambor Structures, President
Baybridge Investments, Technical Consultant
Ekistruct, CEO
Ganges Internationale, GM - Exports
Ganges Internationale, Vice President - Operations
Greenpole, CEO
LeBLANC Communications, Director, International Sales
Metalogalva, Business Unit Manager - Telecom
Orion Slobozia, Commercial Manager
PETROLSEAL GROUP, Deputy Managing Director
Sabre Industries, Director of International Sales
TowerTech Africa, COO
TowerTech Africa, COO

Others

EXFO, Director of Technical Sales Support and BDM for Fronthaul/FTTA
China Communication Technology, Senior Representative
O3b Networks, Market Intelligence Officer
Helios Towers Africa (HTA) is the leading independent telecom towers company in Africa. HTA builds and manages shared telecom infrastructure, delivering improved efficiency and reduced costs for operators and their customers.

Helios Towers Nigeria, an affiliate of HTA that was launched in 2005, was the first independent tower company in Africa.

In 2010, HTA pioneered Africa’s first sale/leaseback transaction with the acquisition of Millicom’s network of tower sites in Ghana.

HTA currently owns and manages 3,500 towers and has operations in Ghana, Tanzania, the Democratic Republic of Congo and a sister company in Nigeria, with new operations under development in several other African markets.

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SILVER SPONSOR:

Eltek

Eltek are committed to meeting the power needs of our customers. For more than four decades Eltek has provided power solutions for telecommunication networks globally. Our systems cover the entire range of power requirements; from small to very large, meeting all the power needs of the telecom industry, in both fixed and mobile networks. Our broad range of rectifiers and converters comply with all international standards and requirements. Eltek’s high efficiency solutions and new, innovative designs help the industry achieve the objectives of combating climate change whilst remaining competitive, by reducing energy spend and environmental impact.

Eltek have offices in more than 40 countries and business in more than 100. Our presence and expertise is close to each individual market we serve. This enables us to truly understand the needs of each market and provide solutions and services specifically adapted to local requirements.

Telecom Hybrid Solutions

Eltek’s hybrid solutions are based on the HE technology for optimal utilization of all energy resources. By combining solar or wind energy input with smart generator control and optimally dimensioned batteries, the scene is set for dramatic OPEX reductions and a positive environmental impact.

www.eltek.com

SILVER SPONSOR:

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
With a highly developed logistics chain, advanced tower manufacturing facilities and an extensive network of warehouses, our solutions are flexible and scalable, providing measurable benefits for customers. Our strong presence worldwide enables us to leverage the combined in-depth regional knowledge of local partners with our industry acknowledged engineering expertise for our customers’ benefit.

The division leverages its proven global track record, comprehensive knowledge and accumulated expertise to seamlessly deliver technologically innovative and best-of-breed solutions including low-cost green energy rapidly deployed sites, single to multi-tenant cell-site solutions, turn-key broadband fiber infrastructure, wireless in-building and outdoor coverage extension solutions and more.

Our sponsors

**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](http://www.invendis.com)

**HOI-MEA**

HOI-MEA is a leading company in GSM full turn key industry field in Middle East, North Africa and Gulf Areas. Since its establishment in 2001, the company has always strived for the highest quality innovated products, which contributed to several projects’ success. HOI-MEA offers technical solutions for Antenna Supporting Structures, whether rapidly deployed Mobile or Permanent Solutions, or Decorative Structures (Pine Tree, Palm Tree, and Flag Pole) and Hybrid Power Solutions. HOI-MEA was the pioneer to provide IS service in Egypt, which led to signing agreements with Vodafone Egypt to build-to-Suit for 150 Sites in Delta region.

[www.hoi-mea.com](http://www.hoi-mea.com)

**Mer Group Telecom Division**

Mer Group Telecom Division provides end-to-end Wireless Infrastructure Turnkey solutions – from network planning, site design and provision of towers, to site construction, equipment installation, network optimization and maintenance. Combining cost effectiveness, short lead times and advanced engineering techniques, we are strongly committed to client satisfaction.

Cummins Power Generation

Cummins Power Generation, a subsidiary of Cummins Inc. (NYSE: CMI), is a global leader dedicated to increasing the availability and reliability of electric power around the world. A trusted name for its market leading diesel generators, Cummins is also a global provider of state-of-the-art hybrid power solution to telecom cell sites. Our wide range of products for the telecommunications
industry serves global telecom operators with access to energy efficient and reliable power solutions. Cummins employs approximately 46,000 people worldwide and serves customers in approximately 190 countries and territories through a network of more than 600 company-owned and independent distributor locations and approximately 6,500 dealer locations. Cummins revenues were $19.2 billion in 2014, 11 percent higher than 2013.

www.cumminspower.com

Bronze Sponsor:

Ascot International

HYBRID GENERATORS DESIGNED FOR TELECOM or TOWER OPERATORS that want to enter into a multi-tenancy agreement – CAPEX & OPEX PACKAGE from 5 to 40 KVA load. More than 30 years of experience in the power sector and 34000 installations in the Telecom Market, make Ascot Industrial leader in Africa, Middle East and Asia for tailor made solution to meet customer needs. A real modular, flexible, scalable and plug & play solution is designed by engineers to guarantee cost-effectiveness too.

Portfolio of products
- High Efficiency Diesel AC Generators from 5 to KVA
- Variable Speed and Scalable DC Generators from 5 to 60 KW
- Full Hybrid Solution (DGS+BATTERY+ PV PLUG & PLAY)

www.ascotinternational.com

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 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:

nexusone

MANTRAC Group

Mantrac Group is the authorized Caterpillar dealer operating in Kenya, Tanzania, Uganda, Nigeria, Ghana, Sierra Leone, Egypt, Iraq and parts of Russia in addition to our subsidiary offices in the United Kingdom and Dubai-UAE.

More than a supplier of generator sets, Mantrac Group specialize in power turnkey solution offering our customers integrated business solutions backed by our technical expertise and in-depth understanding of local markets. Our extensive experience in the Telcom sector working with leading mobile operators to provide them with energy-efficient solutions, has helped them increase their operation efficiency through reducing their owning and operating costs.

High parts availability, along with prompt, professional product support services, represent an integral part of our overall commitment to customer satisfaction. This is guaranteed through our network of branches, 24/7 support, 600+ Field service engineer, 700+ service vehicles, Caterpillar Certified workshops & technicians and spare parts availability to ensure your operation is working at peak productivity with minimal downtime.

www.mantracgroup.com

Bronze Sponsor:
Likusasa

Since 1995 Likusasa has been serving the Telecommunications, ICT, and Energy Infrastructure sectors across Sub-Saharan Africa.

We provide the industry’s leading TowerCos, Operators, and Vendors with multi-disciplined engineering, procurement, construction, installation and consulting services. We have supplied and built more than 4,000 turnkey sites; audited over 1,000; designed, supplied and deployed over 500 hybrid energy systems (0.5kW to 18kW); and installed and maintained over 1,450 RMS systems.

www.likusasa.com

Exhibitor:

Leadcom

Leadcom Integrated Solutions Ltd. is an international leading supplier of telecommunication network deployment services and solutions. We combine extensive global experience, high level of engineering and project management and a major Pan African Vendor with very wide footprint in over 15 African countries.

Acting as a System Integrator, Turnkey Provider and Value Added Reseller, we provide a comprehensive service offering aimed...
Our exhibitors

at major global and local telecom operators, towercos, vendors and large enterprises. Our service offering includes design, engineering, implementation of mobile telecommunication infrastructure as well as vendor-independent managed services provider – focusing on reliability, efficiency and OPEX reduction for our customers.

www.leadcom-is.com

Exhibitor:

Telemisis

Since 1995 Likusasa has been serving the Telecommunications, ICT, and Energy Infrastructure sectors across Sub-Saharan Africa.

We provide the industry’s leading TowerCos, Operators, and Vendors with multi-disciplined engineering, procurement, construction, installation and consulting services. We have supplied and built more than 4,000 turnkey sites; audited over 1,000; designed, supplied and deployed over 500 hybrid energy systems (0.5kW to 18kW); and installed and maintained over 1,450 RMS systems.

We are committed to driving positive change for our customers. Our innovative approach to the market is demonstrated by our investment into low cost rural base stations, efficient power systems, data centres, and innovations such as micropiling solutions.

www.telemisis.com/products

Exhibitor:

Flexenclosure

Flexenclosure is a designer and manufacturer of intelligent power management systems and prefabricated data centre buildings for the ICT industry. The company provides systems that are fully integrated, modular, factory tested for reliability, adaptable to local conditions and quick to install.

eSite is a hybrid power system for off-grid and bad-grid cell sites that delivers 24/7 network uptime and diesel-related cost savings of up to 90%. eSite is an integrated single cabinet system for maximum reliability and speed of installation. eManager, an all-in-one toolbox for site power infrastructure management including remote monitoring, power optimisation, KPI reporting and site logistics, is an integral part of eSite.

www.flexenclosure.com

Exhibitor:

Inala Technologies

Continuous power provides remote sites with reliable and secure environments in which operational equipment and staff can fulfill their unique functions.

To facilitate this, Inala supplies reliable and efficient clean-energy power generation products supported by sustainable new-technology solutions for storing and sharing energy.

In addition to optimization of energy consumption of environmental management systems and hybrid power configuration, Inala can also remotely monitor & control the energy sources via our Remote Monitoring Systems. For multisite OPEX management our device independent business intelligence platform correlates technical and financial data with performance data to allow for the efficient management of infrastructure.

www.inala.co.za

Exhibitor:

Sagemcom

Sagemcom is a French high-technology group with an international dimension. Sagemcom concentrates expertise in telecom and energy solutions enabling the supply of customized connected systems to utilities, telecom operators and services operators worldwide.

The Networks & Systems department offers highly efficient and innovative solutions for Energy & Site Monitoring, Green Energy production & optimization, Radio Site construction, Optical fiber rollout, Telecom equipment and associated services.

As a founder member of the LoRa alliance, Sagemcom proposes a solution that enables the connection with both deep indoor sensors and unpowered objects. This IoT solution is built on LoRa network, accordingly to the LoRaWAN specification.

Sagemcom employs 4,200 people on five continents, with a revenue of around 1.3 billion euros.

www.sagemcom.com

Exhibitor:

Enatel Energy

Enatel Energy delivers an expansive portfolio of configurable systems designed to meet every telecommunication network power requirement. Solutions offer flexibility and scalability, by way of hot pluggable combinations of modular Rectifiers, Inverters, Converters, Solar/Wind Chargers and encompass advanced energy management. Enatel’s SYNERGi hybrid solutions include unique patented generator control capabilities allowing dynamic optimisation to accommodate
Our exhibitors

Off-grid site variables so ensure the highest levels of network uptime, ease of deployment and OPEX savings. Renewable energy inputs can be integrated simply and blended intelligently. Enatel Energy offers renowned support, reliability, and system efficiencies. Solutions are New Zealand made to guarantee design, manufacture and process integrity.

www.enatel.net

Exhibitor:

Emerson Network Power

Emerson Network Power, a business of Emerson, maximizes reliability, deployment speed and operational efficiency for communications networks and data centers. A trusted industry leader in smart infrastructure technologies, Emerson Network Power provides innovative, rapidly deployable solutions that deliver efficiency and uncompromised reliability regardless of network demands. Emerson Network Power offers expertise in AC & DC Power, renewable energy, precision cooling systems, infrastructure management, integrated racks and enclosures, power switching and controls. Our solutions are supported globally by local Emerson Network Power service technicians. Learn more about Emerson Network Power products and services at:

www.emersonnetworkpower.eu

Exhibitor:

Infozech

Infozech is a leading provider of game-changing, technology-led solutions to Telecom tower passive infrastructure providers and communication service providers (CSPs). Infozech has been delivering cost optimization and revenue management solutions to 80 customers across 25 countries for over a decade now. Infozech’s innovative offering iTower (Infozech’s Tower Product Suite) provides solutions for managing and reducing operating costs through real time tower operations tracking, monitoring, prediction and analytics.

Infozech’s Energy Tracking Service (iETS) manages energy costs worth about 837.5 million US dollars across 150,000 towers in India. IETS was adjudged the most innovative product at The ET Telecom Award 2013.

www.infozech.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...
Our exhibitors

quote acceptance that can reduce the runtime of generators and the total cost of ownership of telecom base stations.

quote With 36 affiliates in 16 countries, GS Yuasa has a worldwide presence operating under the GS Yuasa, GS, and Yuasa brands.

quote (GS YUASA)

quote Exhibitor:

quote www.gs-yuasa.com

quote Heliocentris

quote Heliocentris is a German technology company providing autonomous, complementary and emergency power supply for distributed stationary applications.

quote The leading Energy Management System monitors and controls hybrid energy systems including batteries, solar panels, diesel generators or fuel cells. The advanced Remote Management and Service Software enables the cost-efficient management and continuous optimization of BTS sites. Services range from solution engineering and implementation of customized turnkey power solutions to Power as a Service.

quote Heliocentris’ solutions substantially decrease the ecological footprint at much lower operating cost while increasing uptime.

quote The company is headquartered in Berlin with branch offices in Munich, Dubai, Vancouver and representations in Johannesburg and Yangon.

quote www.heliocentris.com

quote Exhibitor:

quote EnerSys

quote EnerSys® is the global leader in stored energy solutions for industrial applications. We complement our extensive line of motive power, reserve power and specialty products with a full range of integrated services and systems. With sales and service locations throughout the world. Headquartered in the United States, with regional headquarters in Europe and Asia, EnerSys employs over nine thousand people and operates 32 manufacturing and assembly facilities world-wide. This vast infrastructure and over 100 years of battery experience positions EnerSys at the forefront of both manufacturing capabilities and new product development.

quote www.ensers.com

quote Exhibitor:

quote ZNV

quote Since 1995, ZNV Technology (the former Power & Environment monitoring and surveillance product line of ZTE) has been providing services for guaranteeing the healthy operation of global communication networks. Now ZNV has 3 main lines of business, Power & Environment supervision, video surveillance, and service business. ZNV’s RMS and security solutions have been installed at 600,000 cell sites worldwide, enjoying the largest market share consecutively over the years. Based on over 10 years of experience, ZNV has thoroughly customized more than 20 integrated monitoring solutions for different industrial customers till now. Our marketing service network covers all the 31 provinces in China and over 70 countries and regions at abroad, providing high-quality products and services for global customers.

quote www.znv.com

quote Exhibitor:

quote Ausonia

quote 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.

quote 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.

quote www.ausonia.net

quote Exhibitor:

quote Imergy Power Systems

quote Imergy Power Systems is a leader in stationary energy storage solutions using innovative flow battery technology. Our game-changing energy storage solutions reduce energy costs, stabilize the grid, and fully unlock the potential of renewable energy sources while dramatically reducing the physical dangers and environmental toxicity inherent in other batteries. Imergy Power Systems is headquartered in Fremont, California, USA, with additional operations in Europe, Asia, and the Americas. For more information about the company, please visit:

quote www.imergy.com

quote Exhibitor:

quote AIO Systems

quote AIO Systems is a next generation solution provider of management control systems for remote site networks tailored...
Our exhibitors

Sabre Industries

Sabre Industries, Inc. is the leading manufacturer of communication towers. As one of the largest tower providers in the world, Sabre engineers and manufactures guyed towers, self-supporting towers, monopoles, concealment products and tower components. Sabre’s custom-engineered guyed and self-supporting towers are designed to carry light to heavy accessory loads for the towerco industry. Sabre has experience in shipping to multiple countries in Africa. Our guyed and self-supporting towers come in welded or knock down sections, and are perfect for international shipments. We also offer camouflaged monopoles in a variety of options, such as palm trees and flag poles.

www.sabreindustries.com

Generator Logic

Generator Logic is an innovative manufacturer of custom-built generators that provide power solutions to a wide variety of industries worldwide.

For the past decade, Generator Logic has concentrated its efforts in providing the telecoms industry with power solutions which are specific to the industry and are built taking into consideration the often harsh environments in which the industry operates in Africa.

Recent innovations include our Hybrid generator incorporating the AC generator, rectifier system and battery bank in a single theft resistant “cube”.

Generator Logic is currently in the process of adding solar to this unit which will be able to be retrofitted to all existing GL hybrids.

www.generationlogic.com

LeBLANC Communications

LeBLANC Communications is a world leader in the provision of fully integrated telecom, microwave and broadcast systems and related infrastructures. Whether it is a 45m GSM tower, a simple rooftop mount or a 300m Self Support Broadcast tower, we have you covered. Our primary focus is customer satisfaction. Our goal is to offer efficient, long term solutions to the challenges faced by our clients. Innovation and willingness to develop customized solutions to the challenges we meet set the LeBLANC team firmly at the forefront of our industry.

www.leblanc.com.my

Abloy

Abloy Oy is one of the leading manufacturers of locks, locking systems and architectural hardware and the world’s leading developer of products in the field of electromechanical locking technology.

www.abloy.com

China Shoto

Since founded in 1990, China Shoto has grown from a manufacturer of telecom batteries to be an innovation centre of highly efficient battery and green energy solutions. As the largest telecom battery manufacturer in Asia and a leading supplier worldwide, Shoto has already started cooperation with renowned companies such as Telefónica, Vodacom, MTN, Deutsche Telekom AG, Orange, Etisalat, Zain, Huawei, ZTE, Alcatel Lucent, GE and Eltek. As overseas market share keeps growing continuously in the recent 5 years, Shoto’s products are widely utilized in more than 80 countries at present. In accordance to different circumstances, Shoto keep on upgrading technologies to optimise its product’s performance.

www.chinashoto.com
Our exhibitors

Exhibitor:

Lineage Power Pvt Ltd

Lineage Power Systems, a subsidiary of PACE Group, is a global leader in providing innovative Energy Management products & solutions for telecom sector. We pride being the front runner in offering a wide spectrum of green technology solutions that are environmental friendly, energy efficient & cost effective and that are capable of delivering a quick return on investment.

We provide Telecom Site Energy Solutions, Solar Hybrid Energy Solutions, and Battery Hybrid Solutions & Remote Monitoring Solutions. We also facilitate after sales Product Services, TSP/EPC Services and O&M Services.

All major telecom operators in India, Africa and Myanmar find a mention of their names in our clientele. The group has over 3000+ strong workforce spread across two continents.

Exhibitor:

Apollo Solar

Apollo manufactures solar and hybrid energy system electronics and software. We are the leader in Africa with the most pure solar systems installed. Our famous T80HV MPPT Charge Controller has 10 years of field proven reliability. Our Smart Hybrid Algorithm minimizes the DG run time and optimizes battery life. Our Integrated Remote Monitoring provides Site Status, Alarms and KPI reports.

Available in sizes for loads from 500 watts to 20kW they can be upgraded in the field as loads increase. Apollo can supply the electronic panels, or complete systems including PV and Batteries. Our customers include MNOs, Tower Companies, System Integrators, EPC companies and ESCOs. We provide systems design, training, technical support and on-site commissioning services. Financing options are now available.

Exhibitor:

Baybridge Investments (SA) (Pty) Ltd

Baybridge Investments (SA) (Pty) Ltd (“BISA”) is a South African-based company that invests in innovative infrastructure technologies to help fulfil the developmental needs of countries in Southern Africa, and the rest of Africa in the medium to long term. BISA has recognised the need in Africa for improved solutions that overcome the limitations
scale management of unmanned remote sites is now a reality with the possibilities provided by Connected Assets, giving operators the visibility and controls to all aspects of remote site management such as environmental, operational health and surveillance and security. It can connect to everything onsite from generators and batteries over fuel tanks to the HVAC or doors, helping to detect critical events like theft or malfunction of equipment. Business intelligence can be automated with rule based policies for each site to harvest operational and productivity efficiency.


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

www.zamilinfra.com

Exhibitor:

AMARARAJA BATTERIES LTD

Amara Raja Batteries, a JV with Johnson Controls Inc (JCI), USA is the largest manufacturer of VRLA Standby Batteries in Indian Ocean Rim. Amara Raja is the most preferred battery in Indian Telecom with installations at close to half of the 400,000 towers under management of Tower companies. Our Proven Technology and Products in 2V & 12V(26-6000AH) batteries have been awarded as most preferred Telecom battery in India by Frost & Sullivan. We are the Strategic sourcing partner with more than 90% share of business with worlds' largest tower company Indus Towers. We offer proven solutions for Tower companies to support efforts in Energy cost reduction and achieving optimal TCO in challenging environment similar to India.

www.amararaja.co.in

Exhibitor:

Towershare

Towershare is a leading independent owner and operator of wireless communications infrastructure, focusing primarily in the Middle East, South Asian and North African markets. Headquartered in the UAE, Towershare's management team comprises telecom veterans who, between them, have built and managed over 30,000 towers in MENA and Asia. TS has an operational footprint in Pakistan where it owns and operates ~150 towers and has signed agreements to acquire more than 5,000 towers from multiple operators in the country. Furthermore, TS is in discussions in more than four different markets for sale and leaseback and build-to-suit opportunities around the region.

http://towershare.com/
IT’S NEVER TOO LATE TO TAKE CONTROL

Take control with SitePro®
World-class remote monitoring and control by Telemisis®

www.telemisis.com
sales@telemisis.com
+44 3333 660088
Meetup Asia 2015

A senior-level networking opportunity with 250 leaders of the Asian telecom tower industry

### Day One | Tuesday 24 November

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00</td>
<td>Registration and coffee</td>
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<tr>
<td>9:00</td>
<td>TowerXchange market analysis and forecasts for the growth of the Asian tower industry</td>
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<tr>
<td>9:30</td>
<td>Keynote Address - Suresh Sidhu, CEO, edotco</td>
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<tr>
<td>9:50</td>
<td>Keynote panel: CXOs of Asia’s leading towercos</td>
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<tr>
<td></td>
<td>- Moderator: Lim Chuan Wei, Partner, Analysys Mason</td>
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<td></td>
<td>- Bimal Dayal, COO, Indus Towers</td>
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<td>- Steve Weiss, CFO, Protelindo</td>
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<td>- Rehan Hassan, President &amp; CEO, Towershare</td>
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<td>- Umang Das, Chief Mentor, Viom Networks</td>
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<td></td>
<td>- Arun Kapur, Chairman, Irrawaddy Green Towers</td>
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<tr>
<td>10:50</td>
<td>Morning coffee and networking</td>
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<tr>
<td>11:20</td>
<td>Introducing the leading energy equipment and service providers in Asia</td>
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<tr>
<td>11:40</td>
<td>Roundtable breakouts</td>
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<tr>
<td>1:00</td>
<td>Networking lunch</td>
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<tr>
<td>2:00</td>
<td>Keynote Address - Akhil Gupta, Chairman, Bharti Infratel</td>
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### Day Two | Wednesday 25 November

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>2:30</td>
<td>Roundtable breakouts</td>
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<tr>
<td>3:50</td>
<td>Afternoon coffee and networking</td>
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<tr>
<td>4:20</td>
<td>Keynote panel: Tower investments in the Asian market</td>
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<tr>
<td></td>
<td>- Moderator: Brandon Amber, Managing Director, Palladium Partners</td>
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<td></td>
<td>- Gulfraz Qayyum, MD, Head of Telecoms MEA, Citi</td>
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<td></td>
<td>- Eric Crabtree, Principal Investment Officer, IFC</td>
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<td></td>
<td>- Kingston Pang, SVP Asia, Macquarie Group</td>
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<td></td>
<td>- Pankaj Suri, Equity Research - Asian Telecom and Media, Nomura</td>
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<td></td>
<td>- Pankaj Agarwal, Director, Capitel Partners</td>
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<tr>
<td>5:20</td>
<td>Close of day one followed by drinks reception and optional dinner</td>
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### Day Two | Wednesday 25 November

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>9:30</td>
<td>Keynote panel: Best practices for MNO tower portfolio optimisation</td>
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<td></td>
<td>- Moderator: Enda Hardiman, Managing Partner, Hardiman Telecom</td>
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<td></td>
<td>- Fahmi Pahlevi, Division Head Tower Commerce - Tower Management Group, Indosat</td>
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<td></td>
<td>- Mohammad Rizvi, Manager of Network Planning and System Engineering, Teletalk</td>
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<tr>
<td>10:40</td>
<td>Introducing Asia’s leading turnkey infrastructure solution providers</td>
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<td>11:00</td>
<td>Morning coffee and networking</td>
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### Day Two | Wednesday 25 November

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<tr>
<td>11:20</td>
<td>Roundtable breakouts</td>
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<tr>
<td>12:40</td>
<td>Operational best practices for tower portfolio management</td>
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<tr>
<td>1:00</td>
<td>Networking lunch</td>
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<tr>
<td>2:00</td>
<td>Roundtable breakouts</td>
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<tr>
<td>3:20</td>
<td>Introducing the leading RMS, access control and Site Intelligence Platforms</td>
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<tr>
<td>3:40</td>
<td>Afternoon coffee and networking</td>
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<tr>
<td>4:00</td>
<td>Panel discussion - Identifying new growth opportunities in the Asian tower market</td>
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<td></td>
<td>- Moderator: Tharma Kunaratnam, Managing Director, Macquarie Group</td>
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<td>- Pak Mohamad Iwan, COO, Komet Infra Nusantara</td>
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<td>- Patrick Tangney, Partner, Alcazar Capital/Golden Towers</td>
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<td>- Ted Zhong, CEO, Q Towers International</td>
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<td></td>
<td>- Mark Bedingham, Managing Director, Myanmar Infrastructure Group and President and CEO, Singapore Myanmar Investco</td>
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<td>- Tushar Kapadia, Vice President, Strategic Initiatives, GTL Infrastructure</td>
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<td>- Dr. Mahadi Harris Murshidi, CEO, Common Tower</td>
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<td>- Philippe Luxcey, CEO, Apollo Towers Myanmar</td>
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TowerXchange Roundtables

First round table breakouts, 11:40-1:00 day one, Tuesday November 24

1. Country focus: India: tower valuations and deal flow
2. Country focus: Myanmar - power
3. Best practices for maturing towercos
4. Country focus: China
5. Tower market investibility
6. Beyond GBTs: opportunities in microcells, small cells and DAS
7. The benefits of tower sharing: optimisation and economies of scale
8. How infrastructure sharing should be promoted and how towercos should be licensed
9. The business case for carve outs, network sharing, and JVs
10. Developing new opex and capex models
11. Translating infrastructure data into intelligence
12. Selecting the right services and business model for each international market

Second round table breakouts, 2:30-3:50 day one, Tuesday November 24

13. Country focus: Indonesia
14. Country focus: Thailand
15. Country focus: Vietnam
16. How to prepare people, processes and assets for transfer to a towerco

17. How to fund a ‘building’ towerco
18. The impact of tower transactions on MNO balance sheets
19. Managing towerco relationships post-separation – the tenant’s perspective
20. How to measure and improve Tower Cash Flow
21. How to minimise the total cost of evaluating and strengthening towers
22. How towercos and their subcontractors can ensure adherence with challenging SLAs
23. How to reduce energy opex
24. Country focus: operational excellence in India

Third round table breakouts, 11:20-12:40 day two, Wednesday 25 November

25. Country focus: Pakistan
26. Country focus: Bangladesh
27. Country focus: Myanmar - building and co-locating
28. MNO consolidation: implications for the tower industry
29. Commercial and technical due diligence on tower transactions
30. The impact of new spectrum on network topographies and demand for BTS and co-location
31. The evolution of towerco service provision; will there be an end to end model?
32. The legal issues in the relationship between towerco and landlord
33. Fixed price, distributed renewable power: can towercos deliver?
34. How to combat fuel theft and energy waste at your site
35. Network planning in the era of infrastructure sharing
36. Community power project management: licensing, implementation, O&M

Fourth round table breakouts, 2:00-3:20 day two, Wednesday 25 November

37. Country focus: Sri Lanka
38. Country focus: Australia
39. How tower transactions and towercos create capital value
40. The contractual terms that create (and destroy) value
41. How to audit your asset register
42. Tower power system design: standardisation versus customisation
43. A unified approach to the management of remote towers
44. Master lease agreements - providing operational flexibility and maximum performance
45. How to manage a broad diversity of managed services, O&M and EPC partners
46. When will hybrid power reach the ‘tipping point’ where the opex savings justify the capex?
What is a Meetup?

Proven over five past events attended by over 1,000 decision makers, TowerXchange Meetups are unique executive retreats for the most influential men and women in telecoms infrastructure. Held annually in Africa, Asia, CALA and Europe, we use small group round table breakouts to give participants unique access to the key stakeholders in the telecom tower industry in each country.

80-90% of the leading towercos and MNOs attend

At other telecom events, a maximum of around 10-15% of the CXOs who lead tower strategy for MNOs and towercos are in attendance. At TowerXchange we regularly attract multiple senior representatives from 80-90% of the towercos active in any region, as well as the majority of MNOs. And thanks to our unique structured networking round tables, everyone has access to these decision makers.

Laser beam focus on towers

Another problem with other telecom events is that passive infrastructure is typically hidden away as an under-appreciated small part of a broader show. The huge audience of middle management, device and VAS influencers at other events dilutes access to the few tower decision makers present. In comparison, TowerXchange has been described as a “networking club for tower geeks” – everyone you meet at TowerXchange is focused on towers, and everyone you meet is a decision maker.

Accelerate vendor selection

If you want to buy telecom tower structures and accessories, energy equipment, energy services, RMS, ILM, access control, H&S equipment, or if you want to contract with tower construction and O&M firms, then...
the private expo at the TowerXchange Meetup provides a ‘who’s who’ of proven passive infrastructure equipment and service providers.

**Identify opportunities for your business today...**

TowerXchange introduces each Meetup with our proprietary research, defining the size of the tower market in each country, identifying who owns the towers today and predicting the future tower transaction pipeline. We also track network rollouts, extensions and densification, and examine ownership of energy assets and the prospects for energy service providers.

**...And opportunities for your business tomorrow**

We use MNO and towerco CXO panel sessions to understand the future of the tower industry. What has been the progress of tower transactions and of portfolio integration? What future acquisitions are planned? How is capex being deployed? What are the priorities of efficiency programmes? Are opex-sharing models being explored? Are microcells, small cells and DAS being rolled out?

**Unique structured networking**

TowerXchange’s renowned round table breakouts are led by an expert moderator, but everyone’s opinions and questions are welcomed. Each round table focuses on a specific country, financial or operational issue. You can attend three or four round tables at each Meetup. Register now to secure your choice of round table and tailor your agenda to meet your networking objectives!

**Suresh Sidhu’s insightful keynote address**
Tower Industry Value Chain

Investors: private equity, DFIs, debt finance, infrastructure funds

Investment management advisors

Independent Towercos
- Sell co-locations
- Generate amendment revenue
- Build-to-suit
- Achieve SLAs
- Efficiency programmes
- Optimise supplier contracts

Strategic consultancy
- Due diligence
- Demand modeling
- Asset register audits

Managed service providers
- Construction services
  - Turnkey infrastructure rollout
  - Tower design & manufacture
  - Import, customs & delivery
  - Site acq, leasing & permitting
  - Installation of towers
  - Tower strengthening
  - Decommissioning
- Static assets
  - Towers & masts
  - Shelters
  - Brackets
  - Enclosures
  - Lighting
  - Fencing
- Monitoring & management
  - RMS
  - Intelligence/analysis
  - Site management
  - Job ticketing
  - Asset lifecycle platform
- O&M services
  - Maintenance
  - Staffing
  - Spare parts
  - Security
  - Refueling
- Dynamic assets
- Energy equipment
  - Batteries
  - Rectifiers
  - Inverters
  - Line conditioning
  - PIUs
  - Air conditioning
  - Lightning protection
  - Controller
  - Voltage regulator
  - Alternator
  - ESCOs
  - Opex models
  - Vendor finance
  - Distributed generation
  - Community power

Microcells, small cells & DAS

Active equipment

Fibre, microwave, satellite backhaul

Who you will meet

TowerXchange Meetups bring together 250+ business leaders representing the entire telecoms infrastructure ecosystem.

TowerXchange engages with MNOs who retain their passive infrastructure, and with 143 independent towercos and network sharing joint venture which between them have acquired or built over 1,876,000 towers worldwide. TowerXchange also maintains relationships with over 500 investment and advisory firms who facilitate tower transactions.

TowerXchange explores the implications of tower transactions for the supply chain: from tower designers and manufacturers to tower construction and O&M firms. The TowerXchange community engages with every major telecom energy equipment and service provider worldwide, including an emerging class of credible ESCOs. We track over 30 different RMS and ILM solution providers, as well as leaders in access control and H&S solutions for cell sites. And we connect the passive infrastructure ecosystem with innovations in microcells, small cells and DAS as well as fibre, microwave and satellite backhaul.

The TowerXchange community is brought together by the renowned TowerXchange Journal, circulated to 11,800 tower industry leaders worldwide. The tower industry’s leaders gather annually at TowerXchange Meetups – we look forward to meeting you there!
edotco Group is an integrated telecommunications infrastructure services company providing end-to-end solutions that includes towers, energy, transmission, operations and maintenance in the region of Southeast Asia.

Today, edotco Group has a large network sites its circle of operations in Malaysia, Sri Lanka, Bangladesh, Pakistan and Cambodia. This represents the company’s commitment to expand possibilities with cost-efficient telecommunications infrastructure that is built around growing competitiveness and connectivity for businesses.

Guided by practical optimism to make a difference in the business we are in, edotco is determined to drive its aspiration – “Enabling Connectivity” by transforming businesses in a way that make a positive impact on the society we live in. Focused on providing innovative and environmentally conscious energy solutions, edotco continues to deliver world class products and services in line with its vision to make a difference today for tomorrow by enabling and empowering communications in a responsible manner in the region.

www.edotcogroup.com
Our sponsors

GOLD SPONSOR:

Huawei

Huawei is a leading global ICT solutions provider. Through our dedication to customer-centric innovation and strong partnerships, we have established end-to-end capabilities and strengths across the carrier networks, enterprise, consumer, and cloud computing fields. We are committed to creating maximum value for telecom carriers, enterprises and consumers by providing competitive ICT solutions and services. Our products and solutions have been deployed in over 170 countries and regions, serving more than one third of the world’s population.

Huawei’s vision is to enrich life through communication. By leveraging our experience and expertise in the ICT sector, we help bridge the digital divide by providing opportunities to enjoy broadband services, regardless of geographic location. Contributing to the sustainable development of society, the economy, and the environment, Huawei creates green solutions that enable customers to reduce power consumption, carbon emissions, and resource costs.

SILVER SPONSOR:

Eltek

Eltek was established in Norway in 1971 as a specialist telecom power systems supplier. Since then, we have grown organically and through mergers and acquisitions to become a leading international supplier of power solutions within several industry sectors, including telecom, rail and infrastructure, power generation and distribution, maritime and offshore and data centers. Eltek reported revenue of NOK 3.85 billion in 2014, is headquartered in Drammen, Norway and became part of Delta Group in 2015, a leading power and thermal management solutions provider.

Eltek’s hybrid solutions are based on the HE technology for optimal utilization of all energy resources. By combining solar or wind energy input with smart generator control and optimally dimensioned batteries, the scene is set for dramatic OPEX reductions and a positive environmental impact. Return on investment is typically only 2-3 years.

Eltek is the only power specialist with true global coverage, with approximately 2,500 employees, offices in almost 40 countries, business in more than 100, which gives us a unique capability to serve global customers. Eltek Power Pte Ltd was set up in Singapore in 1997, since then it has been the Asia Pacific Regional Office and continues today to provide key support for the region. Visit our website to see live HE saving!

www.eltek.com/energy_saved_he.epl

SILVER SPONSOR:

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
specialized site management toolset, Tarantula is a fundamental pillar of support behind the management of more than 350,000 mobile towers and assets worth US$25 billion around the world.

Red Cube Enterprise is Tarantula’s flagship product for smart and efficient telecom site management, with modular design and configurable workflows. The platform is the worldwide industry standard for co-location and tower lifecycle management. The tool also offers additional capabilities such as location management, asset and lease management, operations and maintenance, invoice management, mobile field-force solutions, and comprehensive dashboard reporting.

www.tarantula.net

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**SILVER SPONSOR:**

**Invendis**

Invent, Discover.

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

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**Bronze Sponsor:**

**Vinson & Elkins LLP**

Vinson & Elkins 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

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**Bronze Sponsor:**

**Cummins Power Generation**

Cummins Power Generation, a subsidiary of Cummins Inc. (NYSE: CMI), is a global leader dedicated to increasing the availability and reliability of electric power around the world. A trusted name for its market leading diesel generators, Cummins is also a global provider of state-of-the-art hybrid power solution to telecom cell sites. Our wide range of products for the telecommunications industry serves global telecom operators with access to energy efficient and reliable power solutions.

Cummins employs approximately 46,000 people worldwide and serves customers in approximately 190 countries and territories through a network of more than 600 company-owned and independent distributor locations and approximately 6,500 dealer locations. Cummins revenues were $19.2 billion in 2014, 11 percent higher than 2013.

Miteno Communication Technology Co. Ltd.

Miteno (300038 SZ), is a leading non-state-owned independent owner, operator and developer of wireless communication towers, and a tower designer and manufacturer. In addition to leasing tower spaces, Miteno provides customized DAS, smart cities solutions and smart power poles which consolidates illumination, base station, Wi-Fi, monitoring, advertising, environmental surveillance and charging pile services. Headquartered in Beijing, China, founded in 2004, Miteno has business operation across China. In 2015, Miteno made strategic move to expand its tower leasing business into global market.

Exhibitor:

Telemisis

Telemisis SitePro® enables operators of telecommunications sites to take control of operating expense and improve reliability, by providing improved visibility into the current and future performance and status of their estate of assets. Our team of industry veterans have over 100 years experience designing and globally deploying full site management solutions; including power optimisation, fuel management, electricity metering, environmental management and machine/equipment control in harsh and demanding locations.

Telemisis design and manufacture SiteNode®; the industry's smallest, most flexible and cost-effective remote telemetry node. SiteNode units provide interfacing and data collection capabilities from a wide range of standard devices and sensors that may already be deployed or will be added during a deployment.

Exhibitor:

Flexenclosure

Flexenclosure is a designer and manufacturer of intelligent power management systems and prefabricated data centre buildings for the ICT industry. The company provides systems that are fully integrated, modular, factory tested for reliability, adaptable to local conditions and quick to install.

eSite is a hybrid power system for off-grid and bad-grid cell sites that cuts diesel costs by up to 90%. eSite is an integrated single cabinet system for maximum reliability and speed of installation. eManager, an all-in-one toolbox for remote management, site power optimisation and KPI reporting, is an integral part of eSite.

Exhibitor:

Infozech

Infozech is a leading provider of technology-led and data analytical solutions to Telecom – infrastructure, operators and communication service providers. Infozech has been delivering cost optimization and revenue management solutions, over the past 10 years to 80 customers across 25 countries. Infozech’s innovative offering iTower (Infozech Tower Product Suite) provides an end to end solution for managing and reducing operating costs through tracking real time tower operations, prediction and analytics.

Its iETS product manages energy costs worth about 837.5 million US$ across 150,000 towers in India. iETS was adjudged the most innovative product at The Economic Times Telecom Award 2014.
Our exhibitors

Exhibitor:

Heliocentris

Heliocentris is a German technology company that provides Managed Power Solutions and Services for commercial stationary applications for global Telecommunication Operators and Tower Companies. Services reach from energy optimization and solution engineering to implementation of customized turnkey power solutions and smart operations. The flagship product the “Energy Manager” enables smart connectivity between different components in hybrid energy supply clusters, such as batteries, solar panels, conventional diesel generators or fuel cells, thereby substantially decreasing the ecological footprint at much lower operating cost. The company is headquartered in Berlin with branch offices in Munich, Dubai, Vancouver and representations in Johannesburg and Yangon.

www.heliocentris.com

Exhibitor:

AIO Systems

AIO Systems is a next generation solution provider of management control systems for remote site networks tailored for telecom, power, oil & gas and water utilities. Our customized solutions are designed to control, predict, track and remediate critical network site operations in a timely and pro-efficient manner. AIO’s numerous business models propose alternative operational structures that will guarantee ROI. We address multi-tenant infrastructure complexities, reduce OPEX, assure access to BI services, and deliver effective Asset/Inventory control.

AIO specializes in Hybrid/Energy Resource Management, targeting specific Battery/Generator/Fuel challenges with our newly developed Compact GenFuel solutions and more. With our enhanced Site Hardware and Management Services, such as Site Installation Simulations, System Integrations, Technician Applications & Support, companies can rest assured to address all their RMS needs from A-Z.

www.aiosystems.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 world’s 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:

Abloy South East Asia

Abloy South East Asia is one of the leading manufacturers of locks, locking systems and architectural hardware and the world’s leading developer of products in the field of electromechanical locking technology. We develop safe, aesthetic and easy-to-use locking solutions which satisfy the needs of end-users and our construction industry partners for security, safety and ease-of-access.

Abloy Protec2, which is based on the patented rotating disc cylinder mechanism guarantees the physical security at your site, while electronic Abloy CLIQ technology brings together and integrates the very best of electronics and mechanics allowing flexible control of keys, access rights and audit trails.

www.abloy.sg

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:

ieng Group

i engineering Group provides end-to-end engineering infrastructure solutions to the telecommunications and power industries across Africa, the Middle East and Southeast Asia. We were established in 2007 and are now operating in thirteen countries: Algeria, Burkina Faso, Cameroon, Congo, DR Congo, Ethiopia, Ghana, Lebanon, Myanmar, Rwanda, South Sudan, Uganda and Zambia. We plan, procure, build, optimise and maintain telecom infrastructure; we now have more than 3,000 sites under management.

www.ieng-group.com

Exhibitor:

EnerSys

EnerSys® is the global leader in stored energy solutions for industrial applications. We complement our extensive line of motive power, reserve power and specialty products with a full range of integrated services and systems. With sales and service locations throughout the world. Headquartered in the United States, with regional headquarters in Europe and Asia, EnerSys employs over nine thousand people and operates 32 manufacturing and assembly facilities world-wide. This vast infrastructure and over 100 years of battery experience positions EnerSys at the forefront of both manufacturing capabilities and new product development.

www.enersys.com

Exhibitor:

Imergy Power Systems

Imergy Power Systems is a leader in stationary energy storage solutions using innovative flow battery technology. Our game-changing energy storage solutions reduce energy costs, stabilize the grid, and fully unlock the potential of renewable energy sources while dramatically reducing the physical dangers and environmental toxicity inherent in other batteries. Imergy Power Systems is headquartered in Fremont, California, USA, with additional operations in Europe, Asia, and the Americas. For more information about the company, please visit our website or follow us on Twitter.

www.imergy.com

Exhibitor:

Sagemcom

Sagemcom is a French high-technology group with an international dimension. Sagemcom concentrates expertise in telecom and energy solutions enabling the supply of customized connected systems to utilities, telecom operators and services operators worldwide.

The Networks & Systems department offers highly efficient and innovative solutions for Energy & Site Monitoring, Green Energy production & optimization, Radio Site construction, Optical fiber rollout, Telecom equipment and associated services. Sagemcom employs 4,200 people on five continents, with a revenue of around 1.3 billion euros.

www.sagemcom.com

Exhibitor:

Lineage Power Pvt Ltd

Lineage Power Systems, a subsidiary of PACE Group, is a global leader in providing innovative Energy Management products & solutions for telecom sector. We pride being the front runner in offering a wide spectrum of green technology solutions that are environmental friendly, energy efficient & cost effective and that are capable of delivering a quick return on investment.
Our exhibitors

We provide Telecom Site Energy Solutions, Solar Hybrid Energy Solutions, and Battery Hybrid Solutions & Remote Monitoring Solutions. We also facilitate after sales Product Services, TSP/EPC Services and O&M Services.

All major telecom operators in India, Africa and Myanmar find a mention of their names in our clientele. The group has over 3000+ strong workforce spread across two continents.

www.lineagepowersystems.com

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

Do you provide equipment and services to the Asia tower industry?

Contact Annabelle Mayhew at +44 7423 512588 or at amayhew@towerxchange.com

See you at our future events!

Meetup Africa 2015
1-2 October, Johannesburg

Meetup Asia 2015
24-25 November, Singapore

Meetup Europe 2016
18-19 April, London

Meetup Americas 2016
14-15 June, Florida

Tower Xchange

www.towerxchange.com
We're following the news with this edition's MEA features. With the landscape of African towers still be redefined by Airtel’s tower divestiture, TowerXchange secured an exclusive interview with Christian De Faria, CEO of Airtel Africa. One of the companies whose portfolio is being bolstered by acquisitions is Eaton Towers – we spoke to Group COO Pankaj Kulshrestha. Also in the news this month, newly rebranded HTN Towers is now managing and marketing SWAP’s towers – we present our analysis of the partnership.

Meanwhile, in MENA the Mobily and Zain tower processes continue, prompting us to share more of our own, BMI’s and Mott MacDonald’s coverage of the markets.

Read all about it!
121 Interview: Christian De Faria, CEO, Airtel Africa
124 Interview: Pankaj Kulshrestha, Group COO, Eaton Towers
128 Editorial: HTN Towers + SWAP
131 Contrasting the appetite to divest towers among MEA MNOs
140 Editorial: MENA
144 Analysis: BMI on Saudi Arabia
148 Analysis: Mott MacDonald Share Square for Kuwait
Why and how Airtel sold their African towers

Christian De Faria, CEO of Airtel Africa, heralds the maturation of African telecoms toward a new era of infrastructure sharing

Christian De Faria joined Airtel in September 2013 as CEO of their African Operations, having previously been Group CCO for MTN. Christian’s first exposure to tower outsourcing came while serving as VP of West and Central Africa for MTN, where he was part of the decision making unit which established the valuation and operational issues around selling towers, eventually resulting in the divestiture of MTN’s Ghanaian towers into a joint venture with American Tower. Prior to joining MTN, Christian served as CEO of Telekom Malaysia and held senior financial positions with Deutsche Telecom and Grundig.

**Keywords**: Active Infrasharing, Africa, Africa & ME Insights, Asset Register, Burkina Faso, C-Level Perspective, Chad, Congo Brazzaville, Deal Structure, DRC, Gabon, Ghana, Infrastructure Sharing, Insights, Kenya, Madagascar, Malawi, MNOs, Multi-Country Partner, Niger, Nigeria, Regulation, Rwanda, Sale & Leaseback, Seychelles, Sierra Leone, SLA, Tanzania, Uganda, Zambia

TowerXchange: What motivated Airtel to initially establish your own towerco, Africa Towers, but then ultimately why was the decision taken divest most of Airtel’s African towers to independent towercos?

Christian De Faria, Managing Director & CEO, Airtel Africa: The idea of hiving off our passive infrastructure into a separate entity created by Airtel and run by passive infrastructure experts was in line with our corporate strategy, emulating what we had done in India with the successful creation of Bharti Infratel. Our initial concept and priority was to create a separate company focused on sharing infrastructure, reducing operating costs, and with a view toward future diversification of the shareholding of Africa Towers, or monetisation.

We found that some African operators were not always keen to lease towers from a company with one competitive operator as the sole shareholder. As the monetisation of the assets was always one of the options we considered, we were motivated to monetise our tower assets sooner rather than later, as other African MNOs have done.

Monetising passive infrastructure also provided an opportunity for Airtel to strengthen our capital structure. We were frequently being approached by companies interested in acquiring our towers. There was huge appetite from Africa’s towercos, which were already well established in Africa at that time.

TowerXchange: Having joined Airtel from MTN, who retained equity in many of the towers they

Read this article to learn:

- Why Airtel established their own towerco then divested their towers in Africa
- Why Airtel ran their African tower sale process in-house
- Liaising with regulators
- What will happen to the towers in the countries where the tower transaction has been cancelled
- How Airtel manages relationships with towercos
have sold, whereas Airtel has sold the assets outright, how would you describe the relative merits of each strategy?

Christian De Faria, Managing Director & CEO, Airtel Africa: The model we’ve chosen in African, to divest 100% of the equity in our towers, is driven by corporate strategy. We conducted an evaluation of the merits of each approach, indeed both strategies have their own merits. The end effect is the same; the divestiture of towers. One major reason for going for complete divestiture was to free up management attention for our core GSM business.

TowerXchange: What has been Airtel’s experience running the tower sale process in-house rather than through a third party banker?

Christian De Faria, Managing Director & CEO, Airtel Africa: The process was run by the M&A team in Bharti Airtel’s corporate office in India, which has huge experience in this kind of business.

There were particularities of the African market, so for example we had to make sure any transaction fit the legal and regulatory framework in up to 17 countries.

TowerXchange: What can you tell us about the structure of the transaction? To what extent was the way the portfolio was broken down your decision as opposed to being driven by the shape of the bids you received?

Christian De Faria, Managing Director & CEO, Airtel Africa: The distribution of assets among Africa’s four leading towercos, and the determination of which partner we worked with in which market, was primarily determined by the bidding process. Some bidders already had a presence in country and were seeking to maximise their presence, others were interested simply by the size of the market. We ran a clear bidding process which met the interests of each partner: a memorandum was circulated, each towerco came back saying “I’m interested in this, this and this and willing to pay this” and that ultimately defined the allocation / distribution of towers and structure of the deal.

TowerXchange: It has taken over a year for the announced tower deals to close – are you able to tell us about some of the roadblocks which you have encountered over that time.

Christian De Faria, Managing Director & CEO, Airtel Africa: Tower transactions are complicated transactions, especially in Africa where we had to push for the adoption of specific regulation and licensing regimes for tower companies in some countries. There was lots of work to be done to explain to some regulators that we were divesting part of our assets to a third party, and that divesting passive infrastructure transfers some of the responsibilities set out in our license – for example we would have no responsibility for QoS. The regulatory framework is different in every country and the regulator had to understand the direction we, and the continent, is going with the transfer of towers to independent towercos.

We also had to undertake a long process to review the documentation on a site by site basis.

TowerXchange: Airtel recently announced that your deals with Helios Towers Africa in Tanzania, Chad and the DRC have been cancelled as deadlines have lapsed – what is your short term plan for the management of your towers in these
countries and the other countries in which Airtel will retain its African towers (Sierra Leone and, perhaps, Gabon and Madagascar)?

Christian De Faria, Managing Director & CEO, Airtel Africa: In the instances where the transactions have been cancelled, the towers remain where they were and those parties continue to manage the towers. In some cases the towers remain on our books, in other cases where the assets had been transferred to an Africa Towers subsidiary, they remain there while we evaluate our options.

TowerXchange: Working with multiple towerco counterparties across multiple regions will relieve a huge amount of operational pressure but will give you a number of relationships to manage – how will Airtel manage towerco relationships post-sale?

Christian De Faria, Managing Director & CEO, Airtel Africa: We were running our own towerco before these towers were sold, so we had the staff, structure and governance processes necessary. Even towers on our books we were being managed together with maintenance partners – so we have experience with this on a daily basis.

We already know how to manage towerco relationships and we already know the partners who are acquiring our towers; they already have a proven track record of running other operators’ sites. We’re motivated to ensure good relationships with our towerco partners – several staff have been transferred to them so there is huge continuity in the maintenance of passive infrastructure.

TowerXchange: How will Airtel’s subscribers benefit from the divestiture of your African towers?

Christian De Faria, Managing Director & CEO, Airtel Africa: The subscriber will always benefit from higher service levels. Whether towercos have to serve one, two or three tenants, they have high Service Level Agreements (SLAs) – we also expect the use of a professional company will enable our ongoing endeavors to deliver a high quality, high reliability network.

TowerXchange: Please sum up your vision for infrastructure sharing in Africa.

Christian De Faria, Managing Director & CEO, Airtel Africa: In committing to infrastructure sharing, Airtel has taken the same step as other operators have before us and still other operators will in future. Because we have strong SLAs which ensure our towerco partners provide the highest levels of quality, the MNO can concentrate on serving the market, serving customers and delivering on our value proposition.

The African telecoms industry has matured significantly in the last ten years. Ten years ago, Africa’s MNOs would not have allowed their competitors a ‘free ride’ on their infrastructure, but today I’m pleased to see a highly developed attitude toward sharing passive infrastructure in Africa, and there is still a lot of room to continue sharing in a more active way: fibre sharing and eventually one day why not active infrastructure sharing?
Managing Africa’s most diverse independent tower portfolio

With around 6,500 towers to integrate and a point to prove as the first towerco in MENA, Eaton Towers have a busy time ahead

Over the last nine years, Pankaj Kulshrestha, Group COO of Eaton Towers, has worked on some extremely high profile tower deals. Now leading operations at Eaton, he has the exciting task of bringing efficiency and profitability to a portfolio of 6,370 towers across the African continent. TowerXchange caught up with him to discuss how closely the current portfolio matches Eaton’s plans, how their local teams and knowledge are providing a competitive edge and what capex investments are being prioritised as new tower integration takes priority.


Read this article to learn:
- How Eaton’s plans for the Egyptian market are shaping up
- The management structures which support growth across eight African countries
- The capex needed to ensure SLAs are met
- Eaton’s plans for power across their sites in Africa

TowerXchange: Can you tell us a little about your background in the tower industry and the role you play at Eaton?

Pankaj Kulshrestha, Group COO, Eaton Towers: This is my ninth year in the tower industry. My experience prior to Eaton has been in India, and mainly with American Towers. I was one of the first employees of ATC India, which now has over 10,000 towers. I was deeply involved in the acquisitions and integration of the Excel, Transcend and Essar portfolios. I was also the Regional Head (North & West) for ATC operations. I have been with Eaton Towers since January 2014 as the Group COO.

TowerXchange: As the Airtel deals close and with the MobiNil deal agreed, Eaton’s portfolio is well diversified across the continent. To what extent was the shape of the portfolio planned in advance and how far was it predicated by the opportunities which came up in the market?

Pankaj Kulshrestha, Group COO, Eaton Towers: Eaton Towers has always planned a diversified portfolio to minimise risk. We screened countries and opportunities against risks and returns. Indeed we declined to bid for some. Of course, one needs the right combination of a willing buyer and a willing seller.

TowerXchange: Your recent deal with MobiNil gives you a tower portfolio covering key regions and also opens up BTS opportunities in those parts of the country – as the pace of tower acquisitions begins to slow, how important is this...
and other BTS opportunities for Eaton?

Pankaj Kulshrestha, Group COO, Eaton Towers: Egypt is a very exciting opportunity. This is the first tower company transaction in the region, but is only 10% of the total towers in the country. There is a pent up demand for BTS opportunities that we are looking at very intently. We expect to expand further in the market through both acquisitions and BTS.

TowerXchange: Eaton is ‘breaking new ground’ in Egypt with the first MENA tower deal. The industry will be watching with interest – what measures has Eaton taken to ensure delivery on SLAs as well as profitability in the region? Has your approach differed from that taken in new markets in SSA?

Pankaj Kulshrestha, Group COO, Eaton Towers: A tower company brings a focussed approach towards performance and SLAs. Egypt is new for a tower deal, but some Eaton people have a long history in Egypt. We have also recruited a strong local GM with extensive experience. The team will be well experienced in the market and industry.

Eaton has a site by site approach to identification of issues, their rectification and management. With my experience in India and Africa, power and estate management is crucial towards delivery of high quality service. Operational excellence is the biggest differentiator for any tower company; it helps you get more business. I know the importance of SLAs and we will invest to ensure that they are met.

Egypt has a better power performance but may face reverses if the diesel and electricity subsidies are removed. We are planning for a higher percentage of solar sites, which will help counter this.

TowerXchange: Operating towers for multiple tenants in so many markets must be a very complex task. Can you shed some light on how you manage that? Do you prefer a devolved or centralised management structure?

Pankaj Kulshrestha, Group COO, Eaton Towers: This is still a B2B business. The key is to maintain your independence as a towerco and not indulge in any differential treatment for customers. We have to treat all our customers well, with sensitivity towards their requirements. We need to deliver what we commit to our customers. Our approach towards managing is by devolved management, with tight controls on capex planning, opex optimisation, commercials and contracts. Our MDs, management team members and Key Account Managers are in constant touch with the customers at all levels.

TowerXchange: Can you give us an idea of your plans for the integration of acquired towers into your network? What are the key areas which need to be improved to bring acquired towers up to standard? How do you deploy capex to meet both the short-term imperative to deliver on SLAs as well as long-term efficiency goals?

Pankaj Kulshrestha, Group COO, Eaton Towers: We have a detailed integration plan covering all aspects and departments, with specific timelines and responsibilities. We have a structured shadowing process with MobiNil, which is helping us understand the nuances of the operations. We are also in
discussions with the service providers to understand the portfolio from a bottom up approach.

The capex will be prioritised towards fixing SLA related issues: the upgrade/ replacement of power infrastructure et cetera, safety issues: to comply to Eaton Towers' Health, Safety and Environment policies, and opex optimisation. We will be making capex investments towards new co-locations, and doing the required upgrades for the existing tenants.

TowerXchange: When you acquire a new portfolio of towers, is your inclination to wring every last hour of useful runtime out of existing DGs before installing new, often more efficient solutions, or is your preference to refurbish and sell ageing generators and get more energy efficient solutions onto sites as quickly as possible?

Pankaj Kulshrestha, Group COO, Eaton Towers: During the pre-closing shadowing process we endeavour to identify the DGs that need immediate replacement and those that need to be replaced over the next 12 months. This is mainly due to end of life criteria. The replacements are made with efficient DGs, both in terms of performance and capacity. The end of life DG replacement cycle necessitates that they need to be replaced every five to six years in the countries in which we operate. To deploy capex efficiently, we do use refurbished DGs but they are replaced on sites where the DG running is low.

TowerXchange: What are your improvement capex priorities and how do you determine the improvement capex budget?

Pankaj Kulshrestha, Group COO, Eaton Towers: The improvement capex is budgeted mostly on the basis of the due diligence findings. We invest for uptime improvements and Health, Safety and Environmental measures. This capex is primarily utilised for replacement/ repairs of DGs, batteries, ACs, control panels, rectifiers et cetera.

TowerXchange: Between the 'Big Four' towercos it seems like over a dozen RMS solutions have been piloted or rolled out - what have been the principle challenges making RMS work, and do you think you now have a solution that meets your needs?

Pankaj Kulshrestha, Group COO, Eaton Towers: Having worked with many RMS solutions, I am in favour of working off the passive alarms that are
available from the operator’s NOC. It is important to ensure proper wiring and working of these alarms, but once done, they provide the most reliable alarms, since they ride on the operator’s backhaul. It is possible to manage the network well using these alarms.

TowerXchange: Are Lithium-Ion batteries, or other alternate chemistries, ready to play a significant role in African cell sites’ energy storage requirements, or will lead-acid batteries remain the most widespread choice? Are there different use cases for different energy storage solutions?

Pankaj Kulshrestha, Group COO, Eaton Towers: Lead acid batteries will continue to have their importance in the foreseeable future. They can be used universally. However, I think Lithium-Ion batteries will play a more significant role in days to come. We are yet to evaluate Lithium-ion batteries comprehensively, but they will certainly have applications in single tenant outdoor sites.

TowerXchange: Does Eaton have an appetite to reduce complexity by buying energy by the kWh from ESCOs, or do you prefer to make capital investments in energy efficiency yourselves, keeping the value creation on your own balance sheet?

Pankaj Kulshrestha, Group COO, Eaton Towers: We are still some time away from serious discussions with ESCOs, the present focus being closing and integration of the new operations we are acquiring.

Pankaj Kulshrestha, Group COO, Eaton Towers: If a vendor wants to sell their products and services to Eaton Towers, what do they need to know about your procurement process?

Pankaj Kulshrestha, Group COO, Eaton Towers: The Group Procurement Manager is based in Kenya. We have a transparent procurement process. If there are any specific queries, we can respond to them.

TowerXchange: Do small cells, microcells and DAS have a significant role to play in network planning in Africa yet? Is this an opportunity for towercos, or one best left to MNOs?

Pankaj Kulshrestha, Group COO, Eaton Towers: With a higher demand on data, the requirement for these will increase. Egypt has a large proliferation of small and micro cells, although we haven’t seen much of these in the other countries yet. We are actively looking at providing IBS and DAS solutions, coupled with the outdoor coverage requirements the customers might have in all our operations.

TowerXchange: What’s next for Eaton towers? Can you share your vision for the next 2-3 years? Do you have appetite for further significant acquisitions?

Pankaj Kulshrestha, Group COO, Eaton Towers: This year we will close seven deals in five new markets. So the main task is to get these 7000+ towers operating efficiently, safely and profitably.
HTN Towers + SWAP: first step toward a merger?

HTN Towers’ footprint boosted by agreement to market SWAP towers, builds toward IPO

When the music stopped in the sale of Nigeria’s towers, HTN Towers and SWAP were left standing whilst IHS and American Tower sat on 69% of the country’s towers. It looks like a smart move to consolidate HTN and SWAP’s respective portfolios (Helios Towers Nigeria, now HTN Towers, has 1,203 towers, SWAP 702) within one sales and marketing operation, giving them a footprint in 34 of 36 Nigerian States and increasing their relevance in network planner’s thinking. The announcement that HTN Towers will manage and market SWAP’s sites may be a precursor to a full merger, before or after a potential IPO which HTN Towers is exploring.


Read this article to learn:
- The Nigerian tower market: tower count, penetration, build rate, towercos and PaaS
- Why HTN Towers and SWAP got left in the cold when over 16,000 MNO towers were sold in 2014-15
- Why HTN and SWAP’s portfolios are still highly investible
- HTN Towers’ new pan-African remit – one opportunity that might be a good fit
- What does the future hold for HTN Towers+SWAP?

Making history in the Nigerian tower business

Both HTN Towers and SWAP claim to be Nigeria’s, indeed Africa’s first towerco; SWAP as a function of completing a tower transaction with Starcomms in 2010, HTN Towers (then Helios Towers Nigeria) already had a BTS business in Nigeria at the time of their 2011 deal with Multilinks. As first movers, both portfolios contain some prime sites, and both have built robust, high quality structures capable of supporting multiple tenants. There is reportedly minimal overlap between the HTN Towers and SWAP portfolios – unsurprising given that they come from a similar vintage and with around half their towers from a BTS-driven origin that eschews building one tower too close to another. With 2,300 tenants on 1,200 towers, HTN Towers boasts one of the highest tenancy ratios in Africa at 1.9.

Shifting competitive dynamics among Nigeria’s towercos

So, if their portfolios are good, why were both HTN and SWAP left in the cold as Nigeria’s towers came to market? First, there is sometimes a downside to being first movers as a tower market opens up. The first MNOs to sell might be those who most need the cash, as was the case with Nigeria’s CDMA operators who would ultimately struggle to achieve market share – currently Visafone and Multilinks’ 2.057mn subscribers represent less than 1.4% mobile market share. It took time to rebalance HTN and SWAP’s portfolios away from a bias toward these less credit worthy tenants, an exercise that has been largely completed –back in 2013 HTN Towers CEO
Inder Bajaj told TowerXchange “When Telkom SA withdrew from the Nigerian market, its subsidiary Multi-Links (a CDMA operator) was one of HTN’s key customers. At HTN we decided to immediately re-focus our efforts on the core and stable GSM players like MTN, EMTS, Glo and Airtel... 95% of our business comes from Nigeria’s four tier one operators.”

Meanwhile, the two towercos who would lead the Nigerian market, IHS and American Tower, were building pan-African portfolios and credibility, particularly in partnership with the continent’s leading operator MTN, which then owned the most coveted towers in Nigeria. Whilst this was going on HTN Towers remained somewhat constrained by the geographical limitations imposed by Helios Investment Partners’ granting their other towercos, Helios Towers Africa, a pan-African remit, whilst HTN were restricted to Nigeria (a limitation from which they have since been freed – see sidebar). Thus when 16,241 MTN, Etisalat and Airtel Nigerian towers came to market in 2014, IHS had 10,500 towers in Africa, American Tower 4,851 and HTN Towers (then Helios Towers Nigeria) just 1,300. IHS and American Tower were able to leverage deeper relationships, established pan-African credibility, and strong balance sheets to secure the MNOs’ towers.

The machinations of tower auctions are seldom fully revealed in the public domain, but it is difficult to imagine anyone but IHS having both the capital and flexibility to acquire 8,850 towers from MTN Nigeria for US$882mn whilst allowing the MNO to retain a 51% equity stake. Helios Investment Partners’ towercos had assembled African assets relatively conservatively compared to some of their competitors in the land grab; avoiding deals that combined high valuations with high leaseback rates – leaseback rates that could come under downward pressure sooner – and agreeing that their MNO counterparts retain only minority stakes where requested.

Meanwhile, Etisalat Nigeria attracted the highest cost per tower to date in an African sale and leaseback (US$277,060 per tower) despite not agreeing an exorbitant leaseback rate. Which is a long way of saying: it’s understandable that HTN Towers didn’t secure the MTN or Etisalat towers on the terms sought by the seller.

Freed from their limited geographical remit, a combined HTN Towers+SWAP entity could be well placed to flex the traditional towercos acquisition model and create business models to address segments of the market which the ‘Big Four’ towercos are disinclined to address, given that they are integrating so many recent acquisitions. For example, HTN Towers could negotiate a deal with Sonatel, who are believed to seek a towercos partner in Senegal, Mali and the Guineas. TowerXchange sources suggest there has been finite appetite from Africa’s ‘Big Four’ towercos to engage in a Senegalese market where all three MNO’s (Sonatel, Millicom and Expresso) could have an appetite to partner with a towercos in a 3,000 tower market. It’s just this kind of opportunity that HTN Towers+SWAP might be well placed to address.

It seems likely that, whilst the three Nigerian sale and leaseback processes were going on, American Tower looked at acquiring what is now HTN Towers, whilst IHS was prevailing in negotiations with MTN and Etisalat, there was rumor that Airtel’s Nigerian towers might be divided into two portfolios, North and South, with the two acquiring towercos playing off against one another for service quality and the right to earn more BTS. HTN would have been a contender for one of those parcels, although the inequality of a potential North-South divide in terms of co-location potential may have scuppered the idea (Southern Nigerian is generally more prosperous than the North). Ultimately, American Tower subsequently acquired Airtel’s entire Nigerian portfolio for US$1.09bn.

It was notable that when HTN Towers rebranded in July 2015 and dropped the world “Nigeria” from their company name, CEO Inder Bajaj emphasised their newly pan-African remit: “I am delighted to announce our rebranding to HTN Towers, which heralds a new phase in the company’s growth and reflects our pan-African expansion ambitions. We remain committed to providing best-in-class service to our customers in Nigeria and elsewhere as we continue to expand.”
but ultimately passed on the opportunity. On the one hand their lack of operational footprint may have cost American Tower the chance of securing Etisalat's towers: shortly after the deal then-CFO of Etisalat Nigeria Andrew Kemp told TowerXchange “Both IHS and American Tower's offers were compelling propositions, but in the end IHS's existing capabilities in Nigeria suggested they could provide a lower risk transition.” But on the other hand, with Gordon Porter and a strong management team already installed at ATC Nigeria, the notion has been validated that the U.S. towerco giant didn’t need to acquire HTN to have a credible Nigerian management team.

In the near term, if American Tower remains acquisitive in Nigeria there are smaller, less mature towercos than HTN Towers. These smaller towercos have less of the market’s growth potential realised and priced in – such acquisitions might look like lower hanging fruit than HTN Towers, with or without SWAP.

What does the future hold for HTN Towers + SWAP?

The potential merger of HTN Towers and SWAP has been discussed around their respective boardroom tables for years, and it should be re-emphasised that July’s announcement that HTN Towers would be managing and marketing SWAP’s towers does not yet constitute a merger. However, I like the prospective combination of HTN Towers and SWAP. In a Nigerian tower market where 79% of the towers are owned and marketed by towercos, amplifying the scale of HTN’s portfolio is a smart idea. Blending SWAP’s 702 Nigerian towers with HTN’s to create a portfolio of 1,905 towers gives HTN Towers+SWAP a 6% share of Nigeria’s 30,941 towers, and it gives them more stature in the eyes of prospective customers and prospective investors.

I wouldn’t want my commentary explaining why we think HTN Towers missed out on the acquisition opportunities in Nigeria to suggest I think it is less investible as a result – quite the contrary; HTN’s is a mature portfolio with many built-to-share towers generating good cash flow from a healthy tenancy ratio. It is undiluted by the integration of lower tenancy ratio operator towers, and unburdened by both the debt of substantial acquisitions and the subsequent investment of improvement capex. HTN Towers’ portfolio may be smaller than their competitors, but much of the work that has yet to be done integrating, improving and leasing up IHS and ATC Nigeria’s newly acquired Nigerian towers has already been done on HTN’s portfolio. There are arguments for and against an HTN

Nigerian tower market snapshot

- Estimated tower count: 30,941
- Towerco penetration: 79%
- Current tower build rate: 3,400pa
- Active towercos: IHS (53% market share)
- ATC Nigeria (15%)
- HTN+SWAP (6%)
- BCTek (2%)
- Hotspot and other small towercos (1%)
- PaaS: Most towercos provide full power services

Source: TowerXchange, September 2015

Nigerian mobile subscriber market share

- MTN
- Globacom
- Airtel
- Etisalat
- CDMA

Source: NCC, July 2015

Towers IPO now, the foremost in favor being that towerco valuations are soaring worldwide, so there has never been greater investment enthusiasm for the asset class. On the other hand the devaluation of the NIRA is putting pressure on lease rates.

Whether HTN Towers comes to market alone or as a combined entity with SWAP, they have proved their operational capability and compatibility, which is a huge issue in the context of the huge power problem in Nigeria. If merged the two entities would doubtless save some SG&A and add a few million dollars to the bottom line quickly.

The HTN Towers story may not have played out as their pioneer founders may have envisaged – I don’t think being the #3 towerco in Nigeria was their objective – but I still think they may be rewarded with a healthy IPO if HTN Towers chooses to take that option, and I would not preclude a trade sale still being an option in the future.
Contrasting the appetite to divest towers among the top African and Middle Eastern MNOs

Who is selling MEA towers, under what terms, and what’s left for the towercos to buy?

With the tower transaction deal flow in SSA slowing during 2015, TowerXchange surveys and summarises the landscape of opportunity both in SSA and the emerging tower market in MENA. We examine passive infrastructure monetisation to date at 23 different MNOs. Where tower deals have been completed, what deal structure has been preferred, what was the balance between cash released and opex stabilisation (and why?) What’s left for towercos to buy?

Keywords: Africa, Africa & Middle East, Africell, Airtel, Anchor Tenant, Cell C, Country Risk, Deal Structure, Econet, Editorial, Ethio Telecom, Etisalat, Exit Strategy, Expresso, Glo, Infrastructure Sharing, Lap GreenN, Lease Rates, MCell, MNOs, MTN, Manage With License To Lease, Maroc Telecom, Middle East, Millicom, Ooredoo, Orange, Research, SLA, Safaricom, Sale & Leaseback, Smile, Telkom SA, TowerXchange Research, Unitel, Uptime, Valuation, Viettel, Vodacom, Vodafone, Who’s Who, Zain

What’s left to buy in SSA?

Even though towercos own less than 30% of SSA’s towers, many of the most prized tower portfolios have already been snapped up. Let’s review the balance sheets of Africa’s ‘Big Six’ MNOs to see what towers are left and the prospects of them being sold.

Airtel: Airtel has sold or is in the final stages of selling their towers in 10 of 17 African countries. Those towers Airtel have retained are now subject to increased uncertainty as Bharti Airtel considers a partial exit from Africa, as indicated by their confirmed negotiations with Orange to sell five opcos. Airtel have retained a substantial portfolio of towers in both DRC and Tanzania, but those towers lose value with every co-location sold by Helios Towers Africa, particularly in the context of the aggressive market entrance of Africell and Viettel respectively, both of whom will become key tenants on HTA’s existing towers. Airtel’s Madagascan towers have some value, but the market for them is somewhat stalled by the strength of local player TowerCo of Madagascar (ToM), and their apparent reluctance to meet the asking price for the Airtel towers – no-one else, it seems, fancies competing with ToM. While Chad would have made a compact but sensible acquisition for HTA, particularly if they could bundle the Airtel towers with Millicom’s, the cancellation of that transaction makes it unlikely another towercos will have much interest, both due to an unfavorable regulatory environment and due to Airtel’s negotiations with Orange to...
exit Chad. And finally, it seems unlikely that Airtel pushed very hard to divest towers in Sierra Leone or the Seychelles due to reasons of competition and scale respectively. In summary: when the five announced but unclosed Airtel African tower deals close, there is not much left on their balance sheets to attract SSA towercos.

**Etisalat / Maroc Telecom:** We’ll consider these companies together both because Maroc Telecom’s recently acquired Atlantique Telecom portfolio so recently sat on the Etisalat balance sheet, and because Etisalat owns a 53% stake in Maroc Telecom, although the Moroccan giant controls it’s own destiny insofar as tower strategy is concerned. Etisalat has monetised their Nigerian towers, has a process under way in KSA, and has entertained the idea of divesting towers in Tanzania and beyond – so Etisalat is playing the tower game. Maroc Telecom seem less inclined to play, with a strong predilection to retain and control passive infrastructure. That could change, particularly as Airtel tower deals introduce towercos into several of their territories, but for now consider the Etisalat and Maroc Telecom axis a blend of positive and negative attitudes toward tower divestiture, with some interesting assets remaining on their balance sheets.

**Millicom:** Once upon a time the Millicom were first movers and leaders in African tower divestiture as they embraced partnerships with HTA to monetise towers in Ghana, DRC and Tanzania. But that’s where the strategy ended and, apart from a few mutterings of a potential deal in Chad which would have gotten louder had HTA’s deal with Airtel there not been cancelled, Tigo’s towers in Chad, Sierra Leone and Rwanda remain on their balance sheet. In terms of monetising Millicom’s African towers, the job is effectively 70% done, but whether the remaining 30% of towers comes to market remains to be seen.

**MTN:** South Africa notwithstanding, the most investible MTN towers have already been transferred to towercos, albeit with Africa’s leading MNO retaining substantial equity stakes in selected markets. MTN may yet divest further towers in their small opco cluster, and if and when country risk levels normalise there may be a market for their towers in Syria and Iran, but in the near term the last passive infrastructure assets on MTN’s balance sheet which the towercos are aggressively pursuing are the ~9,000 towers they have in South Africa. In summary, MTN is probably a little over half way in terms of the value of passive infrastructure assets they could bring to market.

**Orange:** Orange may have only agreed deals with towercos in three markets (Cameroon, Cote d’Ivoire and Egypt), but they represent three of their most investible markets – negotiations to acquire five opcos from Airtel notwithstanding. Another attractive asset portfolio in Senegal may be coming to market under an MLL deal structure, bundled with less attractive portfolios in Mali and the Guineas. Mobilin may not be done monetising Egyptian towers, having announced the sale of around a third of their towers to Eaton. Similar verdict to MTN: Orange is probably a little short of half way in terms of the value of passive infrastructure assets they could bring to market.

**Vodacom / Vodafone / Safaricom:** Yes they’re different entities, but the three brands in which Vodafone PLC have substantial equity stakes share a common philosophy toward tower monetisation: they do it selectively, and they are seldom first movers. It seems they are unlikely to ‘select’ to monetise their prized towers in South Africa and Kenya, indeed only Vodafone Egypt’s towers seem ripe for monetisation, given the entry of Eaton towers into the market. In summary: with the possible exception of Egypt, don’t expect any tower transactions to come out of this group of companies in the next 12 months.

**Will there be a market for tier two MNO’s towers?**

Divergent answers to this question. Some towercos contend that they would be happy to acquire towers from, or build towers for, a tier two MNO providing the structure of the deal insulates them against excessive credit risk. Such deals would be particularly attractive as supplements in a market where the same towerco had secured tier one MNO assets.

Other towercos seem to take a position that there are ‘bigger fish to fry’ in terms of partnering with more credit worthy anchor tenants. Certainly Africa’s MNOs will need to invest a lot of management bandwidth into integrating and upgrading the almost 50,000 towers they have
acquired since 2010.

One truth everyone agrees with is that, insofar as towercos have appetite for tier two MNO assets, by definition such assets have less tier one MNOs as tenants, thus a higher proportion of new colocations are likely to come from market leading MNOs.

The emerging tower market in MENA

Eaton’s acquisition of 2,000 towers from Mobinil, about one third of the operator’s stock and around 10% of the country’s inventory of sites, will be a bell-weather for a potential acceleration in tower divestitures in MENA. This acceleration is already evident in the expressions of interest received in 9,200 Mobily towers and 5,000 Zain towers in KSA – Zain is also selling towers in Kuwait and South Sudan. Deal valuations and tower market structures are likely to be different in MENA from SSA, both because the replacement cost of towers is generally low, the grid is more extensive and reliable, and because the potential to lease up the towers is limited by smaller, albeit more rational, MNO competitive landscapes. TowerXchange expect a tower transaction pipeline to open up in earnest in MENA in the next 12 months, driving towerco penetration from 1.5% in Q3 2015 to 13.5% by Q3 2016.

Which deal structure for which market?

Almost any article about the towerco business will compare three different deal structures: pure sale and leasebacks (SLBs), retention of equity in joint ventures with towercos, and manage with license to lease (MLL) deal structures. But a deeper understanding of the genuine drivers behind transactions and the valuation of towers is found within the nuances within deal structures. The nuances in SLBs are all about the balance of cash released versus leaseback rate. For example, Cell C maximised upfront capital in their deal with American Tower in order to raise capital for rollout and to grab market share, but in doing so agreed a high leaseback rate which some commentators feel distorts the South African tower market to this day. In contrast, Vodacom Tanzania accepted a lower valuation per tower in an effort to stabilise opex, of which leaseback rates are a primary component. In an even more direct comparison; in 2010 Tigo realised a valuation of US$120,000 per tower in Ghana, while MTN’s towers were transferred at US$228,375. MTN’s towers were not worth nearly twice as much – they simply took more cash off the table and agreed a higher leaseback rate.

Where an MNO retains substantial equity in a joint venture towerco, that will also be traded off against the amount of cash unlocked and the degree of opex stabilisation. Nigeria provides a good example here: market leaders MTN’s towers changed hands for less than US$200,000 per tower – a good valuation but still almost 10% lower than Etisalat realised selling to the same counterparty, IHS, despite MTN having 43% market share relative to Etisalat’s 16% (source: NCC, June 2015). One of the main reasons for this valuation differential was that Etisalat Nigeria ‘cashed out’, selling 100% of the equity in their towers, whereas MTN retained 51% equity to ensure their objective to maintain a degree of financial control, if not operating control, over their prize Nigerian portfolio.

We may only fully understand and evaluate MTN’s preference to ‘hedge their bets’ by retaining equity in towercos in selected markets if and when one of their partner towercos exits. Similarly, we may only fully understand and evaluate MLL deals, as favored by Orange, when the term of that agreement concludes and the long term future of the towers becomes clear.

Customer satisfaction: do MNOs feel they’re getting a good service?

Since the entry of independent towercos into the market, the quality and immediacy of available towers has improved substantially across the continent. With a brief spell of operational turbulence in one market being an exception, SLAs have largely been met and uptimes are generally excellent.

Towercos have facilitated accelerated time to market for new entrants (sometimes to the chagrin of anchor tenants!) Meanwhile, the engagement of African towercos in provision of turnkey energy services has fostered new centres of excellence in energy management and energy efficiency – providing a further opportunity for towercos to create margin and value. Ultimately infrastructure sharing is unlocking genuine efficiencies and making investment in African ICT a safer bet.
What's next for African and Middle Eastern MNOs?

In the near term, MNOs are exerting downward pressure on lease rates, particularly in markets where forex slides put extra pressure on opex. To date towercos have largely resisted that downward pressure on lease rates, but lease rate negotiations in the relatively small market of Ghana, where the Cedi has been in freefall, will seem like a minor skirmish compared to Nigeria, where the Nira is sliding. With components of tower leases in USD, and with tower leases forming a substantial portion of opex, particularly where a turnkey energy service is bundled in, lease rates are going to be a hot topic in 2016.

The ebb and flow of licensed operators, new entrants and consolidation, affects most tower markets, particularly in SSA which still features some markets yet to fully liberalise (e.g. Ethiopia and to a lesser extent Angola) as well as other markets which seem over-populated with MNOs (e.g. Ghana, where the regulator is seeking to limit LTE to indigenous operators adding to an already present six MNOs serving a population of just over 25mn). Most commentators expect a degree of MNO consolidation in the long term, which may on the one hand lower the glass ceiling on prospective tenancy ratios, while at the same time increase the credit worthiness of those tenants.

MNOs will soon start to look beyond tower sharing to consider sharing transmission, fibre and data centres. Nowadays Africa’s towercos have drafted contracts with the potential for active infrastructure sharing in mind, so terms and pricing are set, but MNOs’ appetite to share radio equipment as well as passive equipment is growing.

What’s next for African and Middle Eastern towercos?

The near term focus of African and Middle Eastern towercos remains on ingesting assets; transferring assets and people, novating leases, deploying improvement capex and commencing efficiency programmes.

Do towercos in MEA still have appetite for more towers after the Airtel transactions drove many to scale? Certainly we believe further tier one MNO’s will continue to be fiercely fought for towers in large, competitive mobile markets with a mature regulatory environment. The prospective sale of MTN’s South African towers being a case in point where at least five credible international towercos are jockeying for position and an opportunity to bid on the assets – if indeed an open auction is inaugurated, given the depth of MTN’s partnership with IHS.

Towercos are starting to prepare themselves for the next major liquidity event, with commentators divided as to timescales: anywhere from 12-36 months hence. Either way, management and early stage investors will be anxious to sell high to take advantage of soaring valuations in the telecom infrastructure asset class (witness the valuations of AMT, SBA, CCI, Bharti Infratel and Cellnex). This creates tremendous pressure on towercos to tidy up balance sheets. High valuations for the towercos asset class amplifies the probability of IPOs, but lessens the chance of a private equity exit / new entrant merry-go-round, given the valuations nextgen equity would have to meet.
## Contrasting the appetite to divest towers within 23 leading African and Middle Eastern MNOs

<table>
<thead>
<tr>
<th>Operator</th>
<th>Towers sold (SLBs unless *MLL)</th>
<th>Towers retained</th>
<th>Tower strategy summary</th>
<th>Appetite to divest towers: commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africell</td>
<td>Uganda</td>
<td>DRC, Gambia, Sierra Leone</td>
<td>More likely a co-locating tenant than an anchor tenant.</td>
<td>One of Africa’s new entrant MNO success stories, Africell leveraged co-location to accelerate time to market in DRC. No tower sales yet, but in Uganda Africell inherited a network where towers had been sold to Eaton, so they have considerable experience of partnering with towercos.</td>
</tr>
<tr>
<td>Airtel</td>
<td>Closed: Congo B, Ghana, Nigeria, Rwanda, Uganda Announced not yet closed: Burkina Faso, Kenya, Niger, Malawi, Zambia</td>
<td>Chad, DRC, Gabon, Madagascar, Seychelles, Sierra Leone, Tanzania</td>
<td>Preference to divest towers selling 100% of equity.</td>
<td>Airtel’s tower monetisation strategy has been restructured with a view to divesting in 10 of 17 countries, with transactions cancelled or towers retained in six countries, where it seems Africa Towers subsidiaries (Airtel’s captive towerco) will resume operating the sites. It remains unclear what will be the impact of negotiations with Orange to sell Airtel’s OpCos in Burkina Faso, Chad, Congo B and Sierra Leone.</td>
</tr>
<tr>
<td>Cell C</td>
<td>South Africa</td>
<td>None</td>
<td>Preference to divest towers selling 100% of equity.</td>
<td>Cell C sold 1,400 towers to American Tower in 2011 in a deal structured to maximise upfront cash release.</td>
</tr>
<tr>
<td>Econet</td>
<td>None</td>
<td>Burundi, CAR, Lesotho, Zimbabwe</td>
<td>Has retained towers to date.</td>
<td>The leading MNO in Zimbabwe, Econet has been under pressure from government to share its towers. To date Econet has not partnered with towercos within any of its jurisdictions.</td>
</tr>
<tr>
<td>Ethio Telecom</td>
<td>None</td>
<td>Ethiopia</td>
<td>Has retained towers to date.</td>
<td>Ethiopia is an unliberalised market with Ethio Telecom holding a monopoly. With a prospective tenancy ratio of one, Ethiopia is effectively uninvestible for towercos.</td>
</tr>
</tbody>
</table>

*Source: TowerXchange Issue 14*
<table>
<thead>
<tr>
<th>Operator</th>
<th>Towers sold (SLBs unless *MLL)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Etisalat</td>
<td>Nigeria</td>
<td>Egypt, KSA, Sudan, Tanzania, UAE</td>
<td><strong>Increasingly inclined to divest towers selling 100% of equity.</strong></td>
<td>Etisalat sold a total of 2,691 Nigerian towers to IHS in two tranches. Expressions of interest in Etisalat (Mobily's) 9,200 towers in KSA have been received. Speculation had previously suggested Zantel's towers in Tanzania may be sold, but rumors have since died down. Etisalat sold their Atlantique Telecom operations to Maroc Telecom, in whom they acquired a 53% stake.</td>
</tr>
<tr>
<td>Expresso</td>
<td>None</td>
<td>Ghana, Guinea, Mauritania, Senegal</td>
<td><strong>Interested in selling towers or outsourcing BTS, yet to consummate deal.</strong></td>
<td>Tier two MNO Expresso has sought BTS and SLB counterparts in several markets but not yet consummated a deal.</td>
</tr>
<tr>
<td>Glo</td>
<td>None</td>
<td>Benin, Cote d'Ivoire, Ghana, Nigeria</td>
<td><strong>Has retained towers to date.</strong></td>
<td>To date, Glo has seemed disinclined to monetise towers, but if Mike Adenuga decides to cash in on passive infrastructure, their value may never be higher.</td>
</tr>
<tr>
<td>Lap GreenN</td>
<td>None</td>
<td>Cote d'Ivoire, Sierra Leone, South Sudan, Uganda</td>
<td><strong>Interested in selling towers or outsourcing BTS, yet to consummate deal.</strong></td>
<td>Lap GreenN has tried to monetise towers in Uganda on several occasions but has been hindered by trading restrictions placed on the Libyan owned parent.</td>
</tr>
<tr>
<td>Maroc Telecom</td>
<td>None</td>
<td>Benin, Burkina Faso, CAR, Cote d'Ivoire, Gabon, Mali, Mauritania, Morocco, Niger, Togo</td>
<td><strong>Has retained towers to date.</strong></td>
<td>Maroc Telecom has historically preferred to retain their towers. Etisalat's injection of Atlantique Telecom assets and acquisition of 53% equity in Maroc takes them from the “never” to “never say never” category, but TowerXchange doesn’t forecast any tower deals with Maroc Telecom within the next 12 months.</td>
</tr>
<tr>
<td>Operator</td>
<td>Towers sold (SLBs unless *MLL)</td>
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<tr>
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</tr>
<tr>
<td>MCell</td>
<td>None</td>
<td>Mozambique</td>
<td>Has retained towers to date but now may be bringing towers to market.</td>
<td>Former fixed line incumbent MCell has about 1,200 of Mozambique’s 4,800 towers. The former market leader is under huge pressure from the aggressive network investments of Vodacom and new entrant Viettel, and may respond by monetising their towers.</td>
</tr>
<tr>
<td>Millicom</td>
<td>DRC, Ghana, Tanzania</td>
<td>Chad, Senegal, Sierra Leone, Rwanda</td>
<td>Has selectively monetised towers, retaining equity, but no recent deals.</td>
<td>Millicom were among the first movers to monetise their SSA towers in landmark deals with HTA, in which they retained equity, but the tower transaction pipeline has since run dry. HTA are believed to have a ROFR with Millicom, which may have been triggered to roll Tigo Chad’s towers together with Airtel’s had the latter deal not been scuppered, reportedly by regulatory uncertainty.</td>
</tr>
<tr>
<td>MTN</td>
<td>Cameroon, Cote d’Ivoire, Ghana, Nigeria, Rwanda, Uganda, Zambia</td>
<td>Benin, Botswana, Congo B, Guinea B, Guinea C, Iran, Liberia, South Africa, South Sudan, Sudan, Swaziland, Syria, Togo</td>
<td>Has monetised towers in seven of eight most attractive markets, retaining 49-51% equity in three.</td>
<td>MTN has monetised the towers in seven of their eight most attractive tower markets in a series of separate transactions, each structured to meet their objectives in the local market. MTN has retained 49% equity in joint venture towercos in Uganda and Ghana before concluding their last five deals with IHS in Cameroon, Cote d’Ivoire, Rwanda and Zambia (all 100% exits) and Nigeria, where MTN retained a 51% stake. MTN’s prized South African assets remain on their balance sheet, but could yet come to market, with IHS seemingly in pole position.</td>
</tr>
<tr>
<td>Ooredoo</td>
<td>None</td>
<td>Algeria, Iraq, Kuwait, Oman, Tunisia</td>
<td>Has retained towers to date, but has partnered with towercos in Asia.</td>
<td>Ooredoo has hitherto preferred to retain towers but has been exposed to deep partnerships with towercos in Myanmar – will this affect their strategies as MENA tower markets open up?</td>
</tr>
</tbody>
</table>
### Operator Towers sold (SLBs unless *MLL) Towers retained Tower strategy summary Appetite to divest towers: commentary

<table>
<thead>
<tr>
<th>Operator</th>
<th>Cameroon*, Cote d’Ivoire*, Egypt</th>
<th>Botswana, CAR, DRC, Guinea B, Guinea C, Kenya, Madagascar, Mauritius, Mali, Morocco, Niger, Senegal, Tunisia</th>
<th>Has selectively sold towers under SLB or outsourced under MLL.</th>
<th>Orange sold their towers in Uganda to Eaton before selling their opco to Africell. Orange agreed an MLL deal with IHS in Cameroon and Cote d’Ivoire. Orange are also majority stakeholders in Egypt’s Mobinil, which recently agreed to sell 2,000 towers (about a third of their inventory) to Eaton. An MLL deal with Eaton in Kenya was cancelled amid Orange’s efforts to exit the country (a deal with Viettel fell through). A further MLL deal may be in the works involving the (Sonatel) assets in Senegal, Mali and the Guineas.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safaricom</td>
<td>None</td>
<td>Kenya</td>
<td>Has retained towers to date.</td>
<td>Safaricom owns the majority of the towers, and the majority of the subscriber base, in Kenya, offering selected towers on attractive terms. They have no incentive nor apparent interest to partner with a towerco.</td>
</tr>
<tr>
<td>Smile</td>
<td>None</td>
<td>DRC, Nigeria, Tanzania, Uganda</td>
<td>More likely a co-locating tenant than an anchor tenant.</td>
<td>LTE pioneer Smile are included not as a seller of towers but as the best exemplar of the next generation of operators who seldom need build their own towers, so substantially do they leverage co-location.</td>
</tr>
<tr>
<td>Telkom SA</td>
<td>None</td>
<td>South Africa</td>
<td>Has retained towers to date but now may be bringing towers to market.</td>
<td>Telkom have an on-off process to divest what at one point was rumored to be ~6,000 shareable structures, a deal later consolidated to focus on conventional GBTs. The regulator’s recent rejection of a network sharing deal with MTN may reinvigorate Telkom’s passive infrastructure monetisation process.</td>
</tr>
<tr>
<td>Unitel</td>
<td>None</td>
<td>Angola</td>
<td>Has retained towers to date.</td>
<td>Unitel owns Angola’s most investible tower portfolio so, should a third operator be licensed in the country, expect amplified interest in their towers.</td>
</tr>
<tr>
<td>Operator</td>
<td>Towers sold (SLBs unless *MLL)</td>
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<td>Tower strategy summary</td>
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<td>----------------------------------------</td>
</tr>
<tr>
<td>Vodacom</td>
<td>Tanzania</td>
<td>DRC, Lesotho, Mozambique, South Africa</td>
<td>Has selectively monetised towers, retaining equity.</td>
<td>Vodacom injected their towers into Helios Towers Tanzania, joining Millicom as equity stakeholders. Could rumored MCel and/or Viettel tower transactions in Mozambique, or MTN’s sale of South African towers prompt Vodacom’s towers in those countries to come to market? Probably not.</td>
</tr>
<tr>
<td>Vodafone</td>
<td>Ghana*</td>
<td>Egypt</td>
<td>Has selectively outsourced towers under MLL deal structure.</td>
<td>Vodafone Ghana struck one of SSA’s first tower outsourcing deals with Eaton as long ago as 2010. Vodafone Egypt may also have some appetite to share towers, having previously led discussion of a potential JV towerco.</td>
</tr>
<tr>
<td>Viettel</td>
<td>None</td>
<td>Cameroon, Mozambique, Tanzania</td>
<td>Has retained towers to date but now may be bringing selected towers to market.</td>
<td>Africa’s most aggressive new entrant, Vietnamese military-backed Viettel, had initially seemed reluctant to accelerate time to market by leveraging co-location. However they have since reached co-location agreements with IHS in Cameroon and with HTA in Tanzania. Meanwhile, rumors suggest Viettel’s rapidly deployed network of guyed-masts in Mozambique may be coming to market, although the structural capacity of the towers is uncertain.</td>
</tr>
<tr>
<td>Zain</td>
<td>None</td>
<td>Bahrain, Iraq, Jordan, KSA, Kuwait, Lebanon, Morocco, South Sudan, Sudan</td>
<td>Has retained towers to date but now bringing selected towers to market.</td>
<td>Whilst Zain has not yet monetised towers, a process has commenced with a view to monetising 5,000 towers in KSA, 1,600 in Kuwait and around 265 towers in South Sudan.</td>
</tr>
</tbody>
</table>
Breaking new ground: how the first MENA deal could open the door to a flood of new tower deals

An overview of the mobile and tower markets in the MENA region

In the wake of the Eaton/MobiNil deal and following the commencement of two more substantial tower sales in the MENA region, TowerXchange assesses the opportunity to invest in an independent tower market in the MENA region, which towercos may be interested in acquisitions in the region and how the MENA tower landscape differs from comparable markets in SSA and Europe.

Keywords: 3G, 4G, Acquisition, Algeria, Bahrain, Co-locations, DAS, Deal Structure, Editorial, Egypt, Etisalat, Infrastructure Sharing, Iraq, Jordan, KSA, Kuwait, LTE, Lease Rates, Lebanon, Market Overview, Morocco, North Africa, Oman, Ooredoo, Orange, Qatar, Rooftop, Saudi Arabia, Small Cells, Tenancy Ratios, Transfer Assets, Tunisia, Urban vs Rural, Valuation, Vodafone, Zain

Read this article to learn:

- How the social and economic profiles of MENA countries differ across the region
- Who leads the mobile market on a country and regional basis
- The current status of 3G and 4G rollouts
- Infrastructure sharing strategies to date
- Where future opportunities lie and the potential shape of the MENA tower market

Mobile markets in MENA

The concept of ‘MENA’ is a fairly loose description, dictated by geography and religion rather than by socio-economic factors. Indeed, wealth and mobile usage in the region varies dramatically, with Gross National Income per capita hitting just US$3,000 in Morocco but reaching US$86,000 in Qatar, almost 30 times more (Source: World Bank). Consequently, mobile usage is heavily varied across the region, with Kuwait and Algeria having 73% and 17% of their populations able to access mobile broadband respectively.

Although many regions still have heavy state involvement in telecoms, and often the mobile market leader is a former or partially-state owned entity, there are several entities who lead the telecoms landscape across the region, as well as having a presence in SSA and elsewhere. Ooredoo, for example, operates in Oman, Algeria, Tunisia, Qatar and Kuwait and Zain provides services in Bahrain, Iraq, Jordan, Kuwait, Lebanon, Morocco and Saudi Arabia. Saudi market leader STC is also present in Kuwait and Bahrain. With Etisalat operating in KSA, Morocco and Egypt, and Orange and Vodafone active in several MENA countries between them, there are plenty of potential tier one tenants in the market.

The current state of 3G and 4G rollouts across MENA GCC

As the availability of 4G-enabled devices has increased and the popularity of new handsets has
soared, operators in the Gulf region have scrambled to bring their networks up to scratch in order to improve capacity and QoS and fight off a new round of competition for subscriber numbers.

Across the Gulf region, 3G is well established and 4G has been rolled out in urban areas for several years. Indeed, in 2011 all three Saudi operators (STC, Mobily and Zain) claimed to be the first in KSA to launch a high-speed network, which made KSA one of the first countries globally to roll out 4G coverage. In the UAE, du and Etisalat are also racing to provide extensive 4G coverage to meet customer demand, with du announcing a 25% acceleration in 4G rollout in 2014 due to huge demand.

Qatar and Oman launched 4G services in 2012, with Ooredoo offering 4G across all of Qatar by early 2014.

Kuwait fell slightly behind the curve, as a lack of telecoms infrastructure meant 4G could not be launched until 2013, but investment in passive infrastructure has allowed Kuwait’s operators (Zain, Wataniya and Viva) to roll out rapidly in an attempt to capture market share.

**North Africa**

Across the North African part of the region, where GNI is considerably lower and political upheaval has slowed technology roll-outs over the last few years, mobile data has penetrated less deeply into the market and has been slower to roll out.

In Algeria, state owned Telecom Algeria is leading the charge in taking Algeria into the 4G era. Fixed wireless LTE was launched in May 2014 with mobile 4G set to be rolled out in 2015.

Tunisia could see its first commercial 4G mobile

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### Market overview

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
<th>GNI/Capita</th>
<th>Connections</th>
<th>Sim penetration</th>
<th>Mobile broadband</th>
<th>Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>40.3mn</td>
<td>$5,000</td>
<td>44.3mn</td>
<td>110%</td>
<td>17%</td>
<td>Djezzy, Mobilis (Algerie Telecom), Oredoo</td>
</tr>
<tr>
<td>Egypt</td>
<td>84mn</td>
<td>$3,000</td>
<td>97.5mn</td>
<td>116%</td>
<td>33%</td>
<td>Etisalat, MobiNil (Orange), Vodafone</td>
</tr>
<tr>
<td>Morocco</td>
<td>33.7mn</td>
<td>$3,000</td>
<td>44.1mn</td>
<td>131%</td>
<td>24%</td>
<td>Inwi (Wana), Maroc Telecom (Etisalat), Meditel</td>
</tr>
<tr>
<td>Tunisia</td>
<td>11.2mn</td>
<td>$4,000</td>
<td>15.9mn</td>
<td>142%</td>
<td>34%</td>
<td>Ooredoo, Orange, Tunisi Telecom</td>
</tr>
<tr>
<td>Kuwait</td>
<td>3.5mn</td>
<td>$45,000</td>
<td>7.6mn</td>
<td>215%</td>
<td>73%</td>
<td>Ooredoo, Viva (KTC), Zain</td>
</tr>
<tr>
<td>UAE</td>
<td>9.5mn</td>
<td>$39,000</td>
<td>16.4mn</td>
<td>172%</td>
<td>64%</td>
<td>du, Etisalat</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>29.6m</td>
<td>$26,000</td>
<td>54.3mn</td>
<td>183%</td>
<td>67%</td>
<td>Ooredoo, Vodafone</td>
</tr>
<tr>
<td>Qatar</td>
<td>2.3mn</td>
<td>$86,000</td>
<td>4.2mn</td>
<td>182%</td>
<td>61%</td>
<td>Mobily (Etisalat), STC, Zain</td>
</tr>
<tr>
<td>Oman</td>
<td>4mn</td>
<td>$25,000</td>
<td>6.2mn</td>
<td>153%</td>
<td>57%</td>
<td>Omantel, Ooredoo</td>
</tr>
<tr>
<td>Bahrain</td>
<td>1.4mn</td>
<td>$20,000</td>
<td>2.4mn</td>
<td>175%</td>
<td>47%</td>
<td>Batelco, Viva (Saudi Telecom), Zain</td>
</tr>
</tbody>
</table>
service by the end of 2016, the country’s newly appointed ICT and digital economy minister, Noomene Fehri, said in a recent radio interview. LTE is viewed as a key component of the high-speed broadband services Tunisian citizens must be able to access in order to guarantee the success of the ‘Digital Tunisia’ national development strategy. Moroccan telecoms regulator, the Agence Nationale de Reglementation de Telecom (ANRT), has announced that it had awarded three 20-year (LTE) licences to the country’s mobile operators – Itissalat Al Maghrib (IAM, Maroc Telecom), Inwi (Wana) and Medi Telecom (Meditel). The operators are required to establish and operate 4G networks covering 65% of the Moroccan population within five years from the date of licence authorisations, and must provide minimum average download speed of 2Mbps for 90% of the population.

Egypt, well covered by 3G at present, plans to award 4G licenses in June 2016, with conditions being announced nearer the time. However with parliamentary elections being pushed back several times in 2015, there is some uncertainty as to whether the government will be in a position to make decisions according to the timescales they have set out.

Tower sharing in MENA to date

Although there have been some bi-lateral swaps in the MENA market, independent towerco activity was minimal before the Eaton/MobiNil deal to transfer 2,000 towers in May 2015. Existing infrastructure sharing agreements in key markets such as KSA and UAE may well raise interest in any towers to come to market over the next 12 months, given the number of deals between MNOs in these markets.

Valuations and interest in MENA

How will the MENA tower market differ from its obvious comps in SSA and Europe? Much remains to be defined, including the regulatory regimes around infrastructure sharing in many markets, but what seems certain is that there is capital interested in MENA towers, and there is growing appetite from the region’s MNO’s to monetise passive infrastructure.

TowerXchange estimates that the average valuation per tower in Africa is around US$130,000 and in Europe around €111,000. Of course much depends on the deal terms; the length of the contract, the amount of equity sold and upfront cash versus long term leaseback costs. Of course, potential valuations will also be affected by the fact that most countries, including the three largest markets, host only three nationwide MNOs and in some cases there are only two potential tier one tenants. The knock-on effect of these smaller markets may be that they appeal to niche towercos who can create a profit in more creative ways, rather than those following a more traditional model of focusing on growth through increased tenancy ratios.

In countries with a huge urban population and an established mobile market, such as Dubai, the need for infill through solutions such as DAS and small cells may well draw the attention of towercos who are well versed in working in established markets such as Europe and whose expertise lies beyond the simple construction and maintenance of towers.

North Africa, however, appears to be flowing a more SSA model in terms of tower expectations. Certainly there is more room for growth in the North African markets, although equally less wealth and fewer tier one tenants.
This aside, it’s clear that in both the wealthy and less affluent markets the data boom is on an upward curve, meaning the demands on infrastructure are increasing and there is scope for significant growth for the right towerco.

Which towers are likely to come to market next in MENA?

Expressions of interest have been solicited and received in two parcels of MENA towers: 9,200 Mobily towers in the Kingdom of Saudi Arabia and further 5,000 Zain towers in the same market, together with around 1,600 Zain towers in Kuwait. TowerXchange also understands one of Algeria’s operators is appointing an advisor to explore the divestiture of ~6,000 towers. Together with the already announced Egypt transaction, we could see tower transactions in MENA’s three largest tower markets within the next year.

“WeThis is a model that is just being introduced in MENA and Egypt so I believe that people will look at it carefully and if it’s successful I’d expect that it can be replicated,” said Kais Ben Hamida, the CFO who championed MobiNil’s tower sale. “In Egypt itself we have 19,000 towers so there’s certainly potential for replication here and also in other countries in the MENA region. So yes, I would expect that people will be looking at this transaction to see how it evolves.”

What next?

Experts on Middle Eastern towers suggest that the ‘domino’ effect will come into play in the MENA region. While the current penetration of towercos in MENA is just 1.4%, TowerXchange forecast that 17% of MENA’s 139,800 towers will be owned and operated by independent towercos by the end of 2016, rising above 25% by 2017.

Over the next few months, the sale of towers in KSA, Kuwait and Algeria will allow the region to determine its own towerco identity, whether that is more closely aligned to the SSA sale and leaseback model, or whether the operators will prefer to keep a chunk of equity in the venture remains to be seen. Once the initial tower sales are completed, independent towercos will have an opportunity to prove their worth in the region, and we consider it likely that operators will begin to feel more comfortable with the concept. This may well result in less equity being retained and in larger packets of towers coming to market.

TowerXchange will continue to watch the MENA region with interest, and predicts this region will become one of the most active for asset transfer over the next two to three years.

### Significant bi-lateral tower sharing agreements in MENA to date

<table>
<thead>
<tr>
<th>Date</th>
<th>Players</th>
<th>Country</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2014</td>
<td>Zain Jordan</td>
<td>Jordan</td>
<td>Zain Jordan signed an agreement with the military’s Special Communications Commission on site sharing</td>
</tr>
<tr>
<td>April 2014</td>
<td>Oman</td>
<td></td>
<td>Omantel and Nawras agreed to jointly deploy sites to remote villages across Oman</td>
</tr>
<tr>
<td>May 2012</td>
<td>Batelco</td>
<td>Bahrain, Jordan</td>
<td>Batelco announced focus on infrastructure sharing with other operators and parked sale-and-lease-back talks</td>
</tr>
<tr>
<td>June 2011</td>
<td>Mobily, STC</td>
<td>KSA</td>
<td>Mobily and STC were in discussions to spin off their towers into a separate company, however, agreement has not been reached</td>
</tr>
<tr>
<td>May 2009</td>
<td>Ooredoo, Vodafone</td>
<td>Qatar</td>
<td>Ooredoo and Vodafone signed outdoor site sharing agreement</td>
</tr>
<tr>
<td>2009</td>
<td>MobiNil, Vodafone</td>
<td>Egypt</td>
<td>MobiNil and Vodafone signed a bi-lateral sharing agreement in 2009, with Etisalat joining the agreement later</td>
</tr>
<tr>
<td>August 2007</td>
<td>Etisalat, Du</td>
<td>UAE</td>
<td>Agreement between Etisalat and Du to share sites</td>
</tr>
</tbody>
</table>

Source: Delta Partners, press releases, TowerXchange
Saudi Arabia’s mobile market is already saturated, with subscriptions hovering between 50-52mn since 2013, and reaching a penetration rate of 173.3% in March 2015. Subscribers in the country have demonstrated a rapidly rising appetite for mobile data services. According to the latest data from telecoms regulator CITC, the total number of mobile data users reached 31.8mn in March 2015, up by more than 56.6% y-o-y. Therefore, while the Saudi market will offer fewer growth opportunities for tower firms through network expansion, generally a core strategy, the unabated rise in demand for data will require network upgrades and densification. Moreover, even with limited subscription growth opportunities, Saudi Arabia’s population of nearly 30mn and mobile ARPU levels of around US$16 set the market apart from Egypt and other Sub-Saharan African countries where tower sharing has emerged.

All three mobile network operators - state-owned Saudi Telecom Company (STC), Etisalat-backed Mobily and Zain - are highly reliable tier-one players in the Middle East, making them attractive partners for tower firms. While there are few data-only players to boost potential tenancy ratios, Saudi Arabia is also host to two experienced MVNOs (mobile virtual network operators), Virgin Mobile Middle East & Africa and Lebara. Both players’ licence agreements currently tie them to their respective mobile network partners, STC and Mobily respectively, but BMI believes that, like their hosts, they will be keen to boost coverage and capacity through tower sharing. A third MVNO, backed by...
regional device and services retailer Axiom Telecom also plans to enter the market on Zain’s network, once the CITC re-tenders its licence.

Weakening economy, but strong fundamentals

In BMI’s view, economic activity in Saudi Arabia has passed its peak, with the forces bolstering the expansion of the non-oil economy set to gradually tail off over the coming quarters. We believe that weaker government spending, diminished gains in oil production, and a more cautious business sentiment will drive a moderation in economic growth from 2016 onward. The effects of the one-off fiscal stimulus package initiated by King Salman at the beginning of this year are weakening, and we expect the government will soon take incremental steps to rationalise public spending. We forecast the Saudi economy will expand by 3.2% in real terms in 2016 (using 1999 as a base year), following 3.7% this year.

So far, the effects of this decline on Saudi economic activity have been limited. The growth of the non-oil economy across the first three quarters of 2015 has been powered by the same mechanics consistently seen over the past decade: high government spending feeding into private consumption and construction activity.

That said, leading indicators of economic activity are increasingly pointing to a decelerating trend in the non-oil sector. Growth in point-of-sale transactions (a proxy for retail sales) is still positive, but has moderated sharply since a 42.5% annual increase in February triggered by Salman’s stimulus measures, while private sector lending growth is now at its weakest level since 2011. Most significantly, Saudi Arabia’s purchasing managers’ index (PMI) reading fell to 56.1 in June, reaching its lowest level since the survey began in 2009 - with the pace of expansion in new orders falling to a record low.

Despite the negative impact of lower oil prices on the economy and private consumption, BMI’s forecast for Saudi Arabia’s GDP per capita to reach more than US$23,000 in 2015 is still far higher than the Middle East and North Africa regional average, and its population of nearly 31mn is the largest in the Gulf Cooperation Council (GCC). These fundamentals

Booming data demand requires network densification

Saudi Arabia mobile data subscriptions, 2012-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Q112</th>
<th>Q113</th>
<th>Q114</th>
<th>Q115</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>2013</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
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<tr>
<td>2014</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>2015</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
</tr>
</tbody>
</table>

- Dedicated mobile broadband ('000)
- Standard mobile data subscriptions ('000)
- Mobile data as % of mobile market

Source: CITC, BMI
Zain and Mobily under pressure
Saudi Arabia operator revenues (SARmn), 2013-2015

<table>
<thead>
<tr>
<th>Quarter</th>
<th>STC</th>
<th>Mobily</th>
<th>Zain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q113</td>
<td>14,000</td>
<td>12,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Q213</td>
<td>12,000</td>
<td>10,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Q313</td>
<td>10,000</td>
<td>8,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Q413</td>
<td>8,000</td>
<td>6,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Q114</td>
<td>6,000</td>
<td>4,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Q214</td>
<td>4,000</td>
<td>2,000</td>
<td>0</td>
</tr>
<tr>
<td>Q314</td>
<td>2,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Q414</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Q115</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: Zain revenues calculated in SAR based on BMI average annual exchange rates. Source: BMI, STC, Mobily, Zain

It is not surprising that Saudi Arabia looks set to be the first market in the GCC to open up to tower outsourcing. Saudi Arabia's large geographical size makes it far more costly for telecoms operators to achieve universal population coverage compared with other GCC markets. Meanwhile, the country has the weakest subscriptions growth outlook in the GCC, which has fuelled intense price competition between the three mobile operators, and now two MVNOs, also resulting in the lowest ARPs in the region, according to BMI data.

However, the demand for mobile data services is on the rise, underpinned by the emergence of several regionally focused video-on-demand (VOD) players, such as OSN and Iflix, and a strong gaming culture. By divesting tower assets, mobile operators will be able to reduce their operational costs, extend mobile networks to underserved rural areas more cost efficiently and turn their focus to innovative services, which will encourage greater data usage and improve customer loyalty.

We retain our view that STC will not choose to follow Mobily and Zain's outsourcing strategies. STC remains by far the largest operator by revenues, owing to its dominance in both the mobile and wireline markets, as well as its position as the leading provider of communications and, increasingly, IT solutions to enterprises and government agencies. Given these strengths STC is under far less pressure to generate cost efficiencies than Mobily and Zain.

Ripe for opening

Mobily is reported to be negotiating with American Tower Corporation and IHS Nigeria regarding the sale of its 10,000 telecoms towers for US$1.5-2bn. BMI believes Mobily’s desire to generate cost efficiencies now is related to the restatement of two years’ worth of its financials following the discovery of substantial accountancy errors in 2014, and a further revision of 2014 profits down from SAR219mn to a loss of SAR913mn in Q115.

Meanwhile, in January 2015 the Zain Group announced that it had hired an advisor to evaluate the viability and financial benefit of implementing a tower outsourcing strategy across some of its markets. Given its challenging financial position in Saudi Arabia - since launching operations in 2008 a heavy debt burden and strong competition have prevented it from reporting a profit - BMI believes it is likely Saudi Arabia is one of the markets where Zain is considering selling towers.

make it an attractive expansion opportunity for Africa’s leading tower firms, which have thus far operated mainly in much less developed telecoms markets, with much tighter operating margins.
Moreover, regardless of STC’s financial situation, BMI believes Saudi Arabia’s government, which still owns 70% of STC, would be unwilling to outsource core telecoms infrastructure owing to the tense geopolitical environment in the Middle East. There are three key factors putting Saudi Arabia in an increasingly vulnerable regional position, which make the sale of STC’s tower unpalatable:

- Saudi Arabia and Iran have consistently vied for geopolitical influence in the Middle East, and Saudi officials worry that an agreement between the P5+1 countries (US, Russia, China, France, the UK and Germany) and Iran on its nuclear ambitions could tilt the regional balance of power in Iran’s favour, with Riyadh retaining a subordinate and insecure geopolitical role.
- The US’s reluctance to get directly drawn into another Middle Eastern conflict raises concern over regional stability.
- Saudi Arabia is ramping up its own military intervention across the region (in Bahrain in 2011, against Islamist militias in Libya in 2014, and Yemen in 2015), putting it at risk of some form of retaliation from extremist groups.

BMI believes under these circumstances the government will see telecoms infrastructure as too politically sensitive to transfer into the hands of an independent third party. This means that a large share - likely more than half - of mobile towers in Saudi Arabia will remain operator captive for the foreseeable future.

www.businessmonitor.com/bmo
Mobile market overview

Kuwait had a population of 4.0mn in 2014, an increase from 3.7mn in 2013. The population has a young age profile with a median age of 28.9 years and in 2014 69% of residents were non-Kuwaiti nationals. Kuwait has an area of 17,820 km² but the population is highly concentrated in Kuwait City and its suburbs, especially on the shore of the Arabian Gulf. Subscriber (SIM) penetration was 221% by the end 2014, growing at >7% a year because multiple SIMs are common as part of the highly competitive environment.

Three Mobile Network Operators (MNOs) serve Kuwait with broadly equal shares of the total subscribers. As shown in Figure one, Zain was the largest of these in 2014 with 35% of the market. VIVA and Ooredoo, rebranded from Wataniya in 2014, had very similar shares at between 32% and 33%. About 74% of total subscriptions were pre-paid.

Zain regard their operation in Kuwait as their ‘flagship business’, growing at 6% in 2014 to serve 2.7mn customers and being the Group’s most profitable operation[1]. VIVA stated a 2014 customer base of 2.4mn up from 2.15mn in 2013 with revenues growing by 31% over the same period. Ooredoo quoted 2.514 million subscribers in 2014, up from 1.970 million in 2013 though they noted a fully-saturated market and slow growth from new customers as explanations for a 14% fall in revenues from 2013 and 165 job losses during the year.

Key mobile developments

Zain was founded as MTC in Kuwait in 1983 and launched its first GSM service in 1994. It rebranded as Zain in 2007. Wataniya was launched in Kuwait in 1999 as the first privately owned telecoms operator. VIVA joined as a third operator, launching its Kuwait services in December 2008. Having acquired a market share of 13% in 2009 VIVA has continued to grow to achieve parity with Wataniya / Ooredoo and almost with Zain by 2014 leading to the broadly equal market shares observed at present. The progression from 2009 to 2014 is illustrated in Figure two.
but also operates the fixed-line network. It may also help to stimulate the fixed communications system which has been outpaced by the mobile sector in recent years. At this stage however, the details of the development are not known and so the market impact remains to be seen.

Kuwait’s tower sharing market

There are approximately 5,100 towers in operation in Kuwait at present. Tower sharing is unusual in the Middle East and so there are few benchmarks in the region. In Kuwait, there is no sharing of mobile base station infrastructure in place at present.

In early 2015 Zain, 24% owned by the Government of Kuwait, started to explore options for tower sharing, an approach unusual for the Middle East and more unusual still for a Government Controlled Company. Zain sought expressions of interest to cover their 1,600 towers, just over 31% of the total in Kuwait. The options could include tower sharing or sale and leaseback of the towers. The Zain request covers options in Kuwait but also includes towers in Saudi Arabia and could result in a joint offer, though different models for each country are also possible.

The regulatory situation may change in the near future because Kuwait’s parliament recently approved a bill to create an independent telecom regulator. This is expected to address the current potential conflict of interest in which the Ministry of Communications currently regulates the industry and more unusual still for a Government Controlled Company. Zain sought expressions of interest to cover their 1,600 towers, just over 31% of the total in Kuwait. The options could include tower sharing or sale and leaseback of the towers. The Zain request covers options in Kuwait but also includes towers in Saudi Arabia and could result in a joint offer, though different models for each country are also possible.

The rationale for this interest may be that while Zain is profitable in Kuwait it is under strong competitive pressure from VIVA in particular and in Saudi has struggled to become profitable. The extent of interest in Kuwait tower sharing will partly be determined by the level of interest from other operators. If this additional interested does not materialise, the approach will tend towards the sale and leaseback approach.
Regulatory issues can also have a major impact on the willingness of investors to consider an opportunity. Issues may include regulations covering tower sharing which could emerge from a future independent regulator, but also compliance with related regulations such as whether towers have the necessary permits in place.

Conclusions

Kuwait’s annual GDP per head is over US$54,000, mobile penetration over 200% and coverage 100% so the mobile market is mature and well served. Growth therefore needs to come from increased capacity requirements driven by new devices and applications. These may arise from the smaller, denser networks required for more modern systems and could also be encouraged if visual impacts become a higher priority in future urban planning. Maintaining profitability also requires that costs be minimised which suggests that there could be an increased appetite for infrastructure sharing.

Zain’s consideration of tower sharing options represents a new frontier for tower sharing which has not been in evidence in the Middle East to date. Possible changes in the regulatory environment also introduce some uncertainties. Nevertheless, Kuwait’s market is mature and represents a relatively low risk opportunity which may serve as a counterbalance to sharing options elsewhere as part of a balanced portfolio.


See you at our future events!

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1-2 October, Johannesburg

Meetup Asia 2015
24-25 November, Singapore

Meetup Europe 2016
April, London

Meetup Americas 2016
14-15 June, Florida

TowerXchange | www.towerxchange.com
We start with a tour of Asian towerco, visiting with Apollo and IGT in Myanmar. Then we pop over the border into China for two fascinating insights into the ~20,000 site independent tower market in the country, and learn about the opportunities created by CTC. Then for a snapshot into the future, we learn about ‘Viom Next’.

Our tour continues into two of Asia’s newest tower markets: Thailand, where BTO disputes may be on the verge of resolution through the creation of two new JV-towercos, joining DIF (formerly TRUEGIF). Finally, we visit edotco in Cambodia to learn about this 9,000 tower, five MNO market. We conclude with TowerXchange’s unique matrix of passive infrastructure equipment and service demand across 12 Asian countries.

Don’t miss:
152 Interview: Philippe Luxcey, CEO and Henry Butler, CF Manager, Apollo
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162 Interview: Zhiyong Zhang, Chairman & President, Miteno
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171 Interview: Ravinder Badwal, Head of emerging Business, Viom Networks
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Apollo prove the bankability of the tower+power business model

One of Myanmar’s two largest towercos secures US$280mn in debt and equity. Proven power service helps secure a further PO for 717 towers from Telenor

Apollo Towers Myanmar has been contracted by Telenor to build a total of 1,827 towers to date, of which at time of writing (early August 2015) 1,100 had been lit. With a full service tower+power proposition, Apollo is building fast and is positioning itself secure co-locations and become one of Myanmar’s two largest towercos. TowerXchange spoke with Apollo CEO Philippe Luxcey, a 20 year mobile veteran who had previously served as CEO of Orange in Uganda and Cameroon, and Corporate Finance Manager, Henry Butler, who had recently helped secure substantial new debt and equity for the towerco.

Keywords: Apollo Towers Myanmar, Asia, Asia Insights, Bankability, Batteries, Build-To-Suit, Business Model, C-Level Perspective, Camusat, Capacity Enhancements, Co-Locations, Construction, Country Risk, Debt Finance, Dimensioning, Foundations, Greenfield, GTL, Hybrid Power, Ieng, Insights, Leadcom, MIL, Myanmar, Network Rollout, O&M, OPIC, Private Equity, Skilled Workforces, SLA, Stakeholder Buy-In, Tenancy Ratios, Towercos, Unreliable Grid, Uptime, Who’s Who

Read this article to learn:
- The challenges of the first phase of rollout and the different characteristics of the latest phase
- How Apollo has maximised service continuity during monsoon rains
- How Apollo got the banks and DFIs comfortable with their ability to deliver power
- The specific investments Apollo have made in power systems to ensure continuity despite Myanmar’s highly unreliable grid
- How Apollo’s CEO foresees demand for co-location

TowerXchange: Thanks for taking the time to speak to us today. Please tell us what Apollo has built to date in the first phases of the rollout?

Philippe Luxcey, CEO, Apollo Towers Myanmar: In phase one of the rollout we secured an initial contract to build around 1,110 sites; most of these have already been delivered. There is a small number of sites that more challenging. We are sorting through those as we speak.

TowerXchange: How would you characterise the differences between the locations of towers you rolled out initially, compared to those you have been contracted to build in the next phase of the rollout?

Philippe Luxcey, CEO, Apollo Towers Myanmar: The first phase of the rollout was concentrated in the main cities, in the densely population areas.

We have a contract to build 717 more towers for Telenor in the next phase of the rollout, but we’re not really pushing into rural Myanmar yet – these are more suburban than urban sites but we are building now in States like Shan, Kachin, Chin, Kayah, Rakhaing et cetera.

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. Our first phase build is all but complete, and we’ve already started building the 717 towers in the next phase.
TowerXchange: So does the next phase of the tower rollout remain within reach of Myanmar's transport infrastructure, or are you having to hand-carry equipment for the last miles to some sites?

Philippe Luxcey, CEO, Apollo Towers Myanmar: We select sites which meet access criteria, and so far we have been able to deliver all towers by truck. Myanmar may have a finite number of tarmacked roads, but there are lots of small mud roads which, if not flooded, you can still use for access.

TowerXchange: It is unfortunate that the latest phase of contracts were awarded just before the rainy season – how have the monsoon rains affected Apollo?

Philippe Luxcey, CEO, Apollo Towers Myanmar: It’s true that we received our PO just before Myanmar’s Water Festival – there are countrywide holidays for almost three weeks from 10 April to early May – but after that we were able to commence site acquisition and building towers. In fact we already have 60 sites on air from the second batch of 717. We have civil works under way for a further 200+ sites, but we’ve had to put about 100 sites on hold until flood waters recede.

Apollo has been exceptionally fortunate that we have only a handful of sites that are flooded, as we designed the majority of our sites with raised platforms.

It’s normal to face challenges rolling out during rainy seasons. I recall in 2007 the launch of a microwave backbone running from the South to the North of Cameroon was significantly delayed due to rain. It has an effect on some tasks yes, but we can still get a lot done during the rainy season.

TowerXchange: How mature is the supply chain of telecom contractors in Myanmar now compared to when you arrived?

Philippe Luxcey, CEO, Apollo Towers Myanmar: We decided to work with four big well known contractors from the outset. Leadcom, Camusat, GTL and ieng have deep experience in emerging markets, both Africa and Asia, as well Eastern Europe, so for them Myanmar was just one more new country, it was not an exceptional challenge. Of course it took time for them to select and train local subcontractors. There was no tower building background in Myanmar like in Africa where you have contractors who move from one operator to another. Here the country was opening so everything was new. It took time to adjust, but now it’s working well.

TowerXchange: Congratulations on raising debt a US$250mn loan from OPIC, recently supplemented by US$30mn in equity from local company MIL. Please tell us about your experiences raising capital for tower ventures in a country with perceived high country risk like Myanmar.

Henry Butler, Corporate Finance Manager, Apollo Towers Myanmar: That perception of high country risk underpins all our discussions.

One of the other Myanmar towercos, who operated
a simple business model with no power risk, were the first to secure debt funding through a consortium of commercial banks out of Singapore. They offshore some of the risk, and structured it with a large cornerstone of equity, so the 'greenfield' risk was significantly reduced at the start of the project. With no power and associated SLA penalty risk, they were able to present a straightforward business model with long term recurring revenues, and were able to secure debt on a relatively low gearing. Of course, if you have access to a parent guarantee that is always going to help offset some of the market or country risk.

However, as the award of next phase build contracts illustrates, providing power services is a source of competitive advantage for Myanmar towercos. Although when Apollo first approached the debt market, the perception was that power was trouble, and that achieving the SLAs was going to be challenging, so we had to get over that hurdle. We spent a great deal of time getting the banks and DFIs comfortable with Apollo’s ability to deliver power, explaining that if you get power right in emerging market towercos you’re going to be the partner of choice – operators have quickly realised that if it’s a choice between tower and power or just the tower, then it’s really no choice at all. Having different suppliers for tower and power can be very tough.

The education process required that we demonstrate our ability to deliver the uptimes required by SLAs, and to improve the banks’ comfort in the potential for co-location growth. Their due diligence teams visited Myanmar, met with our management teams and visited a number of our towers. On this point, a lender's confidence in the management team is vital. The banks built confidence in the experience our management team had accumulated in Africa, Thailand, Nepal, Cambodia and Malaysia, and in the experience and involvement of our shareholders, TPG and Sanjiv Ahuja.

We had lots of dialogue with commercial banks, some of which were very keen as they’d been left out of the consortium making up the aforementioned transactions, but we chose OPIC. Development finance is always a strong play for emerging market towers because they inherently take away some of the country risk – indeed some corporate banks we were talking to at the early stages were only keen to enter Myanmar alongside a DFI.

Any lender that comes into Myanmar or any market like it needs to be aware that they’re not necessarily able to control as many variables as they might in a developed market – think of the lack of hedging products in Myanmar – lenders have to be flexible. OPIC were pragmatic about the realities of building a tower business in Myanmar.

You either have to pay for country risk, or you offset it by minimising contract risk, in the end you probably have to do a bit of both in Myanmar.

TowerXchange: Tell us a bit more about your recent equity raise.

Henry Butler, Corporate Finance Manager, Apollo Towers Myanmar: We wanted to focus on a small group of specialised investors who could add value to our business, and so it was great to announce last week that we’re partnering with Myanmar Investments International Limited (MIL). MIL are listed on AIM in London but are on the ground here with Mike Dean and Aung Htun, who is a Myanmar national. They’re an intelligent and thorough outfit who managed to complete a great deal of due diligence in the weeks running up to closing. They were already invested into Myanmar, believe in the growth story, and they were willing to get involved and get involved at in depth levels. Myanmar is not easy, so shareholders need to be engaged – a hands off approach doesn’t work here.
TowerXchange: Let’s go back to the point about convincing the bankers that it was worthwhile engaging with the complexity of power in Apollo’s business model. What operational evidence were you able to provide to make your case?

Henry Butler, Corporate Finance Manager, Apollo Towers Myanmar: Of course it’s true that there are more moving parts when towercos provide power. But there is also more opportunity to extend your growth story – particularly in Myanmar when the next phase of the rollout has seen all contracts awarded to towercos who provide power – a lender wants to see businesses who grow and wants to grow with them. And we’re dimensioning the power systems for two tenants from the outset on our next 717 sites, and it’s easy for us to add an extra battery bank for a third tenant.

I believe provision of power, not only steel, must be a core competency of any emerging market towercos.

Philippe Luxcey, CEO, Apollo Towers Myanmar: Securing capital required that we demonstrate that we had a good operation, good people, and good contractors. Today we are delivering an average of 99.95% uptime, which demonstrates our ability to meet what might appear to be stringent SLAs.

TowerXchange: What specific investments in power systems have you had to make to deliver such strong uptime statistics?

Philippe Luxcey, CEO, Apollo Towers Myanmar: Today we are using the same solutions as towercos in other countries – there is no energy revolution. A good battery bank for backup is often sufficient in Africa, with generators only on critical sites, but one of our key learnings has been that in Myanmar we need generators on all sites except rooftops.

We’ve been able to connect to the grid at almost every site we’ve built so far in Myanmar, but the quality of the grid is very poor. In Africa generally you have grid power or you don’t, there may be outages but when the grid is available it’s generally 220V. Here you might get 110V, 120V, 130V and that’s much more challenging for power equipment to deliver the 48V DC required to power telecom equipment and recharge the batteries.

We’re using charge discharge battery and DG hybrids – we have deployed no renewable energy so far. Most of our phase one sites were in the Yangon region, which is at a latitude not ideally suited for solar, and there is insufficient wind resource for wind power. The situation will be different in Mandalay and further North, but in the South renewables often aren’t an option. And during the monsoon season you would need sufficient DGs to achieve the desired autonomy even if you had solar.

TowerXchange: How do you foresee demand for co-location? Will KGSM co-locate?

Philippe Luxcey, CEO, Apollo Towers Myanmar: We are seeing demand for co-location growing every day. We have a long term contract with KSGM and a contract with Ooredoo, while of course Telenor is our anchor tenant. What is attracting Ooredoo and KSGM is the quality of our sites. For example most of our ground based tower sites are designed with an elevated one metre slab for power and telecom equipment, so even when the area is flooded with water we can maintain continuity. We view it as critical to maintain 24/7 service especially with regards to power.

Philippe Luxcey will be speaking at the TowerXchange Meetup Asia on November 24 and 25 in Singapore. For more details visit www.towerxchange.com/meetups/asia
IGT leads drive to increase efficiency of Myanmar tower rollout

Leading towerco in Myanmar creating efficiencies through local staffing, O&M, technical and business model innovations

Having been attracted to by the challenge of Myanmar’s greenfield infrastructure rollout, former deputy CEO Ayad Chammas has recently been promoted to CEO of Irrawaddy Green Towers (IGT). Lebanese, born and raised in Doha, Ayad has two degrees; a BSc in Civil Engineering and an MSc in Construction Management / Project Management. He has 21 years’ experience in O&G and telecom infrastructure projects including engagements in the UAE, Oman, Georgia, USA, Qatar, Russia and Kazakhstan, working with national and multinational large operating companies such as ADCO, PDO, BP, Total, QP, Dana Gas, Sajgas, KOC, KPO, KLPE, GASCO, in the energy sector.

Keywords: 3G, Asia, Asia Insights, Bankability, Batteries, Build-to-Suit, Business Model, C-Level Perspective, Capex, Co-locations, ESCOs, Energy Efficiency, Infrastructure Sharing, Insights, Irrawaddy Green Towers, KPIs, KSGM, Lease Rates, Myanmar, NOC, Network Rollout, O&M, Off-Grid, Ooredoo, Operational Excellence, Opex Reduction, Opex Sharing, RMS, Rectifiers, Rooftop, Skilled Workforces, Telenor, Tenancy Ratios, Towercos, Uptime, Who’s Who

Read this article to learn:
■ Are O&G infrastructure professionals an untapped source of talent for towercos?
■ The geographical characteristics of IGT’s tower network and the proportion off-grid
■ Resourcing efficiencies: investing in local skills and striking the right balance between outsourcing and in-house resourcing
■ Procurement efficiencies: smart sourcing, standardised specifications and the potential for ESCOs
■ Driving down cost per tower, driving up tenancy ratios

TowerXchange: I’m surprised we don’t encounter more senior management at towercos who have an O&G infrastructure background as skills and experiences seem to be readily transferrable.

Ayad Chammas, CEO, IGT: After almost 20 years in O&G infrastructure, Myanmar represented a fantastic opportunity to build telecom infrastructure in a virgin market.

There a lot of the same concepts when dealing with O&G and telecom infrastructure: dealing with challenging geographies, understanding the impact of the environment, learning about the people and politics, and managing project implementation economics.

Telecom infrastructure rollouts are similar in nature to O&G – the primary differences are to do with scale and timeframe. A telecom rollout is geographically bigger than most O&G projects, unless you’re doing a cross country pipeline, but the key difference is the timeframe. A telecom rollout has a series of monthly to six week targets – delivery is based on monthly KPIs, whereas mega projects in O&G typically have three to four years, which gives you more time to maneuver and to mitigate against geographical or political issues in order to meet the end date. In a telecom context, we have 30 or less days per tower, less time to maneuver, no time for building contingencies. From site acquisition to tower erection and installation of power systems – sometimes we’re building 150-200 towers per month. Telecom infrastructure is deployed in a shorter time and is logistics and communication...
intensive. I’ve been on fast track jobs in O&G, where the value of the barrel creates the pressure for the delivery date per the contract, but there is more pressure in telecom; every month is a new project and there are different targets to be achieved in different areas that are geographically distant and diverse in nature.

TowerXchange: What have IGT been contracted to build and what have you built to date across the first three phases of the rollout?

Ayad Chammas, CEO, IGT: IGT has been contracted to build 1,800 towers for Telenor and 1,100 for Ooredoo. In addition to that, we have co-location agreements with both international operators plus MPT KDDI.

So far we have built 1,500 towers out of total portfolio of 2,900 towers.

Work on the towers from the Ooredoo contract has started and key purchase orders for these have been placed. I’m proud to say that our delivery team continues deliver and to do an excellent job despite of the severe weather, complex terrain and substandard transport infrastructure.

TowerXchange: Were there significant differences in terms of location characteristics and co-location potential between the (almost complete) first and second phases of the rollout compared to the new contracts awarded for phase three?

Ayad Chammas, CEO, IGT: In terms of location of the sites, our first 1,500 were very much spread over the 16 States/divisions of Myanmar. We started in Yangon, but our initial contract, which was from the second phase of rollout, was predominately outside main Myanmar central corridor, and we were first there for Telenor in States such as Shan, Kachin, Rakhaing and Chin in the North of the country. So while other towercos have concentrated their build on the central corridor, we have focused on more peripheral and Southern states. We are now seeing more capacity sites that are located in the major cities such as Yangon, Mandalay, and populated towns / commercial towns and border cities with China and Thailand as well as touristic places.

In terms of co-location, we have more potential in major cities and commercial towns. Rural areas however have made a slow start with some exceptions, it is important to say that we have realised more potential in co-location in the past two months, which has exceeded our expectations and we may very well be looking at a figure exceeding our target for our portfolio by end of this year.

TowerXchange: Does the more geographically dispersed nature of IGT’s towers mean more are off-grid and beyond the reach of transport infrastructure? If so, what are the implications for engagement with local communities?
We are proud of our active local training programme. Our line managers are doing a great job training local teams on the basics of roll out, generator and battery maintenance, troubleshooting, and remote monitoring. We train technicians in Burmese at a dedicated facility in our HQ. We have more than 250 people local on our payroll, supplemented by 50-60 expats.

Ayad Chammas, CEO, IGT: Around 60% of our sites are off-grid, and many are beyond the reach of transport infrastructure.

We believe if we want to flourish we have to think global and act local, for example by hiring O&M teams from local villages. We see this as a win-win because the population have supported us in the rollout – engaging them in tower maintenance and operations is a small way to pay back societies for their support.

We are proud of our active local training programme. Our O&M managers are doing a phenomenal job training local teams on the basics of generator and battery maintenance, troubleshooting, and remote monitoring. We train technicians in Burmese at a dedicated facility in our HQ. We have more than 250 people local on our payroll, supplemented by 50-60 expats.

TowerXchange: Different towercos have different business models. Some are very lean with every non-core function outsourced, others are more resource intensive keeping many functions in-house. Which functions sit ‘on the payroll’ at IGT and what is outsourced?

Ayad Chammas, CEO, IGT: Monthly our executive directors meet and try to address these issues. At the moment IGT are a cross: for example we have in-house site acquisition, and an in-house site building team, we hire smaller contractors, buy our own power solutions, and install through service providers. At the same time, we are shifting to an EPC finance model – we are retaining control of the schedule but giving part of the rollout to proven contractors.

Outsourcing might be good for economics, but it comes at the expense of flexibility of rollout and towerco’s ability to cater to operators’ specific needs, such as expediting sites they need on air as soon as possible. Keeping some in-house reserve resource is necessary to deliver great customer service and to build a reputation for operational excellence.

EPC contractors are like a train – once you load the train, and set it on track, it takes time to reach the desired speed, and they can be difficult to change course. So for example when the recent floods devastated the Northern States of Kachin, Rakhaing, Sagaing, parts of Mandalay and Shan, we were able to shift priorities to temporarily favour rolling out in the drier States in the South using in-house contractors.

TowerXchange: How can Myanmar’s towercos drive efficiency as you achieve scale, particularly in terms of smart sourcing and O&M?

Ayad Chammas, CEO, IGT: Efficiency and optimisation is an area I personally have been engaged in directly and quite extensively for the past year or so.

There are a number of initiatives that we took on board since August 2014. To name of few; smart sourcing whereby we have reduced our capex by nearly 30% and still there is scope to reduce further. We have shared with our contractors and suppliers a uniform rate card that we have negotiated based on bulk purchases and by planning ahead in procurement. We have done a lot of work with our engineers on optimised infrastructure designs; the use of low cost and quick deployment RDUs has...
proven extremely useful in our rollout. Outsourcing of O&M and smart fuel buying (directly from the source), effective logistics yet ensuring that we provide the best uptime in the industry - as acknowledged by the customer – these are only few of many initiatives we have taken on so far. Here I give a lot of credit in doing so to our finance and procurement teams who have worked relentlessly on driving down the cost of the business while we continue to roll out and meet our targets.

TowerXchange: How have you balanced the demands of standardisation and bulk purchasing savings with the need to customise each site to customer requirements and local conditions?

Ayad Chammas, CEO, IGT: We have more than six different power vendors on our vendor portfolio plus a further 10-15 tower suppliers who we use regularly.

We have managed to standardise specifications. Our power team set standard specifications for power and hybrid system design, enabling us to scale to three to four tenants with minimal changes, adding battery banks and rectifier cabinets plus, in some cases, an extra standby generator.

From a compliance point of view, it is important to have a good portfolio of experienced vendors who know what we want. We need to be able to upgrade power systems to add an additional tenant within 10-15 days at the most. Our in-house power team has done a great job building up fit for purpose specifications, helping us to quickly adapt to accommodate a second or third tenant. Our basic specs are two tenant ready as we realised need to be able to move quick to meet operator expectations: most of our battery banks do not require supplementing for a second or, in some cases, third tenant.

TowerXchange: Given that IGT is the only towerco to secure contracts from both Telenor and Ooredoo, you will be well placed to answer this: now that Ooredoo is commissioning sites with tower+power, are their requirements very similar to Telenor, or are there still significant differences in terms, for example, of wind load and energy requirements of their respective equipment?

Ayad Chammas, CEO, IGT: There is a slight difference between the requirements of the three operators we are engaged with at the moment. On the power side, every operator possesses their own power demand depending on their equipments’ specifications. We didn’t have to change tower or power system designs because we have catered for both cases during our initial design and set up phase of the project. Despite the fact that we’re managing a lot of co-locations on a monthly basis, we have encountered no issues in modifying and adding capacity. IGT has a proven power model that caters for both companies requirements, it is “plug and play” and can easily be modified to suit up to four tenants at this point in time.

TowerXchange: Do you think Myanmar’s towercos must all provide tower+power, rather than just ‘steel and grass’, to be competitive going forward? And do you think there is appetite for towercos to subcontract energy to ESCOs?

Ayad Chammas, CEO, IGT: Absolutely. This has been our major strength – besides Apollo, we are the only towerco to provide both tower and power as an integrated offering and that is the biggest
attraction to customers like Telenor, Ooredoo and MPT. As regards outsourcing of power to ESCO’s that is a distinct possibility and we are examining and assessing that as one of the options.

A lack of mature ESCOs was a problem a year ago, but not now – we see a lot of players in the local market who are qualified with the financial and technical capability to handle substantial volumes. We work with some on a capex model, and when the time is right we may work with them on an opex basis. They are working on understanding their own internal economics to suit Myanmar – they need a lean organisation, the right people, and they need to be in country long enough to analyse costs and offer a better deal on power. More companies now understand the cost of managing and handling power, so we’ll soon see something like an ESCO in this market.

TowerXchange: Please summarise your vision for the future of the towerco business model and of IGT in Myanmar.

Ayad Chammas, CEO, IGT: We are living a telecom revolution in Myanmar, a revolution which is having a very positive impact on society. Mobile broadband will help people embrace change and advance. We see ourselves as one of the major factors of that positive change. We have a CSR programme, and we train a lot of local people, people who previously had no experience of working in a multinational environment are now interacting with foreigners – we have 10-12 different nationalities in IGT; our local staff are learning from us, and we’re learning from them – it’s cultural exchange of ideas. This country is beautiful, the people are friendly, and this rollout offers the potential for many to advance their careers – we’re helping in a big way, responsibly investing in people. This gives us the ability to remain cost efficient – investing in local people pays back on a social, productivity and cost efficiency basis.

The fact is that towerco business is here to stay, not just in this part of the globe but all over, it just can not be disputed. In today’s world of falling tariffs and call rates and limited spectrum ability, especially in ASEAN countries, a shared telecom infrastructure is the only way for an operator to remain cost effective. The explosion in data traffic with increasingly higher penetration of smart phones, innovative consumer apps, enhanced by increased affordability is driving both coverage and capacity needs and therefore an ever-increasing demand for towers. In this context, the towerco business model not only makes the operators asset-light but also people-light and allows them to focus on their core competencies. Further, with introductions of newer radio technologies like LTE (and now even 5G trials are taking place), an existing and upgradable tower infrastructure provides the operators a unique ability to become nimble and yet remain cost effective in new service offerings.

I am proud that IGT are now the #1 towerco in Myanmar: with 1,500 sites and another 1,400 to come, Our vision is to retain our leadership and emerge as the predominant player in this industry, the player which provides the best value and the most efficient network uptime to all our customers. We have invested significantly in technology, people and processes and are focused on developing a local ecosystem to support our vision. We are constantly evaluating both organic and inorganic growth opportunities and continue to explore innovative solutions to cut down our costs, enhance productivity through deployment of innovative tools and technologies and continue to focus on building people skills.

We are strongly committed to the country and are the third largest foreign investors (in the telecom sector) in the country. We have initiated several CSR activities and are very active in local community engagement.
Next phase of Myanmar rollout must be about sharing and efficiency - IGT Chairman Arun Kapur

TowerXchange also spoke with IGT Chairman Arun Kapur, who suggested “sharing towers has begun in Myanmar. We’ve gotten good traction, particularly from Ooredoo and KSGM, and anticipate having co-locations on around 700 of the ~2,000 we’ll have in our portfolio by year end 2015, with a tenancy ratio around 1.3. Achieving those kind of tenancy ratios may be difficult on the phase one towers, where Ooredoo and Telenor built almost in parallel with a high degree of overlap. But because IGT’s allocation was part of phase two, we have less overlap, and have attracted huge interest from Ooredoo in co-locating, particularly on the rooftop sites they need for 3G.”

The other theme of our conversation with Arun was efficiency, particularly relating to the capital outlay per site. “All of Myanmar’s towercos will have to experiment with new structures to bring capex down and to bring loads down. The Asian tower industry started in India, where the first set of towers I built in 2005 delivered a 25% IRR from a single tenant, with lease rates close to US$2,000. By 2012 lease rates were down to US$500 in India, but it took towercos seven years to innovate and create the necessary capex and opex efficiencies – we must make the same improvements much more quickly in Myanmar.”

“Achieving such efficiencies calls for a strong partnership approach between MNOs and towercos,” continued Kapur. “MNOs can’t treat towercos like any other vendor; we’re investing 60%+ of the capex on their behalf! We’re connected via an umbilical chord, so if the MNO squeezes the towerco beyond a certain point they make it more difficult for us to raise capital, which harms them as much as us. We need a realistic, sustainable cost structure in Myanmar. Any towerco will fall by the wayside if they fail to recognise and embrace the drive toward efficiency by optimising staffing costs, site design, O&M and technology deployment, or who fails to leverage RMS to monitor uptime and SLAs. Like it or not, Myanmar will mimic more mature tower markets, and that means costs have got to come down.”

“While an ecosystem of local skills and competencies has been developed, we still can’t buy towers or generators locally – everything is still imported. Local distributors are still building their service capability but in the meantime they need to create a margin. We need smart sourcing and smart buying; vendor categorisation and classification – this is nothing new, but it takes time to do it well.”

“This time last year, IGT had 70% expat staff, now we have 70% local staff,” continued Kapur. “We have outsourced selectively and fostered a large local ecosystem of contractors, encouraging our partners to invest in and build local teams. We have invested in a state-of-the-art tower operations centre (TOC) and in site technology which has enabled us to achieve the best uptime in the industry (recognised on several occasions by Telenor).”

IGT Chairman Arun Kapur felt that the innovations in power systems and business models would be the primary sources of efficiency. “Energy business model innovations will be crucial from a fundraising and capital structure point of view. MNOs started by outsourcing towers+power to towercos, and now we’re talking to several powercos who could buy out all our power assets, introducing liquidity and reducing the burden to raise further capital.”

“I’ve seen the capital cost per tower in Myanmar already come down by as much as 40%, over a third of which is still the power system. The power systems alone on the next 2,000 towers could cost US$50mn, so innovations in both power system technologies and business models will be critical,” concluded Kapur.

Arun Kapur, who is a member of TowerXchange’s ‘Inner Circle’ Advisory Board, and Ayad Chammas will both be representing IGT at the 2nd annual TowerXchange Meetup Asia, taking place on November 24 and 25 at the Marina Bay Sands in Singapore. For more details visit www.towerxchange.com/meetups/asia.
Miteno: A market leader in the Chinese tower industry

Miteno shares some insight into their plans for the Chinese tower market, and international expansion

With the formation of the record-breaking China Tower Company fast approaching, international investors are watching closely to identify new opportunities for investment. As huge as China Tower Company may be, there are still independent tower portfolios in China, comprising an estimated 15-20,000 towers. We spoke with Zhiyong Zhang, Chairman and President of one of the leading independent towercos Miteno to learn about the independent tower market in China and its ecosystem.


Read this article to learn:
- Miteno’s background, development and business model
- The scale and structure of the Chinese tower ecosystem
- Grid access and hybrid energy in the Chinese market
- The impact of the creation of China Tower Company
- Miteno’s long-term growth strategy

TowerXchange: Could you introduce your company and give us an idea of your position in the tower ecosystem?

Zhiyong Zhang, Chairman & President, Miteno: Miteno was founded in 2004 and formally came into operation in 2006 as a designer and manufacturer of communication towers. We gradually branched out into the operation and maintenance of communication infrastructure. Before the establishment of China Tower Co., Ltd., Miteno was a leading vendor for China Mobile’s national central purchasing, the country’s largest telecom carrier. It can be said that Miteno is a market leader in China in the design and manufacture field of communication towers.

TowerXchange: Could you give us some insight into your business model evolution?

Zhiyong Zhang, Chairman & President, Miteno: Miteno was listed on the domestic GEM as an ‘A Stock’ only four years after we came into operation, a testament to the company’s advanced business model. Though in theory Miteno is in a traditional manufacturing industry, we designed an innovative model for communication tower provisioning, which integrates all resources of this traditional manufacturing industry on one operational platform. Under this model, we highlight our brand value by enhancing our technological edge to focus on design. Under strict management, we outsourced most of our manufacturing, which would otherwise require heavy asset management.
Our business focus has gradually shifted to communication tower operation, i.e. leasing communication infrastructure to telecom carriers. Miteno owns a network monitoring platform for tower operation, which not only tracks the status of the tower in real-time, but also gathers other data through extra interfaces, such as video monitoring and environment monitoring. When our towers reach a certain number, this platform will yield a huge network value.

TowerXchange: Can you provide some specific detail on the scale and structure of the ecosystem of privately owned towers in China and how that segment of the market will be affected by the creation of China Tower Company?

Zhiyong Zhang, Chairman & President, Miteno: Currently the number of privately-owned towers in China is around 20,000. Half of them belong to big players like Miteno, the rest of them are scattered and operated by hundreds of private companies throughout China. These independent companies will benefit from the creation of China Tower, because leasing towers from a third party is feasible for wireless carriers. For Miteno, we are participating as a tower consolidator, trying to lease self-owned towers to more tenants. Our strengths lie in tower design, manufacture and installation.

TowerXchange: The tower industry varies considerably from country to country; can you give us an idea of how tower sharing and tower leasing work in the Chinese market?

Zhiyong Zhang, Chairman & President, Miteno: A few years ago, the vast majority of communication towers in China were constructed by state-owned telecom carriers. These assets were later divested to the newly founded China Tower Company, allowing the carriers to co-construct and share the communication infrastructure through administrative means. Private owners across the county also have a small number of communication assets, offering equipment lease services to telecom carriers.

TowerXchange: What is the cost of building new towers compared to the cost of leasing towers in the Chinese market?

Zhiyong Zhang, Chairman & President, Miteno: The situation varies in different areas, and relevant statistics are not forthcoming as lease services have just begun.

TowerXchange: What is the extent, quality and availability of the electricity grid in the Chinese market? Can you give an idea of what percentage of towers are off-grid? Who owns the power equipment when a site has multiple tenants?

Zhiyong Zhang, Chairman & President, Miteno: It can be said that 99.9% of the communication towers in China rely on fiber-optic communication and on State Grid Corporation of China for power supply. Power supply is never a problem.

TowerXchange: The GSMA has stated that there are 35,000 instances of hybrid and renewable power being used in China. Are these solutions used for off grid towers? Do Miteno’s towers use hybrid and renewable energy solutions?

Zhiyong Zhang, Chairman & President, Miteno: Hybrid and renewable energy are used in China only as backup power supply. Government owned mobile carriers have strict design requirements on towers; very few off grid towers exist. We are
introducing new backup power solutions with better cost performance.

**TowerXchange:** The transfer of over one million towers to China Tower Company is unprecedented in the global market. What impact do you think this will have on the Chinese tower market?

**Zhiyong Zhang, Chairman & President, Miteno:** There are three major positive impacts. First, it changes the KPI assessment mechanism of telecom carriers so that they can fully focus on their core business. Second, it shifts infrastructure investment from capital expenditure to operating expenditure in recognition of the third party leasing model. Third, such recognition provides broad space for the development of private capital, thus creating a completely new industry chain in China.

**TowerXchange:** What is Miteno’s long-term strategy, both in the domestic market and internationally? Do you have plans for international growth?

**Zhiyong Zhang, Chairman & President, Miteno:** As a listed company committed to meeting the needs of capital market, we have made “going global” one of our strategies. Miteno’s strengths lie in the tower design, manufacture, installation, operation and maintenance of the communication tower, as well as in financing capacity. We will also receive the support of national policies in exploring the international market.
An insider’s view: how the tower market works in China

The first independent towerco in China, Q Towers, seeks to create transparency and increase the invisibility of Chinese towers

China is about to make international headlines in the telecom press when a million towers, rooftops and DAS are transferred from China Mobile, China Unicom and China Telecom to the recently created China Tower Company (CTC), representing the clearest indication to date that China has embraced infrastructure sharing. What readers may be less aware of is the fact that there are around 15,000 independently owned towers in China. With abundant organic growth opportunities, the Chinese independent tower sector could represent an interesting opportunity for international investors, if those investors can comfort themselves that the market offers sufficient transparency. TowerXchange and Q Towers’ CEO Ted Zhong are on a mission to create that transparency!


Read this article to learn:
- What is the size of the Chinese tower market and how many towers are independently owned?
- The implications of the creation of CTC for China’s independent towercos
- ‘Permitting’, land ownership and protection of the area around towers in China
- The need for a benchmark of the value of Chinese towers as ‘pledge-able assets’
- The current limitations of the Chinese capital markets as sources of finance for Chinese towers, and the opportunity for international investors

TowerXchange: Ted, Please introduce yourself and Q Towers.

Ted Zhong, CEO, Q Towers: I’m a telco veteran with 15 years of executive experience. Before I founded Q Towers I was with China Netcom, a nationwide telco later merged into China Unicom, and Wasu Media Network, a listed carrier similar to COMCAST.

Q Towers was founded in 2007 and has been the pioneer of introducing tower business to China. So far we have 100 ground based towers (GBTs) and 20 rooftops with an extraordinary tenancy ratio of 2.8.

TowerXchange: Please introduce us to the Chinese tower market; we’ve heard reports that there are 1-1.3mn towers, of which China Mobile currently own around half, with Unicom on 30% and Telecom on 20% – before the assets are transferred to China Tower Company (CTC). Are we about right?

Ted Zhong, CEO, Q Towers: If we say 1-1.3mn BTSs rather than towers, then the numbers are correct. Unfortunately Chinese carriers did not distinguish their BTSs as towers, DAS or rooftops historically. We can only estimate that half of them are towers.

TowerXchange: How complete is coverage and the progress from 2G and 3G to 4G, and the associated network densification? At what rate are new towers being built?

Ted Zhong, CEO, Q Towers: Most new build towers in China are monopoles – they consume less land and look prettier!
**Ted Zhong, CEO, Q Towers:** Unlike anywhere else in the world, the Chinese carriers do not allow subscribers to roam between each other’s networks. That’s why all three wireless carriers here need complete coverage, and they have achieved that.

For instance a Provincial capital city in China would require one to two thousand new builds of BTSs and at least half of them would be GBTs. There 30+ cities like this and hundreds of cities with lower numbers. Coverage in China is at 98%+ percent, which is rare in the rest of the world, and densification builds are seemingly endless.

Since all three carriers in China were SOEs (State-Owned Enterprises), they have a mandate to provide 100% geographical coverage. Even for remote areas with few subscribers.

**TowerXchange:** I understand that Q Towers were pioneers in the creation of an independent tower market. What is the structure of the Chinese tower market before and after CTC? How many independent towers are there and who owns them?

**Ted Zhong, CEO, Q Towers:** Before CTC was established there were only a few private tower operators in the market with small portfolios. The total number would have been around 2,000 nationwide. After CTC made its grand entrance, hundreds of small towercos popped up throughout the country. My assumption would be that they own around 15,000 towers in total.

**TowerXchange:** What are the implications of the creation of CTC for China’s independent towercos?

**Ted Zhong, CEO, Q Towers:** The creation of CTC has removed couple crucial obstacles for independent towercos.

1. It validated the market.
2. It forced the carriers to change their budgeting system at a corporate level: no more capex and lots and lots of opex. This broke the glass ceiling we once had with all carriers when their total expenditure on leasing sites exceeded their opex capacity.
3. CTC will soon settle a valuation and risk control benchmark for all financial institutions in China. This will allow us all to access more affordable debt, and will ensure the recognition of towers as pledgeable assets.
4. CTC is offering US$80,000 to acquire towers from the market, so there is one more exit for us.

**TowerXchange:** Is that a standing offer of US$80,000 per tower regardless of the tower cash flow generated per site? It sounds like an attractive offer for some towers, but not a great offer if you have a tenancy ratio of 2.8!

**Ted Zhong, CEO, Q Towers:** Right now CTC don’t seem to care how many tenants are on a tower – they’re offering to buy existing sites because they are struggling to meet the targets set by the carriers’ search rings.

CTC was contracted to build 120,000 new towers.
but I would estimate they only have capacity to build around a third of those sites. 120,000 is a huge number for a new company to build, so the industry is turning back to independent developers to supplement their capacity because they realise they can’t put all their eggs in one basket. CTC is looking for every possible opportunity to fulfill the search rings, for example, if they can use one operator’s tower to fulfill another operator’s site requirement, they will co-locate even though the existing towers haven’t been transferred to them yet.

**TowerXchange: When do you think the transfer of China Mobile, China Unicom and China Telecom’s existing towers to CTC will actually take place?**

**Ted Zhong, CEO, Q Towers:** A press release suggested the legacy tower assets would be injected into CTC by the end of August 2015, The asset registers probably need to be audited and cleaned (which is why it’s impossible to provide an accurate tower count for China), so I think full integration will be at least one year from now.

**TowerXchange: Can you still build towers independently? Can you acquire other towercos?**

**Ted Zhong, CEO, Q Towers:** The truth is everyone is building towers and leasing to all three carriers as we speak.

It is natural for carriers not to put all their eggs in one basket. Besides, records show that CTC can barely deliver a third of the required new builds. That leaves us a huge gap in the market for independent towercos to grow.

Yes we can acquire other towercos. In fact if I wasn’t capital constrained, I would have acquired decent assets with a tower count of several hundred already.

**TowerXchange: Are we right that China Mobile has not shared much infrastructure, but Unicom and Telecom have shared on a case by case basis, meaning few towers have multiple tenants on them in China?**

**Ted Zhong, CEO, Q Towers:** Yes.

**TowerXchange: What kind of tenancy ratio growth has been achieved in China?**

**Ted Zhong, CEO, Q Towers:** Q Towers has 2.8, but it is not realistic to expect to sustain such high tenancy ratios at a large scale. We believe a tenancy ratio of 1.8 – 2 is a realistic near term goal for independent Chinese towers.

**TowerXchange: What lease rates are typical in China?**

**Ted Zhong, CEO, Q Towers:** Lease rates are consistent in China. In well-developed areas,
lease rates are around US$800-1,000 per carrier per platform per month. In remote areas it’s US$650-700 per carrier per platform per month. Once CTC settles pricing guidelines, the rent may rise higher than historical numbers.

Each carrier does not need just one platform because each carrier runs multiple networks and needs multiple tenancies. So whereas in the U.S. each carrier might need only one RAD centre, China Mobile alone owns three different networks which require three different platforms. Admittedly towercos don’t usually charge 3x, providing a discount for purchasing in bulk.

**TowerXchange: What business model is operated by Chinese towercos; steel and grass or full service inclusive of power?**

**Ted Zhong, CEO, Q Towers:** Our position is analogous to that of a landlord. There are three components to the service we provide: tower, shelter and connections to the electricity grid, and we sometimes use them as bargain chips – if you want lower rental rates, maybe we exclude one of the services. We have limited responsibility for security: we provide the shelter, but anything outside the shelter remains the tenant’s responsibility, not the tower operator’s.

We don’t provide backup batteries, diesel generators (DGs) or air conditioning; these remain the responsibility of the carrier. Although I’ve never seen an onsite DG – the Chinese operators all have portable backups, and almost all sites are on grid.

Frankly I’ve not seen a country that enjoys such reliable power supply in Asia.

**TowerXchange: Is it quick and easy to get a permit to build a tower in China?**

**Ted Zhong, CEO, Q Towers:** Compared to a tower market like the U.S., there are less specific permitting requirements in China. Permitting a tower in the U.S. is subject to a zoning system which my American friends describe as a “long and painful road!” In comparison, the process of securing permission to build a tower in China has never been as strict as in the U.S.; there is no specific permitting process for towers in China. This is because historically telecom companies were SOEs, so there was no such thing as permitting, they would just build. There are still urban planning regulations of course, but the government still treats Chinese MNOs like insiders.

There is no registration system that says a tower operator owns land, or that title can be exchanged, indeed lots of people build telecom towers in China without following any procedure, and the reality is that many of the existing towers to be rolled into CTC have not followed a procedure, but they will still be fine.

However, Q Towers and members of our consortium of the country’s leading independent towercos all follow a code: we all secure urban planning permission and certificates of rights of way, which we feel represents best practice in China. We’re hoping the creation of CTC will raise the bar for independent tower operators by instigating a more formal, specific process for permitting telecom towers as CTC’s assets need to be run through the risk management processes of banks.

**TowerXchange: What do our international readers need to know about land ownership and urban planning in China?**

**Ted Zhong, CEO, Q Towers:** Legally the Chinese government owns all the land, but usually they will rent or sell certain usage rights to all kinds of entities, including SOEs and private companies. So it’s not the land owner but the usage rights owner who has to be negotiated with and paid if you want to build a tower.

Even if the usage rights owner signs a contract, legally you still need the permission of the government, so you must apply to the local Urban Planning Bureau (similar to the Zoning Board in the U.S.). As in many tower markets, if you have right connections you are more likely to get the answer you are hoping for! It remains more challenging to secure approval to build towers in urban than in sub-urban and rural areas.

**TowerXchange: How is the area around a tower protected to ensure that, for example, another towerco cannot build a tower across the road from yours?**

**Ted Zhong, CEO, Q Towers:** I feel the protection of tower assets in China is greater than in India,
for example, where it seems you can build almost anywhere. Chinese towers are protected by local and central government.

Local government has the capability to protect against the building of parallel infrastructure. A department which you might translate as ‘City Administration’ can issue a notice to tear down an unpermitted site over the road from an existing tower, or they can intervene directly to prevent the build.

Central government protection provides even more robust protection of cell site locations. All carriers and their senior executives are appointed and managed by the government; there is a department SASAC who says who goes where and who stays – they’re ultimately the entire Chinese telecom industry’s boss. That department has issued a directive that essentially translates as anybody who overbuilds towers – the person who is responsible will be removed from their post and will not regain their position for the next three years.

The Chinese government, your boss, is telling you if you build parallel infrastructure, then kiss goodbye to your career!

I haven’t encountered any overbuild in China since then.

TowerXchange: What is the ownership structure of Q Towers? Can international entities participate in the Chinese tower market?

Ted Zhong, CEO, Q Towers: Q investments owns 90%+ of the company while TZG and a prominent US tower entrepreneur (personally) owns the rest.

We have been active in the tower business for eight years and we have encountered no regulations to prevent us from securing foreign direct investment.

TowerXchange: Why is Q Towers primarily backed by international investors as opposed to by the Chinese capital markets?

Ted Zhong, CEO, Q Towers: The Chinese capital markets lack maturity; they are severed from the rest of the world, more politically dominated.

Consider the two most obvious ways to finance a tower company: debt and equity. Your cheapest option is securing debt direct from a bank, but if the bank does not accept your main assets, telecom towers, as pledge-able assets, then raising debt is not an option.

The other option is through equity. If you want to issue a public offering and get listed in China, the first requirement is that your company has to be profitable. Yet an expanding towerco typically doesn’t achieve profitability for several years. While the tower industry is recognised internationally as a sound platform for debt funded acquisitions, the requirement to be profitable means an IPO is a dead end for many Chinese towercos too.

Venture Capital and Private Equity firms here have no idea what the tower business is – most have same ideas as banks: if the company is not immediately listable in China, it’s not investible. Even when those investment firms call their headquarters in the US, back there they have concerns about a perceived lack of scalability and transparency of Chinese telecom towers.

TowerXchange: What does it cost to build a typical Ground Based Tower in China? And are
there any benchmarks for the value of a Chinese telecom tower?

**Ted Zhong, CEO, Q Towers:** The average cost for tower and its foundation should be US$48,000. We need a benchmark for the valuation of Chinese tower assets to provide proof and recognition of their value to banks.

CTC has the aforementioned standing offer to acquire towers for US$80,000 each, but that does not take into account tenancy ratios, lease rates and the quality of the assets, so it’s not a good benchmark.

I would expect the spinoff of CTC to be finished by the end of this year, which would suggest an IPO by 2017. Before that they will get huge loan from the Chinese National Development Bank, backed by a pledge of their own tower assets. That will set a benchmark for valuation of towers as pledge-able assets. Until Chinese banks recognise telecom towers as pledge-able assets, they don’t know how to sell them and they don’t know what they’re worth.

**TowerXchange:** How are Q Towers and your peers in your consortium seeking to create the scale necessary to attract ‘smart money’?

**Ted Zhong, CEO, Q Towers:** We are currently working on an idea to form an investment vehicle under which we can place 500-800 towers from various high quality, legally sound and robustly constructed independent Chinese tower portfolios, which together expect to grow to over 1,000 towers in the next six months. That investment firm would then have a track record of building and rolling up a substantial portfolios of Chinese towers.

There is the possibility of integrating these portfolios into a single trading entity, indeed all the members had at one point been prospective acquisition targets for Q Towers, but whilst we continue to try to secure the right capital to aggregate towers, the other companies have continued to operate by themselves and have done well.

Ultimately I feel that any of us fighting alone can’t win the war, but together we would represent a very profitable combination for a foreign investor looking for a growth opportunity with a potential future exit strategy either domestically to CTC or perhaps to an international towerco like American Tower, Tower Bersama or Digital Bridge.

**TowerXchange:** Having spoken to several international investors with a track record of investing in telecom towers, it seems that the number one concern when it comes to evaluating opportunities in China is a lack of transparency.

**Ted Zhong, CEO, Q Towers:** I’m not surprised. Few Chinese tower companies have English language websites, and there is limited information available on CTC.

We’re hoping to bring a delegation of stakeholders in the Chinese tower industry to the TowerXchange Meetup Asia this year to meet with the international community, to share best practices, and to share our insights into the investibility of Chinese towers.

**TowerXchange:** Please summarize your vision for the future of Q Towers and of the Chinese telecom tower industry.

**Ted Zhong, CEO, Q Towers:** The Chinese tower market is facing its first gold rush. However the local capital markets were not completely ready to lead the first round. There is a great window for seasoned international investors to take the lead and support the first wave of consolidation.

Comparing China with India, the regulatory environment, the infrastructure, the scale, and value chain have much in common. I have strong reasons to believe that China will lead the global market both in terms of size and valuation (CTC will be listed in China and the Central Government and MNOs as share holders/customers will be happy to see a really high valuation).
Viom’s end to end tower and infrastructure services vision

Viom Next separates ‘AssetCo’ from ‘ServiceCo’

TowerXchange fields an ever-increasing volume of calls from investors wanting our view of the tower market in a particular region, or the investibility of a particular towerco. One question the investors always ask us about is the appetite of towercos for provision of infrastructure and infrastructure services beyond towers – and most of the time we have to manage their expectations. Last mile fibre, backhaul services, microcells, small cells and DAS, even power services might be opportunities for the future, but most towercos remain focused on the core tower business.

There are a few market-making visionaries who propose a more diversified set of end to end services and infrastructure provision, but perhaps the most complete vision beyond the tower is found at Viom Networks, specifically within their ‘Viom Next’ team. TowerXchange asked one of the architects of Viom Networks, Ravinder Badwal, Head of Emerging Business, for an in-depth overview.

Keywords: 3G, 4G, Asia Insights, DAS, Editorial, IBS, India, Market Overview, M2M, Microcells, ServiceCo, SON, TD-LTE, Viom Networks, Viom Next, Wi-Fi

Read this article to learn:
- The evolution of in-building wireless platforms
- Meeting the rapid increase in data demand in India
- 2G, 3G and 4G penetration in India
- The potential for Wi-Fi hotspots to increase coverage
- Creating end-to-end managed services

The convergence of networks

Convergence is where opportunity and innovation meet to deliver real value to millions of people. The telecom industry is on the cusp of a seminal change, and the Indian telecom industry making a big shift from voice to data. This trend is being fuelled by the growing popularity of smartphones, tablets, PCs and a host of portable devices. The data revolution is already bringing about a change in lifestyle, empowering people with realtime information and enabling them to be connected anytime, anywhere.

We are witnessing the emergence of Telco 2.0 – a new business model – one where the path forward is not about purpose-built networks but instead converged and integrated solutions that will be more intelligent, scalable and provide more and better coverage.

The convergence of access, carriage and broadcast networks and the focus on converged devices will enable operators to differentiate their products and offerings to various subscribers in a cost effective manner. The possibility of network sharing may reduce entry barriers as new entrants will no longer be required to invest in network build-out. Existing operators, on the other hand, will be able to increase their network utilisation as well as enhance revenues by sharing their network assets.

In-building wireless platforms have evolved to converge multiple wireless operators onto a neutral host Distributed Antennae System. Next-generation DAS architecture will converge even more services...
and applications – both digital and analog – such as cellular, Wi-Fi, public safety and other applications such as RFID, building automation and more. This will be literally a convergence between the enabling of capacity (wireline) and the delivery of communication services (wireless).

The Indian growth story

The Indian telecom industry with its 400,000 telecom towers is the critical support system for the world’s second largest base of mobile subscriptions. A seldom highlighted fact is that the concept of ‘telecom infrastructure sharing’ was pioneered by tower companies in India. This pioneering business model coupled with the largest base of telecom towers anywhere in the world (China notwithstanding), gives the Indian telecom tower sector a unique distinction that is unparalleled globally.

Thanks to the long-term and stable business model, the telecom tower industry has witnessed steady growth, despite the challenges of the past year. We expect that with increased clarity for the telecom operators over the past few months, the network investment cycle will be enhanced in 2015-16 and beyond.

The telecom tower companies are today offering end-to-end infrastructure solutions to the telecom operators. This will help in increasing rural penetration that now stands around 40% and in dealing with the surging data consumption in the urban markets, providing further impetus to the telecom tower industry. Data will be the next growth driver for the Indian telecom industry in the next decade as voice was in the last decade. With the advent of technology such as TD-LTE, a mobile data boom is expected in the coming years.

The telecom tower industry has reached impressive milestones in size and importance, thereby establishing itself as not only a foundation of the telecom industry but also as a contributor to the country’s economic growth. Viom expects to emerge as a beneficiary of India’s sweeping telecom revolution and the evolving demand for data within it.

Mobile towers in India are handling a surge in cellular traffic as operators upgrade for a new generation of bandwidth-hungry smartphones and tablets. Some of that anticipated growth may come from additional users and more connected devices, but most of it is predicted to come from an increase in traffic per connected device as users demand more and more wireless data. The new traffic translates into soaring growth prospects for tower operators.

Reports predict wireless network traffic to grow another ten times over the next five years with about 75% of this growth expected to be delivered over traditional macro sites, primarily towers. In-building solutions (IBS), Distributed Antennae Systems (DAS) and other small cell installations are projected to support the remaining 25%.

With over 70% of data consumption in urban India happening indoors, in-building solutions (IBS) in the form of micro-cellular technologies such as picocells and femtocells that create small-footprint cell sites within buildings, enable more effective coverage within the premises. With the growing demand for anywhere connectivity, IBS is gaining momentum. Operators use DAS and/or IBS to address issues related to poor wireless reception in indoor environments.
Addressing the Cellular Data Gap

While the urban areas witnessed a shrinking IT device business, this was balanced with the growing adoption of smartphones which are driving the increase in demand for data. The rural areas along with Tier three and Tier four cities were seen as the main drivers for both PCs and phones which highlights the need-gap for much awaited growth in more remote areas of India. The potential of masses living in the hinterland and their inclusion in the mainstream economy can only be imagined when they are equipped with connectivity and functionality to use the public and business services like e-sewa or e-commerce platforms.

With emerging trends like mobile platforms accounting for 41% of e-commerce sales in 2014 it is clear that customers are ready to adopt mobile devices. Mobiles accounted for around 70% of leading e-commerce platforms orders; e-tailers are graduating from desktop sites to app-only models and many more will follow the cue, indicating how the retail sector will evolve through increased connectivity.

The telecom industry is optimistic about the emergence of mobile data usage; we expect that an improved data experience through the use of smartphones will widen mobile data traffic. For instance, there was a 74% increase in mobile data traffic generated by 2G and 3G mobile broadband services in 2014. The growth was primarily driven by robust 3G growth (114%), despite only about half of the 130 million subscribers consuming data using 3G enabled devices (expected to clock 123.3mn in 2015). Currently India’s 3G coverage on average is about 30% of its 2G coverage, which indicates immense potential for expansion of 3G services on 900 MhZ or 2,100 MhZ for nationwide availability and quality of mobile broadband.

Similarly, in 2014 India ranked as the number one in new internet users, having added 63 million users by end 2014. India appears to be covering ground by rising from its third position (232 million Internet users, after China and US) through significant 37% growth over the previous year.

With fixed or mobile internet readily available, it is only a matter of time before it becomes the norm for the public to expect internet access as a basic necessity. Easy and cost effective access is the key to the internet economy. At present, only 10 million individuals have access to Wi-Fi at home or in the office, thereby leaving enough growth room that can be filled in by innovative solutions such as Wi-Fi hotspots. In India, nearly 400 municipalities are likely to deploy Wi-Fi hotspots by 2018, and that would scale up to 2 million hotspots by 2020.

Capitalising on the above trends as the ISPs grow their base and cellular operators surpass 3G towards 4G deployment, we foresee increased data demand coupled with need for high network quality, which will make it an imperative for infrastructure to grow, provide seamless operations and select the right network elements – the area where Viom has an expertise.

Harmonising technology, another important axis, has been at the core of sustaining new patterns. The colossal subscriber growth puts pressure on serviceability and quality of connectivity as there is uneven growth for telecom operators where they currently have a lean base.

In addition to deploying a high-speed mobile broadband network across India, the industry is expected to enhance efficiency and subscriber experience. With more 3G and 4G networks available, subscriber expectations of quality mobile data accessibility will increase. The result is that India will need to deploy more small cells for a seamless telecom experience in high density areas, use intelligent geo-location and 3D mapping-based technologies, graduate to self-organising networks (iSON) and evolve network management by not only looking at base station KPIs but also ‘service management’ or end-user service KPIs.

Viom’s advantage as an end-to-end telecom infra player

As a leader it becomes pertinent to stay ahead of the technology curve and maintain the competitive advantage. Hence, playing on our strengths like IBS, small cells, et cetera and pursuing the new deployments like Wi-Fi hotspots will be the key to success. By the virtue of being an independent and agnostic tower company, we stand in a better position to push the charter of sharing and connected towers and plug the gap as managed service providers. This is augmented by our technology operations platform or Business-Process-
as-a-Service (BPaaS) that provides a strong reason for us to be the partner of choice now and in the future. At Viom, we have ready capability and tested models to meet the increase in mobile subscribers and sustain the interest of our clients in the telecom industry.

Connected towers in the form of fibre-led backhaul and tower companies offering the tower plus fibre solution to telcos will be a trend in times to come with data demand surging and customers wanting a seamless data experience. In addition, the PoP or Point of Presence concept will also gain momentum with tower companies managing all the site elements in a comprehensive manner.

Viom’s interest is in the managed services space where it may operate as a ‘ServCo’ and not necessarily as an asset company; to be both asset-light and be a world class ‘ServCo’ at the same time.

**The tech edge**

On the technology front, we have changed our whole world at Viom Networks, literally. We have set up a clear technology roadmap which delivers end-to-end connectivity, from all our towers right to the billing system we use for our customers which is very different from the current industry standard.

We are focussing on deploying instrumentation on the sites to capture in real time information on availability, asset health and field force data through M2M (machine-to-machine) interfaces, using technologies such as event correlation and aggregation for situation detection. We are eventually moving towards ‘Big Data’ which will be the heart of our tower operations center and will ensure enhanced reliability for the telcos.

At Viom Networks, we are working on integrating our data streams into SAP based core ERP (enterprise resource planning) modules, which will complete the back office, accounting and financial processes – thus, creating a digitally unified, integrated enterprise solution. Some of our innovations will not only be the first for a player in India, but perhaps first globally.

Owing to our innovative approach to managing operations with initiatives such as the use of handheld devices, RFID tagging and more, Viom’s uptime has seen an increasingly upward trend. This well-constructed technology roadmap that leverages data analytics and a mobility platform for informed decision making and interventions has further elevated our competitive advantage and helped us manage cost, report real-time field incidents and track account receivables seamlessly.

**The mobility-driven platform**

With the objective of improving site operations by streamlining the end-to-end business processes through embedded mobile technologies, Viom has built mobility applications wherein the asset managers can register their attendance, do preventive asset management, and raise a ticket if any equipment is not functioning at the site. The end-to-end process is automated with workflows, alerts and to-dos or notifications, which helps the field workforce to do its work more efficiently and economically with a better preventive maintenance schedule and compliance. The field workforce is able to complete all its activities using handheld devices which are integrated into the backend SAP system. This platform helps in better preventive maintenance, asset lifecycle management, and compliance and eventually it helps in improving site uptime.

The project that went live on October 1, 2014 is a classic example of frugal engineering. The organisation developed the project on hybrid architecture keeping the development and architecture cost low to make it easily scalable. The platform was built in-house on an open source platform. As a result, the mobile platform is serving everything up to the field workforce in record time.

Site asset health improvement is a major benefit; prior to implementation uptime was 99.91%. Now it has increased to 99.97%. Asset movement tracking has seen a significant improvement; service request closure used to take 21 days now it has come down to 10 days. Since these devices are location-based, it is easy to know how many sites the field workforce has visited, number of asset maintenance completed per day, per week. It has created more visibility into the system and preventive maintenance compliance has improved from 75% to 95%. Now that the basic modules are in place the next step for Viom Networks is to build smart analytics which can help in proactive decision making and closely track operations performance.
A guide to the Thai telecom tower market

AEC Advisory maps the shifting landscape as Thailand’s BTO regime gives way to a new era of tower companies

As Build Transfer Operate (BTO) agreements conclude, Thailand appears to be on the brink of resolving long standing tower ownership disputes through the formation of what is likely to be three groups of tower companies. TowerXchange connected with AEC Advisory Co-Founder and Managing Director, Dominic Arena, who has extensive experience of working with operators, investors and government stakeholders, to understand who owns what, and what the future could hold for Thailand’s telecom towers.

Keywords: 4G, AEC Advisory, AIS, Asia, Asia Insights, Batteries, Build-to-Suit, Business Case, CAT, Capacity Enhancements, Carve Out, Co-locations, Construction, DIF, DTAC, Deal Structure, Decommissioning, Densification, Hybrid Power, Infrastructure Sharing, Insights, Lawyers & Advisors, MNOs, Market Forecasts, Market Overview, On-Grid, Operator-Led JV, Regulation, Renewables, Rooftop, TOT, TRUEIF, Telenor, Tenancy Ratios, Towercos, True, Valuation

Read this article to learn:
- How the concession / BTO regime has hampered the development of Thailand’s telecom and tower markets
- What we know about the structure of the three towercos which are set to resolve ownership disputes
- Factors affecting the valuation of Thai towers
- Co-location to date, the impact of current and future spectrum availability on demand for towers
- The availability of fibre and grid power in Thailand, including the opportunity for renewables

Dominic P Arena, Managing Director, AEC Advisory: I am co-founder and MD of AEC Advisory; a corporate advisory firm, primarily focused on the TMT, Digital Applications and Service, Energy and Government sectors. Our clients include telcos, satellite operators, tower companies, media operators, governments and regulators, and investors.

Our services include market entry analysis, feasibility studies, restructuring, M&A advisory and post transaction support as well as policy and regulatory work with government ministries and agencies.

Our focus is the ASEAN region, but our clients are expanding our regional remit – we go where they take us. For example, we have recently been working for one of our clients in China and even as far afield as a license application in Iran.

I started in the industry 21 years ago as a telecoms engineer with Vodafone Australia and later joined KPMG Consulting in 2001 when we came to Asia to help launch a mobile operator joint venture. I’ve lived in Singapore and Thailand for most of the past 15 years, working all across Asia including in Australia with KPMG Advisory where I was the responsible Director for the telecom and media business advisory practice. Post KPMG, I was the
Regional Director for BT’s consulting business across the Asia Pacific region and prior to co-founding AEC Advisory, I was the Managing Partner for Value Partners’ South and Southeast Asia corporate advisory business up to early 2014.

**TowerXchange: Please introduce us to the telecom tower market in Thailand – it seems to be quite politicised by the BTO ownership dispute. Who owns what? What are the network characteristics?**

**Dominic P Arena, Managing Director, AEC Advisory:**

You are correct; the Thai telecom towers market is quite complicated by the legacy BTO arrangements. The concession / Build – Transfer – Operate (BTO) regime was adopted in the 1990’s to drive the development of the Thai mobile market. Whilst at the time it probably seemed like a reasonable approach – by offering private, efficient companies the chance to build important infrastructure using the spectrum rights and licences of the inexperienced and inefficient State Owned Enterprises – it is fair to say that the development of the mobile market in recent years has actually been hampered by this concession / BTO regime as they entered their sunset years.

Under the regime, 25 year concessions to build and operate nationwide 2G networks were given to three mobile operators – True (now owned by CP Group and China Mobile), AIS (now Temasek/Intouch and SingTel) and DTAC (Telenor plus local investors).

In return for the concessions, the operators entered into a 20-30% top line revenue share agreement with the state owned concessioners – CAT Telecom (for the 850 and 1,800MHz bands) and TOT (for the 900MHz band) and committed to return the ownership of their ‘networks’ to the state agencies.

As the concessions now expire (the only concession active beyond September is between DTAC and CAT Telecom, which expires in 2018), the suboptimal design of the BTO concept has become apparent.

People are now wiser to the long term value of network assets, especially towers and transmission, and the operators do not want to give ownership (and operational management) of their network back to CAT and TOT. The 2G active equipment itself has little value, but the towers and other passive assets still have considerable retained value. Since all the customers remain with the private operators (who have all now purchased licensed spectrum and also built some of their own towers outside of the concession regime) they want to own and operate those assets, and have argued that passive assets such as the towers did not constitute ‘network equipment’ to be returned under the BTO.

The initial response of both the operators and the state owned entities (SOEs) was enter into legal dispute processes to resolve the ownership issues, however given Thailand’s ambiguous BTO contracts, complex legal processes and many layers of telecommunications related laws (which have seen the SOEs argue for post-concession rights embedded in previous constitutions and regulations prior to the formation of the National Broadcasting and Telecommunications Commission), there was little chance of any agreements being reached for several years, leaving the entire industry in limbo with billions of dollars in stranded assets and billions more in duplicate investment being planned (and deployed).

However, over the past year consensus has been reached that a commercial solution rather than a legal solution is the only way to resolve the ownership disputes.

As a result, all operators, private and SOE, are currently negotiating and putting in place agreements to release their tower assets into joint ventures in order to avoid stranding those valuable assets and wasting more capital, while at the same time providing a means for the nearly bankrupt SOEs to enjoy some sustainable long term revenues to cover large employee welfare entitlements.

DTAC has reportedly almost reached an agreement with CAT for their 11,000 towers under concession - in return for the cancellation of all ownership disputes, wherein CAT will become the 49% shareholder in a joint venture with DTAC who will own the remaining 51% share. The Board of CAT has already acknowledged the JV as the logical way forward.

Similarly, AIS are reportedly attempting to do the same - a JV with TOT for their 12,000 towers under concession, although they appear to be a few steps behind in timing.
Last year, True listed the True Telecoms Growth Infrastructure Fund (TRUEIF, now known as DIF) on the Stock Exchange of Thailand (SET) for around US$1.8bn into which they injected all their non-concession tower and fiber assets – and they are reportedly seeking to inject their 7,500 towers under dispute with CAT into the fund in return for giving CAT a shareholding, as yet to be determined.

Therefore it is likely that we shall soon see three tower companies operational in Thailand – CAT / DTAC, AIS / TOT and DIF (already operational and paying handsome dividends of over 7%).

It’s important to recognise that each of the operators have built towers outside of the concession framework, as illustrated in figure one.

**TOWERXCHANGE: THE JV STRUCTURE SEEMS COMPLICATED; ESPECIALLY IN TERMS OF TOWER VALUATION.**

**Dominic P Arena, Managing Director, AEC Advisory:** Valuation of towers in Thailand is a complicated issue. It is worth scrutinising the DTAC / CAT joint venture in more detail to see the difficulties in assessing value.

Typically in Asia, US$100,000 to US$150,000 per tower is the valuation norm. Based on public information, in the DTAC / CAT venture, the entry value per tower will be well below this range even including the fact that the transaction also includes fibre transmission. Even given that CAT will receive dividends from the venture, compared to typical tower valuations the asset valuation in the JV seems low, something resembling replacement value only.

There are two main reasons why the value per tower may be lower than the norm. Firstly, DTAC has already paid for the towers once when they built them. Secondly, and this is the main reason; DTAC is the single and only anchor tenant on the towers so the tenancy ratio for valuation is likely to be 1.0.

Therefore, it looks like a ground zero valuation at the replacement cost of the towers. But also note that most of the towers in Thailand were constructed as single tenant towers due to the BTO regime, hence it is also likely that lots of improvement capex will be required for retrofitting and strengthening for multi-tenant sharing of these assets.

In addition, there is a significant overlap in tower locations. I recall 14 years ago when I came to Thailand to help launch the TA Orange network, being the third entrant using the same 1.8GHz spectrum band as the second player, their network plan largely resembled that of DTAC wherein the towers were built in close proximity.

Valuations for the towers outside the concession process, designed from the outset for multiple tenancies and built by AIS, DIF or DTAC for example, could attract valuations per tower within the

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**Figure One: Estimated Tower Ownership in Thailand**

- Proposed DTAC-CAT towerco
- DTAC towers built outside concession
- AIS disputed towers built under CAT concession
- Potential AIS – TOT towerco
- AIS towers built outside concession
- DIF (formerly TRUEIF)

Source: TowerXchange
normal range I mentioned.

TowerXchange: How aggressively will DIF, CAT and TOT’s towerco JVs be leasing up the towers?

Dominic P Arena, Managing Director, AEC Advisory: There is considerable upside when you look beyond the current situation with the concession towers. There are three existing MNO players, 4G coming and a potential fourth entrant, and even 3G has only ~50% population coverage and 25-30% landmass coverage, so there will still be demand for towers beyond the roughly 47,500 towers currently in operation.

There could be a need for additional towers up to 66,000 over the next 15 to 20 years given the huge demand for mobile broadband services and lack of FTTH in Thailand.

For these reasons, I believe that the Thai tower market is at that “hockey stick” moment; poised for rapid growth.

We already see this with co-location deals that are happening. First DTAC signed a co-location deal with DIF that covers around 200 sites. Then just in mid August, DTAC signed a second deal with AIS for sharing up to 2,000 towers. The next round of tower sharing deals could be in the multiple thousands of sites.

The prevailing national tenancy ratio is low – currently averaging 1.05x tenancy ratio across all towers and all operators but higher in DIF at around 1.8. The 4G roll out on 1.8GHz next year followed by 2.3/2.6GHz in the absence of 700MHz (due to broadcasting conflicts) and the requirement to cover more of the Thai landmass will drive more sharing.

TowerXchange: Are there opportunities for international investors / towercos to get in on the Thai tower market?

Dominic P Arena, Managing Director, AEC Advisory: I believe that yes you can get in. If you are a brand new player in the market with no existing relationships with an operator then I think it would be very difficult. But if you have prior relationships with the shareholders of the private operators and proven partnerships in other markets, then I think it is possible.

A couple of years ago, some of the regional tower companies came to take a look around but it was somewhat early and still lacking clarity on ownership of the assets, plus they may have misunderstood the mind-set of the Thai stakeholders. AIS, the largest player, has not shown interest in selling towers; AIS has 12,000 towers under concession but have 10,000 other towers that are outside the concession regime which they invested in as parallel capacity, so their mentality to date has been to spend capex (they have low gearing so can easily afford it) and keep control.

Telenor has partnered with towercos in other markets and the drivers for them are different. DTAC has 11,000 under dispute with CAT and only 800 further towers where they have guaranteed tenure as their own. Their motivation is likely less about cash and more about security of tenure and long term efficiency / opex reduction.

With regards to True, their plan is to move all their tower assets in to DIF and even to use the fund as a consolidator of industry assets. As a listed fund, their motivation is driven by fund value maximisation in which they remain the largest single shareholder.

TowerXchange: What are TOT and CAT’s drivers and obligations?

Dominic P Arena, Managing Director, AEC Advisory: It’s important to understand that TOT and CAT’s only profitable income is the revenue share payments from the mobile operators. They are restricted in their ability to streamline their cost base and have little ability to contribute capex to future network investment. They are purely interested in long-term steady income to pay employee welfare benefits.

TowerXchange: What is the regulator NBTC’s position on infrastructure sharing – is there an established regulatory regime governing Thai towers?

Dominic P Arena, Managing Director, AEC Advisory: To operate, tower companies need a license as a telecom facilitator. Obtaining a license is a simple process. You pay a small admin fee and that’s it.
Tower companies are subject to infrastructure sharing regulations, which say you must share towers and also should not build near an existing tower – however such regulations to date have been challenging to enforce in the BTO transitional period.

Also, as a foreign company, any tower investor would be restricted to only owning 49% of the venture.

**TowerXchange: How will future spectrum auctions and next generation network rollouts drive demand for new towers, co-locations and densification?**

**Dominic P Arena, Managing Director, AEC Advisory:** The auctions and next gen network rollouts can only be positive for tower companies. The bandwidths being auctioned will only generate more demand for tower sharing and new tower builds.

The capital city Bangkok accounts for 15% of the total tower stock in country and a large part of those towers are rooftops and not really leverageable for multi tenancy.

30MHz of 1,800MHz and 20MHz of 900MHz are coming to market in spectrum auctions due later this year – the latter for 2G and 3G, 1,800MHz almost exclusively for 4G. 2.1GHz is currently used for 3/4G today and 1,800MHz will be the expansion band.

700MHz still complicated – when digital TV was launched in Thailand it was put in the wrong part of the band so the ITU digital dividend doesn’t currently exist in Thailand.

Therefore we expect that 4G will go on 1,800 and 2,100MHz – that will underpin a lot of demand for additional sites and sharing. 2,300MHz and 2,600MHz spectrum is also coming in the near future.

**TowerXchange: Is there a degree of parallel infrastructure in Thailand? Would decommissioning be part of a towerco play?**

**Dominic P Arena, Managing Director, AEC Advisory:** There is a significant degree of parallel infrastructure and I think there will be some decommissioning eventually, but we’re still in the early stages – as I said, the beginning of the hockey stick.

If we had 700MHz clear around corner we’d have more consolidation because there would be less demand for towers, but with restricted sub-1GHz (apart from 850/900MHz) and data demand growing at over 35%, I anticipate no huge consolidation of parallel infrastructure.

Once the tower JVs are established, the focus will be on how to drive revenues from the existing towers and on what additional sites will be needed for new spectrum. Only after that will there be a focus on what to do with redundant towers – which cost almost as much to decommission as to build.

Only DIF have the vehicle and appetite to be a consolidator and have the financial capability to decommission. The DIF has very little debt (0.18 Debt/NAV) but a high leverage ceiling (3.0 Debt/NAV) so it is only getting started.

**TowerXchange: The traditional market entry route in for an independent towerco would be to acquire a stake in an existing passive network – what about if somebody came with a pure BTS offering? They’d need a local partner, but would that be a credible play?**

**Dominic P Arena, Managing Director, AEC Advisory:** Probably not, as there are a number of good local players building towers in Thailand and they are well entrenched with low costs bases. They are not
towercos so they don’t bring finance or co-location expertise, but they have strong hold on the market.

An affiliate of one of the Indonesian tower company investors tried a build to suit offering approach a couple of years ago, setting up a small local operation but had little success and ultimately pulled out.Were they too early? Not really, because AIS and DTAC were building their own 3G towers then, as was SOE TOT, but it’s just challenging against the local established players.

TowerXchange: The operators are having to pay twice for their existing passive network, CAT and TOT are capital constrained – who is going to finance the next generation rollout? Could someone come in with significant capital to build capacity? If the local players are purely builders, why couldn’t international towercos deploy capital to build a few thousand independent towers and lease them back to the operators?

Dominic P Arena, Managing Director, AEC Advisory: There is nothing stopping them, but cash not a problem for a local player like AIS – they were still making 48% EBITDA margin after paying 25% of their top line revenues to TOT!

 DTAC is somewhat more cash constrained, hence their interest in entering into tower sharing deals. You need to remember that they have over 90% of their towers under the concession regime and in dispute, so when CAT got an injunction to stop them putting 3G and 4G equipment on their disputed towers it somewhat focused them on

Since the 3G rollout, all new sites have been on fibre rings. There is very little microwave backhaul: during tropical storms there is too much fade with microwave, and latency is inadequate for 4G.

The electricity grid in Thailand is very good – blackouts are rare, although fairly regular flash brownouts do occur. For nearly all sites, basic battery backup is more than enough.

The problem does not lie with electricity provision but with cost. Power is extremely expensive in Thailand and is about to get more expensive. Therefore renewable power solutions are definitely of interest, such as solar, wind, hydrogen fuel cells et cetera.

Under the concession regime, there was no real rental market to establish lease rates and power pass through costs, however with DIF the tower rentals are net of utilities which are paid by the anchor tenant (True). If power assets do get wrapped into the JV towercos from concession assets, then we will see whether rental will include or pass through utilities costs. As we know that DIF operates a power pass through, the other towercos probably will be similar.
What are the prospects for towers in Thailand?

The next emerging tower market in Asia or continued uncertainty and political wrangling ahead?

In recent years we have seen South East Asian tower markets develop at pace. Across the region, we have seen the gestation and growth of independent tower companies. Real national and regional heavyweight towercos have emerged such as Tower Bersama and ProTelindo in Indonesia and edotco from Malaysia.

However, Thailand seems to have been overlooked in this shift towards independent tower ownership. The market structure in this major South East Asian mobile market remains unclear to most market observers, and the ongoing political turmoil has meant that tower investors so far have shied away from dipping their toes in the market. One or two have tried and their lack of success seems to confirm the negative market sentiment.

Is now the time to re-assess the Thai tower market?

Keywords: 4G, AIS, Asia, Asia Insights, Bankability, Brownfield, Build-to-Suit, CAT, Country Risk, DIF, DTAC, Editorial, Greenfield, Infrastructure Sharing, Insights, Investment, MNOs, Market Overview, Operator-Led JV, Sale & Leaseback, Stakeholder Buy-In, TOT, TRUEGIF, Thailand, Towercos, True

How the structure of the Thai tower market has developed

Given the pace of change over the past 25 years, it would be wrong to blame the telecommunications authorities in Thailand for getting the structure and development of Thai mobile networks so completely wrong.

According to most observers, the development of the tower market in Thailand has been seriously hampered by the decision to go down the network concession route rather than the licensing route adopted by other national regulators.

As a result, in the 1990’s the Thai telecommunications regulator decided to adopt a concession / Build – Transfer – Operate (BTO) regime to drive the development of 2G mobile networks across Thailand.

25-year concessions to build and operate nationwide 900 MHz band and 1,800 MHz band networks were given to three MNOs – True (currently owned by CP Group and China Mobile – Orange was a previous investor), AIS (owned by Temasek and SingTel) and DTAC (later acquired by Telenor – Orange were also looking).

In return for the concessions, the operators paid 20-30% of their top line revenue by way of a fee to the state owned telecommunications enterprise who effectively owned the spectrum – CAT Telecom for the 850 MHz and 1,800 MHz band and TOT for the 900 MHz band.

Keywords: 4G, AIS, Asia, Asia Insights, Bankability, Brownfield, Build-to-Suit, CAT, Country Risk, DIF, DTAC, Editorial, Greenfield, Infrastructure Sharing, Insights, Investment, MNOs, Market Overview, Operator-Led JV, Sale & Leaseback, Stakeholder Buy-In, TOT, TRUEGIF, Thailand, Towercos, True

Read this article to learn:

- How the structure of the Thai tower market has developed
- How fledgling (but substantial) tower companies are now beginning to emerge
- Investment pointers for investors with a risk appetite
- Thailand’s potential joint venture towercos and the progress to date of DIF
- Potential for new capacity investment
Given that this was the 1990’s, no one involved in the process foresaw that at the end of the concession term, while the 2G active equipment would have little value, yet the towers would still be of considerable value to the operators.

Given what we now know, its unsurprisingly that as the concession terms drew close to completion, all of the operators made legal attempts to block the transfer of their tower assets to CAT and TOT.

All of the MNOs are reluctant to relinquish ownership of their towers or pay twice for the same assets. Even though the towers are up to 25 years old and only built for single tenancy, they are the root cause of the disputes.

While the initial response of the MNOs was to consult their lawyers, fortunately after much activity saner heads prevailed. All parties now realise that the best way to end the disputes is to find a commercial solution rather than continue the legal manoeuvres.

As a result, all of the operators are in active discussions with one or both of TOT and CAT. Both AIS and True have built large numbers of 3G tower assets outside of the concession regime, so they do have a network to fall back on should the discussions reach an impasse.

DTAC have only 800 tower sites not subject to concession, so they are in a more difficult position if the discussions with CAT stall. Already DTAC have been served an injunction by CAT ordering the removal of equipment from a number of disputed towers.

**How fledgling tower companies are now beginning to emerge**

The proposed commercial solution to the ownership disputes is to form joint ventures between the state owned agencies – CAT and TOT – and the MNOs. This is hoped to result in the emergence of three towercos over the coming months.

While the joint venture towercro solution is sub optimal, all parties get something out of the deal. The MNOs get assurance that their passive networks remain in place and up, providing them with the security of service they demand. In addition, CAT and TOT’s revenues streams remain in place, without which they are financially exposed.

DTAC is concluding an agreement to form a joint venture with CAT for their 11,000 towers under concession. CAT will get a 49% share of the JV and the accompanying dividends.

AIS are likely over the next few months to conclude a similar agreement with TOT covering 12,000 towers under concession.

True are also seeking a solution to their dispute via injecting their disputed towers into their recently launched and listed fund – Digital Telecommunications Infrastructure Fund (DIF, formerly known as TRUEIF). CAT would receive shares in the infrastructure fund in return.

An interesting question is what will the MNOs do with the towers they own outside of the concession regime. Only 2G towers were included in the concession agreements and all of the operators have built 3G towers. Current estimates suggest that True
has built over 6,000 3G towers, AIS has built 10,000 and DTAC has built 800. These newer towers may have the structural capacity for multi-tenancy and thus be considerably more valuable should a culture of infrastructure sharing emerge in Thailand.

**Investment pointers for investors with a risk appetite**

**Joint venture towercos**

For a tower investor, there are a number of potential routes to gaining market exposure to the Thai tower market. The first is to acquire a stake in the towercos formed by the proposed dispute resolution solutions. DTAC’s parent Telenor has partnered with towercos in other nearby markets – most notably Myanmar, so they may be receptive to selling some or all of their stake in their joint venture with CAT.

AIS have no pressing need to monetise their tower assets and their owners (Temasek and SingTel) usually prefer to control their network assets. Therefore the probability of AIS selling out to an independent towercos is low, although a sale and leaseback or managed services deal that would significantly reduce their operating costs might pique their interest.

Investing in the joint venture towercos would provide relatively low risk exposure to the market – each JV will have long term rental agreements with strong credit MNO anchor tenants and while lease fees are not publicly disclosed, one has to assume that the unit economics for each tower would be need to be positive and that lease fees would be significantly higher that the operating and financing costs for each tower – assuming that power (almost all sourced from the electricity grid) is a pass through with minimal cost exposure to the towercos.

While these factors de-risk any investment, the big imponderable is what role the Thai state, through their proxies CAT and TOT, will seek to assume. For these stakeholders, the towers represent annuity revenues; it is not clear whether they have appetite to transform the towercos into growth plays, investing in improvement capex and BTS programmes.

Neither CAT nor TOT are cash rich and both have expensive payrolls and employee benefits to fund. As a result, they will not be able to provide financial support to the joint venture towercos. Any refurbishment capex needed (remember the age of the towers) or strengthening required to host co-

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How the current regulatory environment is limiting the development of mobile services in Thailand

Everyone we spoke to in conjunction with this article felt that the current regulations concerning network sharing and the licensing of tower companies was limiting the development of mobile services in Thailand. Indeed, according to one stakeholder, infrastructure sharing remains technically prohibited in Thailand, although that prohibition does not appear to be enforced. In addition, for a country where revenues from tourism are such a major part of GDP, the environmental impact of tower blight should be a concern.

The question needs to be asked: how does the Thai regulator improve the situation?

Firstly they need to look to how their ASEAN peers have structured their regulatory regimes. In countries such as Myanmar and Indonesia, tower sharing is promoted and the emergence of independent tower companies encouraged. The Thai regulator did issue a draft regulation encouraging tower sharing in May 2012, but it appears that the draft has yet to become law.

Some tower sharing is taking place on a limited basis already in anticipation of the new regulation but a three-year hiatus is too long and passing this regulation into law would be a good forward step.

As the current concession agreements time out over the next few years, all operators will need to roll out new 3G and 4G points of service. Without large scale infrastructure sharing and the independent tower company model that exists because of co-location, the operators are going to have to waste valuable capital on network building rather than investing that capital on improving services to customers.

Thailand ought to be an attractive market for towercos. It’s not too late to fix the regulatory framework so that it encourages tower sharing.
location tenants would be for the account of the joint venture partners. This represents a significant risk as its difficult to accurately assess the refurbishment needed for general upkeep and co-location strengthening.

One might also speculate that the newly formed joint venture tower companies may lack management expertise and experience in managing a pure play telecom infrastructure business. While this is also a risk factor, it is also a compelling reason why an experienced towerco from Malaysia, Indonesia or India could add considerable value in terms of process, governance and commercial exploitation.

Finally, the political situation in Thailand is unstable and it is hard to predict how the state might behave once each towerco is up and running, especially when they begin generating better returns through efficiency gains and increased co-location lease up rates.

**Towers built outside the concession regime**

As noted previously, the towerco joint ventures do not include the non-concession 3G towers. It is still unclear what AIS and DTAC will do with these towers. One option could be to inject these assets into their respective JVs, although this would give CAT and TOT a valuation free ride as its unlikely that they would be willing to reduce their 49% shareholding accordingly.

This is less of an issue for DTAC as they only have a small proportion of their towers outside of the concession regime, but for AIS, the impact on the valuation of the JV would be significant. Given their preference for owning their own towers, these assets may remain under their ownership.

The towers built outside the concession regime would appear to be among the most investible in Thailand – their ownership is clearer and more predictable, they are newer and their structural capacity is generally greater.

**DIF**

True, alone among the MNOs, has proactively developed their own towerco solution through the formation of DIF (formerly known as TRUEGIF or TRUEIF). True has injected over 12,138 of their own towers into the infrastructure fund / towerco that they subsequently listed.

DIF appears to include concession and non-concession towers as well as considerable fibre assets in the fund and as such is a simpler vehicle for investors to evaluate than a newly formed joint venture. They are gaining traction in their co-location marketing with DTAC signing then expanding a co-location agreement with DIF.

Many of same concerns that investors and towercos face with the joint venture towercos would also

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**Four potential routes into the Thai market for towercos and tower investors**

- **Investment in DIF** – as a listed fund, this would represent a relatively liquid if passive investment; it would also provide exposure to the market and an opportunity to gather intelligence for a more direct intervention.

- **Direct investment in the DTAC/CAT JV** – DTAC may be receptive to a co-investor in the JV alongside them; an investment of this type could be a precursor to a build to suit agreement for the forthcoming tower builds.

- **Direct investment in the AIS/TOT JV** – AIS’s owners are very conservative and have deep pockets, but they want to see cash back from their investment and realising value from a co-investor in their JV might be of interest.

- **New capacity investment** – Thailand may need 15-20,000 more PoSs over the next ten years, driving demand for build to suit towers and co-locations. While FDI is limited to 49%, there are prospective and credible local partners.
apply to DIF, including refurbishment capex requirements, strengthening required for co-location and so on. The calibre of the management team is also an issue as pure play towerco experience is thin on the ground.

By listing the fund, True has effectively signalled that they would consider reducing their ownership in the fund and this represents a second route to exploit the tower opportunity, either as a significant minority shareholder or as a majority shareholder, FDI restrictions notwithstanding.

Due to the requirements of listing the fund, considerable analysis already exists for investors to conduct their due diligence, although political risk remains a harder factor to evaluate.

**New capacity investment**

Currently there are approximately 45,000 towers in Thailand and while the percentage of population coverage is acceptable, only 50% of the country’s landmass is covered. Estimates suggest that another 15-20,000 PoSs are needed nationwide during the next ten years.

While much of this extra capacity will be supplied via co-location, there will be demand for new build to suit towers. The opportunity will therefore exist for a new player to enter the market to satisfy demand and finance new tower builds.

Thailand has a number of experienced tower constructors and access to quality tower materials with which a new market entrant could partner. The grid is of such high quality in Thailand (such a major issue for many other emerging markets towercos) that power provision is not a significant risk factor and a steel and grass business model could be offered to the local MNOs.

While they will face competition from DIF, it’s unclear whether the joint venture towercos would have the interest or capability to compete for new tower build contracts.

From a risk / return basis, a greenfield tower play may be the most attractive and easiest to execute – especially if the towerco in question already has a relationship and credibility with one or more of the MNOs.

Again, the big question is how to navigate the complexities involved in the start up process in a market where regulations exist but are often ignored, and where FDI is often restricted to a minority stake. A regional towerco has tried this approach in the past, but with little success and a rapid exit.

Perhaps their failure has more to do with political as much as commercial issues. Any of the routes described here carry with them significant political risks – the situation in Thailand is unstable at the best of times and especially now.

The question has to be whether recent developments in resolving tower ownership and the launch of DIF represent a real inflexion point or whether we are in the midst of another false dawn and greater political forces at play will limit any real progress.

Having said that, for investors with the risk appetite for the market, it might be worth considering a hybrid approach – a small tower new build contract or the purchase of part or all of a non concession tower portfolio would provide a beachhead into the market from which further expansion could be launched.

In conclusion, there is room for towercos in Thailand but that room needs to be created, both from a legal and regulatory perspective. Restrictions limiting overseas ownership to 49% of any venture should not be seen negatively as co-investment with the appropriate local investors would help towercos navigate through a complex market.
edotco 360: Cambodia - increasing competition and opportunity

The independent towerco model is starting to be embraced in Cambodia as regulators begin to promote new developments.

With 3G coverage increasing and demand for 4G services starting to appear, Cambodia’s telecoms industry is increasingly starting to adopt the independent towerco model. The development of Cambodia’s telecommunications infrastructure is under way, but the government is doing its part to support growth through new regulations. The stage is set for sustained telecoms and tower market growth in Cambodia.

Keywords: 3G, 4G, ARPU, Asia, Axiata, BTS, Cambodia, Camtower Link, DAS, edotco, Energy, Hybrid Power, IBS, Investments, Market Overview, Managed Services, Regulation, VAS, Insights, Asia Insights, Who’s Who, Towercos, RMS, Market Overview, Off Grid

Read this article to learn:
- The size of the Cambodian mobile and tower markets
- The potential for tower sharing and new tower builds
- The quality of grid access in the Cambodian market
- The deployment of IBS and DAS in Cambodia
- New regulatory developments and their impact on the tower market

TowerXchange: Please introduce yourself and give us some details on your background.

Phillip Wong, Country Managing Director, edotco Cambodia: I served as CFO at Hello Axiata Company Limited from 2009 – 2012, and then CFO at Smart Axiata Co. Ltd from 2013. Before joining Axiata, I was Vice President and General Manager of Alcatel-Lucent for South East Asia where I oversaw business operations. Prior to that I was CFO of Alcatel for Singapore and the South East Asia Region. I have worked extensively in the Asia Pacific region, across six countries and have significant experience in the integration and merging of new businesses and overseeing organisational change.

TowerXchange: How is the development of the Cambodian tower market progressing? How complete is coverage, how mature is the 3G overlay?

Phillip Wong, Country Managing Director, edotco Cambodia: The MNOs in Cambodia (Metfone, Smart, Cellcard) have a total of 21.39 million subscribers, 97.7% of which are prepaid subscribers; the overall ARPU in Cambodia is US$2.5. 3G services now cover 50% of the country, and interest in 4G services is increasing with various operators beginning to deploy 4G infrastructure. There has been a recent shift in the market with the entrance of three Chinese operators. There is currently a total of 9,000 towers in Cambodia, with an expected growth rate of 3% in 2016. edotco is the market leader with a portfolio of 1,700 towers; our main competitor is Camtower Link, the second licensed tower sharing...
company in this market.

**TowerXchange:** How quickly are new towers going up in Cambodia? Is it a good market for tower manufacturers and construction subcontractors?

Phillip Wong, Country Managing Director, edotco Cambodia: The top three operators already cover over 90% of the populated areas. As a result tower growth is expected to be limited, unless they move aggressively on 4G/LTE. However, the new entrants providing mobile services will still require towers. It remains to be seen whether they will opt for tower sharing or building new towers. The potential for growth in the tower market is significant if they choose to go with new tower rollouts.

**TowerXchange:** We understand that the grid is one of the biggest challenges in the Cambodian market. Are a significant proportion of sites off grid or on unreliable grid connections?

Phillip Wong, Country Managing Director, edotco Cambodia: Energy remains a big challenge in the Cambodian market however it has improved recently and now only an estimated 20 to 25% of all sites are off-grid.

**TowerXchange:** What energy equipment is typically installed on sites? Are backup DGs or battery banks widely used? Is power a pass through?

Phillip Wong, Country Managing Director, edotco Cambodia: There are two main types of site: grid and off-grid. On grid sites the operator applies for a grid connection from EDC (Electricité du Cambodge) the government provider, and private grid providers. All sites use batteries for backup but DGs are used for off-grid sites and important sites such as MSC/BSC sites and hub sites. The power in the Cambodian tower market is a pass through.

**TowerXchange:** Is there much opportunity for small cells, DAS and IBS in this market?

Phillip Wong, Country Managing Director, edotco Cambodia: Yes, some operators are investing in IBS and small cells, however the cost of IBS is quite high so the number of deployments are still relatively low. Operators are focusing their investments in IBS at strategic areas e.g. airports, shopping malls, five star hotels and high-rise condominiums.

**TowerXchange:** What is the current regulatory framework around infrastructure sharing? Can you share any insights into regulation of towercos’ equity ownership?

Phillip Wong, Country Managing Director, edotco Cambodia: The regulatory framework acknowledges the benefits of infrastructure sharing between operators, including reduced duplication of investment, ability to build coverage more quickly, lower operating costs, and more efficient use of resources. The Cambodian regulator also supports 100% foreign ownership to encourage investment in the country’s telecommunications infrastructure.

**TowerXchange:** Do you expect any regulatory changes in the near to midterm to further support telecoms development?

Phillip Wong, Country Managing Director, edotco Cambodia: Currently a new telecommunications law is being drafted and it is expected to come into force in the first half of 2016.

Some of the proposed provisions undermine regulatory certainty and investment potential; they will also require universal service responsibility which will increase costs. The government should encourage infrastructure sharing on commercial terms with operators, and they should be free to enter into sharing agreements. The regulator should also look into mandating infrastructure sharing in cases where operators have not shared their towers.

**TowerXchange:** What do you think are the top four changes required to aid the development of
the Cambodian tower market?

Phillip Wong, Country Managing Director, edotco Cambodia: Mandating infrastructure sharing would be a good starting point. Beyond that, new structure types such as pylon trees, and camouflaged structures should be introduced into the market. Towercos should also start to provide managed services for operators including the operation and maintenance of both passive and active infrastructure and equipment; this could enable considerable savings and overall increased efficiency. Finally the number of In-building solutions (IBS) and DAS should be increased to improve the quality of services in larger populations centres, especially the capital, Phnom Penh.

TowerXchange: How do you think the Cambodian tower market will change over the next 3-5 years?

Phillip Wong, Country Managing Director, edotco Cambodia: I expect there will be some consolidation between the operators, and a few of them will not survive. This will definitely have an impact on the towerco market. I believe that more operators will adopt the tower sharing model and this will result in increased tenancy ratios, which will benefit everyone. It’s also possible that tower rental pricing may be impacted due to increasing competition in the tower market. As the tower model is embraced in Cambodia the need for new tower builds should start to decrease year by year. I also predict that towercos will increasingly provide value added services such as managed services and monitoring systems to optimise operations.
Editorial: A first look at the Cambodian tower market

Cambodia has strong demand and pent-up growth; the towerco model will play a key role in fulfilling this

Cambodia may be the next market to watch in Asia, with strong demand for new telecom services and need for new business models for infrastructure ownership and management to help meet this demand. In this editorial, TowerXchange summarises the mobile and the tower markets in Cambodia – finding a country with significant growth potential, with 130%+ mobile penetration and a crowded operator market. However there are still obstacles to be overcome, such as the challenging power grid situation.

**Keywords:** 3G, 4G, Axiata, Asia, Asia Research, Cambodia, Camtower Link, Cellcard, edotco, Huawei, Market Overview, Metfone, qb, Research, Royal Group, Sale & Leaseback, Seatel, Smart, Tower Counts, TowerXchange Research

An introduction to the telecoms market in Cambodia

Cambodia is an up-and-coming tower market with the potential for organic and inorganic growth. With a population of 15.8 million this is a small market compared to its larger neighbours Thailand and Vietnam, but it is a young population that is growing quickly with a 1.7% increase in 2014. Cambodia has experienced strong economic growth over the last decade. Cambodian GDP grew at an average annual rate of over 8% between 2000 and 2010 and over 7% since 2011, according to the CIA Factbook. Although it has its regulatory issues to overcome and some challenging operational conditions on the ground, Cambodia is still a market with strong potential and it represents considerable opportunities.

Cambodia’s efforts to expand and upgrade its telecom infrastructure have been successful despite its status as one of the less-developed countries in the region. There was very little infrastructure remaining from before the Khmer Rouge regime, and as a result, Cambodia leap-frogged the rebuilding of fixed-line infrastructure and launched into alternative technologies, jump-starting its telecommunications infrastructure with digital and mobile technology. As of Q4 2014, the GSMA estimated the number mobile connections at 23.9mn and a remarkably high SIM penetration of 154%.

There are approximately 9,000 towers in Cambodia and a growth rate of 3% is expected in 2016. Cambodia has a crowded, competitive telecoms market; there are currently five MNOs: Metfone

Read this article to learn:

- An overview of the telecoms and tower markets in Cambodia
- Regulatory support for infrastructure sharing
- Grid conditions on the ground in Cambodia
- Obstacles to growth for towercos
Viettel), Smart (Axiata) and Cellcard (Mobitel) lead the market with 9mn, 7mn and 3mn mobile subscribers respectively. The other operators qb (CADCOMMS) and Seatel (Southeast Asia Telecom) have a combined market share of approximately 1mn between them. There is likely to be some consolidation in the Cambodian market, some of which has already taken place with the number of operators dropping from nine licensed operators in 2011 to five in 2015, most recently with former VimpelCom OpCo Sotelco (trading under the Beeline brand), being acquired by market leaders Viettel. In 2012 Axiata’s Hello merged with Latelz Company’s Smart Mobile in a US$155mn deal. Network integration was completed in August 2013.

There has also been a recent shift in the market with a new agreement between Cambodia’s Ministry of Posts and Telecommunications and the Chinese Ministry of Industry and Information Technology (MIIT) which was signed in January 2015. Under the deal, both sides will exchange information, experience and expertise in the development of telecoms and ICT and this agreement may result in new Chinese entrants to the Cambodian operator market. Cambodia also selected the Chinese vendor Huawei as a strategic partner for its ICT development.

4G has been launched in Cambodia with Smart first offering services in Phnom Penh in January 2014 and Seatel switching on services in July 2015. It remains to be seen how aggressive 4G rollouts will be in Cambodia, and whether its launch will encourage any new players to come into the market.

To date edotco is the leading towerco in Cambodia with a total of 1,700 towers. edotco has plans to expand on its foothold in this market in the short term, but in the long term they expect the volume of tower builds to level off. In the meantime they plan to focus on offering end-to-end managed services along with DAS and small cells to optimise use of infrastructure and remain competitive.

Local turnkey infrastructure firm Camtower Link also owns and operates a small independent tower portfolio.

Power grid issues and landmines

The lack of a dependable power grid represents one of the biggest challenges facing the Cambodian tower market. The development of infrastructure suffered a major setback during the Khmer Rouge regime and this is still under development to reach the regional standard. The government has been working steadily on this in recent years and now the number of off-grid sites has been reduced to between 20 and 25%. There are also some security risks when deploying towers on remote sites as there are still minefields in the countryside which are the legacy of thirty years of war in Cambodia; experts estimate that another ten to twenty years will be required to clear all of them.

Regulatory development

In 2012 Cambodia established an autonomous telecoms regulator, the Telecommunications Regulator of Cambodia, as an entity independent of the Ministry.
There may be finite room for many additional towercos in Cambodia with market leaders Viettel historically reluctant to partner with towercos, Smart already working with edotco, and Mobitel backed by the Royal Group.

Cambodia’s telecoms operators recently voiced opposition to a draft law from the Ministry of Posts and Telecommunications Cambodia (MPTC) in July 2014 which stated that no company can operate infrastructure assets and also provide retail services. This legislation would have required telecoms operators that choose to retain their retail operations to sell off their network assets and rely on government-controlled infrastructure providers or towercos. The draft law also reportedly stated that all telecom licences would be reassessed on new criteria, and some companies could be forced to hand back their existing permits. In addition, the draft law also stated that ‘to ensure the effective security, national stability and public order, the minister of the MPTC has the right to order operators to transfer their systems, which control their telecom operations, to the Ministry.’ To date this law has not passed, and the Cambodian government is under pressure to make its legislative drafting process more transparent, which would help to encourage infrastructure development and foreign investment.

The Cambodian government supports the idea of infrastructure sharing to increase the efficiency of telecoms assets, and it also supports 100% foreign ownership to give a boost to telecoms investment and development. A new telecommunications law should come into effect in the first half of 2016 which should have a significant impact on infrastructure sharing in Cambodia.

What to expect next in Cambodia

With new legislation expected to take effect in the near future, LTE being rolled out, and new operators poised to enter the market, Cambodia should see some exciting new developments, and the tower market may continue to attract foreign investment. Prior to edotco’s entry into the market, the last time foreign towerco looked into a potential purchase in Cambodia was in 2012 when Tower Bersama was reportedly engaged in talks with Mobitel to acquire its tower assets.

With such a crowded operator market serving a relatively small population, the greatest efficiencies in Cambodia may be realised in partnership with a single, or at the most two, towercos of scale. This capacity is reflected in the tower industry’s appetite for Cambodia, which would typically see only the top two to three operators as suitable anchor tenants for a market entry. There may be finite room for many additional towercos in Cambodia with market leaders Viettel historically reluctant to partner with towercos, Smart already working with edotco, and Mobitel backed by the Royal Group (Cambodia’s largest privately owned conglomerate, which has strong connections to government).

With telecoms coverage of the population already at 90% it remains to be seen how many new towers will need to be deployed to extend and densify the network to support the demand for 4G services, and this will also be impacted by the new entrants and whether they build new towers or share with the existing market leaders. Overall, if the government continues to support infrastructure sharing, increases transparency and encourages foreign investment, Cambodia should remain a modest yet investible tower market.
Demand forecasts for passive infrastructure equipment and services in Asia

TowerXchange examines demand for six different categories of equipment and services across the dozen most active Asian tower markets

Telecom infrastructure is being transformed in a dozen key markets across Asia, where towercos own and operate between 20% and 70% of each country’s towers. What are the implications for the supply chain? What equipment and services are the towercos buying? How do their requirements vary according to the structure of each tower market?


Read this article to learn:
- How reliable is the grid, and who is responsible for acquiring and maintaining energy equipment in each market – towercos, or is power a pass through to MNOs?
- Are RMS and access control systems installed on most cell sites? Are Site Management, or ILM, systems used in the NOC?
- How many new towers are being erected and what does that tell us about the opportunity for tower manufacturers and construction firms?
- Are DAS, IBS, small cells and microcells being deployed into urban networks?
- Is there a pipeline of tower transactions – SLBs or strategic acquisitions – to generate substantial advisory engagements?

By way of a preview of the forthcoming TowerXchange Meetup Asia, which represents a unique opportunity for vendors to connect with the leaders of Asia’s towercos, TowerXchange examines demand for each of six key categories of passive infrastructure equipment and services in Asia’s 12 most active tower markets.

Which Asian tower markets are generating the most demand for energy storage, DG and hybrid energy systems? In which countries is power a pass through?

How widespread are RMS deployments? What about appetite for small cells, microcells, DAS and IBS?

At what rate are new towers being erected, and existing towers reinforced for co-location?

And in which countries will future tower transactions create demand for advisory services from bankers, consultants and law firms?

TowerXchange examines the 12 most active Asian tower markets, predicts demand for passive infrastructure equipment and services, and lists the largest towercos and MNOs active in each country. The following matrix is compiled based on hundreds of research calls and meetings with Asia’s leading towercos and MNOs in which we’ve diagnosed their procurement and capex priorities.

Meet the key stakeholders at this year’s TowerXchange Meetup Asia, taking place on November 24 and 25 at the MBS, Singapore!
Crown Castle recently sold their 1,772 tower subsidiary CCA to a consortium led by Macquarie. Broadcast Australia is the other towerco of scale – they have some MNO tenants on their ~600 towers. A few smaller tower transactions are anticipated to rollup small towercos, but it seems unlikely market leaders Telstra would sell their assets. There are around 9,000 towers in Australia, but many more may be required by the rollout of the National Broadband Network (NBN), a shared LTE network, which means it’s a good time for tower manufacturers and builders. RMS adoption will evolve over time. With grid power widely available and backup power sources not often used, Australia is not a priority for towerpower vendors. Power is typically a pass through so MNOs retain responsibility for power.

edotco has acquired 5,300 of the 27,000 towers in Bangladesh and the VimpelCom (Bangalink) towers may be next. Bharti Infratel are interested in entering the market, but are seeking favourable regulatory conditions. Potential deals make Bangladesh a priority for tower transaction advisors and strategic consultants. 800-1,000 new towers are going up per year, making Bangladesh attractive for tower manufacturers and turnkey infrastructure (TI) firms. The rainy season demands exceptional cell site autonomy which makes Bangladesh a key market for energy, particularly energy storage.

edotco operates 1,500 towers in Cambodia, where CamGSM and MobiTel have both been rumored to be considering tower sales in the past but not recently. RMS is not yet widely deployed in Cambodia, but edotco plans to invest in a remote tower operations centre in 2016. 20% of sites are off grid in Cambodia. The grid sites are provided both by SOE Electricité du Cambodge and by a range of private microgrids and distributed generation projects. Battery backups are on all sites, with DG on off-grid, MSC, BSC and hub sites. Power is a pass through, so MNOs not towercos remain the buyers of energy equipment. Not much demand for small cells but IBS are starting to be deployed in airports, malls, hotels and condos. With the top three MNOs boasting 90%+ coverage and new entrants increasingly co-locating rather than building, there is limited demand for tower manufacturers and TI firms.
# Vendor opportunity matrix

<table>
<thead>
<tr>
<th>Vendor opportunity matrix</th>
<th>Energy</th>
<th>RMS, ILM and access control</th>
<th>Tower manufacture</th>
<th>Turnkey infrastructure</th>
<th>Small cells, microcells, DAS and IBS</th>
<th>Advisors</th>
<th>Towercos</th>
<th>MNOs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>China</strong></td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>CTC</td>
<td>China Mobile China Unicom China Telecom</td>
</tr>
</tbody>
</table>

The tower market is changing in China – around a million towers will be transferred from the three SOE MNOs to newly formed China Tower Company (CTC), which already has a contract to build 120,000 towers. CTC already has 10,000 employees but it’s still a brand new company with new governance processes to be established, new systems to be deployed and new preferred supplier relationships to be established. The creation of CTC has stimulated a previously dormant local independent towerco market, which is supplementing CTC’s build capacity. China is building towers (mostly monopoles), rooftops and installing small cells and microcells at a phenomenal rate (over 100,000 per year), so it’s a great market for all vendors if you can compete with local incumbents like ZNV, who have around 60% of the RMS market. The GSMA reports that more than half the world’s green powered sites are in China, yet local towercos report the grid is extensive and reliable, so the jury is out on the opportunity for renewables.

| **India**                 | High   | High                         | High               | High                  | High                                | High    | Indus Towers Bharti Infratel Reliance GTL Infrastructure American Tower Tower Vision Ascend | Bharti Airtel Vodafone Reliance IDEA BSNL Aircel Tata Reliance Jio Several small players with <4% |

Towercos operate over 300,000 of the 450-500,000 towers in India – at present, a third of the world’s towerco owned towers are in India. Started in 1995, India is the second oldest tower market in the world, so it’s towercos are big, mature and canny buyers! Tower transaction deal flow is returning to India, where as many as 200,000 towers may be coming to market for sale, IPO or carveout (government owned operator BSNL is seeking to create a new 70,000 tower towerco). It's a great time to be a tower advisor in India! Meanwhile, India is home to the most advanced ESCO projects in the world, and some of the most cost-efficient passive infrastructure manufacturers and service providers, many of which export as well as serve their huge domestic market. Li-Ion is making significant inroads versus VRLA batteries in India. RMS is widely used. And the ongoing spectrum auctions and progress of 3G rollout and eventually 4G mean India may need hundreds of thousands of new towers in the coming years. While there are only a few thousand small cells and microcells in India currently, Indus forecast there will be 50,000 by 2020, making India second only to USA (well, maybe China too) for small cells market potential.
<table>
<thead>
<tr>
<th>Vendor opportunity matrix</th>
<th>Energy</th>
<th>RMS, ILM and access control</th>
<th>Tower manufacture</th>
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<th>Advisors</th>
<th>Towercos</th>
<th>MNOs</th>
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<tbody>
<tr>
<td>Indonesia</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Protelindo Tower Bersama STP Mitratel IBS Tower KIN Retower Balitower Others</td>
<td>Telkomsel XL (Axiata) Indosat Hutchison Bolt</td>
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<td></td>
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<tr>
<td></td>
<td>Towercos own 57% of Indonesia’s ~70,000 towers, making it one of the most mature tower markets in the world. XL Axiata (~6,500) and Indosat (~5,800) may have an appetite to sell their remaining towers in the medium term, but the real question concerns the future of Telkom’s towers who have about 13,000 sellable assets in their 17,615 tower portfolio, but no apparent incentive to sell. That said, Telkom did create its own towerco, Mitratel, which owns a reported 5,500 towers. Mitratel was to be transferred to Tower Bersama under an innovative share swap agreement which has been postponed pending government investigation. With operator towers to be bought and towerco consolidation continuing, Indonesia is a fertile market for advisors. The reliability of the grid in the dense urban areas means the opportunity for energy equipment vendors is finite, but there are remote sites requiring good autonomy. Note that power is a pass through in Indonesia, so MNOs are the buyers of energy equipment. We’ve spoken to RMS and access control vendors with substantial Indonesian contracts. Organic growth is considerable: 3,000+ towers are erected in a good year, and the local ecosystem of TI firms is very fragmented.</td>
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<tr>
<td>Malaysia</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>edotco Sacofa Touch Matrix D’harmoni KJS Common Tower Infra Quest Yikedbina Perak Asia Space Desabina Others</td>
<td>Celcom (Axiata) DiGi Maxis</td>
</tr>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Towercos own around a third of Malaysia’s 20,000 towers. edotco has carved out 3,500 towers from Celcom in Malaysia. A further 3,200 towers are owned and operated by a diverse group of State-backed independent towercos. DiGi and Maxis currently retain their towers but there have been rumors they could create their own towerco, so there may be opportunities here for the advisory community. There is plenty of demand for new structures as the 4G era begins, but much of the work is undertaken by the aforementioned state backed towercos who have a dominant position in terms of permitting in half the States, so TI firms and tower manufacturers need to develop relationships with Malaysia’s towercos. While only 5% of Malaysia’s cell sites are off grid, data demand has driven the load on some sites beyond capacity, so battery banks are widely used. Demand for infill sites makes Malaysia ripe for street furniture, with DAS and IBS starting to be deployed by edotco and MNOs. edotco has already selected its site management system.</td>
<td></td>
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</tbody>
</table>
At one point it seemed like the busdev team from every telecom vendor in the world was camped out in the Traders Hotel lobby taking meetings, but hyperbole has given way to hard work in Myanmar as the rollout enters phase three. Only towercos offering tower+power have secured phase three contracts, and appetite for opex business models is increasing. While a little over 5,000 of a forecast 17,300 towers by 2017 have been lit, phase one was in dense urban areas, phases two to three are pushing into the suburbs and beyond. While most of the towers built to date have been grid connected, that grid has proved very unreliable, with frequent outages and voltage irregularities. As such, generators are on all ground based sites and battery banks are widely used. We’re yet to see the full anticipated demand for cell site autonomy, although hybridisation may be restricted to batteries rather than renewables in the South of the country as wind resources are limited and the rainy season means finite opportunity for PV. Myanmar’s ecosystem of TI firms and local subcontractors is maturing fast. RMS and site management systems are widely used. Towerco investment due diligence and consolidation, starting with the sale of Digicel MTC, means the advisory community will remain busy. Some IBS have been deployed in Myanmar.

**Vendor opportunity matrix**

<table>
<thead>
<tr>
<th>Myanmar</th>
<th>Energy</th>
<th>RMS, ILM and access control</th>
<th>Tower manufacture</th>
<th>Turnkey infrastructure</th>
<th>Small cells, microcells, DAS and IBS</th>
<th>Advisors</th>
<th>Towercos</th>
<th>MNOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>IGT</td>
<td>KGSM</td>
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<td></td>
<td></td>
<td></td>
<td>Apollo</td>
<td>Telenor</td>
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<td>PAMEL</td>
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<td></td>
<td></td>
<td></td>
<td>Digicel MTC</td>
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<td>MIG</td>
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</table>

News has leaked of Tower share’s acquisition of Warid’s 4,500 towers of Pakistan’s ~28,000 towers, but the transaction has yet to be formally announced. Both #1 Mobilink (VimpelCom) and #2 operator Telenor’s towers have also been rumoured to be coming to market and, with edotco's license now secured, there are at least two prospective buyers to keep the advisory community busy. 1,000-2,000 towers are going up every year in Pakistan, making the country a great target for tower manufacturers and TI firms. The unstable grid means eight hour outages are common, and can extend longer in Summer months. Both edotco and Tower share have spoken openly about plans to hybridise sites with batteries and renewables.

**Pakistan**

<table>
<thead>
<tr>
<th>Energy</th>
<th>RMS, ILM and access control</th>
<th>Tower manufacture</th>
<th>Turnkey infrastructure</th>
<th>Small cells, microcells, DAS and IBS</th>
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<th>Towercos</th>
<th>MNOs</th>
</tr>
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<tbody>
<tr>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Unknown</td>
<td>High</td>
<td>Tower share</td>
<td>edotco (AWAL Telecom?)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>(VimpelCom) Telenor</td>
<td>Telenor</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Zong (China Mobile)</td>
<td>Ufone</td>
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<td></td>
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<td>Warid</td>
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</tbody>
</table>
75% of Thailand’s ~47,500 towers have been transferred, or will soon be transferred, to one of three towercos established to resolve BTO disputes. True created and successfully IPO’ed TRUEGIF in late 2013, a fund in which 12,138 towers and over a million kilometers of fibre have been transferred. Meanwhile a joint venture towerco is being finalised between DTAC and CAT, while AIS and TOT seem likely to create a similar venture. New towercos mean new opportunities for vendors. 10,000 AIS and 800 DTAC towers built outside the BTO concession are set to remain operator-captive. Thailand has a degree of parallel infrastructure, suggesting a few decommissioning opportunities, but imminent spectrum auctions for a 4G rollout that lacks sunb-1GHz digital dividend spectrum will maximise demand for co-locations and new builds. Anticipate Thailand’s tower stock increasing 50% in the next ten years. While grid power is widely available, electricity is getting even more expensive, fuelling appetite for renewables and energy efficiency. Energy assets are likely to be owned by Thailand’s towercos, but utility costs will be a pass through.

2,150 transferred from Dialog, Axiata’s local opco, have been transferred to edotco Sri Lanka, representing a little over 30% of the country’s 7,000 towers. While TowerXchange have yet to study Sri Lanka in detail, we understand that cellsite densification for LTE is driving demand for infill sites, camouflage towers and IBS.

Golden Towers, a member of the Alcazar Capital family, has embarked on a rollup play in Vietnam where approximately 10,000 of the country’s 55,000 towers are in towerco hands. Opportunities for tower manufacturers and TI firms are phenomenal in a fast growing tower market that some commentators have estimated is adding more than 11,000 towers and tenancies per year – that’s about twice the rate of Myanmar! Towerco rollups will keep advisors and investors busy now, in the longer term the restructuring of the MNO market could create SLB opportunities. Grid power is extensive and reliable in Vietnam and power is a pass through, so any backup power solutions are retained by MNOs. Battery performance would be improved by more widespread use of RMS. It’s early days for small cells and DAS but that may change under 4G.
Brief commentary on Asia’s less active tower markets:

- Afghanistan: Frontier Towers runs ~1,500 towers for Afghan Wireless and Etisalat and MTN attempted to create a joint venture towerco, but IHS weren’t interested. No immediate opportunities for tower industry growth, therefore TowerXchange has yet to study the market in detail.

- East Timor: Too small to provide the necessary economies of scale to towerco, therefore TowerXchange has yet to study the market in detail.

- Japan: Tough market for foreign investors, and minimal towerco activity, therefore TowerXchange has yet to study the market in detail.

- Laos: Seldom mentioned in rumors of potential tower deals, therefore TowerXchange has yet to study the market in detail.

- Mongolia: No immediate opportunities for tower industry growth, therefore TowerXchange has yet to study the market in detail.

- Nepal: Despite infrastructure sharing being leveraged to accelerate post Earthquake recovery, we’ve seen no mention of potential towerco activity.

- North Korea: Impenetrable to a Western research firm like TowerXchange, and probably impenetrable to foreign investors!

- Philippines: No immediate opportunities for tower industry growth, therefore TowerXchange has yet to study the market in detail.

- PNG: Too small to provide the necessary economies of scale to towercos, therefore TowerXchange has yet to study the market in detail.

- Singapore: Market considered both too small and too mature for towercos, therefore TowerXchange has yet to study the market in detail.

- South Korea: No immediate opportunities for tower industry growth, therefore TowerXchange has yet to study the market in detail.
Europe features

How many towers are there in Europe? And how many of them are owned by towercos? In answering these questions, TowerXchange’s analysis finds three sub-categories of towercos in Europe – read on to find out more.

One of the unique facets of the European tower market is that it’s as much about consolidation as growth. We ask KPR’s Henrik Kamstrup to explain the real costs of decommissioning.

The French telecoms market is a highly competitive landscape, with new players on both the operator and towerco side shaking up the status quo. TowerXchange introduces the French market and the management team at France’s newest and fastest growing towerco – FPS towers, before we wrap up our coverage of France with BMI’s view of the market.

Please read:
200 Editorial: Who owns Europe’s telecom towers?
205 The real costs of decommissioning towers
209 Editorial: Towercos growth in the dynamic French market
214 Interview: The management team at FPS Towers, France
218 BMI bearish on prospects for French towers market
Who owns Europe’s telecom towers?

Smart capital seeks investible European tower builders – and tower consolidators

TowerXchange have spoken to dozens of private equity, institutional and strategic investors keen to put capital to work within the emerging European telecom tower market. So what are your investment options in Europe? Investors in listed entities Cellnex and Inwit have to date enjoyed buoyant valuations – but that opens only passive investments restricted to date to Southern Europe. TowerXchange have identified 26 independent towercos in Europe, and many are highly investible, but most are well capitalised and few are seeking new equity partners. How about Europe’s ten joint venture infrastructure sharing companies? Not easy: few if any currently solicit third party investment. The starting point for many PE firms’ investment in towers are build to suit towercos who permit, build, own and operate towers in response to MNO search rings – but TowerXchange have found few such firms in Europe. A gap in the market perhaps...


Read this article to learn:
- How many towers are there in Europe and who owns them?
- Contrastin infrasharing JVs, operator-led and independent towercos
- The drivers for European MNOs to divest towers
- The need for more European tower builders (and tower consolidators)

A breakdown of the European telecom tower industry by tower ownership

TowerXchange have been studying the emerging European tower industry for almost a year now, and so far we have identified 39 telecom and broadcast towercos in Europe, including ten joint venture infracos, three operator-led towercos and 26 independent towercos. In total these 39 companies own or operate 158,911 towers; 73% of Europe’s ~600,000 towers. The remaining 441,000+ assets remain operator-captive. We breakdown the ownership of Europe’s towers in figure one.

From this simple analysis, you can see that the European tower market is far from fully penetrated. Why?

Two of the three primary motivations for tower divestitures in other markets are less prevalent in Europe: many of Europe's MNOs don’t have the same need to raise capital as MNOs do in emerging markets, nor are they motivated to outsource the expansion of their tower networks to specialist third parties during periods of intense growth. However, the third motivation, the stabilisation of opex by outsourcing or divesting non-core assets and activities remains a motivation. Meanwhile the European tower market introduces a new motivation; the consolidation and decommissioning of overlapping tower networks; creating value by reducing operating costs (primarily land lease costs) and creating value by adding more tenants to remaining towers. This new decommissioning function means business models and balance
Defining ‘towercos’ and ‘infracos’

We define a towerco as a business whose raison d’etre is to construct, consolidate AND co-locate telecom towers – with or without a hybrid business model also including broadcast towers, IoT, heterogeneous and public safety network hosting. Note that there is a sub-category within this segment: independent towercos that are majority owned by parties other than MNOs, and operator captive towercos where most or all of the equity is retained by an MNO. There are three operator captive towercos in Europe: Deutsche Funkturm, Global Tower in Turkey and the Ukraine, and Inwit (which remains 60% owned by Telecom Italia).

Europe also has a number of joint venture infracos, typically carved out of two or more MNOs, whose raison d’etre is to manage, supplement and consolidate those assets, but who don’t market the sites for co-location as proactively as an independent towerco. Typically the tower assets remain on the partner MNOs’ balance sheets, but there are instances of this business model where the passive infrastructure has been transferred to the infraco (e.g. CTIL in the UK).

A simple who’s who of European towercos is presented in figures two and three

TowerXchange include in our analysis of “JV infracos” only infrastructure sharing deals which were consolidated into joint venture newcos. Note that there have been several other infrastructure sharing deals in Europe where the assets apparently remained under the ownership and management of the MNOs concerned:

- Austria (T-Mobile+ Hutchison 3G)
- Belgium (Orange+KPN)
- Czech Republic (Telefonica+T-Mobile)
- Finland (TeliaSonera+DNA)
- France (SFR+Bouygues)
- Iceland (Vodafone+Nova)
- The Netherlands (Tele2+T-Mobile)
- Romania (Orange+Vodafone)
- Russia (Vimpelcom+MTS)

*We understand Deutsche Funkturm has around 8,500 GBTs, with the rest rooftops

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**Figure two: Who’s who in European JV infracos and operator-led towercos**

<table>
<thead>
<tr>
<th>Countries</th>
<th>Est site count*</th>
<th>Business model</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTIL</td>
<td>18,000</td>
<td>JV infraco</td>
</tr>
<tr>
<td>MBNL</td>
<td>18,000</td>
<td>JV infraco</td>
</tr>
<tr>
<td>TT-Network</td>
<td>2,500</td>
<td>JV infraco</td>
</tr>
<tr>
<td>Hi3G</td>
<td>125</td>
<td>JV infraco</td>
</tr>
<tr>
<td>NetWorkS!</td>
<td>Undisclosed</td>
<td>JV infraco</td>
</tr>
<tr>
<td>3GIS</td>
<td>Undisclosed</td>
<td>JV infraco</td>
</tr>
<tr>
<td>Sunab</td>
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</tr>
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<td>Azerconnect</td>
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</tr>
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<td>Mosaic</td>
<td>Undisclosed</td>
<td>JV infraco</td>
</tr>
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<td>VICTUS Networks</td>
<td>Undisclosed</td>
<td>JV infraco</td>
</tr>
<tr>
<td>Deutsche Funkturm</td>
<td>27,000*</td>
<td>Operator-led towerco</td>
</tr>
<tr>
<td>Inwit</td>
<td>11,519</td>
<td>Operator-led towerco</td>
</tr>
<tr>
<td>Global Tower</td>
<td>7,870</td>
<td>Operator-led towerco</td>
</tr>
</tbody>
</table>

*We understand Deutsche Funkturm has around 8,500 GBTs, with the rest rooftops

---

**Figure one: A breakdown of the ownership of Europe’s ~600,000 telecom cell sites**

- MNO-captive (441,089)
- JV infracos (58,500)
- Operator-led towercos (46,389)
- Independent towercos (54,022)
### Figure three: Who’s who in European independent towercos

<table>
<thead>
<tr>
<th>Countries</th>
<th>Est site count*</th>
<th>Business model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellnex</td>
<td>Spain, Italy</td>
<td>15,377</td>
</tr>
<tr>
<td>TDF</td>
<td>France, Germany, Poland, Spain, Estonia</td>
<td>11,000</td>
</tr>
<tr>
<td>Arqiva</td>
<td>UK</td>
<td>10,550</td>
</tr>
<tr>
<td>EI Networks</td>
<td>Italy</td>
<td>2,700</td>
</tr>
<tr>
<td>FPS Towers</td>
<td>France</td>
<td>2,051</td>
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<tr>
<td>American Tower</td>
<td>Germany</td>
<td>2,030</td>
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<tr>
<td>Wireless Infrastructure Group</td>
<td>UK</td>
<td>2,000</td>
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<tr>
<td>Russian Towers</td>
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<td>1,500</td>
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<td>Towercast</td>
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<td>Undisclosed</td>
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Sheets in the European tower market will differ substantially from the ‘old growth’ tower industry in markets like the U.S. and India.

### Time for European MNOs to cash out

Another new motivation for European MNOs to divest towers is the relative favorable relative multiple arbitrage between MNO and towerco valuations. This has never been more pronounced than when called to attention by the valuations secured by the recent successful IPOs of Cellnex and Inwit. Whether MNO’s towers sit on their balance sheet, on the balance sheet of a captive towerco or a joint venture infraco, the potential valuation of European towers at IPO, or indeed to a strategic buyer, may be at an all time high. Is it time for European MNOs to cash in their chips whilst they’re ahead in the game of passive infrastructure? Indeed, is this a game European MNOs want to be playing any more when they could take their metaphorical winnings to the spectrum auction or customer experience improvement tables?

At TowerXchange, we tend to think that four tower transactions of scale (2,000+ towers) being sold and leased back is indicative that a tower market has achieved ‘launch velocity’. That benchmark was achieved with Cellnex’s acquisition of 7,377 towers from Wind Italy, following Cellnex’s previous acquisitions from Telefónica and Yoigo in Spain in 2014, FPS’s acquisition of 2,166 towers from Bouygues Telecom in France and American Tower’s acquisition of a portfolio of 2,031 towers in Germany – the latter two deals being announced in 2012.
With a further 1,822 towers acquired in five smaller sale and leasebacks in the Netherlands (KPN to Protelindo, Shere Group and Open Tower Company) and Spain (the first phase of Telefónica to Cellnex), the blue touch-paper has been lit for tower sale and leasebacks in Europe.

The inauguration of Cellnex, already highly acquisitive when fully owned by Abertis, has created another prospective counterpart for tower divestitures in a market that had previously been stymied by U.S. towercos’ reluctance to close the gap to European MNOs’ valuation of their towers. Equipped with an acquisition warchest from a successful IPO, Cellnex’s investors have bought into a consolidation narrative that will extend the towerco’s acquisition spree. So while U.S. strategic investors may have preferred to deploy their capital elsewhere whilst Europe stood still, the pipeline of tower transactions is flowing now – whether American Tower, SBA Communications or even Crown Castle is interested to tap the European tower transaction pipeline remains to be seen.

**Tower builders and tower consolidators needed**

The European tower market, like any tower market, is not just about large scale sale and leasebacks.

There are some great tower builders in Europe. Some are pure builders, some blend small to medium sized acquisitions into the business model. There are some very solid, investible platforms in Europe – in fact, most are very happy with their capital structure, thank you very much, and looking

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**Paper**

- Get the paperwork done right: it’s really important to have strong ground leases and good tenant agreements in place, especially if you plan on eventually selling the business.

**Assets**

- Don’t cut corners on the construction: I have seen quite a few entrepreneurs opting for cheap solutions when it came to building sites. But in the long run, this strategy won’t pay off. Building robust, multi-carrier towers with plenty of capacity will position your business on the right track to be acquired at a fair price. If a buyer has to reinforce your towers, this will have a negative impact on your ROI.

**Permits**

- Ensure your permits are in place: some towercos start building sites without the necessary permits in an attempt to speed up the process. But permits create immense value for your portfolio and, especially in a place like Costa Rica where sometimes as many as eight or nine permits are needed, you’d better get things right from day one.

**Rates**

- Negotiate the right rental rates with tenants: I have seen some small towercos agreeing very low lease rates in an effort to gain business but again, this strategy won’t pay off and will affect the payout on exit. Aim for good, fair market rates with all your tenants.

**Growth**

- Lease up: a good tower professional needs to keep an eye towards acquiring a second, a third and even a fourth tenant if possible. That’s where the real value is. If your plan is to build single tenant towers in rural areas with limited lease up potential, you might want to re-think your business model.

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Five critical considerations to maximise towerco valuations on exit – by Nicholas Van Slyck, a skilled entrepreneur whose Costa Rican towerco was sold to SBA Communications in 2010. Nicholas is now GM – Costa Rica at SBA
for more assets of a similar ilk to buy. Indeed, TowerXchange has spoken to dozens of private equity firms, infrastructure funds and strategic investors with an appetite to invest in or acquire small to medium sized European towercos. There is more capital with appetite for European tower builders (and tower consolidators) than there are investable platforms.

Consider this; there are maybe 10-12 bona fide build to suit (BTS) towercos serving a European tower market of ~600,000 towers. There are a similar number serving a Brazilian tower market which is one twelfth that size. Wireless Estimator tracks 100 U.S. BTS towercos serving a market a quarter of the size of Europe.

Why so few towercos in Europe? One explanation I’ve heard is that Europe’s tower market is saturated – it’s a consolidation game not a growth game. Well, it isn’t saturated and it isn’t just a consolidation game. In general, Europe’s tower networks are more mature than some other continents; for example there are an average of 1,673 SIMs per tower in Europe compared to 2,597 in MENA, 4,670 in CALA and 4,717 in SSA. However, Europe has considerably less tenants per tower than the U.S. and Indian markets where tenancy ratios are close to two, and where there are 2,352 and 2,091 SIMs per tower respectively, albeit obviously around half that number per BTS. There is some consolidation to be undertaken in Europe – decommissioning represents a great opportunity for tower entrepreneurs in itself – but in every market there is a need for new towers, rooftops, microcells, DAS and small cells as infill and capacity as subscribers demand more and more data, and sooner or later migrate to 4G.

There is no shortage of tower building and tower decommissioning wisdom in Europe – some of the world’s most renowned turnkey infrastructure firms come out of Europe. But there hasn’t been the same appetite to move up the value chain from building towers for MNOs to building towers, retaining those assets and leasing them to MNOs. One reason for this lack of appetite is a lack of realised towerco exits; all I can say in response to that is that any towerco will be not be short of prospective counterparts to realise their exit strategy provided they build a portfolio of several hundred to a few thousand robust tower assets in unique locations, with structural capacity for multiple tenants, and demonstrate the market potential to lease up those towers. Whether the portfolio is assembled purely by building to suit, or as a product of a decent scale decommissioning opportunity where the towerco retains the consolidated towers, European towers are becoming a safer bet.

European MNOs: it’s time to cash in your tower chips.

European tower builders: it’s time to put your chips on the table, the towerco business is now a safe bet in Europe.

We will be hosting our inaugural TowerXchange Meetup Europe in April/May 2016 in London. If you are a stakeholder in European towers, or if you’d like to be a stakeholder in European towers, and have an interest in joining our speaker panel, then email me at kosmotherly@towerxchange.com.
KPR Consult: The real costs of decommissioning towers

Removal of steel and concrete is the tip of the iceberg: the real cost in the cancellation of leases

An increasing proportion of tower markets feature a decommissioning component – particularly in developed markets such as Europe. One international towerco strategist told us “no towerco has ever completed a large scale decommissioning project to prove the economics of consolidating towers, deploying capex to release oneself from lease costs, and improving EBITDA in the medium term.” Cellnex has an ongoing decommissioning project in Spain, and ad hoc decommissioning has taken place in the UK, but since no towerco has completed a decommissioning project of sufficient scale to prove the economics, TowerXchange spoke to tower gurus KPR Consult, who completed an 1,100 tower decommissioning project in Scandinavia recently.

Keywords: Asset Register, Capex, Construction, Decommissioning, Denmark, EBITDA, Europe, Foundations, Intelli Towers, KPR Consult, Lawyers & Advisors, Managed Services, Masts & Towers, Operational Excellence, Passive Equipment, Rooftop, Shelters, Steelwork

Read this article to learn:
- What decommissioning really costs
- The environmental issues you need to consider
- The criticality of involving an experienced third party in lease cancellation negotiations
- Recovering value: sale and scrap
- Conclusions: the economics of decommissioning

TowerXchange: Please reintroduce KPR Consult in terms of your decommissioning experience in particular.

Henrik Kamstrup, Chairman, KPR Consult: KPR Consult is a tower engineering company specialist established 11 years ago. KPR are leaders in analysis, strengthening and co-location management of telecom towers in the Nordic regions. KPR Consult is a partner and backbone in Intelli Towers, which provides innovative tower doctoring throughout the globe.

KPR Consult was engaged in a substantial decommissioning project for the past two years when two Nordic operators decided to merge their tower networks. As a result, they concluded that they had 1,100 overlapping sites, some of which were to be sold, some of which had to be dismantled.

When dealing with overlapping cell sites, your first question is whether you really need to decommission them, or whether you get any value out of the sites? Can the contract be transferred, and can you sell the sites to a towerco or another MNO? If you can’t sell the sites, can you give them away? (Editor: it seems that the recent transfer of 7,700 Telefónica Germany cell sites – mostly rooftops – to Deutsche Telekom and ultimately to Deutsche Funkturm might have been the result of this kind of thinking). Parallel infrastructure which may be needed for infill capacity in future is typically mothballed not decommissioned.

If you can’t sell or transfer the site, you need to
release yourself from the lease obligations and dismantle the site as cost-effectively as possible. The biggest challenge is negotiating the cancellation of hundreds of land leases some of which may have up to ten years still to run at €5-6,000 per site per year.

**TowerXchange: Let’s start by talking about the cancellation of land leases – how should this delicate matter be approached?**

**Henrik Kamstrup, Chairman, KPR Consult:** You need to appoint an independent expert intermediary to literally go door to door and meet with each landlord, negotiate with each and find a closing deal. The worst thing to do is send someone from the operator – this risks the landlord being more belligerent and seeking to enforce the full remaining lease term, and you risk ending up in court.

You’ll need local knowledge, local language skills and specialist skills, so you might use a site acquisition firm, perhaps supported by a specialist lawyer. In the case of the Nordic decommissioning project, KPR Consult were subcontracted by the MNOs concerned, and we found that we could reach agreement on breaking lease contracts without a lawyer.

We joint-owned and managed the contract, we charged a cost price for the project management of decommissioning, and our profit margin from the project was determined by the difference between what the operator was obliged to pay and our share of the savings we realised.

Before you talk to landlord you have to know the remaining lease term left on the contract, and how much of that you can absorb in worst case scenarios. You need to know who you’re working with – we need copies of contracts, any useful information indicating what’s important to that particular landlord.

The more positive dialogue you have with landlords, especially further outside cities, the more chance you have to secure permission safely leave some equipment or foundation materials on the site, again saving costs. On the flip side of that, if you make a mess of the compound, you again risk ending up in court.

**TowerXchange: What environmental obligations have to be fulfilled when decommissioning a cell site?**

**Henrik Kamstrup, Chairman, KPR Consult:** The resale and/or disposal of network material is a big focus in Europe, and is conducted in accordance with ISO 9001, ISO 14001 and WEEE standards.

There’s a process to be followed and a set of strict environmental rules. Companies decommissioning towers, and their subcontractors, are subject to compliance with MNOs’ code of business conduct and CSR policies, and a host of other environmental obligations, the most common of which are summarised in figure one.

**TowerXchange: What can be left on site?**

**Henrik Kamstrup, Chairman, KPR Consult:** It depends on what the landlord will allow, as well as the aforementioned environmental considerations.

It is not illegal to leave concrete in the ground. It certainly reduces the cost of decommissioning the site if you can negotiate with the landlord to leave an enclosed concrete foundation in place, but it’s generally easier to do so at rural rather than urban sites. If reinforced concrete remains enclosed there should be no pollution risk, but if you break up the foundation and don’t take it away it will corrode and pollute.
TowerXchange: Does the steel removed from a decommissioned site have any re-use value?

Henrik Kamstrup, Chairman, KPR Consult: A telecom tower might have a 20 year lifespan, but if one measures the zinc in the steel it’s usually undamaged, a little discoloration aside, so you can use it again. There are a number of specialist brokers of scrap metal from whom you can recover some value from tower structures, shelters, copper wiring et cetera. The resultant savings are typically split between MNO and subcontractor.

You still have to pay to take down the structure and remove the steel. Reinforced concrete, typically used in foundations, is more difficult and costly to recover and has no resale value. This is one of the many reasons why I would advocate using steel-only foundations: steel is much easier to extract and relocate, it can be re-used, and risk of pollution is greatly reduced. In just about all cell site scenarios, concrete no longer need be poured for foundations. The only exceptions are areas prone to flooding, such as parts of Myanmar, but even there steel foundations can be raised and natural drainage designed to ease drainage from below.

TowerXchange: What does it cost to decommission a cell site?

Henrik Kamstrup, Chairman, KPR Consult: Here is some example pricing for the full decommissioning of sites (before our share of lease negotiations and other cost savings):

1. Decommissioning the entire site inclusive of tower, foundation and equipment: US$16,800
2. Decommissioning just the tower and foundation: US$12,600
3. Decommissioning the equipment only, leaving the tower and foundation: US$8,700
4. Decommissioning rooftop site with equipment room: US$10,300
5. Decommissioning a rooftop without equipment room: US$6,900

Other costs to be considered include the MNO / towercos own costs incurred reviewing contracts.
MNOs and towercos often have preferred turnkey infrastructure subcontractors who can execute the actual dismantling of the sites and disposal of material. In our case, if we’re project managing and another company is carrying out the work, we charge a 15% admin / financing fee and a further US$2,500 per site to talk to landlords, to redesign and redraw sites as necessary to satisfy communities, and to update the asset register.

TowerXchange: What does the transfer of the BTS consist of and cost?

Henrik Kamstrup, Chairman, KPR Consult: Height and capacity permitting, you put up a temporary site to ensure continuity of service. An example temporary structure is shown in figure three; a Y tower with concrete blocks for ballast. In some countries the concrete blocks used for roadblocks are readily, cheaply attainable and stackable – a good choice for ballast.

Depending on height, a basic temporary tower might cost US$10-15,000 inclusive of concrete, but most MNOs and towercos have a number of temporary towers in inventory. You might incur US$150 per meter in assembly costs, then the same again to dismantle. Rapid deployment towercos cost more upfront but assembly and dismantling costs can be much lower.

In Europe everything is typically assembled on the ground then erected by crane; it takes just a day to erect a 40-50m temporary tower.

TowerXchange: And what’s the typical total time taken for the decommissioning of a tower?

Henrik Kamstrup, Chairman, KPR Consult: It needn’t take more than one to two days to take up the steel, rising to three to four days if you’re using a temporary structure. Taking up the foundation is less predictable – much depends on the materials used and their condition.

My guess is that it might take two to three years to achieve return on investment in decommissioning (when the capital costs of dismantling sites and paying lump sums to cancel leases are recovered through lease and other opex cost savings). However, the cost of breaking leases is by its nature unpredictable, and much depends on the individual circumstances of the MNO or towerco concerned.

TowerXchange: Do you personally buy-in to the economics of decommissioning as a value accretive part of the European towerco proposition?

Henrik Kamstrup, Chairman, KPR Consult: I definitely buy-in to the decommissioning and rationalisation business model, even if European towercos have to decommission around 10% of the towers they’re buying.

There is an established process for decommissioning towers. There are usually several subcontractors in any market to whom MNOs and towercos subcontract build to suit projects who can take care of dismantling, and recover some value from materials removed from sites – indeed it is often possible to recover most of the cost of dismantling a site from scrap.

MNOs and towercos sometimes do the commercial work themselves, but I recommend working with a trusted, proven intermediary partner to manage the project and to be an independent party in lease negotiations.
Synergies & consolidation: towerco growth in the dynamic French market

As MNOs battle for market share, France’s towercos see opportunity for growth in a changing market

Since Free Mobile burst onto the French MNO market in early 2012, the incumbent operators have struggled to retain market share. As they battle with lower ARPs, higher need for capital investment and increased market competition, French towercos are seeing an opportunity to help release cash, reduce opex and build new, fit-for-purpose networks for their customers.

France is a highly developed Western European market, a founding member of the European Union and is one of the top ten global economies. While it’s easy to assume the ‘data boom’ has already taken place, there remains significant growth potential in the French tower market, both through urban infill and improving rural services. France is also at the forefront of the drive towards the Internet of Things, which will substantially change both the way mobile communications are consumed and the way they are delivered. In a market where operators are jostling for market share and towercos are taking very different approaches to growth, we assess some of the drivers which have brought the market to its current point, and evaluate how it may develop over time.

The French population is currently 64.09mn making it the third biggest country in Europe. Offering GSM services since 1996, there are now around 64.4mn subscribers. Despite struggling to recover from the recession of 2009, the French economy is now slowly coming into line with European growth levels, with the slow growth of 0.4% in 2014 unlikely to be replicated in 2015.

3/4G rollout is well underway with 68% of subscriptions including mobile broadband and all four MNOs in France rolling out their 4G networks since 2012.

**Read this article to learn:**
- How the French economy is recovering from the downturn of 2009
- An overview of the French MNOs and their relationships with one another
- Which French towercos are poised to find growth on the back of a changing market
- How consolidation among the operators or a new entrant into the tower market might upset the balance in the market

**Keywords:** 4G, ARPU, Active Infrasharing, Altice, Anchor Tenant, Bouygues, Capex, Co-locations, Decommissioning, Editorial, Europe, FPS, France, Free Mobile, Iliad, Infrastructure Funds, Infrastructure Sharing, Itas Tim, LTE, Market Entry, Market Overview, Network Rollout, New License, Operator-Led JV, Opex Reduction, Orange, Rooftop, SFR, TDF, TowerXchange Research, Transfer Assets, Urban vs Rural, Valuation

**French MNOs**

The French market currently supports four national MNOs, although rumours of market consolidation...
have been rife for several years. From Orange, one of France’s most established brands and successful exports, to Free Mobile, the newest market entrant, the French market remains dynamic and highly competitive.

**Orange**

Orange is France’s oldest and largest MNO and currently owns 34.6% mobile market share. With origins dating back to the formation of France Telecom in 1988, Orange is a highly recognisable French institution, operational in various forms in 27 countries worldwide, Orange is listed on the Paris Stock Exchange, with a current market cap (at 20.9.15) of €37bn. The state owns 25% of the company, 13.4% directly and 11.6% though BpiFrance, the state-owned investment bank. The remainder is in free float on the Euronext Paris market and the New York Stock Exchange, with no other shareholder owning a stake greater than 5%. In June 2015 Orange’s Fitch rating was upgraded from Negative to Stable, as a result of both Orange’s moves to reduce debt and the growth potential identified in the French market.

Orange lost out in terms of market share when Free Mobile entered the market, losing the most market share to the new entrant. Although competitive pressures will continue to keep tariffs down and force Orange to maintain market share through capex-intensive projects, the market does seem to have stabilised since Free Mobile’s launch in January 2012 and we believe that Orange’s faster deployment of 4G networks should provide an important point of differentiation in the market.

Despite the fact that capex is likely to remain high due to upcoming spectrum auctions, fibre rollout and their commercial strategy to lead the market in mobile data provision, Orange is targeting gross cost savings of €3bn from its transformation programme over 2015-2018.

In 2014 Orange spent €5.6bn (or 14% of revenues) on capex, a number which is likely to increase in the next two years before it can be reduced. Therefore they need to explore different ways to raise cash and reduce opex to support this. Orange does plan to release cash through the prospective sale if its 50% stake in EE in the UK, which should raise around £3.4bn plus a 4% stake in the acquiring party, but there is also a significant asset sitting on their balance sheet in the form of around 20,000 telecoms towers, the sale of which could not only release well in excess of €2bn but which could also help them to stabilise opex for the next ten plus years.

**Numericable-SFR**

Founded in February 1987, SFR also has a long history in the French market and offers services in both fixed line and mobile telephony. Originally founded as an arm of Vodafone in France, in April 2011 Vodafone sold their 44% stake in the company to media giant Vivendi, who owned the company with Altice until Q2 2015. With 28.6% of French market share, they are currently the second biggest MNO in France.

In April 2014 Vivendi’s management accepted a
takeover offer for SFR from Numericable’s parent Altice. Under the terms of this deal, Altice paid Vivendi €13.5bn in cash and Vivendi took a 20% stake in a newly formed company, Numericable-SFR, of which 60% was owned by Altice and 20% publicly listed in Paris. Vivendi exercised its option to sell its 20% SFR-Numericable stake in February 2015, with half of its stake being sold to Numericable-SFR for €1.947bn in cash in February 2014 and an agreement for the remaining shares to be acquired by Altice France no later then 7 April 2016.

Notably, Vivendi’s withdrawal from SFR came only two months after SFR signed a network sharing deal with their competitor Bouygues Telecom. The agreement, which will see the two operators share some 11,500 towers in low-population areas, should save SFR around €200mn and Bouygues around €100mn per annum, a move necessitated by the price war initiated by Free Mobile’s entry into the market in 2012.

Between them, SFR and Bouygues Telecom currently have around 18,500 base stations in the areas covered by the network sharing agreement (representing 80% of French territory and 57% of the population), necessitating the decommissioning of over 7,000 towers, as well as further build to suit in areas which are inadequately served by either network.

Bouygues Telecom

Bouygues, a giant in both the French telecoms and construction markets, is the third biggest operator in the French market, with 14.3% market share. The company is listed on Euronext Paris exchange and is a blue chip in the CAC 40 stock market index. Founded in 1952 by Francis Bouygues, since 1989 it has been led by his son Martin Bouygues who has overseen the expansion of the company, and launch of Bouygues Telecom in 1996.

On June 21 2015, French Sunday newspaper Journal du Dimanche reported that the owner of Altice, telecommunications billionaire Patrick Drahi, had offered more than €10bn to buy Bouygues Telecom, the assumption being that he could merge the company with his existing asset Numericable-SFR to jump straight to the number one market position.

However, the offer proved unpopular with the French government and on June 23 the offer was rejected by Bouygues, citing the significant growth potential it sees in the French market. The move surprised many, as Drahi’s price tag was considered to be a generous valuation – roughly twice that of many estimates.

Bouygues’ ownership is currently dominated by the Bouygues family themselves, with 20.9% ownership of capital and 27.3% of voting rights, the remainder is split between Bougues employees, who own 23.3% of capital, 19.2% of capital is owned by French investors and the remaining 36.6% is owned by foreign investors in the company.

Free Mobile

Arguably the most disruptive force in the French
mobile market in the last five years, Free Mobile has quickly reached 13.4% of market share since its launch in January 2012. Owned by French entrepreneur Xavier Nel, who also co-owns French newspaper Le Monde and Monaco Telecom, Free Mobile’s model relied on low numbers of physical outlets, low-cost offers and non-handset deals to undercut the existing market players, with Nel claiming the incumbent MNOs saw their subscribers as ‘cash cows’ rather than customers.

Originally reliant on France Telcom for around 70% of their network, Free Mobile has been building up their own network coverage and now owns around 10,000 towers in the country. This leaves them some 7,000 short of the 17,000 sites TowerXchange estimates MNOs need for full coverage of the French territory, and makes Free Mobile attractive prospective tenants for towercos in the market.

### France’s towercos

Given the rapid change taking place in the French market, it’s unsurprising that the towerco market has recently enabled smaller players to enter the market and grow rapidly. With Free Mobile’s appetite to grab market share, Numericable-SFR and Bouygues’ network redesign and Orange’s need to reduce opex in favour of high capex deployment to maintain their position as market leader, both the reduced opex offering and the potential to release cash through the sale of towers could prove highly tempting to France’s MNOs.

### TDF

TDF is the most established player in the French tower market, founded in 1975 as a public-sector broadcasting operator and becoming part of France Telecom in 1991. From 2002, the when France Telecom first sold off 64% of the company, TDF has been through several acquisition processes, most recently being acquired in 2015 by Brookfield Infrastructure Group, Public Sector Pension Investment Board (PSP Investments), APG Asset Management N.V. and Arcus Infrastructure Partners, valuing the company at approximately €3.6bn.

TDF provides services and infrastructure to the media, broadcasting and telecommunications sectors in France, owning and operating a national network of infrastructure with more than 6,690 multi-purpose towers and active rooftop sites, as well as 5,000 km of fibre backbone. These services drive almost 90% of the current revenues of the business, supported by long-term contracts and inflation-linked cash flows. The company expects the portfolio’s growth to be driven by ‘increasing tower deployment by mobile network operators as a result of rising mobile data consumption needs’.

Indeed, when Free Mobile entered the market in 2012, declining revenues from the existing three operators meant TDF was forced to take hit in terms of revenue from these clients, however, Free Mobile’s need for rapid market coverage worked

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**Estimated tower ownership in France**

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to TDF’s advantage, and the towerco was able to offer services to all four of the French MNOS, working with them on 4G roll out and securing 35% of their overall revenues in 2012-2013 from the telecoms side of their business (the largest single contributor to Group revenue). TDF sees the ongoing data boom and the future of the Internet of Things as a significant opportunity for them to further capitalise on their network, which remains the biggest in France by some margin.

For the short term, TDF’s growth ambitions appear to be focussed heavily on the domestic French market. Despite owning assets abroad from as early as 2001, when TDF acquired a 49% stake in Digita in Finland, from 2011-2014 they divested several European businesses including Axión in Spain, Alticon in the Netherlands, Digita in Finland and Antenna Hungaria in Hungary. CEO Olivier Huart claimed this series of divestitures was made in order to pay off group debt by selling off non-core assets and refocus the business geographically.

**FPS**

Founded in 2012 through the acquisition of 2,166 towers from Bouygues Telecom by Antin Infrastructure Partners, FPS sees itself as offering the market an alternative to TDF. Particularly focused at first on less well-served rural areas, FPS identified Free Mobile as a potential tenant who would need to make significant headway into their rural network over the next few years. FPS has also benefitted greatly from the 15% stake retained until September 2015 by Bouygues Telecom, who remain their anchor tenant on the majority of sites. As the Bouygues/SFR network sharing deal was already under negotiation when FPS was created, the towerco is in the enviable position of being contractually protected from the worst of the potential revenue loss through decommissioning, while simultaneously being the first choice partner for network extensions and other build to suit opportunities required by the new entity.

A very ambitious towerco, with an eye on significant growth over the next few years, FPS also recently acquired Loxel, a rooftop management company, which opened up their urban network and has made a further 20,000 rooftop points of service potentially available to their clients.

**Itas Tim**

Currently the smallest of the French mainstream towercos, Itas Tim is still well established in the market. Launched in 2008, the Itas group focussed originally on the broadcast market and provision of active equipment to TV, radio and telecoms clients and their core business remains Digital Terrestrial Television (DTT) provision, within which a partnership with TDF allows them to cover the whole of the French territory and serve more than 11mn households.

However Itas Tim does own around 420 points of service in France and sees telecoms as an important new line of service. Their aim is to position themselves as a ‘new challenger’ to TDF and FPS in terms of market position.

**What next?**

Further consolidation in the French mobile market is still likely, and indeed is considered necessary by many, not least the French MVNO community, who represent 9% of the market and have struggled to maintain a competitive advantage since the arrival of Free Mobile in 2012.

Whether this consolidation happens in the short term or not, the market looks promising for independent towercos, whether because of France’s impending 4G spectrum auction, Free Mobile’s need for network expansion or Orange’s desire to increase capex spending in order to support their position in the market.

In terms of the French towercos, TowerXchange believes that there is still a significant amount of organic growth potential in the market due to the above factors. However, this doesn’t rule out the potential for a significant acquisition should a package of towers come to market. Certainly, we believe TDF and FPS would both have the financial backing to raise funds for a large-scale acquisition of >5,000 towers. Of course with both Cellnex (formerly Abertis Telecom) and Telecom Italia’s Inwit eager to prove they can close significant deals in order to justify their high market valuations, and American Tower keen to expand beyond their successful base in Germany, there is a good chance that the French market could become even more competitive than it is now.
Entrepreneurial towerco FPS expands beyond rural towers into urban rooftops

Insights into how the French tower market is evolving to meet the needs of four MNOs, including a new rollout and a network plan being shaped by RAN-sharing

FPS was formed in 2012 by Antin Infrastructure Partners to acquire and manage just over 2,000 towers acquired from Bouygues Telecom. Since then, their ambitious growth strategy has led to the acquisition of Loxel, a rooftop management organisation, in 2015, and further plans to leverage operator consolidation and partnerships to gain market share. We spoke to the management team (Frederic Zimer, CEO, Cedric Lepolard, CFO and Pierre Cassier, Sales Director) of FPS, about how the idiosyncrasies of the French market and how FPS plans to deliver on their growth plans.

Frederic Zimer, CEO, FPS Towers: We now have 2,051 towers which we acquired directly from Bouygues Telecom which is how the company was founded – through a sale and leaseback agreement between Antin Infrastructure Partners and Bouygues Telecom. Bouygues Telecom wanted to divest, and to create a new player in France to animate a market dominated by TDF. We can cover the whole of France but our focus on certain locations means our main offering has been in rural areas.

Now we are engaged in a two-part development plan – one focus is on working to put in place some build to suit towers. FPS sees a way to challenge our competitors because in France you have towers, rooftops, churches, water towers et cetera; you have maybe five to six main types of site which can be used for tenants. With this build to suit programme we’re planning to build towers to densify or to replace existing sites which are expensive or complicated to run, and we’re able to propose a good price for them, so in the next two to three years we expect to build several hundred new towers across France.

In order to complete our footprint in France we also have to address urban areas. Historically urban areas are a complicated area for towercos and carriers to address as there are many constraints...
in terms of zoning and planning. There are also aggressive reactions from people who oppose towers near to their houses, so there are a lot of complications around deployment in urban areas. We think we've found a good way to address this through the acquisition of a company called LOXEL which is a council for building owners and which manages the relationship between building owners and operators. For us it's a way to quickly grow our footprint in urban areas, allowing us to instantly address 20,000 locations in urban areas.

The next step is to continue with the LOXEL offering and at the same time propose an expansion of this concept to building owners in order to put FPS between the building owners and the operators. We can both own rooftops and lease rooftops and propose long term partnerships with building owners to commercialise their rooftop real estate. We expect to transform our urban areas dramatically.

The key difference between rural and urban sites is the relationship we have to establish with the building owners. In urban areas you generally cannot purchase the entire building, you have to enter into a good relationship with the building owners – their main business is to lease apartments, not rooftops, and that's the argument we use when dealing with the building owners. We can manage the rooftops and quickly commercialise empty rooftops as well, you can have this model without any constraints on people. The basics are easy to understand but it's a new approach: it's not only two people in an office signing a lease agreement and that's it, property owners have to focus on their main business. Our proposition is that we can take any constraints they're facing with the rooftop, report back as much as needed and share in a long term process of 20-30 years of added value.

The building owners have the same timescales as us – these are long term commitments. The lease agreement is reassuring for building owners because they worry about entering into a short-term relationship without thought for the future.

**TowerXchange: Tell us more about how the LOXEL portfolio of rooftop terraces fits into your portfolio.**

**Frederic Zimer, CEO, FPS Towers:** Our plan for next two to three years is to continue deployment and manage our relationships with all our customers – we see this as an opportunity to gain market share from our competitors. 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. We are very aggressive in terms of development.

We want to launch this development programme because we feel that our portfolio could be better in terms of footprint and volume to allow us to grow in the ways that we would like and to respond to the increasing market needs (several thousand points of service). The more points we can propose to our customers, the more powerful your place in the market. 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.

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**Breaking news**

As we go to press FPS have confirmed that Antin has acquired the remaining 15% stake in FPS from Bouygues Telecom, making Antin 100% owner of the towerco. Bouygues Telecom will remain a client of FPS, with Frederic Zimmer, CEO of FPS commenting ‘Bouygues Telecom remains an important client to FPS Towers, and the sale of their residual stake reinforces the position of neutrality that we have always had towards our clients’. This is good news for FPS and towerco's in general and confirms their independence, the investability of the class and the continuing appetite for investment in Europe.
TowerXchange: Please introduce us to the French telecom and broadcast tower market: how is tower ownership divided between operator-captive and independent towercos? Roughly how many towers and rooftops are in the market, how has that grown and how much further growth is foreseen? What are typical tenancy ratios in France?

Cedric Lepolard, CFO, FPS Towers: This is very complicated to explain because in Europe and especially in France the competitive towerco market is very new. TDF was the first independent towerco in France and has been operating without competition for a long time. The market was not really dynamic before our arrival and that’s why it’s difficult today to have clear figures in terms of sites and points of service.

FPS is a specialised telecom hosting services company, not an operator or broadcasting infrastructure provider. That’s the big difference. If you can focus on the telecom market in France you have at most 65,000 points of service – 30% (around 20,000) rooftops and the rest (around 45,000) are towers. This means in France you still have a large market share owned by the MNOs still, especially Orange and SFR and I think today Orange doesn’t have an interest in divesting their tower assets. SFR I don’t know; they have a new shareholder called Altice and we do not know what its strategy is.

In the short term we cannot see any global divestment coming from French MNOs, but what we do expect in the short term is a growth of the market due to 1) Free Mobile’s need to quickly deploy its network which means we will see that in the next two to three years there will still be a large number of points of service to create. 2) the diversification process – as the MNOs enter into new technology like 4G or even 5G to provide new standards of data, they will need to increase their price and my feeling is that they are on the way to doing this, meaning MNOs could soon have some more budget to invest in densification and in new urban points of service which is a good thing for us. If we can propose to our customers a large amount of urban points of service, we can facilitate their radio network design within our portfolio and for us that’s a strong added value to negotiate and discuss with them.

TowerXchange: With some commentators suggesting that consolidation is likely (and indeed needed) in the French market, what are the implications for tower sharing?

Cedric Lepolard, CFO, FPS Towers: Today in France you have four main operators – Orange, SFR, Bouygues Telecom and Free Mobile. Free Mobile was the last to enter the market and they have yet to deploy and build their network – something which is a legal obligation but of course also necessary for them. It’s really a specificity of the French market at this time; we have a dynamic actor obliged to build a network from scratch, and that’s a very, very important point for FPS. In terms of point of presence numbers you can make a quick comparison – Orange, SFR and Bouygues have on average 15-17,000 sites each and Free Mobile has fewer than 10,000, so they need 5-7,000 more to be able to compete.

Then you also have the established operators such as Orange, which is the biggest player in the market. Orange is focussed on European consolidation but in France they’re not really dynamic in terms of mobile, they’re more focussed on fibre. Bouygues Telecom and SFR have signed a RAN sharing agreement and are at the beginning of the process. It’s a massive programme because you have to find common process and create a new team which is complicated.

Luckily for us FPS was born during the negotiation of this RAN-sharing deal so we’re protected against losing revenue in the event of consolidation or decommissioning. That means that for us this deal is an opportunity – our portfolio is secure but we can work with SFR and Bouygues to design their new common network. In order to build a common and efficient network it may be necessary to dismantle two existing towers and build a whole new tower, for example if there’s 1km between them you would build a new one in the middle. We can build some new towers from this RAN sharing effect.

If we are clearly talking about dismantling and new builds it’s possible to make a win win deal – we see ourselves very much as partners to the MNOs. Redesigning the network is necessary for the telecom industry, they need to be agile.
TowerXchange: What role will microcells and DAS play as the French network densifies for 4G?

Pierre Cassier, Sales Director, FPS Towers: I don’t know how the operators see the technology but in terms of responding to densification and legal constraints, I think small cells are very interesting. That’s why for us the value of the rooftops in the coming years should increase drastically.

TowerXchange: FPS is owned by Antin Infrastructure Partners, who also own other tower assets in Europe - how far does this affect your remit to extend your footprint beyond France?

Cedric Lepolard, CFO, FPS Towers: Antin is an infrastructure fund today focussed on the Eurozone with several investments across infrastructure, two in towercos; FPS in France and Axion in Spain. My feeling is that we have a lot to do in France in order to grow but I think FPS is more than an investment, it’s a real company with strategic projects and a long term programme. In the short and medium term, FPS has a lot to do in France before we entertain any international ambitions - it’s important to be ‘global’ in the domestic market, by which I mean having the visibility and credibility to address deployment, BTS, solutions in urban areas, new network services, and network design services. We are a young company we want to grow quickly but we have to take one step at a time.

TowerXchange: How can smaller and ambitious towercos gain market share in markets like the UK, France and Germany, where the market is lead by large towercos with seemingly little appetite to acquire towers?

Frederic Zimer, CEO, FPS Towers: I think if you are in a dynamic market, as is now the case in France compared with the past, you have a place for everybody - for big players with process like TDF and for more entrepreneurial firms like FPS.

Our chance is that we’re in a growing market, which means you can address a new market not only to try to gain market share from your competitors, but you can profit from the global growth. Due to Free Mobile and densification in France you can have a place for global players and in the end, in terms of scale, if you want to build or manage less than 1,000 towers you can stay small with few people but if you want to grow and get over that 1,000 mark and continue to grow, you need to design an organisation with strong governance processes.

It’s still new to discuss long term programmes with European operators, this is the main difference between US, a mature market, and Europe; in the US it’s usual for operators to divest or to operate new points of presence with towercos In Europe, this is the beginning of the story.

Cellnex are probably the best recent example of the beginning of the story. Cellnex, active on the financial market, are clearly aiming to be the pan-European player to consolidate the market and to address all existing carriers with a common process and infrastructure relationship across Europe. I am sure that we’re now entering into a period with a lot of discussions taking place.

TowerXchange: Given the volume of transactions in France, Italy and Spain at the moment, it seems there’s a lot of tower activity in Southern Europe, do you feel this will have a knock-on impact in the rest of Europe?

Cedric Lepolard, CFO, FPS Towers: I think that the consolidation process will be accelerated in the coming year. For me it’s nonsense to have three to four MNOs in each country and to have three to four towercos in each country, especially in a mature market. In Brazil or Africa you can launch a towerco relatively quickly and easily with a BTS programme because it’s a growing market, but in Europe you have good infrastructure, you have a lot of funds and I think during the last five years the difficulty has been to go beyond network rationalisation.

TowerXchange: Given the volume of transactions in France, Italy and Spain at the moment, it seems there’s a lot of tower activity in Southern Europe, do you feel this will have a knock-on impact in the rest of Europe?
BMI believes there is growth to be found in this established European market

With its large and well-developed mobile market and rising consumer demand for connected lifestyle services, France represents a good long-term opportunity for infrastructure investor-owners. However, the country’s mobile network operators - which directly control the majority of their passive infrastructure - are burdened by the high cost of developing next-generation services at a time of falling income from proprietary voice and messaging services. In pursuit of cost-efficiencies, operators should consider selling towers to specialised third-party providers in the short to medium term.

**Operators’ strategies constrained by insular thinking**

France’s four licensed mobile network operators have typically built their own passive infrastructures to support their respective networks. While this has involved constructing and operating their own towers, smaller antennae have been sited on buildings, cooling towers, electricity pylons and other high-rise installations to ensure quality signal coverage in both densely and sparsely-populated areas, as dictated by operational requirements.

Orange claims to have been operating 20,400 2G sites at the end of 2014, along with 18,500 and 6,900 sites that supported 3G and 4G services, respectively. The company does not say how many of these support multiple technologies, neither does it say how many of these sites are directly owned.

Numericable-SFR (the result of the 2014 merger of
mobile operator SFR and cable broadband operator Numericable) claims to have had more than 18,500 radio sites at the end of the year, owning 5,200 pylons directly.

Bouygues Telecom - currently the third largest player in terms of subscriber numbers - claimed to be operating more than 15,000 sites across France at the end of 2014; it does not state how many of these are directly owned.

Free Mobile - part of the Iliad Group states that it operated 4,423 3G and 2,009 4G sites at the end of 2014, but does not provide any additional information, such as the number of sites that supported both technologies.

The French players adhere to the traditional mobile operator business models, including the belief that they need to be both an infrastructure owner/operator as well as a service provider. The high costs of building and maintaining networks, as well as acquiring the spectrum that binds these networks together are weighing on their operating margins; this investment will take many years to recoup as income from traditional voice, messaging and call termination/roaming services is being eroded by competitive and regulatory change.

There are few signs, as yet, that the French operators see any real need to divest core network assets that still have monetisable value and we believe they will remain resistant to the notion that selling towers to third parties will make their remaining business more sustainable in the long term. This insular thinking needs to change and, as evidenced by recent tower divestitures in ‘challenging’ neighbouring markets such as Italy and Spain, commercial needs can dictate a change in thinking.

Free stands out as being one of the most disruptive players in the mobile industry, having amassed a subscription market share of approximately 13.4% in under four years. It is close to overtaking Bouygues Telecom, if it has not already done so when eliminating dedicated mobile data connections serviced by the number three player. Free’s arrival prompted Orange, SFR and Bouygues to cut their prices, affecting profitability and ultimately sending SFR into a merger with Numericable and Bouygues to consider exiting the market.

The four players already share passive infrastructure in the mobile space and also collaborate to deploy fibre-to-the-home (FTTH) in markets where it would be prohibitively expensive to invest in next-generation access networks individually. Ultimately, the operators’ strengths are in content and services; to be able to justify continued investment in this area, they will inevitably turn to asset disposals.

The old-guard players will be reluctant to concede defeat, however, and it will take more radical thinking from upstart Free to force the issue. Free has already offered to sell Bouygues’ towers in return for regulatory approval to acquire that company; its offer was rejected, but the notion of tower separation is at least on the table.

Who will buy?

There are few specialised independent telecoms...
towers companies openly at work in Europe, so we believe the likeliest buyers of these assets will be those companies already servicing the broadcasting and utilities sectors. In this regards, we believe the TDF Group is well placed to acquire French telecoms towers. With 9,500 sites across the country, it already serves the telecoms sector with backhauling facilities, access to datacentres and support for content distribution networks. The four mobile network operators already make extensive use of its facilities and its deep technical expertise gives it the resources needed to ensure continuity of service for the time-sensitive telecoms market.

TDF has also branched out into telematics, providing wireless connectivity for smart meters in homes and offices as well as supporting the development of intelligent highways, connected cars and smart toll road payment systems.

The growth of the telematics market is tracked by the French electronic services regulator, ARCEP, which notes that the number of machine-to-machine (M2M) SIMs totalled 8.736mn at the end of March 2015. This represented quarterly and annualised growth of 5.8% and 20.2%, respectively. We expect the number of dedicated M2M connections to grow at a faster pace over the coming decade as more and more ‘objects’ are connected to create the so-called Internet of Things (IoT).

With tens of millions of objects set to be connected to French networks over the next 10 years, so networks will be pressured to cope with increased traffic. We believe today’s mobile network operators are ill-equipped to deal with this rapid rise in (mostly data) traffic and that they need to focus on software-developed solutions that can effectively manage such loads. To do so effectively, they need to offload key infrastructure to specialised providers, particularly those with no direct stake in the content/traffic business to ensure impartiality in an age when expectations of network neutrality will become ever higher.

**International players would be interested**

Besides TDF, there are a number of European and international tower/infrastructure specialists that would be very interested in paying a premium for France’s telecoms towers. Abertis (now Cellnex) in neighbouring Spain has acquired a small batch of towers from local players Telefonica and Yoigo, while the Spanish units of Vodafone and Orange will almost certainly be considering tower disposals as they move to absorb the high costs of acquiring wireline broadband/pay-TV players. Cellnex has already moved to set up a dedicated telecoms towers unit and has mooted the possibility of overseas acquisitions to bolster a business that is already recording strong revenue growth (see ‘Abertis Plan Highlights Potential Of Europe’s Towers Market’, October 31 2014).

In Italy, Telecom Italia has spun its towers off into a standalone unit, Infrastrutture Wireless Italiane (INWIT), in which it sold a 40% stake through an initial public offering (IPO). The cash-strapped operator could well be persuaded to sell
further stakes in the years ahead, which would be beneficial to the market in terms of transparency and neutrality.

INWIT will be competing for business with RaiWay (a unit of broadcaster RAI) and MediaSet-owned EI Towers, companies that could merge in the near future: EI Towers had bid EUR1.23bn to acquire RaiWay earlier in 2015, but the bid was blocked due to government opposition and concerns over market dominance. With INWIT now established and 3 Italia considering the purchase of Wind Telecom (a deal that may necessitate the sale of excess towers or the pooling of the enlarged entity’s entire towers portfolio), EI Towers may be able to convince regulators that its market dominance is now less of an issue. Reportedly, MediaSet plans to sell up to 40% of the merged business and to aggressively target the European telecoms, broadcasting and IoT markets.

And what of global players?

Few towers companies have truly global footprints; most are content to expand regionally, as is the case in Latin America and Africa, where companies such as IHS Towers, Helios Towers and American Tower Corporation are seeking out investments that complement their regional footprints. In Asia, towers companies have generally kept to their local markets, so we do not expect companies such as Bharti Infratel, Reliance Infratel or Tower Bersama to move into Europe.

The only non-European towers company likely to take an interest in France, Italy or Spain might be American Tower. The company has a small unit in Germany, operating 2,000 towers. But its appetites seem limited to emerging African and Latin American markets at present, where the price per tower generally reflects the low population densities. Europe may, therefore, already be too expensive for players from outside the region.

France’s National Frequencies Agency (ANFR) claims there were - in theory - 54,107 2G-ready sites at the end of May 2015, of which it believed 52,003 were in service. In reality, it believes 39,251 were in service. Meanwhile, 53,355 sites theoretically supported 3G service, although just 38,017 were thought to be actually doing so. As for 4G, 21,371 sites were - theoretically - available and in service; in reality, it was closer to 17,493.

Even allowing for the fact that a large proportion of sites supported two or more technologies, this still means that the French towers market is one of the largest in Europe and supports one of the most data-intensive user bases. Tenancy space on French towers could therefore soon be at a premium and investors that are first to market should see considerable returns on investment over the long term.
Regional coverage:

CALA features

Before TowerXchange’s Head of Americas Arianna Neri took a few weeks off to have a baby (congratulations Arianna!) she assembled a comprehensive special feature on the Nicaraguan tower market, featuring views from Torrecom, BMI, Mott MacDonald and the IFC. Arianna also shared updated views on the Mexican tower market, including an exclusive interview with Jose Solar at Mexico Tower Partners, joined at one point by Digital Bridge’s Marc Ganzi.

Our CALA features conclude with interviews with three more of CALA’s fastest growing towercos: Phoenix Tower International has risen from startup to 1,608 towers in less than a year; NMS continues to expand in Nicaragua, Mexico, Colombia and Peru; while TORRESEC have become the first towerco in Argentina with a landmark BTS deal.

Finally, Norton Rose examine the Colombian mobile and tower markets.

Don’t miss:

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Can Xinwei break the Nicaraguan duopoly?
Doubts raised about the Chinese giant plans, while the country falls behind regional standards

A country where a mobile market duopoly is in place is hardly attractive to investors and independent tower companies who usually look at potential to achieve scale, critical mass and competition among more than two carriers to launch operations. But if the same country grants a nationwide license to offer mobile, fixed, broadband, data transmission and pay TV services to a third carrier who promises to invest as much as US$700mn ahead of launching services, the game changes quite considerably. And Chinese Xinwei could be a real game changer in Nicaragua thanks to its considerable upfront investment, projected total US$2bn expenditure in the country and potentially disruptive role in breaking the duopoly while raising the glass ceiling on tenancy ratios beyond those originated from Claro, Movistar and a handful of non-traditional MNOs.

With SIM penetration at 120%, the potential for growth is still considerable and Xinwei could be the catalyst the Nicaraguan tower market has been waiting for. Or not...

Xinwei: the gap between expectations and reality

In recent news, the Chinese economy has been under scrutiny in light of the poor performance of the Chinese stock market. The share value of the telecom giant Beijing Xinwei Telecom Technology Group Co. didn't pass the market test over the past few weeks and has dropped more than 50% during the month of June. In fact, according to official data of the Shanghai Stock Exchange, on Wednesday 8 July, Xinwei shares were valued at CNY31.60 (US$5.08) against the value recorded on June 17 of CNY60.66 (or US$9.76).

Xinwei is not only interested in establishing its telephony business in Nicaragua but is also one of the driving forces behind the Nicaragua Interocceanic Grand Canal, the shipping route currently being constructed through Nicaragua which should then connect the Caribbean Sea with...
the Pacific Ocean for an estimated cost of US$40-50bn. Commentators are currently questioning whether Wang Jing, the Chinese billionaire behind Xinwei, and his pool of investors are actually able to support the infrastructure project as well as the carrier launch in Nicaragua in light of the CNY12,000mn credit line (or US$1.92bn) granted by the Development Bank of China and the debts the company is piling up.

However, Xinwei is currently rolling out its mobile network and Managua is the first municipality being covered by the Chinese giant. Moreover, local sources suggest that Xinwei is currently in touch with towercoS such as SBA Communications and Torrecom to become a tenant on their towers and the financials discussed above would suggest that the company could have an interest in signing lease agreements rather than building its own towers.

Regulatory weakness doesn’t help market growth

It’s been noted how the Nicaraguan regulatory body, Instituto Nicaragüense de Telecomunicaciones y Correos, or Telcor, has so far failed to take strong measures to fully unlock the potential of the telecom sector in the country. In fact, Nicaragua does not have a specific regulatory framework with regards to towercoS and infrastructure sharing.

Several local news outlets reported back in 2014 the inertia of Xinwei who at that point hadn’t started setting up its network after two years of licensing. Commentators were particularly critical about the absence of reactions from Telcor.

One voice was particularly loud in the crowd. As declared by the former director of Telcor, Ana Nubia Alegría, the failure to start any kind of operations within 180 days from the grant of the license would technically imply the nullification of the same, as stated in the concession contract. The 180-day term can actually be extended for just cause but in the Xinwei’s case, its silence lasted from November 2012, when granted the license to time of writing: significantly more than the 360 day limit!

Doubts were initially raised by the unknown terms of the concession contract which was assigned without divulging its financial terms.

Rural areas and electrification challenges

Compounding the complicated reality of a developing country still under a mobile duopoly, any carrier looking at entering or expanding its existing coverage will have to face the challenge of Nicaraguan poor electrification rates.

Nicaragua’s low electrification rate of 77.9% is above only Haiti but lower than any other country in CALA. But having improved from 73% back in 2010, the country is moving in the right direction, thanks to international projects developed by the World Bank among others.
In spite of current efforts, 68% of Nicaragua’s rural population doesn’t have any access to electricity and is mostly served by diesel generators. However, it is to be noted that the country is pushing hydroelectric and solar projects thanks to conspicuous tax breaks programmes with the aim to reach out and connect remote areas.

As an example, the Association of Rural Development Workers—Benjamin Linder (commonly referred to as ATDER-BL), a Nicaraguan NGO, has actively involved local communities in the construction of various types of infrastructure to provide electricity. So far, ATDER-BL has developed tens of electrification projects across rural Nicaragua such as building thirty small hydroelectric plants and over 225km of power lines which have granted electricity of 40,000 people in remote areas.

**Four towercos: are there too many?**

To date, there are four towercos active in Nicaragua including SBA Communications, with approximately 285 sites, Torrecom owning a portfolio of almost 100 sites, NMS and Continental Towers Corp. So far, mobile network operators haven’t divested their tower portfolios and towercos are still mainly working in build-to-suit projects.

TowerXchange believes that the total tower count in Nicaragua should be around 1,000 sites, with both carriers still heavily involved in expanding their coverage and adding sites to their counts. In contrast, GSMA, in its early 2014 report titled “Beyond Coverage: The opportunity for mobile operators to improve access to energy in Latin America”, mentioned that the two carriers in Nicaragua should own approximately 1,500 sites between the two.

What is clear is that whereas we doubt Claro is planning to divest its towers anytime soon, Movistar are believed to have already sold the majority of their Nicaraguan towers to SBA Communications, and are now estimated to own less than 100.

**Conclusion**

Nicaragua is one of the poorest countries in the region with approximately 60% of the population living below the poverty line. However, it has been experiencing a wave of economic growth since 2010, when its GDP started rising. Its overall conditions are still far from ideal and its mobile sector registers very low penetration rates if compared with the rest of the region.

The country needs international investment, business savvy and increased competition to properly stir its mobile sector, which has been so far limited to a duopoly dominated by Claro. The entrance of Xinwei as third player could very well disrupt the status quo but so far doubts have sparked with regards to the Chinese telecom giant’s plans.

Breaking the duopoly would be the first step towards modernising the national mobile sector and towercos would surely benefit from the entrance of a new player, for which speed to market will be essential, if and when Xinwei actually commits to a major rollout. However, all these potentially positive developments will need to be supplemented by a strong regulatory push in the direction of infrastructure sharing and enhanced competitiveness and transparency. The ability of Telcor to liberalise the Nicaraguan market has been under scrutiny and we can only wait to see if any positive developments follow.
Nicaragua had a population of 6.2 million people and 7.4 million mobile subscriptions at the end of 2014, giving a SIM penetration rate of 120% - about average for Central America. Around 81% of subscribers had a pre-paid account.

There are currently two Mobile Network Operators (MNOs) serving the Nicaragua market, of which Movistar was the narrow market leader with 3.9 million subscriptions – 52% market share (See figure 1), slightly ahead of Claro (América Móvil) which had 3.6 million. Movistar has been growing slightly faster than Claro over the last two years – adding 850,000 subscribers in the period, although quarterly net additional subscriber growth has been slowing for both operators.

**Key mobile developments**

At the end of 2014, 77% of subscriptions were 2G, with 23% 3G and no LTE thus far. However, 4G testing has been underway.

Nicaragua has until recently been unusual in Latin America, and indeed in terms of most global markets, by nature of having only two mobile operators. This situation looked set to change in 2012 when Nicaraguan telecoms regulator, the Instituto Nicaraguense de Telecomunicaciones y Correos (Telcor), launched a tender for two new mobile licences in the 1785MHz-1805MHz band – aiming to challenge this duopoly. Xinwei was subsequently awarded a mobile licence utilising the 1785MHz-1805MHz spectrum band in November 2012, after beating off competition from a number of unspecified companies from Asia.

However, only in January 2015 did Xinwei finally start to roll out its mobile network in Nicaragua –over two years after receiving its telecoms concession from the government. According to local news site La Prensa, the Mateara municipality
in Managua was one of the first places to see deployment. Telcor has stated that a commercial launch is likely by the end of 2015, although the timing has yet to be confirmed.

Some doubts have been expressed over the operational strategy of the firm – which is known for its multi-carrier wireless in the local loop (McWiLL) technology and which intends to roll out a nationwide network based on Time Division Synchronous Code Division Multiple Access (TD-SCDMA), previously rolled out by China Mobile.

There were question marks over the circumstances of the award to Xinwei – which Xinwei’s website announced had been made in November 2012, although it wasn’t revealed in the Nicaraguan press until January of the following year. At the time there was speculation linking the company to Laureano Ortega, son of President Daniel Ortega, and the head of investment agency ProNicaragua, which was reported to have had a hand in the deal. Moreover, the price of the concession is said to have been slashed from US$90m to US$20m, again triggering accusations of nepotism. At the time Telcor told the media that Xinwei had promised to invest US$700m in the first stage of launching operations, rising to US$2bn by 2015.

However, this level of investment has not materialised. Indeed, in 2014, according to TeleSemana, the company considerably reduced its promised year one investment from US$700m to US$300m. When roll-out did start in 2015, it was clear that the scale of deployment was vastly lower than the scale laid out in its original licence conditions. According to Nicaraguan website Confidencial, Xinwei planned to launch mobile telephony and broadband connectivity in seven isolated communities in the North Atlantic Region. It also transpired that Xinwei’s initial rollout has in fact been funded by the World Bank, which has supplied it with US$800,000. The project stands to benefit around 15,000 people in the Region Autonoma del Atlantico Norte (RAAN).

The links to Laureano Ortega were also decried by some commentators when it emerged in 2013 that Nicaragua’s National Assembly was planning to resume its discussion of laws governing the installation and location of mobile BTS, which had been pending since 2003. The law, dubbed ‘Article 11’, concerned the proximity of cell sites to heavily populated areas. Eliseo Nunez, deputy leader of the Nicaraguan Liberal Alliance (ALN), commented: “I find it suspicious that you are changing telecommunications laws at the same time as you are introducing a new company that has ties to the current [government].”

Xinwei also received attention in June 2013 when its owner Wang Jing secured the rights to build and operate a US$40bn shipping channel through Nicaragua – with the idea of competing with the Panama Canal. Eyebrows were also raised in October 2013 when Wang Jing was quoted in the South China Morning Post, stating that roll-out would start by mid 2014 – starting with cities with a large population and demand. According to TeleGeography, this urban build strategy was at odds with the conditions attached to Xinwei’s 1785MHz-1805MHz licence. Prior to the concession’s award Orlando Castillo, head of Telcor, said that the decision would be geared towards companies that were prepared to focus on the deployment of rural-focused services.

In mid 2014, Xinwei was awarded six new telecoms concessions by Telcor – local, domestic long-distance (DLD) and international long-distance (ILD) licences valid for twenty years; and data transmission, IPTV and ‘cellular telephony’ concessions, which are valid for ten years apiece. It is unclear how the cellular licence differs from Xinwei’s original licence.

In addition to Xinwei, it originally looked as if Costa Rica-based Grupo Instituto Costarricense de Electricidad (Grupo ICE) might enter the mobile market. In fact, the company had requested bidding documents from Telcor but in the end it announced that it would not compete for a licence. However, in 2014 it did announce plans to offer business services in Nicaragua, using the transmission network belonging to utility company Enatrel.

A Russian backed WiMAX operator was awarded a fixed-wireless telephony licence in September 2009, which was replaced by a data transmission licence in September 2014.

**Regulation**

Telcor is the telecoms regulator, and in general its stance towards sharing is positive – with regulatory
reform favourable to infrastructure sharing underway (such as simplified permit procedures and stipulations regarding tower registration and construction standards, for example). Moreover the regional association FOPREL has made a number of regulatory recommendations which will further facilitate the activities of towercos.

However, it has not all been plain sailing with Telcor – in 2013 it issued a new decree demanding that all private telecoms companies needed to get government approval for their managers, directors, newsroom chiefs and systems managers, giving the telcos 30 days to comply with the request. However, both the Superior Private Business Council (COSEP) and the Nicaraguan-American Chamber of Commerce (AMCHAM) claimed the decree was in direct violation of the Constitution, the Law of Telecommunications and other national laws and regulations that govern free enterprise. After a month-long standoff, the government and the operators reached a compromise, when Telcor agreed to modify the decree.

The tower sharing market

There are estimated to be around 900 towers in the Nicaragua market, and about 530 of them are owned by towercos – giving around 60% penetration, the highest level in Central America. SBA is the market leader with around 285 towers. Torrecom has 93 towers and NMS and Continental about 75 each.

Telefónica sold the majority of its Nicaraguan towers to SBA, and Claro has retained approximately 300.
To date Xinwei has used 100% co-location in its very limited launch in the North Atlantic Region.

There is a possibility, in theory, that in future Claro might consider rolling its towers into a towerco – like the Telesites venture in Mexico – but no indication of this is on the immediate horizon.

4G testing has started in Nicaragua which should mean more BTS projects for towercos as MNOs seek to ensure there is adequate capacity in urban areas and sufficient coverage in underserved regions.

Conclusions

Nicaragua is a small market but one with good potential for growth – in terms of subscriber numbers as well as thanks to the advent of 4G on the horizon. Politically and economically it is a very different country from ten years ago, and has seen healthy growth and investment in the last few years. The regulatory conditions are broadly favourable to sharing, and look set to improve further.

The fact that the market remains to all intents and purposes a duopoly does limit opportunities to a degree – and whilst Xinwei offers potential on paper, its market entry has been slow and levels of investment lower than hoped. It should also be noted that the market already has four active towercos, meaning there is not much room for additional players. However, there may be opportunities through M&A activities.
Debunking myths about Nicaragua

Torrecom on its successes and their positive experience of doing business in the country

Maria Scotti has shared with TowerXchange the pros and cons of the tower industry thanks to her substantial experience and outspoken personality. And this interview on Nicaragua was no exception. The CEO of BTS firm Torrecom discussed with TowerXchange the reality of building telecom towers in Nicaragua, the misconception that it is a dangerous country, and the relative ease with which Torrecom has been able to do business there.

**Keywords:** Americas Insights, Build-To-Suit, C-Level Perspective, Central America, Claro, Costa Rica, Guatemala, Infrastructure Sharing, Insights, Interview, MCM, Movistar, New License, New Market Entrant, Nicaragua, Off-Grid, Regulation, Renewables, SBA Communications, Solar, Telcor, Telefonica, Telesites, Torrecom, Towercos, Xinwei

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**Read this article to learn:**
- Nicaragua: a market poised for growth, and a market without the country risk many assume
- A country with “two and a half” carriers: Xinwei’s path to launch
- From permitting to property registrations: challenges of doing business in Nicaragua
- Nicaragua versus Guatemala: a comparison
- The Nicaraguan government and its commitment to connecting rural and remote areas

TowerXchange: Maria, please share with us your views on Nicaragua, its telecom sector and the expansion of the tower industry.

Maria Scotti, CEO, Torrecom and Director, MCM: First of all, it’s important to stress that the first thought often associated with Nicaragua is the danger related to doing business there. Well, this is a good occasion to debunk this assumption and highlight the good points of the country.

In reality, I have found Nicaragua to be one of the best markets for Torrecom and, ironically, one of the most progressive and safe to do business. We played a role in amending the regulation a couple of years ago and we’ve helped to put in place a system that is working pretty well for towercos. There are challenges just like everywhere else but we are pretty content with our business in Nicaragua so far.

TowerXchange: How is the carriers’ landscape in the country?

Maria Scotti, CEO, Torrecom and Director, MCM: To date, there are “two and a half carriers” in the country. Claro and Telefónica have been sharing the market pretty equally over the past few years and now we are witnessing Xinwei gearing up to launch towards the end of the year.

Torrecom has been building for Telefónica and, on a smaller scale, for Claro. Xinwei, on the other hand, is purely focused on co-locating at the moment in order to speed up its launch. Xinwei
There isn’t much inventory left in Nicaragua. In fact, Telefónica does hold on to some major assets but not many, after the sale to SBA. Claro is retaining its 300 towers and there are questions as to whether they could be transferred to Telesites in the future. However, this is far from realistic at the moment as Telesites is still in the process of setting up its operations in Mexico, which will take some time... On the other hand, Claro did issue an RFQ for 300-350 new sites in Costa Rica and Telesites won it progressing and getting smoother. It’s a process that will still require some time to improve.

TowerXchange: How is the infrastructure sharing market going in the country?

Maria Scotti, CEO, Torrecom and Director, MCM: Telefónica is very open to sharing in Nicaragua and beyond. I’d say the company is extremely progressive when it comes to infra-sharing and has embraced the co-location model throughout the region. I will also add that Claro has ramped up its co-location appetite and this speaks to the importance of the regulation in place. It is important for the environment and experience tells us that multiple towers within close proximity of each other will create an even more difficult permitting process in the future.

There isn’t much inventory left in Nicaragua. In fact, Telefónica does hold on to some major assets but not many, after their sale to SBA. Claro is retaining approximately 300 towers and there are questions as to whether they could be transferred to Telesites in the future. However, this is far from realistic at the moment as Telesites is still in the process of setting up its operations in Mexico, which will take some time. On the other hand, Claro did issue an RFQ for 300-350 new sites in Costa Rica and Telesites won it. So we will need to wait and see whether they start entering other markets in full force.

TowerXchange: What are your expectations for the entrance of Xinwei in the market as third
operator? Are they likely to start building any sites?

**Maria Scotti, CEO, Torrecom and Director, MCM:**
I don’t foresee Xinwei becoming a large build-to-suit client. I know much depends on their network growth but for now, I see them focusing on colocations as much as possible.

Their equipment is smaller if compared to that of traditional carriers, which allows them to co-locate quite comfortably. So that helps from a technical standpoint. On the other hand, much depends on how well they do on the subscriber front and how much they manage to grow in the near future. If you ask me, I don’t see them building a lot of new sites over the next three years.

That said, I don’t exclude the possibility of them building a few sites here and there but we aren’t talking about anything of scale. We need to keep in mind that Xinwei has a lot of network to build and an enormous quantity of equipment to bring in, just to get started. So for now, I don’t see them focusing on requiring new sites in a BTS program.

We have started working with Xinwei a few months ago and from a tenant perspective, they’ve been very good. They are a good customer and, since they’ve been around in Nicaragua for two years prior to starting any operations, they have a strong local team, supported by a few engineers that travel from overseas to assist them. Xinwei has been installing “clean and quietly” and we cannot complain. The critical missing piece is to see how well they will perform marketing their products and we, just like all the other local towercos, really hope they do well!

**TowerXchange: Is Xinwei representing a real threat for Claro and Telefónica and how have the competition dynamics between the two been so far?**

**Maria Scotti, CEO, Torrecom and Director, MCM:**
Claro and Telefónica are extremely comfortable in Nicaragua as the country presents a very stable market for them to do business. Both companies have been doing consistent network upgrades and BTS programmes and right now it is business as usual. They aren’t in a rush to do any major work ahead of Xinwei’s launch. Their deployment pace has been slow but steady, nothing comparable to the rush we are now seeing in Mexico and Guatemala.

From a competition perspective, their way of competing is very similar to that of AT&T and Verizon in the U.S. They are fairly even at the moment with Claro being slightly ahead due to their longevity in the market and because of their other telecommunication asset holdings.

**TowerXchange: The World Bank has been working on a Nicaragua Rural Telecom project for quite some time now and there are more projects being developed to connect remote areas. What are your thoughts on them and how likely are they to become reality?**

**Maria Scotti, CEO, Torrecom and Director, MCM:**
There are a variety of projects being developed in Nicaragua to provide coverage in remote areas, to provide energy in off-grid locations as well as to improve the country’s logistics and connectivity. The World Bank has been developing some projects but in general, most plans have proven more expensive and technically challenging than originally thought, hence are progressing slower than anticipated.

That said, the local government is extremely committed to making these projects happen. They simply won’t let go because of financial or logistic challenges and this is what is contributing to the country’s development. At the beginning, we were skeptical about some projects being realised but now, I can tell you most of them will be developed one way or the other. It will just take time.

The government acknowledges that by empowering local communities, the results will be huge from an economic growth standpoint. Nicaragua is quickly growing as a tourism attraction as well as being a retirement haven for those opting for remote locations to settle down. And so now there is much emphasis on bringing services to those areas such as new gated communities. There is a strong dedication to bringing communications to the citizens of Nicaragua for educational, medical, banking and retail services by accessing wireless technologies.

All this is happening with considerable logistics and financial challenges but the government’s...
the government’s mantra so far has been to bring communication to the citizens wherever they are, and to deal with each issue, whatever they are.

TowerXchange: Being active in Nicaragua and Guatemala, could you compare the two and their respective regulatory, telecom and tower environments?

Maria Scotti, CEO, Torrecom and Director, MCM: Nicaragua is a very stable country compared to Guatemala. In fact, Telcor, the telecom regulator, has done a very good job in structuring the permitting system in a way that actively involves municipalities and empowers them in a positive way. The system takes time, it can be complicated, but it works. You see, Telcor aims at providing some consistency across the board and keep things under control. And this is noticeable from a permitting and general business perspective.

On the other hand, the Stuperintendencia de Telecomunicaciones (SIT) in Guatemala has the power to release permits but this doesn’t mean municipalities accept them without protesting. Quite the contrary, municipalities are often opposed to greenfield projects in spite of their local communities literally begging for coverage. We face protests, sometimes violent ones, and building outside of the city is very dangerous. And keep in mind that moving around Guatemala City isn’t easy either.

Doing business in Guatemala isn’t easy and it’s such a pity. In fact, the country is technically richer than Nicaragua and right now there are a lot of plans to develop new sites and enhance coverage across the country. The problem is to get them done safely.

It’s a shame because Guatemala City has some greatness to it with its high-rise buildings, beautiful gated communities and marvelous scenery out in the countryside. There are a lot of people that would want to progress and get things done! Bear in mind that it tends to be even more difficult during the pre-election phase. Hopefully after the elections in September things may move faster during the regulatory process but it won’t get easier logistically and safety of our team members is in the forefront of our minds as well as the carriers’.
BMI view on Nicaragua: Risks ahead but market ripe for tower development

Charting specific country risk and forex risk as entry of third MNO creates opportunities for towerco's

The introduction of a new telecoms operator creates new opportunities in the towers market. Xinwei requires significant investment in new infrastructure to begin to compete with the existing players, so lower network deployment cost options are highly appealing.

Keywords: Americas, BMI, BMI Analysis, BMI Research, Business Monitor International, Capex, Central Americas, Claro, Co-locations, Continental Towers, Country Risk, IFC, Infrastructure Sharing, Market Forecasts, Market Overview, Movistar, Network Rollout, New Market Entrant, Nicaragua, Off-Grid, Research, SBA Communications, Sale & Leaseback, Torrecom, Xinwei

Newcomer Xinwei will face Latin America’s two largest telecoms operators Claro and Movistar when it launches, both of which have considerable financial backing and regional expertise to hold off any threats to their market shares. Xinwei has experience in the telecoms equipment market, but Nicaragua will be its first major network launch after winning a bid for a licence in 2012.

The new dynamics of the Nicaraguan mobile market have created an environment that BMI believes will encourage operators to consider selling off their remaining tower infrastructure, or in the case of Xinwei, go directly to tower companies. As the largest market geographically in Central America with a low income and sizeable rural population, keeping costs low will become a greater focus for operators at every stage of development.

New player, new dawn?

Xinwei announced it would begin rolling out infrastructure in 2013, but more than two years passed before any further confirmation of network installation was announced. The operator stated in July 2015 that it had begun deploying base stations in Managua and would launch services by the end of the year. Xinwei said it would invest US$300mn in 2014, considerably lower than the total planned investment of US$2bn, announced when it first acquired its licence.

BMI maintains its gloomy view of Xinwei’s prospects given the maturity of the Nicaraguan telecoms market. Competition between Claro and
Movistar drove mobile penetration to 121.5% by the end of 2014; BMI forecasts this will reach 142.1% in 2019. The two companies are increasingly concentrating on data-led services and have the advantage of owning a wide range of local language content as well as their regional footprints enabling them to trial new services in different markets and roll them out quickly in smaller markets like Nicaragua.

Xinwei intends to launch 3G services using the Chinese-developed TD-SCDMA technology, which has not been widely implemented outside its home market. The use of the home-grown technology offers the newcomer cost savings but in using a different technology to its rivals, Xinwei cuts off the opportunity to negotiate use of Claro or Movistar's infrastructure to expand its services more quickly.

BMI believes Xinwei will struggle to gain market share from its larger rivals, suggesting the company will look to offset some of the costs of roll out by using local towers companies to speed up roll out. As towers companies have largely come to the fore after the initial roll out of most markets’ mobile infrastructure, the Nicaraguan market is ripe for towers investment. The high penetration rate means a refocus for operators looking to create cost savings. Existing investors in the country such as SBA Communications already have partnerships with Claro and Movistar across their regional footprints. The tower company has the largest number of towers already in Nicaragua and is therefore well placed to further build on its existing regional partnerships.

Movistar’s sister companies in Brazil, Chile, Colombia, Mexico and Peru have sold towers with increasing frequency over 2010-2015 – indeed Movistar has already sold the majority of their Nicaraguan towers to SBA Communications. Claro’s parent América Móvil has not pursued this trend with the same level of enthusiasm but will be forced to separate its infrastructure in Mexico, which we believe will lead to an increasing interest in the sale of more infrastructure.

Investment so far has been limited in Nicaragua with exception of SBA Communications. The IFC agreed a loan for Guatamala’s Continental Towers in 2012 to aid the latter’s expansion in the region but by mid 2015 the company still only held fewer than 100 towers in Nicaragua. Its regional focus and market knowledge, however, make it a key candidate for Nicaragua’s operators to sell their towers infrastructure. MCM’s Torrecom has also built a substantial portfolio in Nicaragua.

**Nicaragua presents obstacles for tower growth**

Operating in Nicaragua is not without its challenges. Infrastructure is lacking in most rural areas, limiting the ability for network extension, while red tape and political unrest increase the...
uncertainty of the business environment.

Power remains the most significant challenge for telecoms networks, with Nicaragua showing the weakest installed power capacity in Central America. Although BMI’s Power team forecasts strong growth and maintains an optimistic view of the renewable sector, access to power is a significant hurdle for telecoms infrastructure in Nicaragua, particularly as subscriber growth prospects lie in rural areas or in data networks. Own power sources and generators are, BMI believes, a significant cost to existing and prospective operators in the mobile market.

Opposition to the Nicaragua Canal project, to be deployed by Xinwei’s owner Wang Jing, continues to grow. Combined with unrest over President Daniel Ortega’s decision to seek a third term in office in 2016, the political environment remains uncertain. Deteriorating economic conditions in Nicaragua are further undermining Ortega’s popularity. Declining fiscal transfers from Venezuela reduce Ortega’s ability to fund social spending programmes, causing Nicaragua to turn elsewhere to find funding for its fiscal gap. The Ortega administration has expanded its relationship with the Chinese and Russian governments in order to secure financing. It will also continue to attempt to use the Nicaragua Canal project as a means of boosting growth and dollar revenues from foreign investment. This will not be enough to stymie public revenue stagnation, however, and will limit the government’s ability to increase spending ahead of the election. These factors may slow regulatory development or interaction with local authorities for rolling out infrastructure.

These factors are further exacerbated by the crawling-peg exchange rate set by the Central Bank of Nicaragua, which sees the córdoba depreciate 5.0% annually against the dollar; the rate has been in place since 2004. We forecast NIC27.26/USD in 2015, from USD25.96/USD in 2014 and NIC33.14/USD by 2019.

Opportunities for tower players

While there are a number of challenges facing tower companies wanting to enter the market or expand their existing footprints, these are also the challenges facing existing and prospective operators in the market. We believe these challenges will be what drive operators to offload some of their infrastructure as they have in other markets. Both Claro and Movistar have sold off infrastructure in their larger markets and we believe the Nicaraguan market’s dynamics will encourage this strategy. For Xinwei, leveraging the existing towers market will be a significant boost to the expansion of its brand new network, enabling a quicker roll out and allow the operator to begin generating income from its services.

www.businessmonitor.com/bmo
Guillermo Mulville, TMT Sector Lead Latin America, IFC: Nicaragua is the largest country in Central America, although with only six million inhabitants it is not densely populated. A GNI per capita of around US$1,800 makes it a lower-middle income country.

Although the telecoms sector accounts for a comparatively high percentage of the country’s GDP, by regional standards it is quite small, with combined revenues of less than US$1bn. Despite its size, the sector is showing healthy growth and, as expected, mobile data is driving a significant part of it. Fixed line penetration in Nicaragua is very limited, and about three-quarters of industry revenues are coming from mobile.

The mobile telephony sector is showing faster growth than in the rest of the region. Last year, half a million subscribers were added and SIM penetration is now around 120%. As expected, most of the subscriber base is prepaid, and ARPs are around US$7, increasingly sustained by data.

Guillermo Mulville, TMT Sector Lead Latin America, IFC: Nicaragua’s mobile telephony market is still very concentrated and is in essence a duopoly. Claro has a bit over half of all subscribers in mobile, but remains the overall undisputed market leader in the industry, to a large extent as a result of its early entrance following the privatisation of the state-owned incumbent in the 90s. Claro now offers multiple services, including fixed, mobile, Pay TV and broadband. The balance of the mobile market is predominantly in the hands of Movistar.

To foster competition and sustain sector growth, regulator Telcor has issued a number of licenses. For example, both Claro and Movistar were awarded 700MHz spectrum in 2011. Interestingly, Chinese telecoms group Xinwei was given a third mobile license in the 1785-1805MHz band. Despite having obtained its license in 2012, it has not launched yet, but it is already rolling out a network with the expectation of being operational before year-end 2015.

Xinwei is committed to making important investments. We expect them to compete based on price, but also to place particular focus in rural areas, thus helping reduce the large digital divide. Finally, the Nicaraguan mobile broadband market benefits from the presence of Russian-owned Yota, which obtained its license in 2009.

TowerXchange: What is the likely impact of Xinwei on the local telecom and tower sectors?

Guillermo Mulville, TMT Sector Lead Latin America, IFC: Xinwei’s entry into Nicaragua is already having a catalytic effect on investments. Although it is unclear how much Xinwei’s network will cost, we believe the amounts will be significant. In any event, further to Xinwei’s network roll-out, Movistar and Claro would be expected to accelerate their LTE roll-out plans. Of course, the above dynamics should contribute to fuelling the demand for cellular towers.

Despite the relatively small size of market, Nicaragua has an active independent tower market, with four players. We understand that of the almost 1,000 towers in the country, more than half are owned by towercos. All such operators have regional operations, with SBA leading the pack.
Mexico: a tale of two cities
Marc Ganzi and José Sola on MTP, AT&T, Telesites and what is going on in Mexico

TowerXchange is excited about Mexico like everyone else in the industry. But let’s be realistic. AT&T is likely to be great news for everyone but its network plan is yet to be finalised. Telesites has made international and local headlines but hasn’t been approved yet by IFT (which stated in recent news that the session to discuss the approval isn’t likely to happen in July), and the shared LTE network could mean thousands of new towers, but plans are still unclear. To shed some light on what’s really happening in Mexico, we’ve reached out to two of the most knowledgeable tower people in Mexico: MTP’s CEO José Sola and Marc Ganzi, CEO of MTP’s lead investor Digital Bridge Holdings.

Keywords: 3G, 4G, Americas, América Móvil, American Tower, Americas Insights, AT&T, Build-To-Suit, C-Level Perspective, Capex, Digital Bridge Holdings, IFETEL, IFT, Infrastructure Sharing, Interview, Iusacell, Leasing & Permitting, LTE, Macquarie, Market Entry, Market Forecasts, Market Overview, Mexican Infrastructure Fund, Mexico, Mexico Tower Partners, New License, New Market Entrant, Nextel, North America, Regulation, Telcel, Telefonica, Telesites, Vertical Bridge

Read this article to learn:
- How is MTP doing, its future plans, expectations and relationship with investors
- AT&T’s potentially disruptive impact on the local market and the opportunity AT&T represents for towercos
- Which further regulatory changes are needed in Mexico
- Telesites: does anyone know what the towerco is planning to do?
- The 700MHz shared LTE network could need 8,000 sites in Mexico

TowerXchange: José, please share with us the latest developments in MTP.

José Sola, CEO, Mexico Tower Partners: Mexico Tower Partners has been growing steadily over the past couple of years. Our headcount grew from 11 people in 2013 to the current count of 40. Every year we’ve been doubling our staff, which is a good sign.

On the other hand, MTP is still a very lean towerco and we outsource most of the site acquisition and construction work to a network of trusted partners. I’d say 80% of our workload relates to managing the existing portfolio while the remaining 20% of the time we spend dealing with outsourced contractors.

Over the past few years, we have built strong relationships with third party companies that serve us with what is known in the U.S. as a build to flip model. We basically work with local towercos that build towers to then sell them to us. This is an extremely efficient model especially since these partners tend to find it easier to work in difficult regions, have an experienced approach when it comes to Mexican logistics and are very reliable in terms of time to market.

Thanks to this lean and efficient structure, we have both the capacity and resources to build up to 500 new sites per year. And we are able to guarantee our clients a fast and yet high quality service thanks to our long standing expertise and the quality control we do on outsourced partners.

TowerXchange: How do your investors perceive the Mexican market and MTP performance?
José Sola, CEO, Mexico Tower Partners: Digital Bridge created MTP with Macquarie Mexico Infrastructure Partners. Digital Bridge is one of the leading global investors in communications infrastructure with five different investments in tower companies around the globe. Macquarie is an experienced investor here in Mexico with its Mexican Infrastructure Fund and is very familiar with our business model and the tower industry both in Mexico and at an international level. Both Digital Bridge and Macquarie have always seen Mexico as a good opportunity and have been our founding equity partners since day one.

Our investors perceive the changes happening in the Mexican telecom industry as very positive and trust that we are well positioned to make the best out of the entrance of AT&T. On that note, AT&T is a great disruptive element in the telecom landscape. MTP was founded at the end of 2011 and the Mexican market has been pretty quiet since then. Expectations were extremely high in terms of deployments from carriers but in reality most projects have been kept on hold while waiting for the telecom reform to happen. Therefore, I’d say we are coming out of a sequence of disappointing years for the industry in light of the conservative approach carriers took, but the outlook from 2016 looks bright.

The entrance of AT&T has brought a breath of fresh air in the market. Expectations are higher than ever and in general, there has been a change in the mood of investors who are now eager to look at plans for the next three to five years.

José Sola, CEO, Mexico Tower Partners: To date, we only have three clients in the BTS market. On one hand, most of Telcel sites will be built by Telesites so we are left with residual projects with them. Telefónica has been very quiet over the past year and we believe they are now analysing the impact of AT&T on the market before making a concrete plan of action. Their 2015 has been very slow in terms of deployment so we cannot really guess what their plans for 2016-2017 will be.

On the other hand, AT&T is a real potential opportunity for us and we expect to do a significant amount of work with them. They are working very ambitiously and already expect to build 800 towers during the course of 2015. In theory, their 2016 plan should be ready by September and they’ve already launched an RFP for equipment which is clearly a positive indicator.

TowerXchange: Beside the creation of Telesites, are there additional measures being taken by IFT that are easing towercos’ activities?

José Sola, CEO, Mexico Tower Partners: I don’t think there is a real interest in further regulating the industry for now.

One thing we are trying to do is to create an Association among key players to promote certain regulatory changes and push for infrastructure sharing in Mexico. However, this hasn’t been a priority of the regulator and so far little has been done on this front. I think IFT won’t have an interest in looking at the tower industry in the near future beside deciding on the approval of Telesites.

However, permits can be a significant problem for Mexican towercos and this is something we are trying to address. There is a lot of uncertainty when it comes to the procedure to follow as there isn’t a federal regulation on it. Everything is done at a municipality level and there are as many as 2,438 of them in the country! Each of them has their own
rules and it can be extremely difficult to comply and even find out what the rules are! This is an element that needs to be addressed quite urgently along with clarifying the rules regarding zoning.

Right now, the regulator is very focused on implementing and monitoring various measures of the telecom reform that affect the role of the preponderant player in the wireless space, such as the elimination of interconnection rates, whereas infrastructure is less of a priority, especially since the creation of Telesites.

TowerXchange: What kind of uplift does the 700MHz shared wholesale LTE network provide in terms of organic growth and co-location potential?

José Sola, CEO, Mexico Tower Partners: It is estimated that the shared LTE network will require a minimum of 8,000 sites to operate. This is an ambitious project that will require the joint effort of the managing operator, financial sponsors and OEMs. Whoever wins the project will want to minimise the deployment of new sites by using as many existing sites as possible in order to have the network up and running swiftly. However, it is anticipated that there will be also demand for new sites to complete the project.

TowerXchange: Did the entrance of a new strong player such as AT&T stir the arrival of new towercos in the country?

José Sola, CEO, Mexico Tower Partners: Yes. In fact, we are now seeing a variety of small, relatively inexperienced players setting up towercos, and they are putting huge pressure on prices. In fact, these companies are offering their services at very low rates which we fear could become the new benchmark carriers use in their selection of BTS partners.

We see these rates as artificially low and honestly, I assume the quality of these projects must be compromised to stick to those budgets! It is critical that carriers understand the difference in quality of work of serious and committed towercos such as MTP.

TowerXchange: Thanks for joining us Marc! What is your view on the arrival of AT&T, the shared LTE network and the creation of Telesites both as an expert in towercos, Mexico and as the lead investor in MTP?

Marc Ganzi, CEO, Digital Bridge Holdings: Mexico is really a tale of two cities and the present time demonstrates it more than ever. You have AT&T which is clearly amazing news for everyone in the market and tower companies like MTP, American Tower and Telesites will surely benefit.

AT&T could spend as much as US$3bn in Mexico

The transformation of Nextel and Iusacell into one stronger entity pleases us all. And who wouldn’t be pleased with expected capex by AT&T in Mexico reported in the range of US$3bn? If we translate that figure into macro-sites, we could project as

MTP is certified under the Foreign Corrupt Practices Act (FCPA) which is extremely important, especially for U.S. companies. So we are in a great position to work with the likes of AT&T and can ensure we have strong plans in place to comply with FCPA guidelines. We perform yearly reviews of our standards with our internal committee, we organise workshops with specialised law firms to instruct new team members on FCPA standards, and we perform audits and background checks on vendors and subcontractors. This process is time consuming and yes, could delay our operations, but we see it as an extremely important component of our credibility in the market.

We believe that carriers do care about quality of service and expertise, especially in a complicated market like Mexico. So our track record is a critical differentiator when it comes to negotiating with them. No one wants to work with a partner that isn’t qualified to execute the project, and which has shaky financial backing.

It’s a fact: everybody loves the tower industry these days. It’s an attractive and profitable business and we all know it. But it’s not for everyone and it’s not easy. As soon as a towerco is granted a project, they have a certain value in their hands. The simple assignment of the project is a huge cheque but then you need to prove yourself and be able to finance the build, contract the right partners, deliver the project within the deadlines and pass a variety of quality control tests. Only towercos with experience succeed after the assignment phase, this is a fact!
Running a towerco is a complicated business, no matter what everyone thinks, so whether Telesites will be able to compete with experienced towercos in the Mexican landscape only time will tell.

Mexico still tracks behind compared to regional standards

But as I was saying, Mexico lives a double reality of good and bad news and if we look at the numbers, 51% of Mexican mobiles still work on 2G or 3G. The demand to switch to 4G is growing by the second but we aren’t there yet. And Mexico tracks behind regional standards with regards to most indicators, from SIM penetration (82%) to smartphone penetration (37%). There is so much to be done and things are still moving slower than they should, but all of this is exciting news for the consumer and the towercos.

Let’s not forget that Telesites hasn’t been approved yet

The creation of Telesites has brought lots of speculation to the market, especially since no one really knows what their plans are. They will start with over 11,000 towers, which makes them an overnight dominant force in the market, but we don’t have an indication yet of what their strategy will be. We have heard in the market that they plan to control all of the construction of new Telcel’s towers. This is obviously not great news for the other Mexican tower companies. If this is the case, we will see this towerco growing their tower count pretty quickly… And the market will need to discuss whether some additional restraints are needed from a competition perspective. This will really be a question for the Mexican government to ponder.

In reality, we must remember that Telesites is not an approved entity yet (from IFT) and the next step is to understand whether they get the green light or not. Our belief is they will be approved to operate. Once they are operational, we will be able to really assess their plans for the future and how they will manage the huge task of upgrading their single purpose tenant sites (that only serve Telcel) to be able to host additional carriers. Running a tower business focused on co-locations is a complicated business, no matter what everyone thinks. The Slim family has a terrific track record in Mexico entering new businesses in the telecommunications industry, so I would not bet against their potential for success.

We look forward to partnering with AT&T

The good news for all tower companies is that AT&T is getting ready with a significant operational plan and is likely to negotiate leasing terms with towercos in the near future. We expect AT&T to be eager to work with towercos that have a proven track like ourselves and American Tower and we have already begun delivering new towers and co-locations for them.

You see, we have been in Mexico and the U.S. for twenty-one years with Apex, SpectraSite, GTP and now with MTP. The reality of this country and sector opportunity seems perfect in press releases and news but often there is a gap between the excitement and reality. We are keen to find out more about all these changing elements, AT&T, Telesites and the Red Compartida project, while still being realistic and focused on getting the job done of providing our carrier partners with site solutions.
So much to do, so little time
The Mexican telecom tower industry could get really busy very soon

In a recent interview with Marc Ganzi, his first words regarding Mexico were “Mexico is really a tale of two cities” and that concept has been stuck in my mind since, mostly because it is the perfect description I had been looking for. Mexico is a country where opposite realities can coexist in relative harmony and the status of the telecom and tower industries is just another example of that.

Keywords: América Móvil, Telcel, Telesites, American Tower, Mexico Tower Partners, Torrecom, A&T, Telefónica, Mexico, Americas Insights, Editorial, IFT, Regulation, Market Overview, Investment, New License, Capex, Transfer Assets, Market Entry, Build-to-Suit, New Market Entrant, Country Risk

Read this article to learn:
- Telesites’ status pending IFT approval
- Will the position of Telcel prevent them from accessing further auctions?
- IFT could request further measures from América Móvil
- AT&T is just what Mexico needs and here is why
- The 700MHz shared network: what we know so far

América Móvil created its towerco earlier this year with the aim to manage 10,800 Telcel’s sites and develop the operator’s considerable pipeline of build-to-suit projects which has been estimated at around 1,000 sites per year. The creation of Telesites responded to IFT’s request to AMX to limit its dominant position in the National telecom market. But the IFT is yet to decide whether Telesites is the solution they were looking for.

Telesites’ future is currently on hold, pending IFT’s seal of approval and the vote needs a plenary session of the regulatory body which won’t take place before August-September, as recently stated by Gabriel Contreras, President of the IFT. Only then, América Móvil will be allowed to carve out Telcel’s tower portfolio and enable Telesites to operate it.

So as of today, Telesites doesn’t legally operate nor own 10,800 towers and the reported potential deal between AT&T and the towerco to lease space on those sites will need to wait until the approval is actually granted.

Telesites: what could happen after IFT approval

I am inclined to believe that the project will receive the approval of IFT and that Telesites will strike a substantial deal with AT&T, which is eager to start operating in Mexico and whose first and most obvious step will be to utilise existing infrastructure as much as possible to accelerate time to market. However, I am also surprised about the reported current negotiation between the two entities when
in essence, Telesites doesn’t - yet - own any towers. I would also caution about expecting Telesites to have much effect in the near-term; the carve out of towers from other carriers worldwide has illustrated a typical 12-month lag between carve out and tenancy ratio growth, as the initial focus tends to be on auditing assets and establishing governance regimes.

Once in charge of Telcel’s capillary infrastructure network, Telesites will compete against the likes of American Tower and Mexico Tower Partners, whose management teams have been involved in the tower game for decades. Towercos, especially in a complex market like the Mexican one, require a deep understanding of the legal, operational and financial context and this is even truer for a company like Telesites that will handle a considerable portfolio from day one while managing BTS projects for the number one carrier in the country.

One potential challenge is represented by the technical characteristics of Telcel’s assets. It’s not uncommon for carriers to build most of their sites as single-tenant towers and this would mean a greater technical and financial effort by Telesites to upgrade key sites before being able to market them to potential tenants.

Never has a yet-to-be-approved towerco attracted so much interest and press coverage, and understandably so. Telesites and its projected portfolio of assets could change the shape of the Mexican tower game and anyone involved in the local market is speculating about what the future might hold. But the truth is, until the IFT grants a green light, and until Telesites’ lease rates are revealed, if and when they bring their towers to market, all we have is speculation: nobody knows what impact Telesites will have. TowerXchange understands lease rates range from US$800-1,500 in Mexico, with the range reflecting load and the application of escalators. A study by local brokerage firm Accival Casa de Bolsa claimed Telcel would pay Telesites MXN 3.7bn per year, suggesting Telesites lease rates would be around $1,700, at the top end of the market, although the source of the firm’s figures were not given.

Telcel likely to be allowed in new spectrum auction

In the meantime, IFT is planning a spectrum auction whose dates and characteristics will be announced later this year. The auction is likely to take place before the end of 2015 and IFT has recently confirmed that Telcel will be allowed to bid.

Alejandro Navarrete, Director of the Spectrum Unit (Unidad de Espectro Radioeléctrico) within IFT, recently stated that “Telcel is part of the preponderant economic agent in telecoms and our laws state that its participation to spectrum auctions can be limited. However, this valuation is referred to the Economic Competency Unit (Unidad de Competencia Económica)... An analysis is needed but in theory they can participate.”

In separate comments, IFT executives explained that the most important goal of spectrum auctions
With the creation of Telesites, towercos have technically lost Telcel has a substantial client. Additionally, Iusacell and Nextel have now become one entity. However, AT&T has brought capital, expertise and growth cravings South of the border which is just what the industry needed. And the volume of business they are expected to develop in Mexico could be enough to keep AMT, MTP, Telesites, IIMT, Conex and Torrecom quite busy for the next couple of years.

**AT&T is the news towercos were waiting for**

So one of the country's faces is dominated by questions and expectations related to América Móvil and what the future holds for the group. What will Telesites do? Will IFT regulate further? Can Telcel access spectrum auctions? The other side of Mexico is about AT&T and its potentially game-changing effect on each and every carrier and towerco in the country.

With announced plans to invest as much as US$3bn in its high-speed network, AT&T is the ideal catch for every towerco active in Mexico and a good reason for a few start ups to try and enter the market. The carrier's plans include covering 40 million people within the first six months of operations and its final goal would be to reach out to 100 million by the end of 2018.

AT&T brings to Mexico more than just capital. Its expertise and track record is likely to push other carriers beyond their comfort zone and this is particularly true for Telefónica, who hasn’t been very active over the past few months in terms of BTS and is likely to fine-tune its future moves in light of AT&T soon to be released plan of action.

If AT&T represents a threat and an incentive for carriers to improve their service, strengthen their brand and expand their network even further, the U.S. carrier's entrance in Mexico is great news for the tower industry as a whole.

In fact, as José Sola, CEO of MTP shared with us in a recent interview, the Mexican BTS market has been slow over the past couple of years as a result of carriers' reluctance to heavily invest in greenfield projects ahead of the telecom reform. Now that the reform has taken place, the carriers' landscape has shrunk considerably but this isn't necessarily bad news.

With the creation of Telesites, towercos have technically lost Telcel as a substantial client. Additionally, Iusacell and Nextel have now become one entity. However, AT&T has brought capital, expertise and an appetite for growth South of the border which is just what the industry needed. And the volume of business they are expected to develop in Mexico could be enough to keep AMT, MTP, Telesites, IIMT, Conex and Torrecom quite busy for the next couple of years.

In a recent statement, AT&T's Mexico CEO, Thaddeus Arroyo, stated that it will take approximately two years to get the business where the company wants and we hope this includes a strong push in terms of BTS projects, which is just
what Mexican towercos are hungry for.

AT&T’s immediate focus is to unify the acquired networks of Iusacell and Nextel, each of which consists of approximately 4,000 towers, of which around 90% are owned by American Tower. Forecasts suggest AT&T could add between 5,000 and 8,000 new sites to their network over the next three years, including both co-location and BTS, and a mix of capacity infill and coverage extension, 3G overlays and 4G modernisation. TowerXchange expect this to significantly accelerate organic growth within the American Tower and MTP portfolios in particular.

The uncertainty behind the 700MHz wholesale network

The last tale in Mexico is represented by the 700MHz shared network whose plan was included in the telecom reform and whose construction could require an investment of as much as US$7bn.

The goal of setting up a shared wholesale network has been considered of high relevance for quite some time now and was originally included in the constitutional reform of 2013 and subsequently in the 2014 Telecoms Act. However, details of the plan are yet to be fully defined by the Secretariat of Communications and Transport (SCT).

To date, a few elements are clear. SCT received thirty-nine expressions of interest to participate in various aspect of the development of the 700MHz shared network. Of them, 54% came from Mexican companies and the remaining 46% from international entities. 58% expressed interest in one aspect of the project whereas the remaining 42% would be available to cover multiple elements of it.

The number one priority for most applicants is to fully understand the nature of the relationship between the Mexican government and the companies that will be in charge of running the shared network. Specifically, SCT received requests to clarify the role of the public administration in the Public-Private Partnership (PPP) that will manage the wholesale network, as reported by Telesemana.

Other aspects highlighted in the expressions of interest include the commercial viability of the project, in light of the ambitious coverage goals, as well as the required upfront investment especially since the actual demand for the network is uncertain. SCT stated that interested parties asked for “sufficient flexibility to the administrative body in charge of the network with the goal to plan and execute a rollout in line with market conditions and technical standards” which would also mean that the government should limit its participation to the network design and technology selection processes.

Next steps will require SCT to review these requests and publish tender documentation before the end of August. The actual tender should be open for bids around October with the goal to assign the project during the first half of 2016 and start rolling out in the second half of the year.

Telesemana published a non-exhaustive list of interested parties which include Accenture, Cisco, Ericsson, Huawei, Motorola Solutions, Qualcomm, Nokia, Alestra, Axtel, China Telecom, MVS, Pegaso PCS, SES, Total play and associations such as the Ibero-American Association of Investigative Centres and Telecommunications Companies (ASIET), the Mexican Internet Association and PCIA.

Whilst this uncertainty makes it difficult to forecast the implications of Mexico’s 700MHz wholesale network, TowerXchange has spoken to some towercos in the country who forecast that the project may need anything from 8,000-14,000 sites, of which half to two thirds could be co-locations with the rest greenfield - driven by the project’s remit to provide wholesale coverage to areas with no coverage.

Conclusion

Players in the Mexican telecom industry, whether they are towercos, carriers, OEMs or solution providers, could get really busy very soon but there is a catch. Way too often Latin American countries find themselves stuck in tedious bureaucratic processes that slow down the development of any type of project. Therefore, my hope is that Mexico steps it up over the next few weeks and reaches crucial decisions with regards to a variety of key telecom issues such as the approval of Telesites and clarification of the 700MHz shared network. These decisions will enable various players to tailor their strategies and get started with the most exciting year for the Mexican telecom industry to date.
How PTI grew from startup to 1,608 towers in six countries in under a year

Understanding the unique vision and energy of Phoenix Tower International

In a little under a year Phoenix Tower International (PTI) has accelerated from launch to owning 1,608 towers across six countries in North, Central, South America and the Caribbean. CEO Dagan Kasavana, his team and his backers at Blackstone have written a new playbook for the creation of a towerco that combines acquisition with developer partnerships and BTS to create a new proposition for carriers, sellers and communities across the Americas.

Keywords: Acquisition, Altice, Americas, Americas Insights, Amzak Capital Management, Asset Register, Brazil, Build-to-Suit, C-Level Perspective, Colombia, Costa Rica, Dominican Republic, Due Diligence, Insights, Multi-Country Partner, New Market Entrant, Operational Excellence, PTI, Panama, Phoenix Tower International, Sale & Leaseback, Stakeholder Buy-In, T4U, Teletower Dominicana, Towercos, USA, Who’s Who

Read this article to learn:

- PTI’s vision, management team and tower count across six countries
- Combining BTS, acquisition and developer partnerships to drive growth in Brazil
- Why PTI invested in the Dominican Republic
- How build to flip tower entrepreneurs can increase valuation
- How to create a multinational towerco from day one: the three P’s

TowerXchange: For readers unfamiliar with PTI, please re-introduce yourself, your team, PTI’s portfolio and the capital structure of the business.

Dagan Kasavana, CEO, PTI: Phoenix Tower International is devoted to helping its wireless infrastructure partners – customers, sellers, landlords and communities – achieve their goals. Focused on the principles of unwavering hard work and integrity, we demonstrate this mission every day through our dedicated operation of the wireless infrastructure sites we own and operate, and the fair and collaborative manner in which we work with our business partners, helping them achieve their goals and thereby creating long lasting business relationships with PTI.

Most of the team behind PTI previously worked together at Global Tower Partners (GTP) prior to the US$4.8bn sale to American Tower. I met PTI’s co-founder Natalya Kashirina working together in M&A at GTP, PTI’s Chairman Tim Culver was SVP and General Counsel at GTP and a partner of mine for ten years now, PTI’s CFO Orlando Porras was an advisor to GTP with EY and PTI’s VP of Operations, Shylesh Moras was an advisor to GTP with Morrison Hershfield. This core team has been working together for years in the tower space and represents the engine of growth for PTI.

PTI will own over 1,600 towers across the Americas upon the closing later this year of our announced deal to acquire 600 towers in the U.S. from T-Mobile. By the end of 2015 we anticipate having 600-700
PTI could not have achieved this phenomenal growth without the support of Blackstone through their Tactical Opportunities business, who are bullish on the tower sector, and who have shown tremendous confidence in our business plan, enabling us to build a unique new towerco.

TowerXchange: Where will that forecast growth in Brazil come from – all organic or another acquisition in addition to the recent acquisition of T4U?

Dagan Kasavana, CEO, PTI: Blackstone’s Brazilian footprint owned through the affiliated company to PTI, Phoenix Tower do Brasil (“PTB”) includes the 529 towers acquired from T4U, other small developer acquisitions we have in the pipeline, plus substantial build to suit (BTS) activity. We have a pipeline of 250 BTS towers in Brazil, with 15-20 new towers going up every month since the closing and for the foreseeable future.

TowerXchange: Was the acquisition of T4U in Brazil primarily an asset acquisition, or have you drawn substantially from their team and experiences to launch Phoenix Tower do Brasil?

Dagan Kasavana, CEO, PTI: One of the things that we and our colleagues at Blackstone were excited about in the T4U acquisition is that we acquired a platform in Brazil, not just assets. We were impressed by T4U’s large portfolio of well-located towers, many with multiple co-locations already, and the management team in Brazil is fantastic. We knew we needed a strong operational team to manage those assets and realise our aggressive growth plans in Brazil, so we took our existing management team and merged it with T4U’s strong team and employee base to run the business in Brazil. We have a significant team of tower professionals and a management team based locally in São Paulo and across the country that can manage the assets and the carrier relationships professionally and grow the business significantly which allows us to look at opportunities of all sizes in Brazil in the future with confidence.

We also believe that by leveraging the local team’s experience building and operating hundreds of towers in Brazil we can better control the messaging to and experience of our customers, and we can better control vendor relationships – we want our employees and management team to develop direct relationships working with our customers and provide a unique relationship to our business partners in Brazil.

TowerXchange: What’s your vision for Phoenix Tower do Brazil, leveraging the T4U acquisition as a starting point? Do you have appetite to acquire more assets from Brazilian tower builders?
Dagan Kasavana, CEO, PTI: When we look at the tower market in Brazil, we think we’re one of the few companies with significant appetite both for acquisitions and for significant BTS with carriers. PTB is the new entrant in Brazil, but we have significant capital and are seeking the right opportunities to grow, through a combination of BTS, acquisition and developer partnerships.

There are a lot of developers looking for capital in Brazil and the carriers are looking for BTS partners that can execute in a challenging environment. We understand the tower financing market and offer a wide palette of alternate forms of financing to developers. We can provide anything from full financing to enabling developers to provide a greater inventory to carriers with PTI behind them to help them grow and be successful. Different developers need different models to be successful in different markets – we like to find out what they want and need, and form a proposal to meet those needs.

Additionally we are constantly discussing and understanding the needs of our customers and how we can best help them. Domingos Almeida, PTB’s VP of Sales and Development promotes this collaborative approach with each of our customers as we grow in Brazil through direct BTS arrangements. While others may be under-capitalised given the challenging market, PTB is able to meet the significant network demands of our carriers and we believe this helps differentiate us from some of the other developers.

Dagan Kasavana, CEO, PTI: We acquired 189 towers through the acquisition of Teletower Dominicana from majority investor Amzak Capital Management in June 2015.

The Dominican Republic is a very attractive market with no other independent towercos – we see a lot of opportunities there. Teletower Dominicana, which has since been renamed Phoenix Tower Dominicana, is a great business with a strong management team and a great customer base. Our main counterparty in the Dominican Republic, Altice, is a strategic partner with whom we want to do more business with in the future and we value the relationship with them and the other operators in the Dominican Republic.

Caribbean. Is there an opportunity to create a towerco of scale in the Caribbean, or is Dominican Republic one of a few markets that offer the right scale?

Dagan Kasavana, CEO, PTI: We acquired 189 towers through the acquisition of Teletower Dominicana from majority investor Amzak Capital Management in June 2015.

The Dominican Republic is a very attractive market with no other independent towercos – we see a lot of opportunities there. Teletower Dominicana, which has since been renamed Phoenix Tower Dominicana, is a great business with a strong management team and a great customer base. Our main counterparty in the Dominican Republic, Altice, is a strategic partner with whom we want to do more business with in the future and we value the relationship with them and the other operators in the Dominican Republic.

Caribbean. Generally we’re looking for markets with at least three wireless carriers and some existing adoption of co-location. We are able to leverage our operations in the Dominican across the Caribbean which is interesting and allows us to be more opportunistic to execute other tower transactions across the Caribbean given our close proximity in the Dominican Republic.

In every market PTI has local representation that carriers know and trust – one of the hallmarks of our growth structure is that we always have local business strategies with people on the ground who carriers and vendors can call. Of course there are certain resources and operational aspects of the business we can centralise and leverage to oversee other markets. For example our Central America and Caribbean land acquisition programme, whereby we partner with carriers and landlords to acquire land and related rights under wireless infrastructure, is based in Costa Rica but we have local people in Panama and the Dominican Republic executing the
programme locally – we never want the customer to feel they don’t have local people in each country who can help with any infrastructure problems.

TowerXchange: PTI has completed several acquisitions from BTS towercos – what advice would you give a ‘build to flip’ tower entrepreneur – how can they make it easier for companies like PTI to acquire them?

Dagan Kasavana, CEO, PTI: My advice to the build to flip tower entrepreneur would be to focus on the details that make the sale process easier.

Where developers have accrued significant value they have had a robust approach to permitting, entitlements and ground leases. They use high quality steel to build strong towers with capacity for additional tenants. Having a thorough approach to site files and recordkeeping makes the due diligence and sale process immeasurably easier and ultimately increases valuations.

Having done hundreds of tower transactions with some developers who were organised and some who were less organised, I’ve found that those who focused on replicating the U.S. tower business model attracted the highest valuations and encountered less surprises. That means negotiating long term ground leases, investing in high capacity towers, and acquiring all the necessary permits to the extent that they are able – and organising site files in a cohesive manner. We have closed deals and will continue to with sellers that have less than 100% of the required site files and through our diligence process will focus on improving the portfolios both pre-closing and post-closing through various creative solutions and hard work. However, I would recommend sellers focus on both obtaining and organising their required site files to make the process as smooth as possible.

TowerXchange: In terms of organisational structure and governance, how do you separate the complexity of overlapping small to medium sized acquisitions whilst still investing in substantial organic growth?

Dagan Kasavana, CEO, PTI: Our business plan was to create a multinational towerco from day one. This challenge is to grow and scale and operate as a best in class tower company while retaining the energy of an entrepreneurial start-up – that energy that carriers, developers and landlords love.

It comes down to the three P’s: process, people and passion.

We need processes, and supporting IT, that can be scaled and customised to meet the needs of each market. A one size fits all approach will not work – every region has different norms, different regulations and different guidelines to be a good partner to our customers, sellers and communities. When a carrier gives us a co-location or BTS order, we need to fulfil it quickly and efficiently. When a carrier expresses interest in a site location we
need to get them on that tower as quickly as possible. When undertaking a new transaction, we use a process driven formula we’ve been using for years and years to push through negotiation, due diligence and integration but also which is customised to each country we do business with, relying on local expertise with our local operations teams and transaction advisors.

We’ve hired great people who are well versed with significant experience in towers. We have tremendous transaction experience and provide oversight and process support from our HQ in Boca Raton. Our M&A team, led by Natalya Kashirina, focuses on opportunities and transactions in the U.S. and Latam overseeing multiple opportunities in various stages of vetting, diligence and closing with a unique mix of professionalism and a friendly honest approach which really resonates with our business partners. We have separate legal teams for the U.S. and Latam – each market has its own General Counsel. Our Finance team led by Orlando Porras is overseeing tax structuring and compliance, collections, payables and cash management across all six of our markets. Our operations team, led by Shylesh Moras has resources in country overseeing various BTS implementations and the maintenance of our existing sites. Lastly, our local teams in each market have been in the tower business in these countries for a long time – that experience has been critical to us scaling appropriately and professionally.

Lastly but most importantly: passion. You can’t replicate it or fake it. Our team works long nights, tireless hours on behalf of customers, sellers, landlords and communities. We are professional, hard-working, and we genuinely passionate about what we are building together with the various partners we do business with. There are no shortcuts in this industry – we have to hire the right people who buy in to an energy that the management team has established and which has enabled us to rollup 1,600 sites in just under a year. That passion drives us, and I’m very proud of the management team and regional teams we have hired and the unique relationship we have developed with our business partners.

TowerXchange: Congratulations on entering into a contract to acquire 600 towers from T-Mobile in the U.S. Do you have a specific vision, or remit from your investors, in terms of the balance between PTI’s domestic and international portfolios?

Dagan Kasavana, CEO, PTI: We have a clear business plan, but there is no specific vision concerning the balance of U.S. and international assets.

Our focus has always been to first simply build a bigger sandbox – to seek out the best transactions across a wider geography – that could be a BTS in Brazil, a developer investment in Central America, a ground lease buyout in Colombia or a carrier sale and leaseback in the U.S. The tower industry is a global industry – if we were focused on just one or two tower markets we feel we’d be doing ourselves, our customers and our investors a disservice.

We don’t need to raise new capital every time we see a new market opportunity – this enables us to be a more flexible partner to support carriers in the markets they want to develop, or to partner with developers to help carriers in a different more strategic way. The publics are doing many of the same things of course but at a larger scale. PTI is able to be a more flexible, entrepreneurial partner for our customers. We can help with a 100 tower BTS – that will have my full attention. We can help a local developer secure the capital he needs to drive to scale. We’ll buy five towers in Panama! We will work with a landlord in Costa Rica to monetise their ground lease payments that they can use to pay off their mortgage! We’ll do what publics don’t have time to do, or what smaller, geographically restricted towercos don’t have the remit to do.

We saw a vacuum in the market – an opportunity to build a towerco that does things differently. We wanted to focus on building partnerships with carriers, landlords, vendors and developers. We want to provide lawful support of our communities by obtaining all the appropriate entitlements. And at the same time we want to execute the best possible transactions across the region.

If we stick to that original business thesis, we will continue to grow organically and inorganically in a way that is logical and well balanced over time.

Dagan Kasavana is the latest tower industry leader to join the TowerXchange ‘Inner Circle’ Informal Advisory Board.
Network Management Services (NMS) has quietly built 600 towers across Central America, Mexico, Colombia and Peru since 2011. NMS pride themselves on their ability to execute build-to-suit programmes entirely in-house. Only recently, TowerXchange managed to speak on the record with Mariano Gomez, Executive Vice President and one of the Founders of NMS, about the company’s activities, outlook for the future and challenges CALA towercos face in terms of fair competition.

**Keywords:** Americas Insights, Central America, South America, Caribbean, Network Management Services, NMS, Mexico, Colombia, Peru, AT&T, Who’s who, Interview, Build-to-Suit, Capex, Opex, Lease Rates, Market Entry, Business Model, Business Case, Regulation, Skilled Workforces, Small Cells, DAS

Read this article to learn:
- NMS’ footprint, portfolio and capabilities
- Which markets are driving NMS’ business in the CALA region and why
- Views on pricing: from aggressive premiums to excessively low bids
- NMS’s top strength: its skilled in-house team of professionals

TowerXchange: Mariano, please tell us about NMS, its footprint and future plans.

Mariano Gomez, Executive Vice President, NMS:
NMS was founded back in 2011 by Tatum Martin and myself. Soon after the creation of the company, executives Omar Vallecillo and Carlos Barrantes joined the team.

Our executive team is formed by tower professionals who prior to NMS were engaged in tower manufacturing, turnkey services and network development all over the Caribbean and Latin America. Therefore, our team features a unique combination of technical and strategic skills, all very relevant to the local tower industry.

To date, NMS is focused on the Central American market, Mexico, Colombia and Peru. We have staff based in every country where we operate with a great level of synergy between our head office and subsidiaries.

TowerXchange: Out of the countries where you operate, which ones are leading the expansion of the tower model in the region and why?

Mariano Gomez, Executive Vice President, NMS: To date, I’d definitely say that Mexico, Colombia and Peru are leading the expansion for us and for the tower industry as a whole.

The entrance of AT&T, as well as a dated network in need of upgrading, are the main growth drivers in Mexico. Colombia and Peru both require substantial
improvements to their networks to satisfy the ever-growing demand for coverage and improved quality standards.

TowerXchange: Do you feel CALA towers are changing hands for a justifiable premium price? And talking about build-to-suit (BTS) projects, do you think they are fairly priced?

Mariano Gomez, Executive Vice President, NMS: Some tower companies active in the region are very hungry for assets, no matter what the asking price is. Whether the price is justified or not, it's all a matter of financial projections... And I have always believed that numbers don't lie!

The CALA tower market is very energetic and customers demand seamless wireless service from carriers virtually everywhere. The ever-increasing pressure on carriers has stimulated the growth of the towerco model and, as a side effect, the level of prices we have been witnessing for sale and leaseback transactions are pretty high.

On the other hand, I believe BTS prices are decreasing, and not for the right reasons. Prices often go down due to the irresponsible decision of small companies to lower their bids beyond sustainable levels just to sign a contract and obtain search rings.

Unfortunately, way too often we see purchasing teams within carriers exclusively focused on their opex rather than the quality of service a towerco can offer. If a new towerco arrives in town offering lower prices, some carriers will take the opportunity and force all of us to revisit our pricing. Sometimes, the same dynamic happens due to tower giants who own hundreds if not thousands of sites in a country and are able to offer heavily discounted lease rates on their existing portfolios in exchange for search rings.

Both these strategies are technically legal but can cause a great deal of damage to the tower business from a revenue perspective and by shrinking our capex budget. This is particularly relevant nowadays when multiple regional governments are adopting laws demanding that we conceal sites, which result in even higher costs.

BTS is a beautiful and proven business model, I believe all tower companies must preserve its attractiveness by fulfilling contract scope, preserving reasonable market prices and providing seamless service to carriers.
TowerXchange: What are the key challenges you are encountering in the countries where NMS operates from a regulatory/permitting perspective?

Mariano Gomez, Executive Vice President, NMS: Although with differences among countries, I’d say one common challenge is the Not In My Back Yard (NIMBY) mentality, whereby communities are often opposed to greenfield projects due to misconceptions related to the risk of radiation. The region still lacks awareness on the actual issues around radiation and I believe communities need an educational resource to inform them which can only partially be fulfilled by towercos.

TowerXchange: What is the ratio between portfolio acquisitions and BTS for NMS? And if you rely exclusively on BTS, how many towers are you building per year and what are the key capabilities that allow you to win projects with carriers?

Mariano Gomez, Executive Vice President, NMS: NMS operates exclusively in the BTS market and to date, we have the capacity to build 800 sites per year in the countries where we are active. The demand for tower sites across the region is still very high and this is why we are sticking to what we do best.

That said, we see small cells as a growing market trend and have been evaluating the opportunity to get involved.

TowerXchange: So is the entirety of NMS staff in-house or do you outsource any function to trusted partners?

Mariano Gomez, Executive Vice President, NMS: We rely exclusively on our in-house staff. NMS is a fully integrated company which owns every single phase of the tower management business, from bidding all the way to construction.

Our staff is our greatest asset. From civil work technicians to C-level executives, we are all committed to delivering the best possible final product to our clients and our relationship with carriers is very much based on trust, a proven track record in the region and quality control.

Over the course of the years, NMS has acquired a deep understanding of the regional telecom industry and our staff brings to the table years of experience in market analysis, regulatory issues, demand and business case modelling.

TowerXchange: Our research tells us that NMS owns over 400 towers in the region. Is that correct?

Mariano Gomez, Executive Vice President, NMS: Actually, we are getting close to the 600 mark thanks to our solid financials which have been helping us to scale our business exponentially.

We firmly believe that the right combination of performance, excellent customer relationship and seamless team integration gives us the right edge to achieve our growth goals.
TORRESEC is the first towerco into Argentina

BTS contract may be first of many as Argentina needs 4-5,000 additional towers for 4G

The hitherto untapped Argentinian tower market welcomes its first independent towerco in Innovattel / TORRESEC, which has secured their maiden build to suit contract in Argentina, and which is already hiring a full time staff in-country. Innovattel/ Torresec is a build-to-suit (BTS) towerco with over 350 towers across Puerto Rico (Innovattel Properties), Ecuador (Torresec Ecuador), Peru (Torresec Peru), and Colombia (Torresec Colombia). TowerXchange caught up with COO Juan Cueria in an airport departure lounge for a snapshot interview to get some insight into TORRESEC’s launch in Argentina.


Read this article to learn:
- The drivers and scale of the tower build in Argentina
- Infrastructure sharing to date in Argentina
- Real estate costs in Argentina
- Site acquisition and permitting challenges
- TowerXchange estimates of the number of towers and SIMs per tower in Argentina

TowerXchange: Congratulations on TORRESEC becoming the first Towerco in Argentina! What has attracted you to invest in Argentina?

Juan Cueria, COO, Innovattel / TORRESEC: Argentina has potential beyond precedent. The recent LTE licenses awarded to the three major players, the need for growth in numbers of sites and in the capacity in the country for each of the carriers exceed any other territory in LatAm (not including Brazil).

There is sufficient demand for the four operators to grow and compete in the country. DIRECTV is aggressively growing as well.

Our management has extensive experience in the country. Argentina has no shortage of professionals and a well trained labor force; the demand for services will continue to catch up with the rest of the world.

TowerXchange: Please tell us a bit about the Argentinian tower market – how big / how mature is the tower network? What is driving growth?

Juan Cueria, COO, Innovattel / TORRESEC: I don’t have specifics on the number of sites, but you can imagine how large the territory is; with over 2.7mn km², Argentina is the second largest country in LATAM, is virgin to the concept of tower leasing and BTS, yet familiar with co-location strategies among the operators. There is substantial demand for sites: both capacity and coverage, new technology...
deployments with 4G spectrum recently allocated, and big requirements for small cells.

**TowerXchange: What can you tell us about the build to suit (BTS) contract you have secured?**

**Juan Cueria, COO, Innovattel / TORRESEC:** We have closed one and we are negotiating three more. The carriers welcome very much the concept of an independent tower company to facilitate infrastructure sharing and they are very positive about having an additional source to help in the deployment of sites. The BTS market will work like any other: we will build and own the sites.

We don’t see any appetite for Argentina’s carriers to sell their tower assets at the moment.

**TowerXchange: What level of new tower building are you anticipating in the Argentinian market as a whole?**

**Juan Cueria, COO, Innovattel / TORRESEC:** From the conversations we’ve had, I foresee Argentina’s carriers needing 4-5,000 new sites in the next two to three years. Argentina has been in a holding pattern pending the award of 4G licenses at the beginning of the year, so deployment has only recently begun for the country’s fiercely competitive three main carriers. As well as new coverage obligations, there is also an urgent need for capacity – it’s hard to place a call in Buenos Aires – so Argentina’s carriers need to build and they need to build fast.

**TowerXchange: Is there an existing culture of infrastructure sharing? For example have there been many bi-lateral swaps between carriers in Argentina?**

**Juan Cueria, COO, Innovattel / TORRESEC:** As in many other territories, Argentina’s carriers...
have swapped sites one by one, but large scale infrastructure sharing agreements between carriers have proved impossible to date.

Nextel has been doing a lot of co-location on their ~600 sites to generate income, so Argentina’s towers have been commercialised on a limited basis.

TowerXchange: How savvy are Argentina’s landlords to the value of real estate to carriers and towercos?

Juan Cueria, COO, Innovattel / TORRESEC: Land is expensive so rent is expensive in Argentina. The majority of land owners request at least one year in advance rent, or some rent in U.S. dollars, so the price structure is higher than some countries in LatAm. Landlords in metropolitan areas are pretty slick and smart – they know the need for telecom sites, and negotiate tough deals. We’re often able to find better sites and negotiate better agreements in rural areas.

TowerXchange: How have you been able to get comfortable with country risk?

Juan Cueria, COO, Innovattel / TORRESEC: The private sectors and the government agencies are cooperating well with new business and job creation opportunities. You still need to have a conservative approach, but so far we are very optimistic with the country and the opportunity.

TowerXchange: What is your impression of the regulatory environment, for example is there an established licensing regime for towercos and how is site permitting governed?

Juan Cueria, COO, Innovattel / TORRESEC: This is the area that requires a lot of changes; the site acquisition and permitting process is very challenging. Like any other countries some municipalities’ restrictions apply and you need to be creative and work with them and with the process, you cannot force the entrance. But it can be a long process to acquire permits.

There is no real regulation applying to the tower industry, although the government is facilitating that now.

TowerXchange: What is your strategy for raising capital to invest in Argentinian towers?

Juan Cueria, COO, Innovattel / TORRESEC: You may be surprise how many equity funds are interested in Argentina; everybody recognises that this is a sleeping market, ready to awaken. We see this as a long term opportunity therefore we are comfortable with our financial plan.

TowerXchange: How do you foresee the future of the tower market in Argentina?

Juan Cueria, COO, Innovattel / TORRESEC: Argentina is a virgin territory for the concept of tower leasing. The demand growth can make this the second largest player in the LatAm territory. Overall we see this market becoming the largest focus in the LatAm tower industry in the next three years.

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TowerXchange estimates the size of the Argentinian tower market

While we haven’t yet studied the Argentinian tower market in detail, we have solicited estimated tower counts from several stakeholders, giving us a weighted mean suggesting there are ~13,700 towers in Argentina. This suggests Argentina has 4,577 SIMs per tower, comparable to Brazil at 5,625 but still distantly lagging the most mature tower market in the Americas, the U.S. with 1,220 SIMs per tower.

The country’s three leading MNOs (Claro, Personal and Movistar), head a well balanced competitive mobile market with 30%-35% market share each. Each MNO has a tower portfolio of around 4,000 sites. Nextel, subject to exit rumors, has 3% market share and ~600 towers.
Columbian towers – an under-explored opportunity

Norton Rose Fulbright’s analysis of the Colombian mobile and tower markets invites investment

Favourable mobile market characteristics

According to the latest studies conducted by the Colombian Mobile Industry Association “Asomovil”, Colombia is experiencing a significant increase in the consumption of mobile internet services. With the falling prices of smart phones and tablets, it is expected that the number of users will continue to grow exponentially. Currently, tablets and smart phones account for more than fifty percent of the mobile communications market in Colombia, leading to very substantial data demand in a country which combines a vast geographic area (approximately 1,000,000km², approximately four times the size of the United Kingdom), that accommodates parts of three major mountain chains (with many areas well over 1,000 metres over sea level), and a scarcely populated vast expanse that accounts for almost half of the country. These geographical characteristics combined with a cellular penetration very close to 100% (with more active mobile lines than inhabitants) and an operator mix of three large international players dominating the market together, with six other small operators accounting in aggregate for 7% market share, provide a very attractive opportunity for tower companies to exploit an emerging market with great potential.

Until very recently, the construction and installation of telecom towers in the Colombian market was not an attractive business for specialist infrastructure investors. In fact, towers were usually owned and operated by the mobile network operators themselves. Vertical integration was the preferred MNO model and as such the space for towercos in

Keywords: 3G, 4G, América Móvil, American Tower, Americas, Americas Insights, Bankability, Build-To-Suit, Colombia, Concel, Densification, Infrastructure Sharing, Insights, Lawyers & Advisors, Leasing & Permitting, Market Overview, Millicom, Movistar, Norton Rose Fulbright, Regulation, Telefonica, Tigo

Read this article to learn:

- Attractive geodemographics and mobile market context
- FX considerations: devaluation of the Peso and declarations of the entry and repatriation of US$
- Regulatory framework: infrastructure sharing obligations, no restrictions on FDI, security of movable assets, but a lack of a unified permitting regime
- Challenges of land availability in urban areas and site access and power in remote areas
the market was extremely limited. However, the
development of regulatory innovations, including
the obligation of MNOs to allow access to tower
space to competitors, has greatly changed that
position and has begun to shape the market in a way
that is similar to the standard of European markets,
with specialist tower companies owning and
operating the infrastructure whilst MNOs focus on
sales, customer service, marketing and distribution.
A defining transaction was the sale by Tigo, the
third largest mobile network operator in Colombia,
controlled by international conglomerate Millicom,
of 2,162 telecommunications towers to American
Tower’s Colombian operation, ATC Infraco in 2011,
for US$182mn.

A very attractive outlook

The Colombian telecoms market has a series of
characteristics that make it a potentially very
attractive investment for foreign tower companies.
In addition to a surging demand for towers driven
by mobile usage and technological advancement,
and the geographic characteristics which necessitate
a greater proliferation of towers to service the
population, those advantageous characteristics
include the macro-economic circumstances of the
country, the network provider mix as referenced
above, and the new regulatory framework regarding
tower construction.

From a macro-economic point of view, Colombia has
recently been perceived as one of the most attractive
developing markets for foreign investors into the
telecoms sector. A very stable political and legal
regime, combined with an increasing consumption
capacity, have been key in the enhanced appeal
of the jurisdiction. In addition, a very strong
devaluation of the Colombian Peso during the last
year (from approximately COP$1,700/USD to around
COP$2,700/USD) provides for cheaper acquisition
and development costs for international investors.

Most telecoms towers in the country are still either
owned by the incumbent international MNOs
(Comcel, controlled by Mexico’s América Movil, and
Movistar, a subsidiary of Spain’s Telefónica) or the
mid-sized Colombian network operators. As such,
there are still significant opportunities for towerco
acquisition through divestment strategies of the
operators.

Towers and network demand are currently
concentrated in the major cities and urban
areas. However, mobile usage in rural areas has
significantly increased during the last few years
due to the Government’s initiative to bring internet
to the most remote places of the country. In excess
of one trillion pesos has been invested into the
connectivity of rural areas since 2013. Furthermore,
all network operators in Colombia are already
offering 4G services to customers, although such
technology is not yet available outside the main
capitals and productive centres of the country. This
technological advancement will drive a demand for
the densification of tower networks and the addition
of equipment to existing 2G and 3G sites.

The Colombian legal and regulatory framework
also encourages the tower company model. In
order promote accessibility to telecom services in
every region of the country and the efficient use
of infrastructure, the Communications Regulation
Commission has issued various resolutions to
provide solutions for the lack of antennas and
towers available across the national territory.

Obligations apply to tower owners to share their
infrastructure in exchange for a fee which is subject
to certain maximums in accordance with the
legislation[1], depending on the characteristics of the
tower. There are certain exceptions to the sharing
obligation, for example if there is a lack of feasibility
from a technical or physical perspective, but the
broad application exists.

There are no regulatory restrictions that limit the
participation of foreign capital in the telecom service
market, and, as in most other industries, there is
no minimum threshold of national ownership for
MNOs or tower companies. Investments made by
foreign companies are treated on the same basis as
investments by domestic persons.

A third element of the regulatory framework that
makes the Colombian tower market attractive
for foreign investors is the new law of security

[1] Resolution 4245 of 2013. Article 10. The provider of
infrastructure, networks and/ or services of Telecommunications
or the operator of television may negotiate freely the
remuneration in exchange for the use of the shared
infrastructure (…)

(…) Under no circumstances the remuneration for the sharing of
electric infrastructure for the provision of Telecom services can
be superior to the following annual figures (…)
over movable assets, pursuant to which securities granted by the tower companies to their lenders (although the law applies across sectors) can be registered quickly and efficiently (and at only notional cost) in a public system. The purpose of the registry is to ensure that the creditors, whose loan benefits from the relevant guarantees or security, will have seniority as against other creditors in a liquidation or other insolvency process. The public visibility of the records will also guard against malpractice by companies in offering competing security to other credit providers.

Some challenges

However, Colombia is not without its challenges. The first issue with the Colombian legal regime for tower companies lies in the lack of a unified legal framework that specifically regulates the construction and operation of towers. Currently, the right to install these antennae is governed by the land use plans of each municipality; there is no unified national code or set of rules. Therefore, the ability to obtain relevant permits to build towers is dependent on the support of each different municipality (although this requirement for local district permitting is not exclusive to Colombia). That being said, each municipality is bound by central regulations which dictate the time period within which a permitting decision must be made (45 days from application). Despite this complication, the permits required for tower developments are relatively streamlined with only one permit being required per tower (rather than separate planning, building, and/or environmental requirements), with one exception being where antennae are constructed within space that is subject to regular air traffic, in which case tower companies may also need to meet other specified requirements established under international aeronautical standards.

A second challenge that creates difficulties for the development of tower infrastructure in Colombia is the lack of land availability within the Colombian urban centres. Although this is attractive for tower companies in as much as it drives a need to share towers, it can be an issue if operators seek to preserve competitive advantage, particularly with respect to lucrative inner city towers and therefore turn against the towerco model for these sites. This challenge has been mitigated to an extent by Resolution 4245 of 2013, which regulates the infrastructure sharing agreements between tower owners and the other operators and grants operators access to previously unavailable infrastructure. The Resolution does not assist in breaking down barriers for new urban build to suit developments however, which is adverse to the creation of a dynamic market place amongst tower companies and improvements of network capacity in these areas.

Whilst the geography of Colombia presents its advantages, these are not without counter-balancing difficulties. From a purely physical standpoint the construction of towers and antennae in certain areas of the country will require additional manpower and machinery in order to access the location and perform maintenance, and grid availability still presents a challenge for continuity of power services for towers particularly in remote rural areas. This will increase transportation and general costs, although it is notable that the towercos currently operating in Colombia have power costs as a pass through.

Although relatively minor in effect, an additional challenge for foreign investors is the complicated
foreign exchange regime that Colombia has in place. The Colombian Central Bank operates an exchange regulation regime (largely for statistical and anti money laundering purposes) under which declarations on the entry of dollars and their repatriation have to be filed and registrations have to be permanently updated. Furthermore, the Superintendence of Corporations of Colombia has the authority to impose very stringent sanctions to corporations that are not in compliance with the foreign exchange regulation regime. Therefore, despite the relatively low impact that compliance with the FX regime has, investments may be deterred based on the assumption that an additional regulatory burden is placed upon investors.

**Conclusion**

The nature of the operator market, the regulatory support for the model, the availability of land, the geography of the country and the surging demand for network and data capacity all contribute towards an attractive opportunity for tower companies in Colombia.

Challenges do exist, but challenges exist in every jurisdiction and Colombia’s regulatory framework would appear to be one within which tower companies can develop their business more easily than others where a successful towerco model has already emerged.

Whilst the jurisdiction has already seen towerco activity, Colombia could be set to be the next boom market for the tower company model.

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**See you at our future events!**

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[www.towerxchange.com](http://www.towerxchange.com)
2015 has been a milestone year for the National Association of Tower Erectors (NATE) as we are celebrating our 20th Anniversary. Twenty years after NATE was founded, the Association is once again demonstrating our leadership by collaborating with prominent companies and stakeholders from throughout the wireless industry ecosystem to establish the National Wireless Safety Alliance (NWSA). The NWSA is a national non-profit assessment and certification organization that is under development by the wireless industry in the United States. The mission statement of the NWSA is to provide thorough, independent assessments of knowledge and skills and provide verifiable worker certification in order to enhance safety, reduce workplace risk, improve quality, encourage training, and recognize the skilled professionals who work on towers and other non-standard structures.

The NWSA organization is a by-product of collaboration between a broad coalition of the industry’s leading subject matter experts, companies and stakeholders representing wireless carriers, tower owners/vertical realtors, OEM’s, turnkey management firms, engineering firms, public safety entities, small contractors, tower technicians and industry associations. A Board of Governors representing a broad cross-section of companies in the industry has been selected to provide leadership and oversight for the organization.

A national assessment and certification organization has been needed in the wireless industry for quite some time. The NWSA will standardize the assessment and certification process and provide a greater degree of confidence to the industry that an employee who is trained in Massachusetts and an employee trained in California (at the same level of worker category), are qualified to perform the scope of work required of them. Workers, regardless of their training pathway, will be required to take a standardized NWSA assessment. An NWSA certification card will be a source of pride for industry workers and will ultimately raise the bar on safety and quality.

The NWSA plans to offer a variety of assessments leading to certification based on defined categories of workers within the industry. The NWSA is planning a gradual, progressive roll out of these respective programs to the marketplace. It is anticipated that the Signal Person and Rigger programs will be the first to launch. The Telecommunications Tower Technician I (TTTI – Authorized Climber/Rescuer)
and Telecommunications Tower TechnicianII (TTTII – Competent Climber/Rescuer) programs will likely be the next programs to launch. Other assessment and certification programs the NWSA will likely develop include Antenna & Line Foreman, Tower (Stacking) Foreman, Structural Modifications, Foreman, DAS Systems, Small Cell Systems, Broadcast Structures and Outside Plant/Fiber to the Home and Business.

You may be asking yourself, who will benefit from the National Wireless Safety Alliance? There will be tremendous benefits associated with the NWSA for the entire industry. Consider the following:

- Tower technicians and other industry workers will ultimately benefit through a safer working environment, opportunities to enhance/diversify their skill-sets and by receiving the recognition and national credentialing that these skilled professionals deserve.

- Contractor companies will ultimately benefit through a safe and qualified employee base and by leveling the playing field for these companies. Simply put, NWSA’s national certification program will reward the contractor companies who do things the right way when it comes to safety and quality, while at the same time forcing the “fly-by-night” contractors to raise their game (through an investment in safety and quality) or to get out of the game.

- Tower Owners/Vertical Realtors will ultimately benefit through diminished liability exposure and by receiving greater assurance that the men and women working on their tower sites are adequately trained and prepared to perform the scope of work required to work on their valuable property.

- Wireless carriers will benefit by receiving a better quality network build-out from a reliable, safe and qualified contractor company. The carriers know that there is a direct correlation between their network performance quality and the qualifications of the contractor. NWSA will provide wireless carriers with a national certification that they may place as a requirement within their contracts. This step will provide greater assurances that the men and women working on their network build-outs will perform quality work.

- Equipment manufacturers will benefit by receiving greater assurance that their PPE equipment is being utilized properly and safely by more of the industry’s workforce.

- Industry training providers will benefit through the consistency of the uniform vernacular, worker categories, knowledge-based skills and field-based skills outlined in the NWSA’s National Wireless Skills-Based Matrix.
There is a direct correlation between safety and quality – if you hire a safe worker who’s certified, there’s going to be a direct correlation to the quality and performance of the network. The NWSA will provide the wireless carriers with a mechanism to require NWSA worker credentials in their contracts in order to complete work on their projects. It will give carriers clarity and confidence, because it’s based on a nationwide, standardized approach.

Every sector of our smartphone economy depends on lightning-speed connectivity and this is made possible by the men and women who deploy wireless infrastructure on communication sites. The NWSA’s professional certification can be compared to those that apply to other occupations in the United States that demand high-level skills from their workers. If you’re a truck driver, you need to get your Commercial Driver’s License (CDL). If you are a nurse, you have to take nursing boards to get your license. The same concept applies with the NWSA and the wireless industry workforce.

For more information on the National Wireless Safety Alliance or to request a NWSA representative to speak at an industry event, visit http://nws-a.org today.
Your safety is our mission

National Association of Tower Erectors
The industry leader in tower climber safety

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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.

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# TowerXchange's who's who in passive equipment and services

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**Access control, Health and Safety**

- Abloy
- Acsys
- Acsys on SLAs
- Acsys mobile app

**Construction, O&M and managed services**

- ADNA
- AJ Ingenieros
- Alifabs (now CommScope)
- Alkan CIT
- Ardom Telecom
- Camusat
- Camusat East Africa
- Camusat Myanmar

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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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Is your company not included in our Who’s who? Would you like to suggest additions? Please email amayhew@towerxchange.com
Siterra’s purpose-built site management solution for telecoms evolves to support the global tower market

Proven platform scales from 100 to over 100,000 towers, and now supports users in multiple languages

Whether you’re an MNO seeking to manage your telecom real estate and assets, a small towerco seeking to migrate from spreadsheets to an affordable SaaS platform to manage sites, or a large towerco with international aspirations, the purpose-built Siterra platform from Accruent should be on your shortlist of prospective solution providers. In this latest interview, TowerXchange focused on the scalability of Siterra in conversation with Accruent’s General Manager of Telecom, Kevin Reichle.

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:
- Understanding and monetising available space on towers
- Standardising project management best practices across the supply chain to improve quality and time to market
- Scaling Siterra from rapid market deployments for small towercos to multinational deployments

TowerXchange: Please reintroduce Accruent and Siterra for readers not familiar with your company.

Kevin Reichle, General Manager of Telecom, Accruent: Accruent is a leader in real estate and facilities management software. Whereas some software developers are analogous to Swiss Army Knives, adaptable to multiple industries, Accruent builds industry specific suites, and Siterra is our purpose-built, market-leading software-as-a-service solution for site, project, lease, and asset management for the telecom industry.

TowerXchange: The first question our readers always ask is “how proven is the solution?”

Kevin Reichle, General Manager of Telecom, Accruent: Siterra manages over 1 million telecom sites, 750,000 leases, and 1.7 million projects for our customers. In the U.S., Siterra is used by the top MNOs.

In addition to our MNO clients, our towerco clients range in size from small regional towercos to a large U.S.-based towerco that is actively pursuing portfolios internationally. We’ve deployed Siterra for them in six countries, and are currently scaling up teams in additional countries. We’ve worked with regional towercos with as few as 100 towers to multi-national towercos with portfolios over 75,000.

TowerXchange: As independent towercos become increasingly multinational, how does Siterra support that globalisation?
Kevin Reichle, General Manager of Telecom, Accruent: Many of our towerco clients already operate in multiple countries and languages, and they have found their operations in those countries achieve more traction when they make the local language a pillar of doing business.

The underlying architecture of Siterra has always supported configurable languages, and we’ve found that even at a user level people want to specify which language they use. Now in 2015, Siterra supports this user-level choice. For example, there is a clear distinction between requiring that all users interact with your site management system in German, versus enabling your project administrator and local project team to interact in French while the corporate office interacts in German. Users can be more flexible and deliver work more efficiently and productively when the key piece of software they are using is in their native language.

Being on a single instance across multiple countries makes Siterra the system of record. This improves operations by sharing PMO best practices across multiple countries, enabling our clients to rollup assets, leases, vacancies, tenancy ratios and other KPIs on a consolidated regional or country level.

International towerco executives need the visibility and tracking to provide accurate financial forecasts and portfolio valuation across multiple countries. Quite simply, without a tool like Siterra, this type of exercise becomes guesswork at best.

TowerXchange: What are the benefits of this global standardisation of systems?

Kevin Reichle, General Manager of Telecom, Accruent: Our clients are starting to realise significant cost savings through a reduction of

International towerco executives need the visibility and tracking to provide accurate financial forecasts and portfolio valuation across multiple countries. Quite simply, without a tool like Siterra, this type of exercise becomes guesswork at best.
five different countries may have five different methods to manage build to suit (BTS) projects. With Siterra you can standardise workflows to support global rigidity with local flexibility, resulting in project management, asset and reporting efficiencies across all countries.

Kevin Reichle, General Manager of Telecom, Accruent: We foster an ecosystem approach where the MNO, towerco and their service providers all collaborate on projects. Conversely, in an environment where all project resources work within their own system, delays and errors are introduced as data has to be “manually” passed between teams and uploaded to different systems. We foster collaboration so everyone is working in the same system concurrently – this is less prone to error, fosters better working relationships, and creates tremendous efficiencies.

TowerXchange: Are purpose-built Site Management Systems like Siterra only affordable for large towercos with thousands of towers?

Kevin Reichle, General Manager of Telecom, Accruent: Siterra can and does support towercos with as few as 100 towers to those with over 75,000. For smaller companies we have a rapid market deployment methodology which is 90%+ preconfigured – allowing us to get those clients up and running quickly. At this level, it’s usually a case of migrating from spreadsheets to the Siterra platform, and we can repeat a migration process we’ve refined over several implementations.

Our pricing scales up and down based on the number of assets under management.

We enjoy working with smaller towercos in growth mode. Siterra can help them grow fast. As a towerco progresses beyond their first couple of
hundred towers, managing sites, assets, leases and projects soon becomes highly complex: they see the train coming at them and want to be able to move quickly to avoid a crash!

**TowerXchange:** One of the first questions a towerco asks when it acquires a new portfolio is what space is on each site? How does Siterra help towercos consolidate asset registers and determine available space?

Kevin Reichle, General Manager of Telecom, Accruent: After acquisition, towercos will typically audit and re-baseline their asset register. Once that is complete, by utilising a single system our clients are able to control and manage those assets more effectively, dramatically reducing discrepancies going forward.

The ability to manage depreciable and non-depreciable assets provides towercos with visibility to all the equipment on the tower. Siterra provides a view of what space is available as quickly as possible: the specifications of the tower, the capacity, and what space is occupied, vacant, and/or reserved. For example, one of our global towerco clients uses Siterra to standardise all the attributes they use to describe their sites and the related equipment on their sites that helps them understand vacancies and available space. They consolidate tower, site and equipment data (both owned equipment and tenants’ equipment) down to a granular level with information on the make and model, maintenance schedule, and warranty information. Understanding what’s on a site, what it looks like, and what capacity exists for additional tenants is core to a towerco’s business model.

In addition, after an acquisition, towercos using Siterra can run an asset inspection project which will systematically lead the field force through an inventory of the acquired assets. The results of the asset inspection drive future maintenance schedules, planned upgrades, and visibility into available space.

Our MicroStrategy business intelligence compares leases versus capacity at a regional, portfolio, or global level. Based on these reports, users can take actions to improve availability of space and to monetise the available space on their towers faster.

**TowerXchange:** How do you integrate Siterra’s ILM ‘dashboard’ with remote monitoring systems (RMS) in the field?

Kevin Reichle, General Manager of Telecom, Accruent: We are growing our partnerships with RMS vendors.

Through our partnerships, RMS data (including alarms) is pushed into Siterra via web services. Once the RMS data is in our data warehouse you have access to powerful business intelligence via MicroStrategy.

While we see a lot of synergies with RMS, Siterra is a software not a hardware solution – we are looking at ways to better integrate with and standardise gathering and consolidating data and alarms from third party sensors.

**TowerXchange:** Please summarise the benefits to towercos of utilising Siterra to manage cell sites.

Kevin Reichle, General Manager of Telecom, Accruent: In simple terms: we provide a single system of record that towercos need to maximise their revenue per tower. Siterra’s Site and Asset Management provides a consolidated view of the sites in a towerco’s portfolio and the equipment that is installed. Siterra’s Project Management drives process around site development and modification, co-location, and maintenance. Siterra’s Lease Administration module delivers the ability to manage lease activity, while creating accountability around critical dates and payments. We enable spend control – ensuring suppliers are paid for work that’s done, and we enable the efficient ongoing maintenance of the tower – avoiding costly emergency maintenance. Our best in class project management tool enables collaboration through the supply chain and ensures more projects are completed on time and on budget.

It’s easy to focus on a Site Management systems’ ability to drive co-location and tenancy ratios – the ability to increase profitability by improving the speed and quality of BTS and co-location execution. But we think there is at least as much value in standardising processes, proof of task completion, and optimising ongoing maintenance.

Ultimately, consolidation of systems drives bottom line cost savings.
How AIO Systems’ operations in Nigeria address unique market needs

All-in-one solution addresses key challenges such as unreliable grid, fuel and equipment theft

Operating cell sites in Nigeria is notoriously challenging. The challenges of an unreliable grid, compounded by a rampant diesel mafia, put real pressure on opex and on margins. But AIO Systems has delivered opex savings of 40% across 7,000 Nigerian cell sites, offering return on investment in their RMS and Hybrid solution in less than a year and a half. TowerXchange spoke to CEO Asher Avissar to learn more about AIO’s Nigerian success story.

Keywords: Africa, AIO Systems, DG Runtime, Energy, Energy Efficiency, Fuel Security, Hybrid Power, Job Ticketing, KPIs, Lithium, Monitoring & Management, Nigeria, NOC, Opex Reduction, RMS, Site Management System, Site Visits, Skilled Workforces, Unreliable Grid, Who’s Who

Read this article to learn:

- Resourcing AIO’s operations in Nigeria, including a dedicated NOC and local project management, deployment and installation staff
- How AIO Systems maximises use of grid power
- Monitoring regular site maintenance stops to reduce equipment write-offs by 14% across 400 sites
- How AIO monitors, manages and reduces diesel and equipment theft
- How AIO’s “know your opex” policy enabled 40% opex savings across 7,000 sites; amounting to over $1mn per annum

TowerXchange: Please re-introduce AIO Systems for readers who are unfamiliar with your company.

Asher Avissar, CEO, AIO Systems: AIO Systems develops, produces and markets advanced solutions for the management of remote networks tailored specifically for tower management. AIO Systems is renowned for our cutting edge technologies that are based on robust turnkey platforms for hardware, software and management services, and which are customised to suit the individual needs of our clients.

Under our “All-In-One” umbrella we tackle towerco operations from A-Z. For example, just for energy we supply equipment for providing electrical power to the sites, advanced site hardware controller systems, and site detector equipment that is backed up by our CMS management system aimed at significantly reducing energy costs. The list simply goes on and on.

TowerXchange: What is the scale of your activities in Nigeria - what project management and support resources do you have deployed locally?

Asher Avissar, CEO, AIO Systems: AIO’s largest subsidiary is based in Nigeria, which has consistently and diligently served our clients for the past four years. The success of this team is testimonial to the scale of our operations that includes thousands of sites, featuring some of the most prominent towercos in Nigeria.
Our team of experts handpicked for their local knowledge and skills, include a sales and marketing unit, specialised project managers, deployment and installation staff, a NOC dedicated only to provide services to our clients in Nigeria, and a financial and logistics department.

Customers/Suppliers via our portals have privileged access to our BI engine, which allows them to focus in on specific network information (HR performance, site components, equipment, impact of environment, price fluctuations, et cetera) from a global scale to a single site. AIO’s BI engine empowers them to take remediate steps which includes financial analyses enabling them to optimise their network operations even further.

**TowerXchange: What operational challenges and KPIs come to the fore in the Nigerian market?**

**Asher Avissar, CEO, AIO Systems:** It is our experience that Nigerian towerco operations redefine the term KPI. Characteristics such as the poor maintenance of electrical networks, leading to the instability of these networks, and subsequent high costs of fuel due to the use of generators, are not necessarily unique only to Nigeria. What makes Nigeria stand out from the rest of Africa is the dynamics of the market.

I will give one good example. We found that the power from the utility (when available) is still cheaper than the costs of generators and diesel. Towercos don’t usually take into account unforeseen generator maintenance costs and their product life due its high usage. AIO Systems have found a way to make full use of power from the utility. Electrical networks for sites in Nigeria are based on three phase networks. Almost 36% of grid failures fail when one of the phases in the network falls. As a consequence the site’s power will automatically switch to generator power. AIO’s solutions are based on two or single phases. Therefore the site is able to remain on grid power should one of the phases fall, and our systems will also bypass the automatic switch to generator power.

Another good example is what to expect during a “regular maintenance stop”. To effectively manage our sub-contractors and what they are doing during their site visits, AIO Systems has developed our Mobile inSite application for technicians. Our NOC team could ensure that they are actually in the site’s vicinity when logging in at the site, how they respond to alarms/tickets, and of
course what maintenance procedures are being carried out during their stop with actual pictures of equipment. Just with this simple measure, equipment write-off for our client towerco was reduced by 14% for 400 sites alone.

TowerXchange: The Nigerian tower market is unfortunately notorious for high levels of diesel and equipment theft from cell sites - how have you been able to combat this problem?

Asher Avissar, CEO, AIO Systems: As with any challenge, we design, redesign and implement our solutions to resolve the issue. As I mentioned these challenges are dynamic that needs a dynamic solution.

Yes, diesel theft is not any different. Now instead of just monitoring the situation, AIO Systems can manage the challenge in full. Immediately when inconsistencies are detected, we can remotely switch the generator on/off, set off a full security procedure including locking the site's access and of course monitor and record everything on camera. Our solutions also control the diesel’s flow, quality, close/seal off the tank and of course filter out any water in the diesel that may have been “accidently” added to the diesel. AIO’s saver-logic algorithm enables towercos to manage everything from the cost of diesel, refueling to minimising its use with our hybrid solution. Measurements are based on duplicated measurements and verification systems, making it almost impossible to tamper with any measurements/data.

Equipment theft can be just as damaging for the site’s operations, and yes this has also evolved in recent years. We’ve found that adding measures such as detecting and videoing the “displacement” of equipment is not enough. Yes you need to know that it is being moved, but you also need to track it while it is being moved. Our RFID tracking and identification solutions for assets is an effective measure to track and map in real-time when, where and what is being moved.

AIO's solutions are backed by a comprehensive alarm and ticketing system. We pre-programme thresholds for inconsistencies, which sets off the aforementioned security procedures. Not to mention the fact that one of AIO Nigeria’s partners is KingsGuard, is one of the biggest local security companies. Kingsguard offer physical security services fully backing network site security day and night.

TowerXchange: For similar reasons, one would imagine tamper proofing of RMS is critical in Nigeria - how has this been achieved?

Asher Avissar, CEO, AIO Systems: Yes, unfortunately many of the culprits are well-familiar and have wide technical experience. The destruction of
controllers, cutting wires and vandalism have forced AIO to implement drastic measures such as our SMART-Tampering components. We adapt a military-standard policy for our hardware. Components placed in a durable, tamper proof housing that is equipped with a micro-switch that sets off alarms once it is being tampered with. Wiring is replaced by wireless communication.

It is also necessary to secure data with backup software which incorporates control systems that pre-emptively manage user levels and will automatically detect inconsistent data entries. AIO protects the aforementioned wireless communication with effective firewalls, SSL protocols and data verification systems.

TowerXchange: I recall learning that MTN was the second largest power generator in Nigeria! That was of course before they sold their towers. How have you been able to improve energy efficiency at Nigerian cell sites?

Asher Avissar, CEO, AIO Systems: Yes, of course energy efficiency is top priority for any towerco. That is why RMS vendors fashion their sales packages around this issue. Nigeria is notorious for their unstable grid, accounting for the wide use of diesel generators. There is no Time of Use billing system in place, and as mentioned previously it is important for towercos to make optimal use of the grid as the most cost-effective energy source. Unfortunately, power has to run 24/7 for companies like MTN to guarantee their service.

Our “Know your opex” policy, coupled with our Hybrid solutions, have been very effective to tackle this problem in Nigeria. AIO’s Hybrid solution addresses the grid instability in three ways. The Hybrid solution automatically switches the power to the cheapest power source available. When the grid becomes unavailable, power is switched to the lithium battery bank. Should the battery bank become unavailable, power is switched to next available source generator/grid. We’ve found that the grid is usually available during the late hours of the night until early morning, at which stage we use the grid to recharge the battery bank, of course at the cheapest rate.

Delivering this opex knowledge to the right people within the towerco has proven to be very effective. On average we were able to reduce these expenditures by 40% for 7,000 sites. Savings that amounted to over a million dollars per annum.

TowerXchange: Can you give us a sense of some of the operating performance parameters of a Nigerian cell site before and after the installation of your solutions?

Asher Avissar, CEO, AIO Systems: AIO Systems has conservatively calculated that by adapting our solutions, a typical cell site in Nigeria can make a return on investment within 17.6 months of operation. Our Hybrid solution alone contributes to 65% of these savings, with fuel at 15%.

In addition to the direct savings, AIO systems introduces a set of “soft savings”, which indirectly add to the cost benefit of the system, and reduce even further the period for return on investment.

- BI machine learning wisdom increases the monetary worth of the network
- Prolonged life-span of equipment
- Prevent unnecessary run-time of equipment and reduced rate of failure
- Efficient use of equipment when put in operation
- Reduced site visits for real maintenance
- Reduced site visits for false alarms
- Reduced down-time
- Preventive maintenance
- Cost control

TowerXchange: Please sum up your experiences in Nigeria and how they prove AIO’s credentials to monitor and optimise performance of other large tower portfolios in emerging markets.

Asher Avissar, CEO, AIO Systems: The large scale and continuity of AIO’s operations within Nigeria is testimonial in itself. Our ability to adapt our solutions and succeed in one of Africa’s toughest and ever-changing emerging markets, has made us the number one choice time and time again. Our credentials not only lie in our cutting-edge technology and ability for our clients to make substantial profits, but also in the excellence and consistency of AIO System’s local support. It is this dedication and commitment that I am very proud of. AIO Systems Nigeria is indeed one of our shining examples of how large towercos are able to optimise their performance on another level.
Keeping it in the family: three generations of energy solution evolution

Ausonia explain their switch from capex-only to offering a full opex solution to the market

TowerXchange: Please introduce Ausonia – where do you fit in the telecoms infrastructure ecosystem? How did you get started in this business?

Massimo Ombra, CEO, Ausonia: Ausonia has a very long history, we were the first company to produce diesel generators in Italy, starting our activities in 1932 thanks to the efforts of my grandfather. We are still a family company today and following the management of my grandfather and my father, I have now the role to lead and manage the company, keeping client satisfaction as our main priority.

Since the outset, we have continuously invested into R&D activities and we expanded our product portfolio to meet all the specific needs of our customers, who come from many different industries and countries, and who always need tailored products. Thanks to this, over the years we provided power solutions to critical sectors such as telecoms, oil & gas, defence, healthcare and many others. Specifically for the telecoms market, we provide different kinds of gensets for powering base transceiver stations, BSC/MSC, data centres – all kinds of cell sites, as well as mobile power units for energy recovery and no-break power systems for TOC sites. More recently, we added into our portfolio High Efficiency Power Units dedicated to remote areas and off grid, base transceiver station power supply applications. With such wide flexibility, we can definitively say that Ausonia is not only a product manufacturer, but it’s also a solution maker.

As towercos consolidate their portfolios and search for proven power solutions which fit with their need to reduce opex, Ausonia talk us through their long history in the market and how they developed both capex and full opex solutions to enable them to deliver power solutions to the complex African market. Drawing on over 80 years of R&D experience, Ausonia’s hybrid solutions are proving successful for both towercos and MNOs.

Keywords: Africa, Ausonia, Batteries, Energy, Energy Efficiency, Energy Storage, ESCOs, Fuel Security, Hybrid Power, Installation, Interview, O&M, Opex Reduction, Site Visits, Unreliable Grid, Who’s Who

Read this article to learn:

- How Ausonia has grown in the tower industry
- The driving factors fueling their growth in telecom towers
- The importance of flexibility when developing solutions for clients
- How high efficiency solutions can reduce opex costs and O&M demands
Massimo Ombra, CEO, Ausonia: Ausonia entered the tower market through the supply of power units to MNOs and towercos on a pure capex model basis. After many years of experience in this industry with this business model approach, in 2003 we got the opportunity to enter into a big challenge which definitively changed our way of approaching the telecoms market. That was when we were awarded a contract by Vodafone Italy for the supply of energy to their off-grid base transceiver station sites in Italy through a full opex business model. This was something new to us, but we structured ourselves in order to give Vodafone the utmost power availability on site and achieve their complete satisfaction for the energy services we had to provide.

We then created our energy service company (MediPower, ndr) and developed a genset model specifically designed around the needs of this activity and able to optimise our operational costs. Since then, we have continuously expanded this business by signing power lease agreements also with TIM, Wind (Vimpelcom) and H3G. Furthermore, in 2010, we have also developed a family of high efficiency diesel gensets solutions dedicated to off grid and bad grid cell sites, in order to further reduce our opex and share this advantage with the telecom operators, enjoying a continuous growth which has been possible thanks to the high quality standards of our products and the excellent service levels offered to the Italian operators. Today we can say we power almost 85% of the off grid, base transceiver station sites in Italy. We realised that the solid experience we gained directly from the field could allow us to start offering and replicating the full opex business model also in foreign countries.

Massimo Ombra, CEO, Ausonia: Honestly, very positive and with excellent forecasts for the future. Being very flexible in our offer, going from a pure capex offer to the full opex business model, we can now satisfy different kind of demand for power.

After the testing we directly performed on the sites we service in Italy, we have today a proven technology which has been installed in several countries with different temperature, humidity and
when they think about their sites located in harsh climactic conditions, where they can eliminate the costs of the batteries and of the ACU needed for the battery cabinet, further reducing both the power and fuel consumption on site.

**TowerXchange:** In a sector where opex is kept to a minimum, can you talk us through the numbers which make your solution stack up? How does capex and opex compare?

Massimo Ombra, CEO, Ausonia: There are multiple advantages to our high efficiency solutions for powering cell sites. Thanks to the significant reduction in fuel consumption and different capacities of our integrated fuel tank, we can extend the refueling interval of our power units up to three to four months. On top of this, our high efficiency solutions can be configured to have a preventive maintenance interval of up to 2,000 hours, which is more than 80 days and requires only four or five trips to a site per year to perform maintenance activities.

Additionally the systems can be controlled and managed remotely through a web-based dedicated system which can be integrated to the Network Operation Centre (NOC) to track alarms, ticketing and escalation. Moreover, thanks to the scalability of our modular solution, we can deliver systems to power multi-tenant sites, in which each operator can be billed singularly for its energy consumption.

Considering all this, if our customers compare our DC gensets solutions with the traditional solutions in terms of fuel cost savings and number of maintenance and/or refueling trips to site.

They clearly understood our technology went beyond the typical concept of “hybrid solutions”, in which a genset needs to cycle with batteries in order to achieve the desired opex reduction. In fact, we are able to achieve even more savings than the typical hybrid power units available in the market by directly operating our variable speed DC generator, which automatically adjusts the engine speed according to the load existing on site and following the most efficient point of its power curve. All this is done without the necessity to add deep cycle batteries for CDC operation, and this makes our customers more than happy, especially

altitude scenarios, guaranteeing extreme reliability and power continuity.

Remember that we are not only a producer of these power solutions, but also first users in performing the energy service model, so we are perfectly aware of the importance of the reliability of a product, as well as its capability of maintaining unaltered performance over its lifetime. Our customers know this and in the recent years they asked us to provide them with our High Efficiency DC gensets, which are based on variable speed DC generator technology we developed internally in Ausonia for the telecom industry. With our units on their sites, our customers realised that this technology can guarantee them huge opex reductions, both

![Fuel consumption trends over three years](image-url)
installed around the globe, they realise that the payback period is often less than one year and the product lifetime goes over five years, making it therefore an excellent investment even in preparing short term business plans.

TowerXchange: Do you always work directly with the operator or towerco or do you also work closely with managed service providers in the market as well?

Massimo Ombra, CEO, Ausonia: All these scenarios are possible in this market. We have supplied directly to operators when they owned the passive infrastructure assets, but we have sold our units also to towercos when the sites were on lease. In some other cases, we offered our solutions to local managed service providers who wanted to add a ‘plus feature’ into their current offers for services. So, I have to say we are totally open to work in all possible directions with any reliable partner, given for us it is mandatory that we have to keep our client happy – what’s best for them is also the best for us!
Apollo Solar: How to take the operational and financial risk out of solar power

Proven at 600 cell sites in Africa, Apollo advocates the TCO benefits their Pure Solar and Hybrid Solar/DG solutions

Solar power is no longer a high risk gamble on unproven, capital intensive solutions with uncertain economics. Operational risks have been minimised by the demonstration of the efficiency, reliability and scalability of Apollo’s solutions at 600 cell sites across Africa. Close partnerships between Apollo Solar and key EPC contractors such as Camusat and AKD Solar ensure a trained field workforce is in place to install and support sites. And now financial risks are minimised too through Apollo’s trade finance partners.

TowerXchange spoke to Apollo Solar CEO John Pfeifer to learn more...

Keywords: AKD Solar, Africa, Apollo Solar, Batteries, Camusat, ESCOs, Energy, Energy Efficiency, Hybrid Power, O&M, Off-Grid, Opex Reduction, Orange, Plant Engineering, RMS, Renewables, Skilled Workforces, Solar, Uptime, Vendor Finance, Who’s Who

Read this article to learn:
- Apollo’s faultless performance history in Africa
- The criticality of training and technical support for EPC partners
- The capacity and space requirement for solar solutions and their scaleability as additional load is added
- A five year TCO comparison: DG vs DG+battery vs DG+battery+solar vs Solar+battery
- Leveraging trade export finance to offer a zero-capex option

TowerXchange: Please introduce your company – where do you fit in the telecoms infrastructure ecosystem?

John Pfeifer, CEO, Apollo Solar: Apollo Solar is in the risk minimisation business for remote energy systems. We have proven that our Pure Solar systems eliminate or greatly reduce the risks and unknown costs associated with the diesel generators including their maintenance, the delivery of fuel and risk of theft. Furthermore, we have removed the risks of converting to Pure Solar or to our Solar/DG Hybrid systems with reliable, field-proven equipment.

We are now taking the next step by minimising the financial risks for our customers. By providing financing or leasing options for qualified customers, Apollo Solar is making it easy for the forward thinking tower company or MNO to reduce their ongoing opex without the large capital expenses often associated with solar installations.

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?

John Pfeifer, CEO, Apollo Solar: Apollo Solar now has about 600 systems running in Africa. The performance has been essentially perfect since there has been no down time at any of them. It is important to note that most of the Apollo Systems are Pure Solar without any generators. This is
a bold statement since these systems have no generator for backup and therefore must be 100% reliable. Our systems were specified because of the reliability of our core charge controllers which have a ten year history and many thousands of units installed around the world.

The end users are Orange and a number of the MNOs which are partners with Orange, plus several tower companies and other MNOs. The installations and ongoing O&M is provided by Camusat. Orange and Camusat are continuing to specify and purchase the Apollo equipment.

**TowerXchange: How are Apollo Solar’s solutions installed and supported on the ground in Africa?**

**John Pfeifer, CEO, Apollo Solar:** Apollo Solar sells primarily to EPC companies who have teams in place for installation, operation and maintenance. Having the best team on the ground is critical for the class of service we provide, so Apollo considers our relationship with our EPC partner extremely important. We provide complete training and ongoing technical support to the EPC so they can provide the very important Operation and Maintenance over the long term.

When a tower company or MNO comes to us directly, Apollo will bring in the EPC partner with the best proven track record. We certainly recommend our partner, Camusat in the countries where they have a presence. In Nigeria, we recently partnered with AKD Solar, a subsidiary of Plant Engineering of Nigeria. They bring a depth of experience successfully servicing the demanding oil and gas industry with integrity and high standards.

**TowerXchange: What size of solar array is necessary for solar to start to become an economically viable option?**

**John Pfeifer, CEO, Apollo Solar:** The short answer is that a hybrid site with just 6.8kW or 21 PV panels at 325 watts each will break even in 15 months against a typical diesel only site with 1.8kW of DC load. This PV array needs about 40 square meters for mounting which is available even on a small 12meter by 12meter site. Of course there are many factors which change the calculation. Apollo Solar will be pleased to calculate the price and the total cost of ownership for any potential site. Just tell us the load size, the location and your current cost of diesel fuel delivered to your sites.

**TowerXchange: What magnitude of fuel and O&M savings can be realised using your solutions, and how does TCO compare with traditional diesel-oriented energy solutions over an eighteen month, three year and five year scenario?**

**John Pfeifer, CEO, Apollo Solar:** Apollo Solar uses a sophisticated simulation programme which produces charts with the answers to all of those questions. See figure one.

Figure one shows the total cost of ownership on a 1.8kW load site going out five years for the energy systems using Diesel Generator only, DG plus deep cycle battery, a Hybrid with 6.8kW of PV and a DG and finally a Pure Solar system using 12.6kW of PV and no DG.

One can see that our Hybrid DG & PV system will pay for itself after only 15 months (where the orange line crosses the brown line). The Pure Solar version (yellow line) becomes less expensive than the Diesel-Only site in about 22 months. The deep cycle battery addition to the DG takes about 34 months to break-even against the diesel only generator and it is not very cost effective over time. At the end of five years, the DG only sites will have
cost US$270,000. The TCO of the Hybrid DG plus a small PV array will be US$130,000 and the Pure Solar site will be US$120,000 and will remain the lowest cost going forward.

**TowerXchange: What is your capacity to offer financing for the leasing of power systems?**

**John Pfeifer, CEO, Apollo Solar:** Apollo Solar is working with American Trade and Finance Company and their guarantor, the US Export-Import Bank. The amount of capital available to purchase our systems is limited only by the credit worthiness of our customers. It is possible for the Apollo Solar team, working with a local bank to provide financing for 100% of the total equipment cost, plus the costs of site preparation and installation such that the tower company or MNO can simply make a lease payment.

**TowerXchange: SLAs often demand 99.5% or higher uptime – tell us about the reliability and autonomy of your solution.**

**John Pfeifer, CEO, Apollo Solar:** Our Pure Solar sites have batteries large enough for three to five days of autonomy and harvest enough solar energy each day such that the batteries are discharged less than 20%. The end result is uptime of essentially 100% for every site. Since we knew the strict terms of SLAs before hand, our systems were designed with inherent redundancy, eliminating the risk of single point failures in the critical power train. Our systems include our own integrated remote monitoring which warns of any component issues back at the NOC. Our O&M partner has days of early warning to schedule crews to bring the system back up to full capacity during regular maintenance visits without the risk that the batteries will approach a dangerous level of discharge.

**TowerXchange: How is your solution scalable to accommodate the increasing power requirements as multiple tenants are added to a site?**

**John Pfeifer, CEO, Apollo Solar:** Apollo Solar understood that adding tenants is an essential part of the tower company business model, so we designed our systems to be modular for easy upgrades. We reasoned that installing an oversized system just in case additional energy might be required did not make sense, so we kept the basic system small and scaleable. The PV arrays and batteries can be increased in logical sized sections. Our cabinets do not put a limit on the capacity of the batteries as several competitors do. Our battery cabinets are separate from the electronics cabinet for easier installations and simple modular upgrades.

**TowerXchange: Please sum up how you would differentiate your solution from your competitors?**

**John Pfeifer, CEO, Apollo Solar:** Apollo Solar counts our strong points as follows:
- Our great track record for reliability at challenging sites in Africa.
- We have 10 years of experience building solar energy harvest systems.
Our MPPT Charge Controller is 98% to 99% efficient. Some competitors are proud of their 96% efficient versions.

We design and manufacture all our hardware and software in the USA.

We have found that in Africa, it does not matter what you can do, or even what you say you will do, but rather what you have actually done. Apollo Solar has 600 solar powered sites working reliably every day.

This cabinet harvests up to 20kW of PV which will power a 2kW load.
An East African odyssey – how Camusat plays to the strengths of four very different markets

Increasing fuel security, upskilling workforces and pioneering new technologies to lead in these growing markets

With vast differences politically, culturally and technologically, Kenya, Tanzania, Uganda and Malawi require a number of different services from fibre roll-out to tower construction. From humble beginnings, Camusat has focussed on organic growth in the region, building up to a significant base with over 450 staff working on sizeable projects. Emmanuel Fresco, Managing Director of Camusat’s East Africa business, talks us through these four distinct markets and assesses the opportunities and roadblocks which can be encountered working in each.

Keywords: Africa & ME, Camusat, Co-locations, Construction, Country Risk, Data Room, East Africa, Fuel Security, Infrastructure Sharing, Kenya, Logistics, Malawi, Managed Services, Market Overview, O&M, Orange, Regulation, Risk, SLA, Skilled Workforces, Tanzania, Tenancy Ratios, Uganda, Urban vs Rural, Who’s Who

Read this article to learn:
- How the Kenyan and Tanzanian markets are supporting technology roll out
- The development of each market and why towercos have thrived in some markets and not in others
- The key factors driving data growth in East Africa
- How Camusat are recruiting and training skilled workforces in the region

Thanks to Camusat’s experience in all stages of network development, I’d say we focussed on steady growth in East Africa, opening in new markets roughly every 18 months for the last seven years. Our team has proved very adaptable and capable of making Camusat a key player within the East African region – today we have 450 people working here.

Despite the fact that Kenya, Tanzania, Uganda and Malawi make up our ‘East Africa’ region, we have
been developing totally different lines of business in each market. Although in Kenya we began doing a lot of tower builds and engineering, we now focus on a full turnkey service for cable operators and do a lot of fibre business.

In Uganda our focus is currently mainly on managed services for towercos; we capture all of the passive infrastructure including security and fuel et cetera.

Our Tanzanian offering is different again, with a mix of fibre solutions and towerco managed services projects – our clients there benefit from the experience we’ve had in Kenya and Uganda over the last few years. We are also trying to develop the business around fibre and data by focussing on the data centre business in the region, which we see as a big potential market.

TowerXchange: These are four markets with a very different towerco landscape - can you talk us through how these markets have evolved and what has contributed to that?

Emmanuel Fresco, Regional Managing Director East Africa, Camusat: These four markets all have big differences in their towerco landscapes and the way they operate and the way MNOs develop their business.

For Eaton Towers in Kenya for example, the Econet deal collapsed then an Orange deal was mooted; MNO consolidation has muddied the landscape. Eaton has been established here for almost three years; soon they shall integrate Airtel’s Kenyan towers. In terms of MNOs, Safaricom, who have the most sites, clearly lead the market. One of the challenges Eaton or any other towerco would face in Kenya is that Safaricom has been prepared to share their huge tower network on relatively attractive terms.

Uganda has a similar number of operators to Kenya but they do support two towercos, ATC and Eaton. With four or five operators there is much more competition. It’s going to be hard to reach good tenancy ratios but the model has been effective in this country for quite some years.

Tanzania is another interesting market as we have one towerco which was about to own all the towers. If we compare Uganda to Tanzania, the main difference is the regulator, which has a different policy in terms of licenses meaning Helios Towers Tanzania has been permitted to build a very strong position in the market.

In Malawi the market is in its early stages, it is a small and less advanced country. There are only two operators: the legacy operator and Airtel. Eaton, although they have not started the handover of Airtel towers yet, will be the only towerco in this market and we do not see room for a second towerco.

TowerXchange: How do the needs and demands...

The theft of fuel, batteries and solar panels is the main issue, particularly in Uganda. We have to constantly challenge ourselves and display inventiveness to fight this scourge. In Uganda we come across more organised crime with a lot of means behind it.

Emmanuel Fresco, Regional Managing Director
East Africa, Camusat: As an operations and maintenance subcontractor to towercos in Uganda we must be flexible and focus our attention on achieving the SLAs. We must locate our team at the nearest point to the sites in order to achieve targets. The towercos are really more focussed with us on the KPIs and the mean time to response (MTTR) is very important. In Uganda we have five regional offices in the country in order to cover the region and to be efficient.

TowerXchange: Can you give us an overview of the logistical and operational challenges you face in these markets and how you overcome them?

Emmanuel Fresco, Regional Managing Director

East Africa, Camusat: The main issues we are facing are the general climate of insecurity as well as the time we require to train our technicians. Our professions require a high level of technical skill. Training a skilled labour force takes time and meanwhile, activity is still developing so it is not easy task. Moreover, we have to adapt our staff to business peaks. We can only overcome these challenges by being continuously inventive in our control methods and by finding the critical balancing point between overstaffing and being stretched too thin – the right resourcing level to make us flexible and responsive to our customers’ demands.

I would say there is uniformity across the region in terms of the problems themselves but different levels of severity in each of the markets. The challenges are always the same; combating theft and the drive to achieve consistent high standards.

The theft of fuel, batteries and solar panels is the main issue, particularly in Uganda. We have to constantly challenge ourselves and display inventiveness to fight this scourge. In Uganda we come across more organised crime with a lot of means behind it.

Theft of fuel is also a problem in Kenya but at a lower degree. In Tanzania we’ve got quite a lot of theft but as you go further south it is quieter. Malawi seems quite peaceful in our experience so far.

Another major logistical issue is access problems.
Most towercos won’t invest in refurbishing the access roads which we need to get our vehicles to critical sites. As time goes on, of course, the problem gets worse. We need adapted vehicles, such as heavy duty 4x4s or quads and to be creative in the way we ensure the security of our personnel and the goods or fuel they’re carrying. Access to sites varies also from country to country and tends to be more of an issue in Uganda and Tanzania.

TowerXchange: As regulators force MNOs into rural areas and urban infill becomes a necessity to meet data demands, where do you see the most growth at the moment?

Emmanuel Fresco, Regional Managing Director East Africa, Camusat: Data demands specifically in Kenya and Tanzania are growing rapidly. Everyone is working on it, trying to get cheaper smartphones. Nairobi was actually classified as one of the most developed ‘smart cities’ in the world recently! Safaricom have a huge footprint even in rural areas and have a big legacy as they have been here for over ten years.

They need data connectivity in rural areas as this is probably where they make most money through their Mpesa network. We’ve been involved in a number of projects to bring some rural sites online in revenue-sharing deals with some operators but a big reason for this data penetration is also that Kenya has a relatively good power grid. The Kenyan government is deploying a lot of investment to bring power to everyone.

It’s really an asset in terms of introducing data in rural areas. Camusat also offers specific technical solutions for rural areas. It is a way for us to help our clients to meet this challenge.

In Uganda, there is still some major work to be carried out in terms of road infrastructure and power. Operators still have many areas to cover. Kenya is far ahead of the other countries as even the most disadvantaged households have smartphones. Taxes are only submitted online, and administrations are pushing the population to move to these new technologies.

Tanzania is also quite far ahead with the government stimulating investment into ISPs. However in Malawi, means are clearly different, the delay in deployment is noticeable. 3G is barely deployed and the broadband speed and footprint are very narrow.

TowerXchange: What can you tell us about the skills of the workforce in these countries? How closely do education and training levels meet the needs of the tower owners and where do the gaps lie?

Emmanuel Fresco, Regional Managing Director East Africa, Camusat: Some of these countries have at least 10-12 years of (mobile) telecom experience and our relationships with contractors have been built up around our experience in the field. Our clients are demanding and we totally adhere to the high standards they ask for but since they don’t all come from the region, they do not have necessarily the vision we have of the labour market.

Training leading to qualification in these countries do not allow us to fully meet the high standards required by our activities. Moreover, we operate in a fast-changing environment so we have to constantly upgrade to meet standards.

That is the reason why at Camusat we put great value on sharing know-how through in-house training. We believe in people, we care about our people and invest in them. We have a high level of requirement in terms of safety and health and we ensure continuous improvement in processes. Indeed, it should not be forgotten that some of our activities are done at great height and are consequently dangerous. We provide training sessions as well as “Passport to Safety” to this category of staff so that they are aware of the importance of respecting safety rules. It is not always a reflex in this region.

You do have some rare pearls however. In Kenya we have an institution called ‘National Youth Services’ which helps kids from a poor background to be trained in vocational jobs like electricity or civil work, it’s paramilitary in style and they come out very disciplined. The team I’ve had from them are excellent and the level of churn is very low.

I think that to meet this challenge, the right balance must be found between our customers’ requirements and local cultures. It is important to respect and adapt to local cultures otherwise you can’t succeed.
Rapid roll-out multi-tenant hybrid solutions
Heliocentris’ achieves unprecedented growth and quad nines uptime in Myanmar

Doubling their footprint from 1,000 to around 2,000 towers through a massive roll out in a burgeoning Myanmar tower market has enabled Heliocentris to refine their offering not only in terms of technology but also process, partnership and flexibility. They’re now keen to take the lessons learned in Asia and apply them in the African market, where their presence is already established and growing.


Read this article to learn:
- Heliocentris’ readiness to provide ‘Power As A Service’ (PAAS) business models
- How a rapid rollout of energy solutions for 20 sites a week was achieved in Myanmar
- The importance of monitoring and control solutions in the African market
- Locating and training a skilled workforce to maximise the lifecycle of your technology investments
- Simple shortcuts for increasing efficiency in legacy equipment

Jens Fiedler, VP Sales & Marketing, Heliocentris: Heliocentris offers energy solutions for autonomous, complementary and emergency power supply of distributed stationary applications, supplemented by I&C, O&M services and financing to enable an offering of opex-like business models to customers, especially tower companies. We are component agnostic, have a world class remote energy management system and a vertical technology portfolio enabling completely autarkic carbon free solutions based on fuel cells and electrolyzer products combined with solar technology. This is unique in the market and offers the customer not only solution engineering in order to optimise solutions to their specific needs, but also enables us to offer financed power businesses, up to a full ‘Power As A Service’ (PAAS) offering, for which Heliocentris is well prepared.

The rollout in Myanmar of close to 1,000 sites over the past year demonstrated the strength of our organisation and partners, and we are currently raising the footprint to above 2,000 sites equipped with our advance energy management system for operators and towercos. Myanmar now represents around 50% of our footprint and Africa around 30%, although we expect to grow our business there.

Andrew Gruar, Business Development Manager, Heliocentris: We have deployed networks in Mozambique and Zimbabwe and also deployed
networks with some of the Middle Eastern MNOs including Etisalat and Du. Over the last year we've doubled our operational sites footprint. Based on customer demand, we have been deploying an average of 20 sites, at peak even up to 70 greenfield sites per week in Myanmar. That’s a compliment to the product but also to our ability to commission teams, interoperate with other vendors’ equipment and manage ongoing O&M through a power NOC. We can replicate that in Africa and apply the same competence where the market isn’t focused on both legacy and greenfield sites.

TowerXchange: How has Heliocentris grown in the tower market and what has fuelled that growth?

Jens Fiedler, VP Sales & Marketing, Heliocentris: Years of expertise in energy management and hybrid solutions is the foundation of our business which has translated into substantial growth. Years of development of our advanced and field-proven energy management system yielded a leading approach to remote management of hybrid power solutions for telcos and other businesses. The uptime we achieved - Quad 9 (99.99% uptime) - in Myanmar is a big success for our clients and for our system.

In terms of the origin of the business, the first key success for us was in the Middle East with companies like Du, later on supplemented by business in Africa then in Asia.

Another significant commercial change which took place last year is that we’re now publicly listed on the Frankfurt stock exchange. This improves our ability to finance and support different service models and gives us more scope to offer clients mutually beneficial business models.

We also have another business in education and research. We call it ‘empowering the future engineers’ and we offer services and products starting from schools and into universities and companies. Our aim is to provide the tools to educate future engineers about renewable power and systems so people can work with solar power and fuel cells et cetera and understand them better. It’s a worldwide project: we have business in Latin America, Africa and North America.

Andrew Gruar, Business Development Manager, Heliocentris: From our recent conversations with several African towercos we know that in Africa they have been through at least two generations of remote monitoring and energy hybrid systems. A variety of technologies have been deployed to varying degrees of success, meaning every three years infrastructure owners ended up spending more money trying to improve power systems and control. We want to help create an environment where we can help to train our clients’ workforces, in product and process, create a competence centre and ensure installed systems are properly looked after in the field.

TowerXchange: How have you found customer response to your solution in the African market? Which products are most popular and how does that vary across the continent?

Dr Sakib Khan, General Manager sub-Saharan Africa, Heliocentris: Due to the diversity of the African telecommunications market Heliocentris is well placed to offer a wide range of power solutions, from autonomous solar and fuel cell solutions to generator/battery hybrid systems through to simple remote monitoring. The response from African customers has been extremely positive, in particular due to the fact we have an office with supporting staff based in Johannesburg who are extremely well versed in doing business
in Africa, and rapidly supporting projects in Africa. Our battery/genest hybrid system, enabled by our energy management system has been very well received due to the significant savings it offers. Our remote management NOC software receives praise from our users, as well as our flexibility in providing customized solutions.

TowerXchange: As operators turn their attention to meeting regulatory requirements in rural areas and on maximising capacity through urban infill, do you see a change in what the market demands?

Dr Sakib Khan, General Manager sub-Saharan Africa, Heliocentris: Towercos are now some way through acquiring and optimising the ‘most desirable sites’ in Africa’s most densely populated areas, and now are asked by operators, through build to suit programs, to increase number of sites and colocations in rural and off grid sites.

This drives interest in ‘Fit & Forget’ solutions: power cubes, solar integration et cetera; minimising the use of ‘technology’ and focusing on minimal maintenance, total system deployments. The ultimate goal would be to purchase power, not solutions. However Heliocentris is prepared to support almost every site situation with an optimum power solution while also reducing carbon emissions.

Moreover, we are exploring how we can support tower companies and MNO’s in providing power to remote communities with the BTS site as the “anchor” in a mini-grid construct. This enables the use of productive power instead of just consumptive power for communities and increases social development.

TowerXchange: In a sector where both capex and opex are kept to a minimum, can you talk us through the numbers, which make your solution stack up?

Jens Fiedler, VP Sales & Marketing, Heliocentris: We can’t talk about specific numbers since each and every solution differs but mostly there is strong interest in ROI of less than three years and provision of financing on a long term basis. Even where fuel is a pass-through there are opportunities to save money and resources, which are distributed either through shared saving models or fixed rates which reduce over time. It’s hard for renewables like solar power to deliver that kind of ROI within three years however we have solutions and cases which can support this kind of requirement.

TowerXchange: Tell us more about operations and maintenance? How does that compare to the other energy options on the market?

Jens Fiedler, VP Sales & Marketing, Heliocentris: O&M is the biggest part of a long term contract so people are interested to reduce the burden here. You can have highly trained people but the equipment should be easy to use and manage remotely, providing for flexibility in terms of operational costs. It is extremely important to implement efficient solutions and processes, prepared for multi-tenant growth, long life utilisation of components such as batteries, and the lowest possible number of maintenance site visits.

We installed a monitoring system for a client in the Middle East and just through raising visibility we reduced fuel loss by 20%. There are companies in the market who offer tools and monitoring across the entire supply chain, and they have revealed that most of the theft takes place within the supply chain, not on site. With this in mind we’re on the way to implementing mobile operations within our offering to reduce theft.

TowerXchange: What are your ambitions for the future? As the African market shifts towards independent towercos, are you finding a need to change your services to suit?

Jens Fiedler, VP Sales & Marketing, Heliocentris: Heliocentris have a strong foundation in the design and delivery of Energy Solutions, including Energy Management, RMS, Hybrids, Batteries, Solar & Fuel Cells. Our ambition is to provide towercos with Certified I&C and O&M services, direct or through partners, to ensure the longevity and cost benefit is sustained in the African market.

As towercos scale, increasing tenancy ratios, building new sites, winning new clients, we aspire to support their technology and process advances, and offer solutions and business models, including finance/risk share for mutual benefit. Our ambition – to invest in Africa ▪
Next level communication: the growth of artificial intelligence in passive infrastructure

Huawei want your air con to talk to your batteries, and your diesel generator to speak to your engineer, creating intelligent networks across the globe

Huawei’s impressive global scope and position as market leader in the telecom and telecom power sectors has won them significant business in the African market to date. Their intelligent RMS system allows the NOC to monitor, diagnose and communicate the health of the network and infrastructure, combining site-level details with network-level visibility. Huawei see that a data explosion in Africa is imminent, and that towerco data management systems still need significant work in order to allow seamless and effective control of their growing networks. TowerXchange spoke to James Qiao, Vice President of Marketing & Sales Support at Huawei Telecom Energy about their exciting intelligent solution and plans for growth in Africa.


TowerXchange: What do Huawei foresee in the future development of the African communications market?

James Qiao, Vice President of Marketing & Sales Support, Huawei Telecom Energy: Smartphone penetration in Africa is quite low, about half of the global average: the global average is about 30%, in Africa it’s below 15% which means there’s significant potential in Africa for mobile broadband growth. Also I see all the major service providers in Africa have already defined their strategy on mobile broadband which will promote data services in the African market and lead to more network construction and site build up. This implies significant opportunities for both towercos and Huawei.

TowerXchange: What challenges are African towercos facing and how can Huawei help?

James Qiao, Vice President of Marketing & Sales Support, Huawei Telecom Energy: I see that towercos in Africa are facing significant challenges. Some challenges are on the financing side, also some long-term profitability concerns, and on how to improve the resource sharing rate.

I believe the financing issue will be solved eventually, that’s not the blocking issue. As long as we have a justified business case there’s no reason why towercos can’t get financing. But long-term profitability and long-term sustainability are more of an issue. Today the situation is not so satisfactory. I see a lot of issues, as an example,
very high fuel costs. Lack of grid availability means many sites are powered by diesel generators which are old and don’t operate in an efficient way. Another example is tenancy ratio, today the tower tenancy ratio is about 1.2 in Africa but when we look at the leading tower cos in some developed countries such as the US the tenancy ratio is around 2.5-2.7.

There are challenges on the management systems as well; some tower cos run several management systems from several vendors which are silos with no interaction. Lack of unification costs more on OPEX and also creates a lot of trouble. When you look inside tower cos’ existing sites, most of which were inherited from the MNOs, many of the configurations are very complicated and difficult to manage, systems from many different vendors which may not even exist any longer, obsolete and less reliable technologies, less energy efficient technology solutions... In terms of building new sites, hard to reach places, difficult site acquisition and energy acquisition are the major challenges. Looking forward, tower cos will also have to look at building and growing sites along a well-defined evolution path, evolving to support future higher user traffic, higher service demand, and support the future convergence of the IT and CT worlds in a much more effective and efficient manner. These challenges must be addressed and these are the things Huawei is good at and can contribute to, with its world leading platform it has established around all CT, IT, power electronics, renewable energy, chipset, software, and artificial intelligence technologies.

**TowerXchange: What is Huawei’s vision for the future of cell site energy in Africa?**

**James Qiao, Vice President of Marketing & Sales Support, Huawei Telecom Energy:** When people talk about cell site energy and power systems they think of legacy products or solutions which are bulky, less efficient, and not quite reliable and scalable. Besides, in the past power systems were also just dumb devices without much built-in intelligence, people had to schedule routine tasks and visit cell sites in person to undertake maintenance. Maintenance was labour intensive and required a large number of highly skilled technicians. Even worse, there were large amounts of unstable diesel gen-sets running on the networks of Africa, leading to high fuel consumption, high maintenance cost and telecom service outages.

We envision the future cell sites in Africa have to be more reliable, more energy efficient, more scalable, easier to be built up, and easier to be maintained and managed, including energy management.

In terms of cell site energy, Huawei proposes three level energy efficiency. At system level, Huawei provides the highest energy efficient power systems in the world. And with site level and network level energy efficiency implementation, we ensure the maximum overall network-wise energy efficiency. Huawei’s specially designed site and energy solutions also ensures the highest level of reliability, scalability and simplified operation, maintenance, site and energy management.

**TowerXchange: Do you anticipate energy equipment remaining a capital purchase by tower cos and MNOs in Africa, or do you anticipate OPEX sharing and ESCO business models playing an important role? Where does Huawei see its role within the ESCO proposition?**

**James Qiao, Vice President of Marketing & Sales Support, Huawei Telecom Energy:** Actually we see both business models existing concurrently. Today some tower cos are following the CAPEX purchasing model. The technology vendors provide the solution and equipment and the MNOs own the assets after installation. There are also some tower cos that would prefer an OPEX model to pay from the future energy saving or maintenance cost reduction, due to the shortage of initial funding or due to their uncertainty about the value of new generation site and energy solutions, especially on the quantification of energy savings and the overall OPEX savings.

Some tower cos may chose the OPEX model at the beginning, however, I believe after careful evaluation and after they see the results from real-world practices, most of them will eventually move on towards CAPEX model, because with OPEX model, it’s true they pay less to technology solution providers at the initial stage, however, over years the accumulated payments will most likely be much higher than the CAPEX model. The value of new technologies is there, and I believe MNOs and tower cos will realise that through practices.

Huawei is flexible, today I think the majority of
our revenue, 95% or more is still coming from the CAPEX model. However, in some cases, if the customer prefers, we can work with the towercos and MNOs to find out solutions around the OPEX and ESCO model. The decision will be on project basis, case by case.

**TowerXchange: Should remote monitoring capabilities be embedded into energy equipment, or should a third party RMS be used to integrate performance data from all equipment on a cell site?**

**James Qiao, Vice President of Marketing & Sales Support, Huawei Telecom Energy:** For Huawei, we focus on both aspects of efficiency, energy efficiency and management efficiency. Management efficiency and OPEX reduction is critical for towercos business success, and RMS plays an important role there.

Let’s take a look at an example of the power system. We want to be able to remotely schedule how the power system works. If there’s an electricity tariff change between busy and non-busy hours, for example, if in the daytime electricity charge is higher than that of the night, do you want to be able to control the behaviour of the power systems to take advantage of the lower tariff at night, such as storing electricity power into the battery at night, while during the day when the tariff is higher, taking power from the battery to reduce the extra operating costs?

Huawei’s solution is we schedule the battery charging and discharging in a smart, automated, and remote way.

And for the batteries, do you want your staff to schedule routine site visits to understand if the battery is healthy or not? In the US if you send one person to visit a cell site, it will cost over $300, even if he finds nothing wrong. In this case, this site visit is purely unnecessary. Let’s imagine a network of 10,000 cell sites with one unnecessary site visit per site annually, the saving potential is huge. The labour cost of skilled technician in Africa is lower, but still accounts for a majority part of the OPEX and it’s worth taking a serious look into.

Huawei’s solution is to plant intelligence onto each individual battery cell, it will automatically perform a health check for each individual cell and will tell us how much capacity they have if they’re fully charged, how much electricity power they can provide, how long from now you need to change or replace the battery cell et cetera. It can report all the health check information, no matter if it’s about battery cells, diesel gen-sets, or other systems, to the centralised site monitor on the cell site, which can aggregate information and send it to a centralised management platform in the NOC. The team can then understand the situation of each of the tens of thousands or hundreds of thousands of battery cells in their network. They can then schedule visits for the sites which have problems so there are no wasted site visits. The engineer can combine trips and deal with all the problems at once.

These are just two little examples among many more. Basically, Huawei’s remote site and energy management platform has multiple capabilities compared with the legacy platforms which typically just provide an alarm to alert you once something has gone wrong, meaning when engineers go to the site the damage is already done. So we don’t just provide the alarm, we provide performance monitoring, health check, intelligent analysis, proactive maintenance, end-to-end energy management, and reporting. We also offer mobile apps. Let’s take another example. Huawei’s energy management will monitor power consumption for all energy consuming devices, including each load or network equipment, the gen-sets fuel consumption, the energy consumed by air con et cetera. If we have 100 similar sites across a certain region, and ten of them are consuming 20% more electricity than the other sites, these kinds of issues would be visible on our platform, then you can quickly analyse whether the air con is set too low or if there is something wrong with the enclosure or network devices or other stuff, and take immediate action to correct the situation. By introducing artificial intelligence and proactive management into the traditional dumb infrastructure, we can ensure the highest level of overall site energy efficiency, and identify potential issues before they compromise site performance, reliability, or generate very high OPEX.

**TowerXchange: Tell us about what sets Huawei apart from its competitors in the African market?**

James Qiao, Vice President of Marketing & Sales Support, Huawei Telecom Energy
Support, Huawei Telecom Energy: Today we have already reached the number one DC power market position in terms of annual shipments globally. Huawei's market share is 24.7%; we lead the second place competitor by 6%. We have about 1.7mn power systems running day and night in the networks of 310 different MNOs across 170 countries. In almost every country you can find Huawei’s power systems. That means Huawei’s power systems are proven to be reliable in the field and we have a lot of field experience.

And in Africa, Huawei already serves all major MNOs, we understand the MNOs, we understand their networks, we understand the deployment scenarios, and we already have superior service capabilities in the region.

The power systems are different with telecom network equipment. Power systems are very diversified, they need to survive in all different environments, protecting, powering and cooling network equipment; mountains, coastal, city centre, rooftops, desert, stable-grid, unstable-grid, off-grid – its’ really tough to build the complete and profound portfolio which can support all those different scenarios well. Today, we have all these in place already, and we are still continuously making them better, by leveraging our technology leadership in digitalization, internetworking, and artificial intelligence in both the CT and the IT worlds. I believe, Huawei’s field experiences in the region, along with the global reach in almost every country both product-wise and service-wise will make Huawei an ideal partner for both international and regional towercos.

See you at our future events!

Meetup Africa 2015
1-2 October, Johannesburg

Meetup Asia 2015
24-25 November, Singapore

Meetup Europe 2016
April, London

Meetup Americas 2016
14-15 June, Florida

TowerXchange

www.towerxchange.com

www.towerxchange.com
IPT PowerTech: the evolution from product provider to one stop shop and now ESCO

Creating a single point of accountability and selling energy by the kWh demands faith in people, products and services

When and how should power system providers invest in overhead and back their products with an end to end service proposition? And when should they supplement that proposition with zero-capex, ESCO business models? This is a journey IPT PowerTech have taken over the last 20 years: their business model has evolved as fast as the business has expanded geographically.

TowerXchange: Please introduce IPT PowerTech to our readers.

Khaled Habbal, VP & COO, IPT PowerTech: When IPT PowerTech was established in 1993 we were not a telecom service provider, but a provider of automotive and specialty batteries. As the telecom sector picked up in 1995-96, we thought we could add a lot of value so we started selling batteries to the telecom sector. We expanded into selling power systems in late 1990s, and later added site construction services, telecom services, and managed services and maintenance to create a one stop shop for telecom infrastructure equipment and services.

We made a strategic decision to become one of the few companies in the region, if not the only one, to combine product R&D and manufacturing capabilities to ensure optimum delivery. That combination of products and services together enables us to provide the maximum benefit to our customers.

Our journey has been an evolution from being a regional, Middle Eastern power systems integrator and batteries vendor, expanding into 11 countries on three continents with 1,700 employees across two main divisions. Our power division provides a wide range of power products for telecom sites; from batteries to power systems, hybrid systems, power generating sets, energy efficient solutions, and our own enclosure manufacturing and assembly. Our telecom services division provides managed services, with three main pillars:

Keywords: Afghanistan, Africa & Middle East, Algeria, Asia, Batteries, Business Model, Construction, Energy, Energy Efficiency, ESCOs, Ghana, Hybrid Power, Installation, IPT PowerTech, Iraq, Lebanon, Linfra, Managed Services, Morocco, Multi-Country Partner, Myanmar, Nigeria, O&M, Off-Grid, Operational Excellence, PCT, PowerTech, RF Design, RMS, Saudi Arabia, Shelters, Skilled Workforces, Stratum Enclosures, Syria, Unreliable Grid, Who’s Who

Read this article to learn:
- Creating a single point of accountability through the combination of power products and managed services
- Meeting the challenge of energy efficiency at unreliable grid and off grid sites in Myanmar
- Developing and scaling a zero-capex, ESCO proposition
- The two different energy efficiency investment strategies employed by African towercos
construction – the building of telecom sites and the laying of optical fibre; maintenance and managed services; and telecom installation and network services.

While some suppliers sell energy systems with a certain promise of efficiency, it is all too easy for clients to struggle to achieve that efficiency in the field. IPT PowerTech provides a single point of accountability – we put our money where our mouth is.

TowerXchange: The perception is that telecom product development and services are very different businesses with different P&Ls – how have IPT PowerTech managed that combination from a corporate financial point of view?

Khaled Habbal, VP & COO, IPT PowerTech: One of IPT PowerTech’s strengths is that we are self-funded which gives us freedom in decision making. Naturally, we take well calculated risks.

The way we run our managed services business has delivered a very consistent balance sheet. We sign long term contracts over three, five or ten years. Because of our focus on operational excellence in delivery, our financial risks are minimised. Yes there is a lot of overhead in managed services compared with pure product development, for example we have had to build a significant workforce to manage more than 3,500 sites in Africa, but we find that if we excel operationally, the business is in a good place in the medium to long term.
the electricity grid in Myanmar is growing steadily through public and private investments, with projections that over the next ten years we could see 50-60% of telecom sites connected with high quality grid. African countries like Nigeria.

So we are willing to invest and expand into new geographies, as long as that growth is profitable and aligned with the strategic direction of the business.

TowerXchange: Please would you contrast the typical energy equipment and service requirements in a market like Myanmar, where grid power is neither extensively available nor reliable, with a market like KSA where one would imagine cell sites have much less complex backup power and maintenance requirements?

Khaled Habbal, VP & COO, IPT PowerTech: These markets present very different kinds of challenges. Myanmar is a fabulous country which has been developing steadily recently. However grid connectivity remains a challenge for the telecom sector. Today the grid does not reach all the villages – perhaps 20-30% of sites are grid connected, and often the grid is unreliable. But the electricity grid in Myanmar is growing steadily through public and private investments, with projections that over the next ten years we could see 50-60% of telecom sites connected with high quality grid.

This requires that we overcome a lot of challenges in harnessing energy efficient solutions that reduce diesel consumption. The impact of high energy opex is considerable, particularly in countries where ARPU is low, thus the need for energy efficient power solutions with the lowest TCO possible.

The President of Myanmar recently announced a...
we have the faith in ourselves, in our products, in our management, and in our field workforce to sell energy by the kWh – you need to have that belief because you're taking all the risk on your back.

In contrast, the challenges in KSA are completely different. Power is more stable, over 90% of sites are grid connected, and in KSA the challenge is the large geographical area – balancing resource allocation to achieve targeted MTTR whilst delivering a profitable service. Like in any market, SLAs and KPIs are differentiated according to the importance of each site – so it's critical to negotiate reasonable agreements that take into account logistical challenges.

TowerXchange: How would you characterise the tower and tower power market in MENA, where the towerco business model is only starting to be adopted, relative to the more mature towerco market in SSA?

Khaled Habbal, VP & COO, IPT PowerTech: The last five years have seen a revolution in SSA telecoms – IHS, Helios Towers Africa, Eaton Towers and American Tower have transformed the market with a very positive impact for themselves, for their MNO counterparts and for the environment as they increasingly rollout energy efficient solutions that are more eco-friendly than the previous 24/7 operation of DGs.

Once this business model comes to MENA there will be a change in the status quo. But the energy logistics challenge does not exist in the Gulf region, even in North Africa; in Algeria and Morocco the grid is significantly better than in most countries in SSA.

TowerXchange: As emerging market telecoms evolve toward ‘energy as a service’ business models, do you see IPT PowerTech evolving into an ESCO and selling energy by the kWh?

Khaled Habbal, VP & COO, IPT PowerTech: This is at the heart of our strategy. IPT PowerTech has evolved from a product company, adding services, then combining products and services, and over the last years we’ve been talking about opex models to sell energy by the kWh. We have already started offering kWh propositions – providing energy to a certain number of sites on a kWh basis, using a zero capex, opex business model.

In fact IPT PowerTech is the first company to offer an opex business model in Nigeria five years ago. We went into Airtel after their acquisition of assets from Zain offering a kWh model, but the concept was ahead of its time – it was not as exciting as it is today.

We believe IPT PowerTech is most suited to offering opex business models given that we develop, manufacture, install and maintain our own solutions – we have the faith in ourselves, in our products, in our management, and in our field workforce to sell energy by the kWh – you need to have that belief because you’re taking all the risk on your back.

TowerXchange: I understand that IPT PowerTech has worked with several of the leading tower companies in SSA, including American Tower, IHS and Helios Towers Africa – are the towercos investing substantially in energy efficiency programmes and hybrid energy yet, or does the focus of your work with them remain on maintaining legacy diesel-based power systems?

Khaled Habbal, VP & COO, IPT PowerTech: We’ve seen different towercos go in one of two different directions when it comes to investing in energy efficiency programmes. Some towercos invest ‘full
Some towercos invest ‘full blast’ in energy efficiency from early on and it takes them 12-24 months to upgrade the power systems on most of their sites. Other towercos... install RMS to monitor sites for 12-18 months after which they decide where and how to invest in energy efficiency.

What matters most is Total Cost of Ownership (TCO). Having acquired a new portfolio of towers, a towercos may find themselves owning a number of inefficient diesel generators with several thousand hours of potential runtime before they need replacing.

You can run those assets into the ground, or you capitalise on their immediate refurbishment and resale value and invest in a more efficient solution that delivers RoI in 12-18 months. It all depends on the way each towercos looks at TCO. It is also driven by the availability of capital to invest. Towercos are mostly generating capital to acquire new towers, they don't always have the financing needed to invest in energy efficiency across the entire portfolio until they complete a new round of funding.

TowerXchange: Finally, please sum up how you would differentiate IPT PowerTech from other turnkey infrastructure providers for telecoms?

Khaled Habbal, VP & COO, IPT PowerTech: IPT PowerTech distinguishes itself by merging the worlds of power and telecom. We have our own manufacturing facilities in Lebanon and Romania, which means we are uniquely able to combine high quality in-house products coupled with our own services proposition.

Our outstanding management team, both in our headquarters and at country level who are leading the operations, reflects the fact that our people are as valuable as our products and services.

Our company slogan, “redefining power solutions, reinventing telecom infrastructure” is illustrated in three ways:

1. We always redefine and customise power solutions to maximise quality of power delivery and economise power costs in the light of the declining ARPU.

2. We have more than 20 years of experience. With proven R&D teams and 1,700 experts in the field we are the most specialised power solution provider in this industry, operating in areas where power has always been a challenge.

3. On the other hand we reinvent telecom infrastructure by being a one stop shop for any telco, towercos or vendor in terms of infrastructure services from site acquisition, to the building of sites, managed services and maintenance, telecom installation and integration.
LeBLANC structures accelerate time to market for towercos and MNOs worldwide

Tower manufacturer proven in Asia, Africa, CALA and Oceania offers conventional, camouflage and rapid deployment solutions

We thought we’d do something a little different to introduce tower designer and manufacturer LeBLANC. Instead of telling you about the two day installation of LeBLANC’s rapid deployment units, we thought we’d show you the installation in a series of timed images, together with a brief commentary introducing this innovative tower design and manufacturing firm, which has thousands of towers installed across Asia and Africa.

Keywords: Africa, Asia, Capacity Enhancements, Construction, Digicel, Fencing, Foundations, Installation, LeBLANC, Masts & Towers, Myanmar, Oceania, Passive Equipment, Shelters, Steelwork, Who’s Who

Read this article to learn:
- How LeBLANC’s communication towers have been proven through installations worldwide
- LeBLANC’s manufacturing base and capacity
- Use case scenarios for LeBLANCs RDS and RDUs
- A photographic storyboard of the two day process of erecting a 30m RDU

Matt Pritchard, Director, International Sales, LeBLANC Communications

TowerXchange: Where does LeBLANC fit in the telecoms ecosystem?

Matt Pritchard, Director, International Sales, LeBLANC Communications: LeBLANC’s core business is the design and fabrication of communication and broadcast structures; from your basic 30m telco tower up to a 300m self support broadcast. We also offer a complete range of foundation designs for all structure types and soil conditions. In addition to the supply side of the business we also offer full turnkey services for all aspects of the telecom and broadcast market.

LeBLANC has been in operation since 1962 when it was founded in Canada. Since it’s inception it has grown into a multi-national company with operations in over ten countries and on four continents. LeBLANC Communications Malaysia, (LCM) has been in operation for over 20 years supplying towers to Asia, the Pacific region, Africa and South America. LCM is now a stand-alone company, completely Malaysian owned and no longer part of the LeBLANC Group, but still working closely with them and supplying their needs for Australia and Indonesia.

TowerXchange: Please share some examples of your major supply contracts.

Matt Pritchard, Director, International Sales, LeBLANC Communications: Since January 2014 we have supplied over 1,000 towers to towercos and MNOs in Myanmar. We are a preferred supplier to E/// and are currently supplying to Ericsson in...
Sri Lanka, the Philippines and Australia. Over 900 of our towers have been deployed into the Digicel network across the Pacific and even into Panama and Costa Rica. We have supplied towers to Centennial Towers, Global Tower Partners and rapid deployment structures to American Tower in CALA. We have a continuing partnership with Sagemcom whereby we supply the towers and they do full turnkey solutions direct to the MNOs or towercos throughout several African countries. From 2010 until 2013 we also supplied to ALU.

TowerXchange: What is LeBlanc’s manufacturing capacity?

Matt Pritchard, Director, International Sales, LeBLANC Communications: We can manufacture 1,300 tonnes of towers / 15 monopoles per month from our factory in Malaysia, and up to 5,000 tonnes per month from two separate factories in China.

TowerXchange: Please tell us about the use cases for LeBLANC’s Rapid Deployment Solution (RDS) and Rapid Deployment Unit (RDU).

Matt Pritchard, Director, International Sales, LeBLANC Communications: LeBLANC’s RDS is an ideal solution for remote sites where excavation is challenging or where there is no access to concrete.

Over 300 of our RDSs have been deployed into Papua New Guinea, and dozens are also in use within American Tower’s Mexican network. While the typical weight for a complete 45m RDS is just 18 tonnes, the total transportation weight for the same 45m tower with a concrete foundation would be approximately 58 tonnes – illustrative of the savings in transportation costs alone!

The RDS can be buried just 50mm below ground level and the excavated earth used as backfill, or indeed you can build above ground level and use surrounding earth as backfill. With minimal disturbance of soil, building permits can be easier to obtain.

A 45m RDS tower can fit on a plot as small as 7m x 7m.

If land space and costs are really at a premium, our RDUs fit plots as small as 4m x 4m, and can be installed in under 12 hours. With no excavation required, sometimes you may not need a building permit, and with the entire site built, inclusive of TI, your crew can be in and out before complaints from locals can halt work.

TowerXchange: As a company with a global footprint, can you tell us about the African market differs from the rest of the world?

Matt Pritchard, Director, International Sales, LeBLANC Communications: We currently have limited presence in Africa, working on a supply only basis for several key customers. We have supplied over 1,000 towers over the past few years. We are very much looking forward to becoming a bigger part of the African tower market, which is one of the reasons we have decided to participate in TowerXchange this year.

TowerXchange: As the market tips from towers being MNO-captive to owned by towercos, are you seeing a difference in client demands?

Matt Pritchard, Director, International Sales, LeBLANC Communications: Yes, definitely. The towers are becoming slightly heavier to enable them to cater for multiple operators. The need for versatility in tower heights, as well as ease of upgrading, is also becoming increasingly important.

TowerXchange: Where do you see the growth in Africa? How many new towers are needed and where?

Matt Pritchard, Director, International Sales, LeBLANC Communications: I would need a crystal ball in order to answer this, and hence the reason we are coming to TowerXchange!

TowerXchange: Please can you sum up what differentiates Le Blanc from other equipment and service providers to MNOs and Towercos?

Matt Pritchard, Director, International Sales, LeBLANC Communications: LeBLANC delivers cutting edge communication and broadcast structures on spec and on budget. We are driven
by the need to meet and exceed the expectations of a diverse group of customers, inspiring us to provide tailored products and systems rapidly and efficiently.

LeBLANC leverages over 30 years of engineering excellence from the simplest communications structures to huge, complex broadcast towers. We use state of the art “engineering platforms” for tower design which enable us to quickly adapt to specific countries’ engineering standards. We listen to our customers and to their build to suit requirements, and do not overdesign to sell more steel.

Our solutions are industry approved by leading equipment manufacturers such as Ericsson, Alcatel Lucent and Huawei, who conduct comprehensive factory inspections.

We understand that time to market is critical in the tower and telecommunication business, so our innovative RDS is supported by a best-in-class shipping methodology which employs trolley systems to accelerate the packaging and roll-in and roll-out of containers. We keep shipping in-house to ensure efficient, cost effective on-time delivery and to give our customers a single point of accountability.

LeBLANC is renowned for our “customer guarantee” – we stand by our products no matter what the cost. We go the extra mile to assist operators, towercos, OEMs and their subcontractors with infrastructure build out
Day two, 8.30am - Start installing guyed-mast

Day two, 9.30am – Installing guyed-mast

Day two, 10.30am – Guyed mast completed

Day two, 1.30pm – Install side fencing

Day two, 4.30pm – 30m RDU completed with four man crew in two days
Push-button site management technology for the challenging African market
Nexsysone draws together critical operational data into an easy-to-use platform

Jim Prosser, CEO of nexsysone, had the vision to take the software from a global system integrator and apply it to the burgeoning tower industry. Focussing on their core market of telecoms, nexsysone offers operators, towercos and system integrators an integrated software platform to deliver turnkey projects from site acquisition to tower site sharing and network maintenance. Having been used exclusively to support Lemcon Networks projects across 40 countries since 1996, nexsysone has now become the software platform of choice in Myanmar. The next step for nexsysone is to embed itself further into the African market to help facilitate the growing tower sharing market.

Keywords: Africa & Middle East, Asia, Brownfield, Co-locations, Decommissioning, Energy Efficiency, Greenfield, Health & Safety, Infrastructure Sharing, Interview, KPIs, Logistics, Middle East & Africa, Monitoring & Management, Myanmar, O&M, Opex Reduction, RF Design, ROI, Site Surveys, Skilled Workforces, Urban vs Rural, Who's Who, nexsysone

Read this article to learn:
- How nexsysone grew from Finnish roots to lead the Myanmar market
- How integrating data onto one platform can improve efficiency, visibility and tenant relationships
- The importance of ongoing training for workers in the field
- The growth of mobile solutions to enable visibility across a portfolio

TowerXchange: Tell us about nexsysone’s current offering and footprint?

Jim Prosser, CEO, nexsysone: Nexsysone is a system that has been moulded through 20 years of experience of designing, building and operating mobile networks. We have secured two thirds of the Myanmar market because of the completeness and suitability of our offering.

Consistently, in all the deployments I have been involved with over the last 20 years, we’ve found that operators, and now towercos, require a scalable management system managed through a single interface. They need to: consolidate documentation; control progress; manage leases, rental billing, and cost control; maintain the network; provide quality assurance; manage their workforce; provide end-to-end asset management; consolidate RMS data; and develop the competence of their resources and subcontractors. Our offering has five software modules which address all these issues. For us it’s all about synchronizing the data and aligning processes between departments and companies into a single interface to manage communication within turnkey projects.

Currently our busiest regions are the USA and Myanmar. In Myanmar two of the three MNOs (Ooredoo and MPT) use nexsysone to manage their rollouts. This means it is being used by all the active towercos, system integrators and OEMs in Myanmar. The Myanmar network rollout is a greenfield network rollout with a strong focus on site sharing. In the USA, Mycom International use...
our software to manage their extensive Sprint, Verizon and AT&T turnkey rollouts. We're also in Zimbabwe, the Philippines, and Indonesia.

**TowerXchange: What drivers are making your clients make the switch to nexsysone's solutions? Is the decision simply financial?**

**Jim Prosser, CEO, nexsysone:** I firmly believe that it is the tacit knowledge that exudes from nexsysone that appeals to our customers. It is a robust and dependable solution, with an unrivalled history of experience inside it. So no, it is not just a financial decision. It is all about understanding our customer needs and adapting the system to meet them. No project is ever the same. I worked on enough to know that!

To understand nexsysone it is important to understand its history and pedigree. Nexsysone is not new to the telecoms industry. Nexsysone was part of Lemcon Networks until 3 years ago. Lemcon was a Finnish system integrator operating in 40 countries across five continents, which grew with Nokia in the 90s and 2000s. When Lemcon’s parent company divested I took full ownership of nexsysone. Nexsysone was at the heart of planning, building, integrating, upgrading and modernising well over 150,000 cell sites since 1996. It was a system my team and I designed and built for our company. We were constantly adapting it to meet the challenges of the dynamic telecoms industry.

It is a product that helped me manage some of the world’s toughest rollouts and implement game changing rollout management strategies, which are now common practices.

Having used our solution, towercos come to us with their own requests for additional stand-alone features, or to integrate their existing systems with nexsysone. Nexsysone allows them to confidentially manage their own projects or unrelated projects. They also have other projects on going and other things happening that doesn’t necessarily need to be shared – meaning they need their own central asset database for example for passive infrastructure or task work force management solutions.

**TowerXchange: How does the relationship between nexsysone, operator and towerco work?**

**Jim Prosser, CEO, nexsysone:** Nexsysone is the relationship between the operator and the towerco. We work together with our customers and their supplier ecosystem so that nexsysone defines those relationships.

In Myanmar our first customers were the operators Ooredoo and MPT. Nexsysone binds the objectives and operations of their stakeholders together, and has become the primary single source of truth for official project communication and progress measurement.

Any experienced rollout manager will tell you that the biggest challenge in every large rollout is getting all the stakeholders on the same page. In its simplest form, it boils down to inter- and intra-company communication. We understand the conflicts that arise between stakeholders in a rollout. In a towerco scenario we focus on making the agreements between operators and towercos as transparent as possible. Transparency reduces unnecessary communication and improves time to market.

Time to market is critical during a new rollout. Harmonising the complex needs of marketers, planners, designers, OEMs and contractors, with different priorities in different companies is essential. Providing a single interface to attain efficient interaction is the key. And that is where nexsysone comes in.

**TowerXchange: Tell us more about how you help operators and towercos work together**
more effectively? How does that stack up against the other options on the market?

Jim Prosser, CEO, nexsysone: We listen and customize nexsysone to meet our customers’ exact requirements.

Whilst the macro objective is always the same: build the best network for the lowest cost in the quickest time; the processes to get there are always different. Different countries require different permits and different acquisition procedures. Efficient construction methods differ from country to country, so lead times differ. Contract and regulatory requirements mandate a different focus and priority. All these issues must be captured within the management system if the project is to run successfully.

Choosing a system to manage your project or network is all about saving money, improving efficiency and obtaining visibility. Once you have made the decision to spend hard fought budget on such a system, it must deliver for you. We believe nexsysone offers the best value in the market in this regard. We don’t just invest in standardisation; we invest in customisation. As a result our approach allows us to deliver highly customised solutions at very affordable costs.

TowerXchange: Which of your applications is most popular? Why do you think that is?

Jim Prosser, CEO, nexsysone: The Projectone and Towerone platforms are the most popular.

They are the most popular, because they are the applications needed at the start of the rollout. As time progresses our customers may expand their used modules. Assetone, Taskone and Staffone may come into play as their pain point shifts. We however with our project experience try to address these future pain points before they happen by implementing the correct customized platform from day one.

Our project management platform is popular but it focusses on the actual site build process rather than the site sharing process. It therefore has a lot more features. Towerone captures the processes of sharing sites. All the modules are extremely scalable and designed to work together.

Light versions have been used by system integrators for simple milestone tracking, documentation control and quality assurance.

The taskone platform manages the workforce’s daily activities is becoming very popular. Its attraction is that it helps manage operational teams, and more significantly it measures their performance. It comes with an advanced geo locator to track the location of resources or teams with an associated easy to use ticketing system. Site build and maintenance tasks are made easy with taskone.

The mobile apps which are integrated in to our system are very popular. They provide field resources, project managers and executives quick access to key project or company KPIs.

TowerXchange: How would you sum up the lessons learned from working with towerco and MNO partners in Africa?

Jim Prosser, CEO, nexsysone: In our experience, the focus in Africa is competence development. And more importantly the management of competence development in the field.

Constantly changing technology, and the availability of skilled resources means our customers typically rely on trained expatriate resources in Africa. This results in an artificially high cost base. Staffone addresses this pain point...
by combining the feedback from passive and active network elements (RMS systems and Base Station alarms) with field team’s operational data. Staffone allows you to track your employees or your subcontractor employees. It allows you to register and monitor their skill set, as well as any network issues linked specially to their actions needed in the field. The result allows our customers to develop highly focused and effective training sessions that address issues which are adversely effecting SLA performance.

What we do in practice is to register all the staff into Staffone and track their competencies via a unique staff ID number. We register their skill sets and schedule and track their training. As an optional service, we offer training and build modal sites to continually train employees or contractors.

For example, if a worker has performed a maintenance task on a generator multiple times, but the same failure continues to reoccur, Staffone helps us recognize this. Appropriate training is devised and implemented to stop the mistake from being made again. This improves staff satisfaction and hence retention, and therefore leads to reduced costs in the long run.

**TowerXchange: As well as integrating acquired towers into their portfolios, towercos are investigating BTS opportunities – can you talk us through some of the challenges they face in optimising both types of opportunity and how nexsysone can help?**

**Jim Prosser, CEO, nexsysone:** I am no stranger to multi-project environments. Nexsysone came about to better manage multiple sub projects within a bigger project. In fact this is the reason behind our modular approach.

It allows a combined internal view without compromising the external view. This is critical to towercos involved in various BTS programmes with different customers. Internally it is one project, however, externally it can be reported in whichever way suits the respective customers.

For MPT we’re building, expanding, upgrading and dismantling sites. MPT must see it all. Their vendors, Huawei and ZTE, however, only see what they need to see to manage their respective portions. The same goes for Ooredoo Myanmar’s vendors, OEMs and towercos. They only see what they need to see.

**TowerXchange: How does nexsysone improve MNOs' visibility into towercos' achievement of SLAs? And how do you help towercos achieve those SLAs?**

**Jim Prosser, CEO, nexsysone:** To achieve SLAs you need a competent staff base. To achieve SLAs you need to know what you have built, when and what your asset base is. To achieve SLAs you have to have full visibility into the implementation of the maintenance regime. We provide all this. What is more, we provide in a customised format and framework so that it makes sense and yields the best return on dollars spent.
Sabre Industries: designing and upgrading Africa’s towers for multiple tenants

How a high quality US tower and shelter manufacturer was able to meet the shipping, installation and maintenance needs of the African market

Creating structures in Africa for over 30 years has given Sabre Industries a unique perspective on the growth and development of the mobile market and, more recently, the advent of the independent tower industry. Using technology proven in the mature US tower market, combined with local African expertise, Sabre Industries is able to assess a client’s requirements and create bespoke structures which not only account for their load and environmental requirements, but also for shipping, construction and ongoing maintenance issues. TowerXchange spoke to Mike Checchio, Director of International Sales, about Sabre Industries’ background and future in the African market.

Keywords: Africa, Build-to-Suit, Co-locations, Construction, Loading, Masts & Towers, North America, Passive Equipment, Sabre, Site Surveys, Steelwork, Tenancy Ratios, Urban vs Rural, Who’s Who

Read this article to learn:
- The growth of the tower manufacturing industry in Africa
- Why African towercos respond well to Sabre Industries’ solutions
- How regulatory requirements affect tower design and demands
- What towercos need to consider when replacing, repairing or strengthening legacy portfolios

TowerXchange: Please tell us about Sabre Industries’ current product range and footprint.

Mike Checchio, Director of International Sales, Sabre Industries: Having been in the tower industry for more than 40 years, Sabre Industries is one of the largest tower manufacturers in the world. We have our own in-house engineering and drafting departments, making it easier for us to keep up with the growing demands of the industry. We offer a wide variety of tower and monopole structures, along with shelters, accessories and installation worldwide.

Sabre's biggest market is North America; probably 90% of our sales are in North America and 10% of them are outside. Having said that, we've been in the African market for over 30 years and we were in Africa long before the telecom industry existed, working in broadcasting, AM towers for some of the missionaries and churches, and creating infrastructure for the UN.

Sabre started to really take off once the mobile phone industry came about. There weren't a lot of tower manufacturers at that time. Although the competition has increased enormously since then, Sabre has identified some key niches we're good at doing which no one else has figured out.

For example: We have the largest selection of guyed towers in the industry worldwide. We can now offer guyed towers for any application whether for cell sites, broadcast, CCTV surveillance towers, microwave in the oil industry, and many other

Keywords: Africa, Build-to-Suit, Co-locations, Construction, Loading, Masts & Towers, North America, Passive Equipment, Sabre, Site Surveys, Steelwork, Tenancy Ratios, Urban vs Rural, Who's Who
Because we have our own in-house tower engineering and drafting department, we have the ability to design anything we want right at our fingertips applications. We've designed some nice variations which the African market seems to like. Sabre's guyed towers range in face width from 1 ft. to 8 ft. and are available in heights over 1,000 ft. They come in easy build knock down sections ranging in lengths from 10 – 20 ft., or all welded sections in lengths from 10 – 20 ft. Our guyed towers feature solid or tubular design members, and angle or solid round bracing. In addition to guyed towers, Sabre manufactures both three and four-legged self-supporting towers with either solid or tubular legs. These towers are capable of handling any type of antenna or wind loading.

We also offer monopoles with design choices such as round flanged sections or 12, 16 or 18 sided slip fit designs. Our monopoles can be camouflaged as mono-palms, pine or elm trees, or flagpoles. We offer shelters manufactured from various types of material such as concrete, steel, and lightweight aluminum. In addition to structures and shelters, Sabre offers hardware or accessories such as light to heavyweight antenna mounts, light kits, and paint.

We have also added a new division with its own engineering and construction services for all tower modification needs. This has become a necessary factor for all towercos who have purchased pre-existing sites and need to add tenants.

TowerXchange: Please introduce our readers to Sabre Industries' manufacturing plants – what capacity do you have?

Mike Checchio, Director of International Sales, Sabre Industries: Sabre Industries now has four manufacturing plants located in North America, with a total of 1,415,200 square feet of state-of-the-art manufacturing and related facilities. We have the manufacturing capacity for approximately 329 million pounds of steel structures annually. Our brand new operation in Sioux City, Iowa is set on 150 acres, and is one of the most streamlined and efficient manufacturing facilities in the industry. In addition to manufacturing, Sabre has an on-site galvanizer at our Alvarado, Texas facility that is one of the most environmentally friendly galvanizers in the United States. It is home to one of the world's largest operating kettles measuring 65' long x 11' deep x 9' wide, and capable of dipping even the largest structures with ease.

TowerXchange: How has Sabre grown in the tower market and what has fuelled the growth?

Mike Checchio, Director of International Sales, Sabre Industries: The mobile phone industry has certainly fueled our growth in the telecom sector over the past 20 years; with the towerco/build to suit industry being one of our leading customers outside of the independent operators who purchase directly.

Because we have our own in-house tower engineering and drafting department, we have the ability to design anything we want right at our fingertips. Using an industry-accepted software programme, we create the least expensive route for our clients. We take the number of sites, wind and environmental information, etcetera, and enter it into our software programme which then spits out a structure. We then assess that structure for shipping and erection purposes - maybe in a jungle or a remote site – and work out the best solution for the client.

TowerXchange: How have you found customers’ response to your towers in the African market? Which products are most popular and how does that vary across the continent?

Mike Checchio, Director of International Sales, Sabre Industries: Some customers at first can’t imagine Sabre being a North American manufacturer capable of competing in the local markets throughout Africa. While it can be difficult, we have been successful in supplying our self-supporting and knock down guyed towers throughout the African Continent. Both products are designed for ease of installation and shipping; and built with Sabre’s strong quality control standards that ensure our products arrive complete and ready to erect.
The response we've received from erectors throughout the African region and elsewhere is that they love to see a Sabre tower show up on their site because they know everything will be there and fit together with ease.

TowerXchange: As operators turn their attention to meeting regulatory requirements in rural areas and on maximising capacity through urban infill, do you see a change in what the market demands?

Mike Checchio, Director of International Sales, Sabre Industries: Yes, we have seen changes. In the past towers have been designed for a standard three to four carrier loading across the board in both rural and urban areas. We are now beginning to see height restrictions being regulated in urban areas, along with camouflage structures mandated; in some cases, near parks or on properties such as those owned by the government and hotels.

It’s really unique, and each case brings unique situations. The towerco business in Africa is all new so I wouldn’t call what’s happening ‘change’, but they’re adapting as the market evolves. A towerco supplying towers throughout the continent looks at each country differently. One African country may only have two operators in a region while another might have five operators in the market. The towerco has to consider several different things. If they buy towers for the market now, will they have capacity to serve the operators; will there be another license down the road; and will there be growth in the market? They need to judge how much to invest or whether it would be better to stick with the infrastructure they already have. That trickles down through country after country. The towerco has to adapt to stay in business. It is pretty simple math; there is no guessing or misjudgment because this footprint isn’t the first time it’s been put down.

We understand this at Sabre, because our sales and marketing staff has more than 20 years of experience in BTS. Several of our competitors don’t offer that.

TowerXchange: What are your ambitions for the future? As the African market shifts towards independent towercos, are you finding a need to change your services to suit? What is the difference between what they ask for?

Mike Checchio, Director of International Sales, Sabre Industries: Sabre has been supplying structures to independent towercos/build to suits throughout North and South America for the past 20 years, so we are aware of the requirements and needs of the towercos in other regions of the world, and particularly Africa. With having so many product options to choose from, Sabre is a great partner to have for any towerco or operator.

The difference between what the main operators and towercos ask for is that the main operators historically only want enough antenna loading for their own systems. Now with the towercos leading the market in providing structures, most of the operators demand for antenna loading has increased significantly to handle each operator’s antennas and lines. For example, a main operator’s typical single carrier tower would consist of one level of panel antennas at the top with a few microwave antennas mounted below. Now, a typical towerco owner will want to utilize, where applicable, as many as six levels of panel antennas with microwave scattered in between.

Towercos are going to have to go back and look at the sites they’ve purchased and do structural analysis with future loading requirements for what they need to offer. They’re going to have to build the tower up. Sometimes they may do a ‘drop and swap’ where they replace the tower outright if they can get away with permits and zoning. Another option is to use the same equipment and maybe put a temporary site in until they put a new tower up, or reinforce the existing tower. At the present time reinforcement of existing structures is the biggest market in the U.S. domestically, and eventually Africa will be the same.
Sagemcom offers a vast number of critical services to African infrastructure providers, from RMS to power optimisation and from fibre to cell site construction. We spoke to their Managing Director of Systems and Networks, Paulo Dias Da Graca, about the future – their newest offerings, the growth of the African market and how technological developments like fibre roll-out and the Internet of Things will affect towercos in Africa.

**Keywords:** Africa & Middle East, Batteries, Community Power, Energy, Hybrid Power, Interview, Managed Services, Monitoring & Management, Next Billion, O&M, Off-Grid, Opex Reduction, RMS, Renewables, Sagemcom, Site Management System, Skilled Workforces, Unreliable Grid, Urban vs Rural, Who's Who

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**Read this article to learn:**
- How Sagemcom has grown into one of the biggest telecoms service providers in Africa
- The role of community power in rural locations
- How to make tower structure audits, rehabilitation and upgrades affordable
- How to reduce fuel consumption by 30% with Sagemcom’s proven RMS plus smart ATS solution

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**TowerXchange:** Please re-introduce Sagemcom for readers who are not familiar with your company.

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom: Sagemcom is a leading European group in the high added-value communicating terminals market (set top boxes, internet boxes, electricity meters, et cetera) and telecom/energy infrastructures based in France. Group turnover totals €1.3 billion, the headcount of 4,200 employees work in more than 40 countries, and the group has been profitable since it was created. Sagemcom designs, manufactures and ships more than 22 million terminals worldwide every year. Sagemcom has in house R&D and manufacturing capabilities in both terminals and the telecom/energy market.

**TowerXchange:** Could you describe which services and solutions you provide in the telecom and energy market?

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom: The subsidiary Sagemcom Energy & Telecom concentrates Sagemcom Group expertise, R&D and industrial capacities, in telecom and smart metering, enabling the supply of customised connected systems to utilities, telecom operators, tower companies and services operators worldwide.

The combination of these activities addresses the increasing needs of vertical markets and allows Sagemcom Energy & Telecom to propose efficient...
end-to-end turnkey solutions through its high value added equipment and platforms, easily making smart environments a reality.

In particular we offer solutions and services for smart sites including turnkey construction, tower reinforcement, hybrid and solar power generation, energy optimisation solutions and RMS.

We have built several thousand cell sites, including hybrid and solar power generation, in African countries. We have deployed our in-house RMS solution in several countries including Slovakia, Poland, France, Philippines, Madagascar, Tanzania, DRC and Morocco.

Our smart infrastructure solution includes intelligent traffic systems, optical fibre backbone, fibre to the home/building/curb and fibre to the antenna. We are currently rolling out several FFTH and FTTA networks in locations such as Sénegal, Mauritius and Mali as well as fibre backbones in Madagascar and Senegal.

We have rolled out more than 30,000km of fibre networks in Africa on a turnkey basis in the last few years. This expertise is more and more useful for towercos and telcos as the cell sites are fiberised.

"We have rolled out more than 30,000km of fibre networks in Africa on a turnkey basis in the last few years. This expertise is more and more useful for towercos and telcos as the cell sites are fiberised."

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom has been present in Africa for 40 years, with 18 established affiliates. In all these affiliates we have skilled technicians and engineers, both through the local team and in management. This has allowed us to support our main clients and to provide a flexible and effective range of services.

In particular we are currently providing managed services for the main African towercos and operator groups. We are also providing more and more energy optimisation audits and services.

TowerXchange: What differentiates Sagemcom from other energy/RMS equipment suppliers or site construction companies?

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom

TowerXchange: Tell us more about your history and presence in Africa.

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom

TowerXchange: Which kind of new valuable services or solutions are you planning to propose to the towercos in the near future?

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom

Furthermore, as a founder member of the LoRa alliance, Sagemcom has developed a complete "Internet of Things" offering compliant with the LoRa standard. We believe that this will pave the way to helping towercos both to address their
internal needs and offer new services to their clients with a minimal initial investment.

**TowerXchange: What are the main operational challenges you see towercos and MNOs facing in the African market at the moment? What is Sagemcom doing to address this?**

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom: In the very near future half of the cell sites will be towerco owned or managed. Some of them, with a built to suit origin, have multi-tenant capacity from the start, but many others, acquired from MNOs, need to be upgraded from single tenant towards multi-tenant capacity. This results in significant tower structure audits, rehabilitation and upgrade challenges as well as energy upgrade and optimisation needs. These audits and upgrades works have to be made at an affordable cost, by skilled teams. Sagemcom, through its local presence in 18 African countries, with skilled local technicians and engineers, has the ability to provide such services quickly and efficiently. We find MNOs can have the same type of needs, even when they do not sell their sites to towercos but still want to share them with competitors.

The other obvious challenge remains energy costs and security. When mentioning it, we immediately have in mind fuel costs, due to grid unavailability or poor quality grid and due to fuel theft. Sagemcom provides a powerful RMS system which helps to analyse the fuel consumption of the sites and detect anomalies, thus allowing us to prevent faults, excess consumption, thefts et cetera.

We also couple this RMS system to battery cycling or smart ATS solutions which allow customers to decrease their fuel consumption. Even in countries where the grid is quite stable, and diesel is seldom burned, we can help MNOs to reduce their energy bill. Recently, we have installed our RMS solution in a few hundred sites of one of our Northern Africa customers. It allowed them to detect abnormal behaviors in the air conditioning and discrepancies between the power utility bills and the real consumption. This resulted in a 30% reduction of the sites’ energy consumption.

We also offer managed services to address those challenges.

**TowerXchange: Tell us about your views on the growth of the African market? How will Africa grow? Which markets will be hottest and what kind of infrastructure upgrades will be needed to support this?**

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom: All reports show that Africa will remain the fastest growing market for mobile communications in the next ten years. It is expected that the number of mobile subscribers will exceed 500mn in 2020 (growing by 50 % compared to 2014). It will overtake Europe and become the second largest mobile market after Asia Pacific.

There is a strong trend towards infrastructure sharing and therefore towards infrastructure upgrades. We should also mention the very special challenge of rural coverage expansion.

**TowerXchange: How do your clients’ demands differ in rural versus urban regions?**

Paulo Dias Da Graca, Managing Director, Systems & Networks Department, Sagemcom: The rural related demand has a number of specific characteristics. Due to a lower ARPU and a lower density, the MNOs require low cost sites and solutions. They are ready to accept coverage or technical constraints in order to make it economically viable.

The issue of rural electrification is also very much connected to rural mobile communications. Today there are approximately 260mn mobile customers in emerging countries without access to the electricity grid. Due to charging difficulties, their phones are switched on only when absolutely necessary, thus resulting in loss of revenue for the MNOs. We have developed energy management solutions which allow us to provide the excess energy from cell sites to the local population, through a local plug cabinet (or even through a distribution network). The energy management system warrants that the priority is, at any time, given to the cell site. It allows us to guarantee the site availability, with only the excess energy being distributed.

Many institutions, such as the World Bank, are promoting this concept of rural cell sites being used as anchor points for a first rural electrification
Zamil reduces TCO of telecom towers

Diversified tower designer, manufacturer, managed services and power solution provider helps clients accelerate time to market

US$8bn giant Zamil provides a range of tower design and manufacture, managed services and power solutions to the telecom industry. In this interview, CEO Vivek Gupta focuses on the tower design and manufacturing capabilities of Zamil, emphasising how they accelerate time to market and reduce TCO.

Keywords: Construction, Hybrid Power, Logistics, Managed Services, Masts & Towers, O&M, Shelters, Steelwork, Who's Who, Zamil Infra

TowerXchange: Please introduce your company – where do you fit in the telecoms infrastructure ecosystem?

Vivek Gupta, CEO, Zamil Infra: Zamil is an 85 year old group from Saudi Arabia which has more than US$8bn group revenue with operations in 90 countries. Zamil has a comprehensive offering both for the build and management of infrastructure. In build our face, not only do we supply world class towers and power solutions, but also render our turnkey services to optimise capex. Zamil is also one of the leading managed services companies and is capable of managing both passive infrastructure as well as telecom equipment all across the globe. In the renewable energy space, Zamil is both an EPC company as well as a power developer and can offer hybrid power solutions to our customers.

TowerXchange: What is your production capacity in tonnes of steel, and how does that convert into volume of, for example, 40m three legged telecom towers?

Vivek Gupta, CEO, Zamil Infra: Zamil has a fabrication capability of more than 700,000 MT on a comprehensive basis which include towers, pre-engineered buildings and other steel structures. Purely for towers, Zamil is capable to supply more than 25,000 towers through its own manufacturing facilities and OEM’s.

TowerXchange: The first question our readers will want to know is ‘how proven are the structures in the field’ – please tell us about some
example clients and some example projects?

Vivek Gupta, CEO, Zamil Infra: Zamil design includes all the leading standards globally and is known for delivering world class quality. In the steel business, we have more than 35 years of experience in telecom and power transmission towers and leading telcos and power utilities globally are our esteemed customers.

TowerXchange: How should MNOs and towercos strike a balance between the cost and volume benefits of standardisation versus the needs to customise structures for different environments and wind loading?

Vivek Gupta, CEO, Zamil Infra: We appreciate that each customer has got different requirements including wind velocity and loadings. At Zamil our constant endeavor is to bring design marvel, optimisation of tower weights and pass on the advantages of economies of scale by reducing total cost of ownership. Needless to say that a lighter tower needs a lighter foundation.

TowerXchange: How do you ensure the deliverability and easy installation of your structures?

Vivek Gupta, CEO, Zamil Infra: Our towers are delivered well staged and packed in wooden boxes with a comprehensive packing list. This avoids ambiguity at the time of secondary transportation to the sites. Since each tower is fabricated only after exhaustive prototype approval process, the work of the field team is very comfortable when it comes to erecting the tower meeting aggressive timelines. We provide comprehensive guidelines through our erection manual to the field teams which in many of the cases are local companies hired by our esteemed customers directly for erection purposes.

TowerXchange: What innovations in foundation materials and design can be leveraged to accelerate time to market, reduce costs and improve the re-usability of towers?

Vivek Gupta, CEO, Zamil Infra: More than 30 years back Zamil revolutionised the construction industry by offering prefab buildings against conventional brick and mortar structures. In the same way Zamil in Saudi Arabia owns a manufacturing unit which builds precast blocks. Today when speed to market is key some rapid deployments can be made operational in less than 24 hours using precast blocks. Even for conventional foundations, Zamil designers keep in mind the concrete to steel ratios balance to optimise the overall foundation cost. As I said earlier, for us speed as well as total cost of ownership matters when we deliver our towers to our customers.

TowerXchange: When designing new sites, how do you balance the concerns of camouflage, cost and structural capacity?

Vivek Gupta, CEO, Zamil Infra: Due to constant pressures of civic bodies and neighborhood communities camouflaging is becoming a regular practice in majority of the countries. Zamil’s camouflage portfolio encompasses of not only a palm tree but also street light poles, rain-bus shelters, harmonic sites and all kinds of roof top camouflage structures which can match the glazing of the building facade. Zamil is also offering customised minara structures even for religious spaces for worship.

TowerXchange: Please sum up how you would differentiate your solutions from your competitors’?

Vivek Gupta, CEO, Zamil Infra: While we all acknowledge that steel is a commoditised business, yet at Zamil we are committed to leverage our design innovation and economy of scale to deliver the best at the most economical prices. We carefully listen to the needs of our customers and want to sell them what they want rather than standard off the shelf product.