Meetup Americas 2019

The sixth annual retreat of the top CALA telecom infrastructure elite

New for 2019: vendor briefings

TowerXchange special edition journal: CALA market analyses, attendee list, towerco, MNO and exhibitor interviews

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CEO, International Digital Infrastructure Alliance

Zhiyong Zhang
Chairman & President
Mitenno

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Chairman
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Sharing New Business Program Director, Orange

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Phoenix Tower International

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edotco

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Ted Zhong
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Astro Tower

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Cellnex Telecom

Manish Kasliwal
VP and Chief Business Development Officer,
C&SE Asia, American Tower

About TowerXchange

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

TowerXchange produces a monthly newsletter and quarterly journal, both available to subscribers, which cover industry news and provide deep insights into telecoms infrastructure worldwide. We also host annual Meetups on each of four continents to bring together the leading tower industry stakeholders.

TowerXchange was founded by Kieron Osmotherly, a TMT community host and events organiser with 21 years’ experience, and is governed with the support and advice of the TowerXchange “Inner Circle” – an informal network of advisors. TowerXchange was acquired by Euromoney Institutional Investor PLC on December 1, 2017.

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TowerXchange’s analysis of the independent tower market in CALA

The CALA infrastructure industry is undergoing considerable changes and 2019 is expected to be quite an exciting year across the region. Towercos (or should we call them infracos?) are finally eyeing opportunities beyond macro-towers and diversifying into two segments.

On one hand, fibre and edge data centres are being identified as new revenue streams with the likes of American Tower and Phoenix Tower International to name two scooping up existing fibre portfolios while starting to deploy dark fibre too. On the other hand, towercos across CALA are partnering with ESCOs or RESCOs to provide energy management solutions to their clients. A groundbreaking change in direction for a business model originally firmly set on steel and grass.

In terms of deals, Phoenix Tower International is acquiring portfolios at a fast pace and recently made its move into new markets including Bolivia, Argentina and Nicaragua, in addition to its entrance in Mexico with a fibre deal. And while consolidation among towercos isn’t going as fast as originally predicted, MNOs are making the headlines with Telefónica divesting its Mexican and Central American units and Millicom and América Móvil strengthening their positions.

In this analysis, TowerXchange takes a close look at each country’s telecom infrastructure market, its characteristics and reports on the latest tower counts from across the region.

Mexico

The Mexican BTS market continues to expand with most towercos reporting tens of new towers in their portfolio. In the meantime, Phoenix Tower International entered Mexico where it now owns 974km (or 17 rings) of fibre. TowerXchange is currently starting its coverage of fibre news in CALA and we hope to have more details soon.

As of June 2019, ALTÁN Redes’ Red Compartida covers around 33% of the country’s population. To date, ALTÁN Redes has signed 35 contracts with 26 clients, including Telefónica, Televisa and Dish. Promtel estimates that the country has invested over US$638mn on the project’s deployment and Red Compartida’s network includes more than 2,700 BTS as well as 20,000km of fibre.
Our clients depend on SBA to provide the wireless infrastructure that allows them to transmit the signal to their customers. As their first choice provider of wireless infrastructure solutions, we are continuously setting the standard for customer satisfaction by “Building Better Wireless”.

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Software Solutions for the Telecommunications Industry

Tower companies and mobile network operators worldwide have been utilizing Accruent’s software solutions to increase operational efficiency, improve colocation processes, and get sites on-air faster. With solutions that support the entire site lifecycle, Accruent is the software partner that helps telecommunications organizations scale their businesses seamlessly.

- Infrastructure Lifecycle Management
- Site Survey & Site Access Management
- Project Management
- Lease Administration & Accounting
- Field Workforce Management
- Engineering Document Management

Contact us for a demo at sales@accruent.com
### CALA top towercos - Q1 2019

<table>
<thead>
<tr>
<th>Towercos</th>
<th>Number of Towers</th>
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<tbody>
<tr>
<td>American Tower</td>
<td>37,535*</td>
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<tr>
<td>SBA Communications</td>
<td>13,091**</td>
</tr>
<tr>
<td>Mexico Tower Partners</td>
<td>2,100</td>
</tr>
<tr>
<td>Cell Site Solutions</td>
<td>~2,000</td>
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<tr>
<td>QMC Telecom</td>
<td>~1,400</td>
</tr>
<tr>
<td>Brazil Tower Company</td>
<td>~1,200</td>
</tr>
<tr>
<td>Innovattel/Torresec</td>
<td>~1,049</td>
</tr>
<tr>
<td>Torrecom</td>
<td>903</td>
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<tr>
<td>IIMT</td>
<td>600</td>
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<tr>
<td>Intelli Site Solutions</td>
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<tr>
<td>Telesites</td>
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<tr>
<td>Grupo TorreSur</td>
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<tr>
<td>Telxius</td>
<td>3,390</td>
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<tr>
<td>Telxius</td>
<td>3,390</td>
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<tr>
<td>ATP Torres Unidas</td>
<td>2,300</td>
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<tr>
<td>ATP Torres Unidas</td>
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<tr>
<td>ATP Torres Unidas</td>
<td>2,300</td>
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<tr>
<td>20+ towercos with</td>
<td></td>
</tr>
<tr>
<td>&lt;100 towers</td>
<td></td>
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</tbody>
</table>

* AMT global count 170,750 ** SBA global count 29,647

Source: TowerXchange
Your phone is Your Key

194,000 Sites & Assets Secured

65,000 Field Technicians Controlled

194,000 Sites & Assets Secured

2 YEARS BATTERY LIFE

REAL-TIME LOCK STATUS

BLE 4.0 COMMUNICATION

ADMIN MODE

BLE 4.0 COMMUNICATION

REAL-TIME LOCK STATUS

GRADE 4 SECURITY FEATURES

LED VISUAL COMMUNICATION STATUS

LOCK STATUS SENSOR

ON-SITE LOCK SCAN

CODE AUTHORIZATION OVERRIDE

TACTICAL ID LOGIN

FACE ID LOGIN

WE PROTECT ASSETS EVERYWHERE

Acsys International Ltd. - Industry Leader in Telecom Infrastructure Access Management
www.acsys.com | sales@acsys.com
Major tower transactions in Latin America 2011/2019

*1,000 urban wireless sites and 2,500km of fibre

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

<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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<td>Bolivia</td>
<td>Trilogy</td>
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<td>$211,231</td>
<td>Company acquisition</td>
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</table>
KLEOS is exhibiting the world’s most powerful 4G+/5G base station, PEGASUS.

PEGASUS is a platform that empowers operators and enable them to achieve higher profitability by providing a more ubiquitous coverage, higher capacity, an exceptional performance in combating interference and an unprecedented simplicity and flexibility in deployment.

This wireless superiority coupled with our unique IoT platform capabilities and smart Virtual EPC, position our solution as the ultimate path for both, Commercial and Public Safety operators, in their evolution towards the new era of 5G.

SPECTRONITE is exhibiting its X-Series, the first 5G ready wireless backhaul and is taking the lead on microwave radio capacity.

X-Series extreme capacity ranges from 1Gbps up to 10Gbps in licensed microwave frequencies (6 to 38 GHz bands) while allowing for longer microwave hops through its unique Digital Long-Haul architecture.
## Major tower transactions in Latin America 2011/2019

<table>
<thead>
<tr>
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<td>American Tower</td>
<td>1554</td>
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<tr>
<td>2011</td>
<td>Brazil</td>
<td>Sitesharing</td>
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<td>666</td>
<td>$585,000,000</td>
<td>$878,378</td>
<td>Company acquisition</td>
</tr>
</tbody>
</table>
BrightSites

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Wireless broadband is vital for smart cities. BrightSites smart poles deliver faster broadband connectivity that gives residents and businesses non-stop access to the digital world.

BrightSites smart poles provide smart city services and applications via small cells in the existing street lighting infrastructure. Connected sensors and devices also improve operational efficiency and reduce costs.

Applications

BrightSites smart poles are ideal for areas challenged by connectivity coverage or capacity e.g. dense urban areas, historic districts, transit centers, campuses.

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**Applications**

- **LightPole Site Slim**
- **Smart Fusion pole**
- **T2 smart pole**
- **4G/5G smart pole**
- **5G millimeter wave coming soon**
In the meantime though, ALTÁN Redes’ progresses are good news for Mexican towercos since build-to-suit activities have been stalling in the country for the past two years.

One might argue that this is the perfect scenario for towercos to start a consolidation process. But in reality, some of these new firms have built unsellable towers, on discounted lease rates and in remote areas and unlikely to attract multiple tenants or - even worse - unsuitable for being shared from an engineering standpoint. So larger towercos who might have an appetite to consolidate and rationalise the market are left empty-handed unless they are willing to buy “bad towers”... A no-go especially for public entities such as American

**Market highlights**
- PTI seals deal with Uniti Towers and acquires fibre
- Telefónica assessing unit sale

**Mexico quick facts**
- **Towers**: 32,584
- **SIMs per tower**: 3,535
- **Mobile connections**: 107.3mn (Q4 2017)
- **Population**: 130mn (Q4 2017)
- **SIM penetration**: 83% (Q4 2017)
- **MNOs**: Telcel, Movistar, AT&T
- **Towercos**: BTS Towers, Telesites, American Tower, Mexico Tower Partners, IIMT, Centennial, Torrecom, Intelli Site Solutions, Conex, MX Towers, Rent-A-Tower, Tower One, Phoenix Tower International, several other smaller local and new entrant towercos

Source: GSMA Intelligence, TowerXchange

![Mexico - Estimated tower count 32,584](image)

- Telesites
- American Tower
- Mexico Tower Partners
- IIMT
- Torrecom
- BTS Towers
- Phoenix Tower International
- Other independent towercos (QMC, Centennial, Conex, Rent-A-Tower et cetera)
- Estimated MNO captive towers

* Being acquired by PTI

> **Tower and Telesites**, especially since Carlos Slim is reportedly considering the divestment of a minority portion of his 61% stake in the towerco.

Telefónica has been considering a potential sale of its Mexico unit but the company’s President José María Álvarez-Pallete has recently stated that the MNO is now exploring “agreements to share its network with other operators to improve capital return”, which could stop the company from exiting Mexico. Meanwhile, América Móvil has announced an investment of US$8.500mn to deploy fibre, towers and new technologies as the company is also getting ready to provide triple play services in the country.

The MNOs, that contract power through state-owned CFE, are now exploring the integration of renewables to cut down energy costs and looking to sign Power Purchase Agreements with the many international and local providers that are now offering affordable power solutions across the country.

**Central America and the Caribbean**

In Central America, the biggest news are coming from Telefónica as the Spanish telecom giant has signed an agreement with Millicom for the sale of partial and whole parts of Telefónica Costa Rica, Panama and Nicaragua for US$1.7bn. The MNO...
Who sold their towers in Central and South America?

<table>
<thead>
<tr>
<th>Country</th>
<th>Major Tower Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>América Móvil</td>
</tr>
<tr>
<td></td>
<td>Telefónica</td>
</tr>
<tr>
<td></td>
<td>AT&amp;T*</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>América Móvil</td>
</tr>
<tr>
<td></td>
<td>Telefónica</td>
</tr>
<tr>
<td></td>
<td>SBA Communications</td>
</tr>
<tr>
<td>El Salvador</td>
<td>América Móvil</td>
</tr>
<tr>
<td></td>
<td>Telefónica</td>
</tr>
<tr>
<td></td>
<td>Continental Towers</td>
</tr>
<tr>
<td>Guatemala</td>
<td>América Móvil</td>
</tr>
<tr>
<td></td>
<td>Telefónica</td>
</tr>
<tr>
<td></td>
<td>Phoenix Tower International</td>
</tr>
<tr>
<td>Honduras</td>
<td>América Móvil</td>
</tr>
<tr>
<td></td>
<td>Telefónica</td>
</tr>
<tr>
<td></td>
<td>Telesites/Telxius</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>América Móvil</td>
</tr>
<tr>
<td></td>
<td>Telefónica</td>
</tr>
<tr>
<td>Panama</td>
<td>América Móvil</td>
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<tr>
<td></td>
<td>Telefónica</td>
</tr>
<tr>
<td></td>
<td>Millicom closes Nicaragua deal with Telefónica, Costa Rica and Panama still pending</td>
</tr>
<tr>
<td>Belize</td>
<td>379.7K connections</td>
</tr>
<tr>
<td></td>
<td>100% penetration rate</td>
</tr>
<tr>
<td></td>
<td>Costa Rica</td>
</tr>
<tr>
<td></td>
<td>Panama</td>
</tr>
<tr>
<td></td>
<td>Nicaragua</td>
</tr>
<tr>
<td></td>
<td>Central America market highlights</td>
</tr>
<tr>
<td></td>
<td>América Móvil’s takeover of Telefónica in El Salvador on hold, Guatemala completed</td>
</tr>
</tbody>
</table>

Costa Rica - Estimated tower count 3,889

- SBA Communications
- American Tower
- Telesites
- Phoenix Tower International
- Continental Towers
- Other independent towercos (Continental, TOCSA)
- ICE
- Claro

Source: TowerXchange

Central America market highlights

- América Móvil’s takeover of Telefónica in El Salvador on hold, Guatemala completed
- Millicom closes Nicaragua deal with Telefónica, Costa Rica and Panama still pending

Belize has already completed the sale of its Nicaraguan subsidiary for US$437mn, while Salvador’s regulator has put the sale of Telefónica’s assets to América Móvil on hold. Earlier this year, the Spanish telco agreed to sell both El Salvador and Guatemala’s unit to América Móvil for US$500mn, with the goal of reducing the company’s debt and strengthening its balance sheet.

Belize has 379.7K connections and 100% penetration rate as of Q4 2017 according to GSMA Intelligence. With two carriers, Digicell and Smart, and no active towercos to date, the country is too small to attract much attention from the tower industry, and our estimates suggest there are approximately 70-80 towers in the national territory.

Following the spectrum auction held in Costa Rica last year, Claro and Movistar have finalised the acquisition of additional spectrum in the 1800MHz and 2100MHz bands. The announcement follows last year’s frequency auction, during which Claro paid US$19mn and Movistar US$24mn for available spectrum in the two bands.
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
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El Salvador - Estimated tower count 1,807

Source: TowerXchange

Selected estimated CALA tower counts

Source: TowerXchange

Since telecoms were liberalised in 2008, Costa Rica has proved an increasingly fertile ground for towercos. SBA Communications remains Costa Rica’s largest towerco with just nearly 800 sites, followed by American Tower and Telesites. PTI, Continental and a handful of local firms complete the roster of towercos, who own over half the country’s towers between them.

Cuba’s SIM penetration grew from 29% in Q4 2015 to just 40% in Q418 according to the GSMA, but that isn’t enough to get anywhere near the regional average. With only one mobile network operator in the country, ETECSA, who share around 500-700 towers with radio companies and TV stations, it will take some time for international towercos to be able to enter the island. However, TowerXchange is keeping a close eye on Cuba in light of its untapped market and undisputed potential to become a

Estimated total towers in rest of South America: ~5,700 (Venezuela, Ecuador, Uruguay, Surinam, French Guiana and Guyana)
TAKE CONTROL

Secure your business continuity and revenue flow with remote access management.

NATIONAL INFRASTRUCTURE
Assign service jobs and access based on monitoring of critical assets at the site.

OPEX
Decrease costs with less travelling and reduced aborted visits, enabling more demanding SLAs.

UP-TIME
Reduce down time by quick access and make decisions on asset renewal, based on the frequency of visits.

COST CONTROL
Verify and control billing with data about actual time against spending.

RISK MANAGEMENT
Reduce risk of stolen or lost keys by assigning access only when needed.

REPORTING
Make effective decisions based on the data from operations and access control.
The only towercos active in the Dominican Republic are Phoenix Tower International, which runs a portfolio of almost 1,800 sites and Torresec. PTI scaled its Dominican Republic’s operations thanks to a string of acquisitions including Teletower Dominicana’s 190 sites, Viva’s 545 towers’ portfolio and, lastly, the agreement to purchase the assets of Teletorres del Caribe, owned by Altice Europe (1,049 sites) for US$170mn. Following a regional trend, market leader Claro, who owns around 1,400 towers in the Dominican Republic, is now integrating renewable energy in more than 40 sites across the country and plans to continue expanding its renewable energy use to power towers nationally.

In February, Tigo El Salvador sealed an agreement to sell up to 800 towers to SBA Communications for US$145mn. SBA Communications owns and operates 242 sites in El Salvador and this deal with exponentially grow the company’s footprint.

Guatemala is a complex country with a very competitive tower industry. SBA Communications, Torrecom, Balesia and Continental all operate in the local market which is characterised by a fairly strong regulatory environment and the huge influence of local communities – Consejos Comunitarios de Desarrollo Urbano y Rural (COCODES) – in the approval of new deployments. In spite of these difficulties, Torrecom and SBA Communications have achieved good levels of organic growth in the country and have added a combined 300 towers since Q2 2015. In October, Phoenix Tower International entered the market with the acquisition (from an unknown seller) of twenty towers.

### Guatemala - Estimated tower count 3,908

Source: TowerXchange

### Guatemala quick facts

- **Mobile connections**: 3,908 (Q4 2017)
- **Population**: 4.1mn (Q4 2017)
- **SIM penetration**: 78% (Q4 2017)
- **MNOs**: Claro, Orange, Viva

Source: GSMA Intelligence, TowerXchange

*América Móvil acquired Telefónica’s operations and assets.*

---

### El Salvador quick facts

- **Towers**: 1,807
- **SIMs per tower**: 5,704
- **Mobile connections**: 9.6mn (Q4 2017)
- **Population**: 5.4mn (Q4 2017)
- **SIM penetration**: 150% (Q4 2017)
- **MNOs**: Claro, Movistar, Digicel, Red, Tigo
- **Towercos**: SBA Communications, Phoenix Tower International, Continental Towers

Source: GSMA Intelligence, Phoenix Tower International, TowerXchange
FOR 60 YEARS
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Local billionaire Mario Lopez owns substantial equity in market leaders Tigo, and also owns most of the land under their towers, which makes the operator reluctant to participate in widespread infrastructure sharing. Could Tigo consider selling any of its assets following the sale and leaseback deals in Colombia and Paraguay?

According to TowerXchange’s research, Honduras is home to two towercos, Balesia and Continental Towers Corp. For now, there’s been little visibility on the local industry and its potential with around 20% towerco penetration and the two carriers – Tigo and Claro – still holding on to their tower portfolios.

In spite of being a high-risk market, Nicaragua presents interesting build-to-suit opportunities. In 2018, the market stalled due to security issues.

---

**Guatemala quick facts**

- **Towers**: 3,908
- **SIMs per tower**: 5,380
- **Mobile connections**: 19.8mn (Q4 2017)
- **Population**: 17.1mn (Q4 2017)
- **SIM penetration**: 116% (Q4 2017)
- **MNOs**: Tigo, Claro, Movistar
- **Towercos**: SBA Communications, Torrecom, Continental Towers, Movistar, Phoenix Tower International

*Source: GSMA Intelligence, TowerXchange*

---

**Honduras - Estimated tower count: 1,200**

- **Operator captive towers**
- **Independent towercos**
  - (Balesia and Continental Towers)

*Source: TowerXchange*

---

**Panama - Estimated tower count 1,719**

- **SBA Communications**
- **Phoenix Tower International**
- **Torrecom**
- **Other independent towercos**
- **Cable & Wireless**
- **Claro**
- **Tigo**

*Millicom in the process of taking over Telefónica*

*Source: TowerXchange*
In 1995, Polar was the first company in the Telecom industry to introduce DC Generators as a prime power replacement to AC generators. Polar was also the first to incorporate DC Generators into Solar Hybrid systems. For over 22 years, our focus has been to improve reliability and maintenance by making every component within the system better through engineering innovation, new production tooling, and raw material sourcing.

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for nearly seven months but now towercos have resumed BTS activities.

Panama earned an entry in the regional tower transaction report through the acquisition by Phoenix Tower International of 60 sites from American Tower. SBA remain market leaders but lately the country has seen the entrance of another towerco, Torrecom, who has acquired 25 sites and made its debut on the market. Other portfolios are held by Continental Towers and Torres de Panama.

According to GSMA Intelligence, Panama is a fast grower market in Central America with four active carriers (Cable & Vision, Claro, Digicel and Movistar), 138% penetration rate and 5.7mn mobile connections (Q4 2017). TowerXchange estimates there are around 1,700 towers in Panama.

In 2018, Phoenix Tower International announced the acquisition of 215 towers from Digicel in the French Antilles. While no further details of the
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Bolivia - Estimated tower count: 4,200

- Entel: ~2,100
- Tigo: ~1,500
- Phoenix Tower International: 400
- NuevaTel: 200

Paraguay - Estimated tower count: 4,250

- American Tower: 1,309*
- Personal: 600
- Claro: 750
- Tigo: 400
- Vox: 1,100

* 1,400 announced of which 1,309 transferred

Brazil quick facts

- Towers: ~60,500
- SIMs per tower: 3,879
- Mobile connections: 221.6mn (Q4 2017)
- Population: 210.1mn (Q4 2017)
- SIM penetration: 105% (Q4 2017)
- MNOs: TIM Brasil, Vivo, Claro, Oi, Nextel, Algar Telecom, Sercomtel
- Towercos: American Tower, SBA Communications, Grupo TorreSur, Phoenix Tower do Brasil, CSS, Brazil Tower Company, AlfaSite, Centennial, QMC, Skysites, Telxius

Source: GSMA Intelligence, TowerXchange

Brazil

Brazil has faced three tough years as a result of a deep economic recession and political crisis but to date, the market finally seems in full recovery both towercos and MNOs are now focusing on efficiency, energy management, cost reduction and new technologies integration.

On the towerco front, Phoenix Tower do Brasil has been steadily growing and now runs 2,019 sites, including 373 small cells thanks to the acquisition of K2 Tower. The towerco recently spoke with TowerXchange and shared its plans to offer energy management services across certain sites by partnering with a RESCO.
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TowerXchange gathered that to date, every towerco in Brazil is equipped or getting ready to provide energy solutions to its clients—a real game changer after years of steel and grass operations.

Consolidation among towercos isn’t moving very fast but it’s been reported that certain portfolios might be up for sale, including CSS’ nearly 2,000 sites.

On the MNO front, market leader Vivo has set ambitious deployment targets and aims to build 1,500 new sites per year between BTS and co-locations. Claro will consolidate its position as the second operator in the country with Nextel’s acquisition, which will give them almost an extra 2% of the market share. América Móvil’s agreed to pay US$905mn to NII and AI Brazil Holdings BV but the transaction still needs to be approved by telecom regulator ANATEL. In addition, Claro is developing the largest private renewable energy generation project in Brazil as the operators seeks to improve efficiency and cut down cost throughout its infrastructure and all Brazilian MNOs are exploring different renewable energy auto generation initiatives. In the meantime, Oi has hired Bank of America Merrill Lynch to assist them with their sale of non-core assets, which will include more than 13,000 towers as well as the MNO data centres. Finally, regulator ANATEL has recently confirmed that the bidding for 5G spectrum will take place early next year and the four MNOs have already started their trials in different parts of the country.

In Q4 2017, SBA Communications has sealed a deal for the acquisition of approximately 900 towers to its Brazilian portfolio from Highline do Brasil as well as solid build-to-suit pipeline. TowerXchange has recently interviewed the Senior Vice President of International for SBA Communications, David Porte, who said about Highline’s portfolio that it “included a set of solid BTS contracts with positive terms that were negotiated before a wave of mediocre contracts were signed by numerous towercos across the region.”

**Bolivia**

After many years of failed attempts, Bolivia has finally welcomed the first independent towerco. In fact, earlier this year Phoenix Tower International sealed the sale and leaseback deal with Trilogy International Partners’ subsidiary NuevaTel and initiated the acquisition of 600 sites (400 of which have already been transferred) at a total price of US$100mn. While Bolivia has always been perceived as a “risky market”, TowerXchange looks forward to finding out more over the next few months.

**Paraguay**

Paraguay is one of the newest markets to open its doors to towercos, following the acquisition by American Tower of 1,400 Tigo’s towers at a value of US$125mn (of which 957 were transferred in Q3 2017). As anticipated, the valuation per tower in the Tigo/AMT deal is lower than the regional average (US$89,285 vs US$199,966). In fact, valuations are
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- Rising Star
- Outstanding Achievement
- Recruitment Programme of the Year
- Marketing or Social Media Campaign of the Year
- Project of the Year
- Agent of Change
- Company or Organisation of the Year
- Best Woman in Tower
- Best Tower Company
- Best Woman in Data Centre
- Best Data Centre Company
- Best Woman in Network Orchestration
- Best Network Orchestration Company
- Best Woman in Wholesale Telecoms
- Best Wholesale Carrier
- Best Woman in Subsea
- Best Subsea Company

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affected by the limitations on the length of land leases, currently capped at five years, as well as the rising real estate costs. Along with Millicom’s portfolio, Personal’s 1,100 towers could come to market soon and this would surely increase the interest of towercos in this new market.

In January 2018, the 700MHz spectrum auction took place and generated bids for US$84.5mn. Tigo, Claro and Personal all scooped spectrum allocation while State-backed Vox didn’t enter the bidding process.

**Colombia**

In December 2017, the Colombian Ministry of IT and Communications (MinTIC) increased the spectrum caps to allow operators to increase the capacities of their networks. The move should allow the spectrum auction (of 700MHz and 1900MHz bands) to get back to track following two years of delays. In fact, one of the reasons why the local BTS market has been stagnant is the delay in the spectrum auction and the subsequent absence of strong deployment plans by the local operators.

In 2017, the country has delivered some interesting tower news with various deals having been completed over the past few of months. Tigo has announced the sale and leaseback of 1,200 sites to American Tower for US$147mn while Phoenix Tower sealed several deals with two Colombian firms (and a Peruvian one) for a total of 150 sites. PTI’s deals are under confidentiality agreements and no further details have been disclosed. Lastly, SBA Communications acquired Torres Andinas’ portfolios in Colombia and Peru in yet another private deal.

With tens of towercos operating in the country and not enough business for everyone, local players report tough pricing and economic

---

**Peru - Estimated tower count 11,202**

![Pie chart showing estimated tower count in Peru](chart.png)

**Paraguay quick facts**
- Towers 4,250
- SIMs per tower 1,788
- Mobile connections 7.6mn (Q4 2017)
- Population 6.9mn (Q4 2017)
- SIM penetration 111% (Q4 2017)
- MNOs Tigo, Personal, Claro, Vox
- Towercos American Tower, BTS Towers, Innovattel

**Colombia quick facts**
- Towers 16,351
- SIMs per tower 3,626
- Mobile connections 56.4mn (Q4 2017)
- Population 49.3mn (Q4 2017)
- SIM penetration 114% (Q4 2017)
- MNOs Claro, Movistar, Tigo, Avantel
- Towercos American Tower, SBA Communications, Andean Tower Partners, Innovattel, Torrecom, PTI, QMC, Telesites, Tower One

Source: GSMA Intelligence, TowerXchange, TowerXchange
conditions which are putting small BTS firms under more pressure they can sometimes handle and TowerXchange expects more consolidation to take place among towercos, especially since some developers might decide to exit the market, exemplified by one of PTI’s counterparts in the latest deals.

On the MNO front, the local government is currently selling its 32.5% stake in Movistar, following the fine imposed to Telefónica and Claro for a breach of their 1994 licensing contract. According to the terms of the original agreement, the operators were supposed to return all wireless network infrastructure to the State after ten years, a term then extended for a further ten years, but failed to. As detailed by Telegeography, the government was one of the co-owners of the operators and therefore “duly obliged to participate in a capital increase of approximately US$1.64bn to pre-pay all commitments in relation to PARAPAT, the consortium that owns the telecoms assets and manages the pension funds of the former companies that resulted in the creation of legacy operator ColTel (now Telefónica Colombia).”

The evolution of the CALA telecom tower industry 2013-2019 (Q1)

<table>
<thead>
<tr>
<th>Year</th>
<th>Est. total towers</th>
<th>Towers owned by towercos</th>
<th>Towerco penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>140,000</td>
<td>46,011</td>
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</tr>
<tr>
<td>2014</td>
<td>148,000</td>
<td>61,729</td>
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<tr>
<td>2015</td>
<td>156,000</td>
<td>69,850</td>
<td>44%</td>
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<tr>
<td>2016</td>
<td>164,207</td>
<td>81,207</td>
<td>49%</td>
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<tr>
<td>2017</td>
<td>172,542</td>
<td>89,142</td>
<td>51.6%</td>
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<tr>
<td>2018</td>
<td>181,527</td>
<td>96,427</td>
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<tr>
<td>Q119</td>
<td>186,549</td>
<td>98,099</td>
<td>52.58%</td>
</tr>
</tbody>
</table>

The Ministerio de Tecnologías de Informacion y las Comunicaciones (MinTIC) has finally announced that the much awaited 700MHz spectrum auction should take place in October this year.

**Ecuador**

Ecuador is the quietest of all Andean States especially since its MNO landscape is less attractive for towercos. Claro enjoys a dominant position in the country, while CNT is the government-owned player holding the third spot after Telefónica’s Movistar.

On the towerco front, SBA Communications is reporting steady growth in Ecuador where it now runs a portfolio of 405 towers. The portfolio is made of sites acquired by Innovattel/Torresec as well as sites built via BTS. Local firm Aplicanet has confirmed good volumes of BTS activities too, having added 35 sites to its portfolio in Q1 2018.

**Peru**

Last year, Phoenix Tower International sealed a private deal with a Peruvian firm and added 49 towers.

**Peru quick facts**
- **Towers**: 11,202
- **SIMs per tower**: 3,531
- **Mobile connections**: 37.6mn (Q4 2017)
- **Population**: 32.4mn (Q4 2017)
- **SIM penetration**: 116% (Q4 2017)
- **MNOs**: Movistar, Claro, Entel, Bitel
- **Towercos**: American Tower, Andean Tower Partners, Innovattel, Balesia, BTS Towers, Telxius, Torrecom

Source: GSMA Intelligence, TowerXchange

**Ecuador quick facts**
- **Mobile connections**: 14.5mn (Q4 2017)
- **Population**: 16.7mn (Q4 2017)
- **SIM penetration**: 87% (Q4 2017)
- **MNOs**: Claro, Movistar, CNT
- **Towercos**: SBA Communications, Innovattel, Balesia, Aplicanet, Ecuador Tower Company

Source: GSMA Intelligence, TowerXchange
sites to its portfolio, SBA Communications snatched Torres Andinas’ 100+ towers and Andean Tower Partners further contributed to consolidating the market by sealing the landmark acquisition of Torres Unidas. Telxius has more around 930 sites and the company plans to continue expanding its footprint in the country.

With only a handful of towercos now active in the country, Peru is one of the less penetrated and possibly more sustainable tower markets in CALA. To date, MNOs haven’t shown much appetite to divest their tower portfolios, resulting in the level of towercos penetration to remain low (approximately 25%).

However, Telefónica has recently announced a project that set an example and drive towercos penetration in the country. Alongside Facebook, the Inter-American Development Bank and the Development Bank of Latin America, the Spanish telecom group is launching Internet para todos (IpT), an open-access, wholesale broadband mobile internet service that aims to expand coverage in rural areas. The project aims to bring a new, open approach to network deployment that can be replicated across Latin America to deliver mobile broadband to remote areas.

**Chile**

Still affected by the infamous 2012 Antenna Law, Chile isn’t like any other CALA market yet the two main regional towercos both operate in the country in spite of its challenges.

**Chile quick facts**

<table>
<thead>
<tr>
<th>Towers</th>
<th>9,148</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMs per tower</td>
<td>2,916</td>
</tr>
<tr>
<td>Mobile connections</td>
<td>26.1mn (Q4 2017)</td>
</tr>
<tr>
<td>Population</td>
<td>18.1mn (Q4 2017)</td>
</tr>
<tr>
<td>SIM penetration</td>
<td>144% (Q4 2017)</td>
</tr>
<tr>
<td>MNOs</td>
<td>Movistar, Entel, Claro, WOM</td>
</tr>
<tr>
<td>Towercos</td>
<td>American Tower, Andean Tower Partners, Antyl, Balesia, SBA Communications, Telxius, Torrecom</td>
</tr>
</tbody>
</table>

As part of the Women in Towers initiative, TowerXchange talked with Priscila Oliva, Country Manager for Chile at American Tower, who recently described the country’s market as follows: “Most towers in Chile are still in the hands of operators and since 2012, there haven’t been significant divestments […]. Chile is advanced in terms of its densifications and networks so we are working on a lot of alternative site typologies such as light poles and other low coverage solutions.”

In 2017, SBA Communications has entered the market thanks to a deal with CTR, a local cable and internet provider. In a previous interview with TowerXchange, SBA’s CEO Jeffrey Stoops noted that “entering Chile isn’t easy since companies need to be licensed and approved, and SBA has been through that process, which has been a barrier to entry for other towercos. In Chile, we’ll focus on new deployments and we’ll keep an eye if any portfolios of existing assets become available.”
After a very tough socioeconomic year, Argentina is back in the spotlight as one of the most promising tower markets in CALA. The country needs to build around 50,000 towers in the next five years and the government, who is very aware of that need, is working very closely with MNOs, infrastructure providers and local government bodies to reduce the regulation barriers that have historically slowed down infrastructure deployment in the country.

Market leader Telecom has set ambitious deployment targets and both Claro and Movistar are expected to build a decent number of towers this year to continue their expansion and keep up with the current aggressively increasing demand.

The market is very fragmented and tower cos own around 1,300 towers. Torresec is the market leader with 356 sites and 300 more under construction. After paying US$30mn to Telefónica for 323 sites, Telxius was able to build only six new sites last year, and they expect to deploy 40 more before the year ends.

GME Alliance, one of the first market entrants, has a portfolio of over 100 sites and has 30 more under construction. Atis Group, who received a US$100mn injection from Pátria Investimentos, has successfully developed a portfolio of almost 100 sites, and they are hoping to build 150 more in the next few months.

Although the country’s economy is slowly recovering and both central government and operators have started to understand the benefits of infrastructure sharing, the fee regime imposed by municipalities alongside the tedious permitting process for new builds are still posing considerable challenges to the expansion of the tower cos model across Argentina.

### Argentina quick facts

| Towers | 17,252 |
| SIMs per tower | 3,777 |
| Mobile connections | 61mn (Q4 2017) |
| Population | 44.5mn (Q4 2017) |
| SIM penetration | 137% (Q4 2017) |

**MNO captive towers**

- Claro)
- Movistar
- Telecom Argentina

**Tower cos**

- American Tower
- SBA Communications
- Atis Group
- Innovattel/Torresec
- Plata Tower Company
- Teletower Argentina
- Tower One
- Telxius
- CSS
- GME Alliance

Source: GSMA Intelligence, TowerXchange
UPDATED: TowerXchange’s who’s who in CALA towers

TowerXchange presents its 2019 edition of the key players in the CALA telecom infrastructure industry

TowerXchange offers its readers an updated guide to the Who’s Who in CALA telecom infrastructure, featuring key towercos, MNOs and investors active in the region and latest major deals and transactions.


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**Accel:** One of the leading venture capital firms in the world with over US$8.8bn in capital under management, Accel has funded the likes of Facebook, Dropbox and Spotify. QMC Telecom is among its investments in the tower sector.

**Albright Capital Management (ACM):** A private equity firm specialised in emerging markets. In April 2016, ACM granted a US$45mn five-year term credit facility to Innovattel LLC for the development of build-to-suit projects in Argentina.

**AlfaSite:** AlfaSite is a Brazilian build to suit (BTS) firm part of Grupo Alfa which also owns a tower manufacturer (Metal Alfa), an MSP (Alfa Erb) and an energy equipment company (Alfa Energia).

**Algar Telecom:** Algar Telecom is a Brazilian mobile operator serving approximately 1.5mn subscribers across Rio de Janeiro, São Paulo, Santa Catarina and Paraná among others via 31,000km of fibre. It currently offers 3G services and is working alongside Nokia Networks to launch 4G LTE.

**ALTÁN Redes:** The company was founded in 2016 in Mexico and enjoys a Public-Private Partnership with the Organismo Promotor de Inversiones en Telecomunicaciones (Promtel). ALTÁN Redes is deploying a wholesale shared network utilising the 700MHz spectrum. Red Compartida will significantly improve the footprint coverage of wireless voice and data services in the country; this, through a 4G-LTE & 5G ready network built to reach 92.2% of the population, including regions that...
up until now have been neglected by traditional carriers. ALTÁN is currently on target with its aggressive coverage plan.

The company has Grupo Multitel as strategic partner and Morgan Stanley, Caisse de dépôt et placement du Québec (CDPQ), FFLATAM-15-2, Hansam, S.A., Isla Guadalupe Investments as investors and the IFC as development institution.

**Altice:** Altice took over Orange Dominicana and Tricom in 2014, respectively the second and fourth MNOs in the Dominican Republic. Orange Dominicana and Tricom both offer 3G and 4G LTE across the Dominican Republic. In 2018, Altice sold its Dominican assets to Phoenix Tower International.

**Altman Vilandrie & Co:** AV&Co. has extensive tower industry experience spanning tens of engagements (including Latin America, Africa, Asia, North America, Europe) over ten years, including tower operator strategies as well as tower transaction due diligences. Their recent work has addressed a number of relevant topics such as the impact of small cells, the future opportunity for DAS and the changing role of rooftops.

**América Móvil (AMX):** AMX is one of the largest mobile network operators in the world and part of the Carlos Slim’s group of companies, serving approximately 284mn mobile subscribers across fourteen markets.

Back in 2014, AMX faced regulatory pressure to reduce its dominant position in Mexico, which forced it to carve-out over 11,000 of its telecom towers and create Telesites, a separate infrastructure entity (see Telesites for more details). Apart from the Telesites venture, which has already expended into Costa Rica, AMX has not faced regulatory or balance sheet pressure to divest assets elsewhere, and thus has favoured retaining their towers.

AMX operates as Claro in most of its CALA markets and it offers both 3G and 4G LTE. In Mexico, where it operates under the Telcel brand, the operator is now offering 3G and 4G LTE. In January, the MNO announced the acquisition of Telefónica’s operations in El Salvador and Guatemala. The Guatemala acquisition was completed in the same month while the El Salvador one is still pending regulatory approval.

**American Tower (AMT):** The world’s largest independent commercial towerco, AMT need no introduction within this publication. With its headquarters in the U.S., AMT operates a global portfolio of over 170,000 sites across the U.S., South America, Africa, Europe and Asia.

AMT is the leading towerco in the CALA region in terms of its tower count, with over 37,500 sites across Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and Paraguay.

**Amzak Capital:** Amzak Capital Management is the private investment firm of the Kazma family. The Kazma’s developed and operated cable systems in Canada and the U.S. until 1992, when they entered the Latin American markets, with operations in Aruba, Venezuela, Trinidad & Tobago and Martinique. In 1997, they built and operated Amnet, Central America’s largest cable television/triple play company, which was sold to Millicom International Cellular S.A. in 2008. Originally from Canada but based in the U.S. since 1979, Amzak counts BTS Towers among its current investments.

**Analysys Mason:** A recognised global consulting firm specialized, among others, in tower market analysis and due diligence.

**ATP Torres Unidas:** Part of the Digital Bridge group of companies, ATP Torres Unidas owns a portfolio of 2,300 towers across Colombia, Chile and Peru as well as manages 32,200+ master sites in Colombia and Peru.

**Aplicanet:** Aplicanet is a BTS firm active in Ecuador, where it runs a portfolio of around 100 towers.

**Atis Group:** Founded in 2016, Atis is an independent Argentinian towerco with a portfolio of around 100 sites. The company received a US$100mn injection from Patria Investimentos and is planning to build around 150 more towers before the end of 2019.

**AT&T:** AT&T made its entrance in the Mexican mobile market thanks to the acquisition of Iusacell,
Unefon (part of Iusacell) and Nextel back in 2014. AT&T has 17.7mn subscribers as of Q1 2019 and a 13% market share. AT&T has inherited networks largely divested to towerco, but has still found sufficient capacity on those inherited sites, such that the anticipated volume of new build from AT&T’s market entrance has been slow to materialise.

**Axtel:** Axtel is a Mexican operator offering internet, telephone and TV services in 45 cities across the country. After selling 142 sites to AMT in 2017, in 2019 it sold its fibre business in five Mexican cities to Megacable for US$60.17mn.

**Avantel:** Avantel is the fourth mobile network operator in Colombia where it offers 3G and 4G LTE services.

**Balesia Towers:** Balesia is a BTS focused towerco operating in CALA and owned by International Tower Corporation (ITC).

**Barclays:** Barclays’ global investment banking division offers a leading Technology, Media and Telecoms (TMT) franchise. The TMT team has significant experience representing leading tower operators as well as telecom service providers around the globe on buy and sell side assignments. In this capacity, Barclays has supported its clients in the valuation and/or marketing of tower portfolios as well as the negotiation of various agreements associated with these transactions.

**Berkshire Partners:** Berkshire Partners is a leading private investment firm acting through nine private equity funds with more than US$16bn in aggregate capital commitments. Berkshire Partners has substantial experience of tower industry investments, having been an early stage investor in Crown Castle and the investment arm behind Torres Unidas until its acquisition by Andean Tower Partners.

**Bitel:** Bitel is the fourth mobile network operator in Peru, wholly owned by Vietnam's largest MNO Viettel and mostly focused on serving rural communities across the Andean country. Bitel offers an extensive 4G network across Peru and has the biggest fibre network among Peruvian operators with more than 33,000km.

**Blackstone:** Blackstone’s Tactical Opportunities (Tac Opps) specialises in time-sensitive and complex ventures and is the investment firm behind Phoenix Tower International’s expansion in the U.S. and CALA. Blackstone has previous experience of the towerco asset class having invested in Global Tower Partners, which they successfully exited through the sale to AMT.

**Brazil Tower Company (BTC):** BTC is a Brazilian BTS focused towerco with a portfolio of 1,200 towers, owned by private investors, including the company’s CEO Dr Chahram Zolfaghari, and 1848 Capital.

In 2018, the towerco has closed a US$104mn long-term senior secured debt financing with three international lenders led by Cordiant Capital of Montreal, Canada.

**BTS Towers:** A build-to-suit firm formed by the same executives behind NMS. Its shareholders include Cartesian Capital Group, Amzak Capital and the International Finance Corporation. BTS presently operates in Mexico, Colombia and Peru.

**Cable & Wireless:** Acquired by Liberty Global in November 2015, it serves 3.7mn subscribers in fifteen markets across the Caribbean and Latin America under the FLOW brand.

**Cartesian Capital Group:** A global private equity firm with proven expertise in assisting closely-held companies to expand internationally. Since its inception in 2006, the firm has managed more than US$2.7bn in committed capital. Cartesian was the founding investor of NMS and is currently behind BTS Towers. The firm also holds a minority participation into Grupo TorreSur.

**Centennial Towers:** Centennial Towers is a BTS firm active in Colombia, Brazil and Mexico funded by Breslau Capital, a New York based firm with presence in both Panama and Tel Aviv. To date, Centennial runs a portfolio of approximately 1,500 sites.

**CMA Strategy Consulting:** CMA is a boutique consulting firm focused on the telecoms, media and high-tech segments. With offices in Boston and San Francisco, the firm has done extensive due diligence
Continental Towers: Continental Towers is a BTS firm focused on deploying sites in Central America. Originally a joint venture between Terra Projects and Credit Suisse, it then received a US$120mn loan package from the IFC to further fund its Central American expansion in 2012. Since then, the company has been quite secretive and to date, it operates in Guatemala, Costa Rica, El Salvador, Jamaica, Honduras and Panama.

Cell Site Solutions (CSS): CSS was created in 2013 as a joint venture between Gávea Investimentos and Goldman Sachs. Focused on BTS projects, co-locations, DAS and full turnkey services in Brazil, it runs a portfolio of over 2,000 sites across the country. To date, the company is fully owned by Goldman Sachs and it has branched out to Argentina via Cell Site Solutions Argentina, which was founded in 2016.

Citi: One of the world’s leading tower transaction advisory groups can be found within the TMT team at Citi.

CyCSA: The Argentinian engineering firm was acquired by American Tower in December 2016. With the deal, American Tower secured over 1,000 urban wireless sites, 2,500km of fibre-optic network and exclusive rights to deploy mobile infrastructure in various locations across Argentina.

Delmecc: The tower experts in consultation and engineering, providing global solutions to operators, towercos and regulators on standards, guidance and due diligence for portfolio management. Engaging audit, assessment and analysis for structural enhancement, capacity and maintenance as individual activities or by way of managed services.

Deutsche Bank: Deutsche Bank provides M&A advisory services as well as financing services in the tower space, including both equity and debt products. Deutsche Bank has been involved in the tower sector on a global basis, successfully executing transactions in North America, South America, Europe, Africa and Asia.

Digicel: Digicel is a leading MNO with a presence in over twenty countries across Central America and the Caribbean, including Jamaica, Panama, El Salvador and Haiti. Since 2017, Digicel has started to divest its assets and has sold towers to Phoenix Tower International in El Salvador, Jamaica and the French Antilles.

Digital Bridge: Digital Bridge Holdings, LLC, was formed in 2013 through a partnership between Ben Jenkins of Dering Capital (and formerly of The Blackstone Group) and Marc Ganzi (former founder and CEO of Global Tower Partners).

The firm is involved in the acquisition, funding and management of firms in the infrastructure sector such as Mexico Tower Partners, Vertical Bridge, Andean Tower Partners, ExteNet Systems, DataBank and Vantage Data Centres.

Digital Colony: A global investment firm behind the operations of Digital Bridge, active within the global digital infrastructure industry.

Ecuador Tower Company (ETC): ETC is a BTS firm founded by executives behind Brazil Tower Company.

Ente Nacional de Comunicaciones (ENACOM): Part of the Secretaría de Modernización (Argentina’s Modernization Ministry), ENACOM is the telecom regulator in the country. The entity is trying to support both MNOs and towercos through different regulatory initiatives and the Argentinian government aims to develop a law for which ENACOM would become the “unique window” and decision maker of all deployment permits in the country.

Entel: Created back in the sixties by the Chilean government, Entel was privatised in the early nineties. Since then, the company has become the largest mobile network operator in Chile and in 2013 acquired Nextel de Perú for US$400mn. To date, Entel owns approximately 3,000 sites in Chile and 2,400 in Peru and offers 3G and 4G LTE services in both countries. While the company has not sold any towers, Entel have increasingly relied on third party towercos for new sites.

Entel SA: Entel SA is the Bolivian State-owned telecom company which was nationalised in 2008. Former shareholders include Telecom Italia which settled a dispute with the Bolivian government over
the nationalisation for US$100mn. The operator now offers 3G and 4G LTE services in the country.

**EY:** TMT strategy and corporate finance advisory team with extensive experience of advising on tower transactions.

**First Corporate Finance Advisors:** First is a financial advisory firm based in Argentina. The company specialises in M&A, valuation, infrastructure advisory and securitisation. Serving clients throughout Latin America, First is now actively involved in the opening of the Argentinian telecom tower market.

**Gávea Investimentos:** Gávea was founded back in 2003 by the former president of the Central Bank of Brazil, Arminio Fraga. The fund invested approximately US$150mn to create CSS back in 2013 in a joint US$300mn investment with Goldman Sachs and sold its shares to the latter in 2016.

**GME Alliance:** GME Alliance is a private towerco active in the Argentinian market.

**Golden Comunicaciones:** Created in April 2016 via a joint venture between Goldman Sachs and Innova Capital Partners, the BTS firm is focused on serving the Colombian telecom market and headed by CEO Herman Torres.

**Goldman Sachs:** Goldman Sachs returned to the Brazilian private-equity market with its 2013 investment in CSS, alongside Gávea Investimentos. In April 2016, Goldman Sachs created a joint venture with Innova Capital Partners for the creation of Golden Comunicaciones, a BTS firm focused on the Colombian market. In the same year, the firm took over Gávea’s participation in CSS.

**GP Investments:** GP Investments is a leading investment firm in Latin America and was the firm behind BR Towers, one of the leading towercos in Brazil with its 4,200 sites that was sold to American Tower in 2014 for US$978mn.

**Grupo TorreSur:** With its 6,500 towers portfolio, GTS is the third largest towerco in Brazil and the largest private towerco in CALA. Headed by Jim Eisenstein, one of the pioneers of the U.S. tower industry and co-founder of AMT, GTS is funded by Providence Equity Partners, one of the leading equity firms in the global TMT industry.

**Hardiman Telecommunications:** A unique consultancy equally capable of advising on engineering and operational issues as they are on commercial strategy and corporate finance. Extensive experience advising on both the buy-side and sell-side in tower transactions.

**Highline do Brasil:** Currently headed by Fernando Viotti, Highline was created back in November 2012 to serve the Brazilian market with its BTS and co-location services. In 2017, Highline’s portfolio of 970 sites was acquired by SBA Communications in a private deal. The company is now back in business and has developed a growing portfolio of 205 new sites. Its investor Patria has recently expanded into Argentina via Atis Group.

**Housatonic Partners:** Housatonic Partners is a U.S. private equity firm with over US$1bn in capital under management. QMC Telecom is among its investments in the telecom infrastructure sector.

**Instituto Costarricense de Electricidad (ICE):** ICE is the State-owned electricity and telecom provider of Costa Rica. Operating under brand Kölbi, the company is the leading MNO in the country ahead of Movistar and Claro. ICE has to date retained its portfolio of ~1,000 towers, but has used towercos for new build and co-location.

**International Finance Corporation (IFC):** A member of the World Bank Group, the IFC is the largest financing institution in the world entirely focused on the private sector, with specific attention to developing and underdeveloped countries. In CALA, the IFC is involved in various debt financing projects with the likes of Phoenix Tower do Brasil, ON Telecom, Continental Towers and ALTÁN Redes.

**IIMT:** IIMT is a BTS and co-location firm active in Mexico where it runs approximately 600 sites. In addition to its own portfolio, IIMT enjoys an agreement with the Federal Electricity Commission in Mexico to utilise its infrastructure for telecom purposes.

**Indigo Capital:** Indigo Capital was founded in 1998 in New York and is an investment firm focused
on private equity in Latin America. Indigo Capital counts Torrecom and Torres Unidas among its current and past investments.

**ING:** Leading Dutch bank with considerable experience of providing debt finance to the tower industry. In April 2018, ING Bank (Brazil) and QMC Telecom announced the closing of a R$150mn (US$43mn) Delayed Draw Credit Facility and Team Loan.

**Innova Capital Partners:** Innova is a global investor focused on energy and infrastructure projects and the investing arm behind Golden Comunicaciones (Colombia), via a joint venture with Goldman Sachs.

**Innovatel:** Operating under the brand Torresec in most markets and headed by Manuel Aviles, Innovatel is a Puerto Rico based BTS firm active in Colombia, Peru, Panama, Ecuador, Puerto Rico and Argentina with a total portfolio of nearly 1,000 sites. In February 2019, Torresec sealed an agreement with the city of Neuquen (Argentina) for the installation of 50 sites.

**Intelli Site Solutions:** Intelli Site Solutions is a Mexican towerco focused on BTS projects as well as indoor and outdoor DAS. To date, the towerco runs a portfolio of over 300 towers across Mexico and enjoys an agreement with the Federal Electricity Commission (FCE) to utilise its infrastructure for telecom purposes.

**Internet Para Todos:** Formed by Telefónica, Facebook, IADB and CAF, Internet Para Todos is an innovative open access wholesale infrastructure operator that aims to provide connectivity in rural areas across Peru, where 3.2mn people only have access to voice services and 2.8mn don’t enjoy any coverage at all. The company will be deploying 4G technology on 3,130 sites that acquired from Telefónica and will build 1,000 towers between 2020 and 2021 with a total investment of US$100 mn, allowing Peruvian MNOs to provide signal on remote locations.

**JP Morgan:** Leading TMT advisory team with extensive experience in towers, including some of the landmark transactions.

**KPR Consult:** Renowned ‘tower doctors’ – go-to guys for structural and technical due diligence, improvement capex planning, decommissioning and just about anything to do with tower design and maintenance.

**Macquarie Group:** Australian Macquarie is a leading investment and advisory firm globally active in the telecom tower sector. Among its notable operations: investment in Mexico Tower Partners (via the Macquarie Mexican Infrastructure Fund and in conjunction with Digital Bridge), acquisition of InSite Wireless (Puerto Rico, U.S. and Canada) and participation in a consortium which acquired Crown Castle Australia (now Axicom).

**Madison Dearborn Partners:** MDP is the U.S. based private equity firm behind BTS firm Centennial Towers.

**Message Center Management (MCM, Inc.):** MCM is a U.S. independent developer and owner of telecom towers with a portfolio of around 800 sites. Its management team is among the leading forces behind two CALA towercos, Torrecom and Torres Unidas (prior to the sale to ATP).

**Mexico Tower Partners (MTP):** MTP is the largest independent towerco in Mexico beside American Tower. MTP was originally formed as a joint venture between Digital Bridge and Macquarie Mexican Infrastructure Fund. To date, the company owns over 2,050 sites across Mexico and is run by an experienced team led by José Sola, whose background includes successful spells within Global Tower Partners and Telefónica.

**MHC Holdings:** MHC is an investment firm focused on telecoms and emerging markets based in Panama. The firm backed Torres Andinas until the towerco sold its assets to SBA Communications and stopped operating in the region.

**Millicom:** Millicom is an international telecom company active in fourteen markets in Africa and Latin America, mostly trading under the brand Tigo. In the CALA region, Millicom is active in Guatemala, El Salvador, Honduras, Paraguay, Nicaragua, Colombia and Bolivia.

In 2019, Millicom initiated the acquisition of
Telefónica’s operations in Panama, Costa Rica and Nicaragua for an estimated US$1.65bn.

**Montezuma & Porto:** Montezuma & Porto is a Peruvian based law firm specialised in telecommunications, IT, Internet, data protection and other digital services. Partners Oscar Montezuma Panez and José Miguel Porto Urrutia have advised towercos and mobile operators on a variety of strategic issues.

**MVP Capital:** Financial brokers and advisors active in the U.S. since 1987. Clayton Funk, one of its Managing Directors, has been personally involved in 125 sale and leaseback transactions and although focused on the U.S., he always keeps an eye South of the border.

**MX Towers:** MX Towers is a towerco created by executives previously involved in the Macquarie Mexican Infrastructure Fund focused on offering DAS and other alternative solutions across Mexico. In 2018, MX Towers announced the acquisition of 72 towers from Maxcom in a sale and leaseback deal.

**NII Holdings:** NII Holdings was the company behind the Nextel brand. In 2019, the last Nextel brand of its portfolio - in Brazil - was sold to América Móvil for US$905mn. NII has received approval to dissolve its holdings once the deal is fully closed.

Between 2013 and 2015, NII Holdings run the Nextel brand in Chile, Peru and Mexico but then sold them respectively to Novator, Entel Chile and AT&T. Additionally, in 2013 NII Holdings divested 6,396 towers in Brazil and Mexico (to American Tower) and faced bankruptcy in 2015.

In 2016, NII Holdings sold all its remaining shares in Nextel Argentina to media giant Clarín Group. Nextel Argentina is now owned by Clarín’s subsidiary Cablevisión and is the fourth mobile operator of Argentina.

**Norton Rose Fulbright:** Norton Rose Fulbright is a Legal 500 law firm serving clients in a multitude of industries. Among them, the law firm provides services in the infrastructure and TMT arenas and is able to help its CALA clients via its offices in Brazil, Colombia and Venezuela.

**Oi:** Oi is the fourth mobile network operator of Brazil offering 3G and 4G LTE services. Since 2012, Oi has divested the majority of its 11,000+ towers across Brazil to Grupo TorreSur, BR Towers and SBA Communications and is reportedly seeking to divest the rest of its unsold assets.

In June 2016, Oi filed for bankruptcy protection for a total amount of US$19bn (the largest filing in the history of Brazil). The carrier has since resumed its activities, reporting a Q119 net profit of US$170mn and working to reduce its financial expense to reflect the in-court re-organisation agreement with creditors.

**Overseas Private Investment Corporation (OPIC):** OPIC is a U.S. Government financial institution that provides capital to private equity funds. They supported IHS and Helios Towers in Africa and also financed Apollo Towers in Myanmar, being the first U.S. institution to invest in the country. They work with IFC, Cartesian and Amzak Capital among others. In addition, they just approved a US$26mn allocation to support BTS expansion across Peru and Ecuador.

**Orange:** Orange is the leading French telecom operator founded in 1988 with operations in Europe, Africa, Asia and the Americas. In the Americas it is active in Guadeloupe, Martinique and French Guiana where it offers 3G services. Its Dominican Republic unit was sold to Altice in 2013.

**P2 - Pátria:** Pátria is a leading private equity firm active in Brazil in a variety of sectors including infrastructure and counting Blackstone among its partners. In 2012, Pátria invested in Highline do Brasil and in 2015 in Odata, a data centre infrastructure and co-location service company. As of 2017, P2’s latest investment in the sector is ATIS Group, an independent towerco active in Argentina.

**Peppertree Capital:** Peppertree is a private equity fund focused on growth equity, recapitalisation and buyout opportunities in the telecom infrastructure industry. Mostly focused in the U.S. where it has backed companies such as Branch Towers, 4G Towers, Clearview Tower Company and Light Tower Holdings, it keeps an eye on opportunities in Central and South America.
**Peterson Partners:** Peterson Partners is a private equity and venture capital firm primarily active in the U.S., Canada, Europe, Mexico, Brazil and India and counts QMC Telecom among its PE investments.

**Phillips Lytle LLP:** Phillips Lytle is a U.S. based law firm offering a wide range of services. Partner Douglas Dimitroff is an expert in DAS and other het-net solutions and is able to advise U.S. as well as international clients on their business and regulatory dynamics.

**Phoenix Tower do Brasil (PTB):** Phoenix Tower do Brasil is the Brazilian sister company of Phoenix Tower International (PTI), created after the acquisition of T4U Holdings by PTI. Run by former BR Towers’ CEO Mauricio Giusti and backed by Blackstone, PTB is the largest independent towerco in Brazil with a portfolio of over 1,550 sites. In recent news, PTB acquired small cell, DAS and urban solution company K2-Towers, led by Leandro Simões.

**Phoenix Tower International (PTI):** PTI was founded in 2013 by Dagan Kasavana, the M&A mastermind behind the GTP rollup strategy and sale to American Tower. PTI now owns and operates approximately 5,280 towers across the CALA region and in the U.S.

PTI has achieved its current scale via both organic and inorganic growth and is active in Argentina, Bolivia, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, French Antilles, Guatemala, Jamaica, Panama, Peru and the United States.

**Plata Tower Company:** Created in 2016 by one of the executives behind Brazil Tower Company and Arqueiro Telecom - Alex Sepehri-Nik - Plata Tower Company is a BTS firm active in Argentina.

**Providence Equity Partners:** One of the largest global private equity firms operating in the TMT industry with US$54bn in assets under management across complementary private equity and credit businesses. Providence is an investment partner of Brazilian towerco Grupo TorreSur.

**QMC Telecom:** QMC Telecom was founded back in 2008 and currently runs a portfolio of approximately 1,400 towers as well as rooftops and DAS in Brazil, Colombia, Puerto Rico as well as Mexico, where it operates under the Conex brand.

In July 2018, the towerco sealed a financing agreement with ING Bank for US$50mn in addition to the US$250mn previously raised.

**RBC Capital Markets:** RBC Capital Markets is a Canadian investment bank part of the Royal Bank of Canada. Jonathan Atkin, Managing Director of RBC’s Telecom Research, is one of the most respected analysts in the global telecom and tower space and regular at TowerXchange Meetups.

**Rent-A-Tower:** Rent-A-Tower is a BTS firm active in the Mexican market.

**SBA Communications (SBA):** With almost 30,000 towers across the U.S., Central and South America and Canada, SBA is one of the top ten towercos in the world. SBA runs over 13,000 sites across Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Nicaragua, Panama and Peru.

The towerco’s latest deals include the acquisition of Highline do Brasil, Torres Andinas as well as Tigo El Salvador’s portfolios.

**Scotiabank:** In November 2015, Scotiabank granted to Phoenix Tower Dominicana (Phoenix Tower International subsidiary) a US$45mn five-year credit facility to finance the acquisition of Teletower Dominicana and further develop its portfolio in the country. In April 2017, Phoenix Tower International sealed another loan facility for US$120mn with Scotiabank to finance wireless infrastructure across Latin America and the Canadian bank also advised the towerco during the acquisition of 1,049 towers from Altice Dominicana back in July 2018.

Among its latest involvements, Scotiabank acted as lead arranger and bookrunner for the financing of the Andean Tower Partners’ acquisition of Torres Unidas and acted as the buyer’s financial advisor.

**Sercomtel:** Sercomtel is a local mobile network operator serving the Brazilian region of Paraná.

**Silver Swan Capital:** Silver Swan Capital, a NY-
based investment firm, sealed a US$40mn funding deal with Brazil Tower Company in August 2016 to finance the towerco expansion plans across Brazil.

**Skysites**: Skysites is an infrastructure firm active in Brazil focused on BTS, small cells, co-locations and iDAS. The company is led by Roberto Massaru Nishikawa.

**Southern Cross Group**: Southern Cross Group is a private equity firm focused on Latin America with offices in Argentina, Brazil, Chile, Colombia, Mexico, Uruguay and the U.S. Mexican BTS and MSP firm Even Telecom is among its latest investments in the telecom infrastructure industry.

**Telecommunications Partners**: Telecommunications Partners is a BTS firm active in the Peruvian market.

**Telecom Argentina**: The Argentinian MNO is the market leader by subscribers. After the merger with Cablevisión, the cable broadband unit of Grupo Clarín, Telecom Argentina absorbed Nextel’s portfolio and the new consolidated giant announced a two-year investment plan of US$5,000mn to boost connectivity through a considerable infrastructure upgrade and expansion.

The company has a portfolio of 6,553 sites made of 5,084 owned towers and 1,469 co-locations and they are planning to build around 700 towers before the end of the year.

**Telefónica**: Telefónica is a Spanish telecom company active in Europe, Asia, North, Central and South America. Since 2011, the MNO has divested over 11,000 towers across the region and has since created its infrastructure arm, Telxius in 2016. After a tentative IPO in 2016, Telefónica has finally transferred 40% of its stake in Telxius to private equity firm KKR.

In 2019, the MNO has divested its Central American operations to América Móvil (El Salvador and Guatemala) and Millicom (Panama, Costa Rica and Nicaragua).

**Telesites**: Telesites is the infrastructure company created by Carlos Slim which debuted on the Mexican stock exchange in December 2015. As of Q1 2018 the company owns and manages 15,066 towers in Mexico as a result of the transfer of assets from América Móvil as well as organic growth. Additionally, Telesites is active in Costa Rica where it has built 268 sites for Claro as of Q1 2018, and has started operations in Colombia.

**Telxius**: Telxius was created in February 2016 by Telefónica with the goal to manage the operator’s infrastructure including its towers and sub-sea cable. To date, Telxius manages over 13,350 sites in Europe, 1,655 in Brazil, 304 in Argentina, 327 in Chile and 849 in Peru. In addition, the company runs 31,000km of submarine fibre optic cable, including SAM-1, a submarine cable that connects the United States with Central and South America. After a tentative IPO in 2016, Telefónica has finally transferred 40% of its stake in Telxius to private equity firm KKR.

**Tillman Global Holdings (TGH)**: Multinational tower and infrastructure investment and operations firm led by Sanjiv Ahuja, former Chairman and co-founder of Eaton Towers and ex-CEO of Orange. TGH has a joint venture partnership with JC Decaux, giving them the opportunity locate points of service, particularly small cells, on over 1mn prime locations worldwide. TGH is pursuing a couple of key opportunities in CALA.

**TIM Brasil**: Owned by Telecom Italia, TIM Brasil is the second mobile network operator in Brazil, serving more than 70mn subscribers across the country. In 2014, TIM entered into a sale and leaseback transaction with American Tower for the sale of the majority of its sites in various tranches. The deal was finalised in 2017 with a total of 5,873 sites transferred for a total value of US$850mn.

**TOCSA Towers**: TOCSA Towers is a BTS firm active in Central America.

**Torrecom**: Torrecom is a leading BTS firm with a portfolio of over 880 towers across Nicaragua, Guatemala, Mexico and Panama. The firm is now expanding into the Andean region. Its management team includes experienced executives from U.S. towerco MCM, Inc. such as Maria Scotti who acts as CEO and Eric Zachs, Co-Chairman and Co-Founder of MCM. Indigo Capital is one of the investment firms behind Torrecom.
Torres Andinas: Torres Andinas was a BTS firm active in Colombia and Peru. The firm stopped operating in the region following the sale of its assets to SBA Communications in 2017.

Torres Unidas: Torres Unidas operated 1,644 sites across Chile, Colombia and Peru before its acquisition by Andean Tower Partners in 2017. Led by Daniel Seiner, who is now CEO of ATP Torres Unidas, the towerco was backed by Berkshire Partners.

Tower One: Tower One was launched in 2015 and is a towerco listed on the Canadian Stock Exchange. The company has operations across multiple international markets including Canada, Colombia, Argentina and Mexico.

Uniti Towers: a Latin American towerco, subsidiary of CS&L, a U.S. based REIT, Uniti Towers sold its assets to Phoenix Tower International in February 2019 and closed its regional operations. The US$100mn transaction included approximately 500 towers across Mexico, Colombia and Nicaragua.

WOM: WOM is the fourth mobile network operator in Chile where it’s been offering 4G LTE since the end of 2015.

Vinson & Elkins (V&E): V&E is one of the oldest and largest international law firms, with approximately 700 lawyers located in 15 offices around the world. Their global telecommunications team has extensive experience advising on international telecoms and telecoms infrastructure transactions in numerous countries.

Viva Bolivia: Viva is the third mobile network operator in Bolivia and is owned by Trilogy International Partners. Viva launched its 4G LTE services in July 2015. In February 2019, Phoenix Tower International announced a sale and leaseback with Trilogy for 600 towers in Bolivia.

Viva Dominicana: Viva Dominicana is the third mobile network operator in the Dominican Republic where it offers 3G services. In March 2016, the MNO sealed a deal with Phoenix Tower International over the sale of 145 sites and transfer of marketing rights of a further 400 towers. In November 2015, Trilogy International Partners sold Viva Dominicana to Telemicro Group, owned by local entrepreneur Juan Ramon Gomez Diaz.

Who have we missed?

Have we missed a company active in the CALA telecom tower market? Then please email Arianna Neri, MD - Americas and Asia, at aneri@towerxchange.com and don’t forget to sign up for the sixth TowerXchange Meetup Americas, taking place in Boca Raton, 9-10 July. More details can be found on our website: www.towerxchange.com/meetup/meetup-americas/
2019 UPDATED: Demand forecasts for passive infrastructure equipment and services in Central and South America

TowerXchange checks in on demand across six different categories of equipment and services in the 15 most active CALA tower markets

The CALA telecom infrastructure market is home to some of the most interesting countries in terms of communications infrastructure build and upgrade. 2019 see several towercos starting to explore energy services, which will require enhanced monitoring and access control systems, there are also enhanced fibreisation plans in key markets such as Mexico and Argentina, the consolidation among operators with Telefónica divesting its Central American operations and Millicom enhancing its position. These are just a few of the top events affecting the regional industry and, in light of them, TowerXchange is pleased to offer an updated overview of the most significant opportunities for equipment and service providers across CALA.

In the run up to sixth edition of the TowerXchange Meetup Americas, taking place July 9-10 in Boca Raton, we offer our readers an exclusive analysis of where opportunities lie for tower and smart pole manufacturers, turnkey providers, small cell and DAS, energy solution providers, RMS and site management system suppliers, access control experts as well as consultants.

In this article, we analyse the dynamics of the top markets in the region as well as provide a snapshots of some of the other countries which are yet to see any towerco activity but might become interesting targets in the future.

Keywords: Access Control, Americas, Argentina, Asset Lifecycle Platform, Batteries, Belize, Bolivia, Brazil, Build-to-Suit, Capex, Central America, Chile, Colombia, Costa Rica, Cuba, DAS, Dominican Republic, Ecuador, El Salvador, Energy, Energy Storage, Guatemala, Honduras, Hybrid Power, IBS, Jamaica, Lawyers & Advisors, MNOs, Managed Services, Market Forecasts, Market Overview, Masts & Towers, Mexico, Monitoring & Management, Nicaragua, O&M, Off-Grid, On-Grid, Panamá, Paraguay, Passive Equipment, Perú, Procurement, RMS, Sale & Leaseback, Site Management System, Small Cells, South America, Steelwork, Strategic Consultancy, TowerXchange Research, Towercos, Unreliable Grid, Uruguay, Venezuela

Read this article to learn:
- Which markets should be business development priorities for solution providers?
- What is happening in terms of new network deployments across the Americas?
- Which MNOs could still sell their towers and generate new business in terms of tower upgrades and O&M contracts?
- Which countries need towers and which projects are driving growth?
- Which are the hottest markets for small cells and DAS?

Here is a list of the specific categories we are analysing:
- Energy: with towercos starting to go beyond steel and grass and offering efficient energy management
solutions to their customers, solution providers interested in the region have an interesting opportunity to expand their portfolio of clients beyond carriers. Renewable energy solutions, more efficient batteries and partnerships with ESCOs are all being analysed and taken into consideration.

- **RMS, ILM and access control:** while RMS and ILM are still a relatively new concept in CALA, access control solutions are among the top products being purchased by both MNOs and towercos to secure their sites and equipment. In fact, theft is a real threat to business continuity and regional players report it to be a more stringent issue in urban environments than in rural areas.

- **Towers and Smart Poles:** BTS levels have been a bit slower than expected in 2019, but the outlook remains positive and several spectrum auctions planned in Mexico, Guatemala and Colombia which should lead to stronger investments to densify networks in both rural and urban environments. Key regional players expect to build 50-75% traditional macro towers, 25-50% alternate site typologies over the next two years.

- **Small cells, IBS and DAS:** While slower than in other geographies, new technologies are starting to be adopted across CALA. Opportunities for small cells are intensifying in Brazil while IBS is stronger in Mexico and Peru. As towercos open up to becoming neutral hosts, TowerXchange expects the deploying of het-net solutions to intensify.

- **Advisory and consulting:** Where are deals happening? Which countries are still designing their telecom and infrastructure legal framework? These are the markets where the expertise of consultants and law firms is high on demand!
### Vendor opportunity matrix

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<tr>
<th>Vendor opportunity matrix</th>
<th>Towers and Smart Poles</th>
<th>Energy</th>
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<tbody>
<tr>
<td>Argentina</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Telecom, Movistar and Claro</td>
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Argentina has around 17,252 towers (most in hands of the MNOs) and needs to double or triple that number in order to reach acceptable levels of coverage. Towercos landed in Argentina three years ago and despite the huge potential of the market, they haven’t achieved the expected level of penetration due very complex permitting and tax regimes as all the licenses have to be approved by local municipalities that don’t necessarily respond to the central government authority. Additionally, operators are very reluctant to release their assets so it’s very hard for international towercos to develop a reasonable footprint there. However, the potential of this market is enormous and if regulators, operators and towercos can overcome these barriers, Argentina will become one of the biggest and most dynamic tower markets in CALA.

Telecom, the market leader in terms of subscribers and number of towers (6,553 sites) is very open to collaborate with towercos and they will allocate around 40% of their 710 new sites to tower companies in 2019. Claro plans to build 200 new sites and 30% will be done by towercos, while Telefónica is building just around 100 new sites and 40% of them will get done through BTS contracts - mostly by Telxius and SBA as they have master agreements. MNOs also build their towers independently so there is also big potential for infrastructure providers to work directly with operators, who also prefer to manage small-cell and urban solutions deployment independently, dealing with the technology provider directly.

While grid access is not a major issue, MNOs need power solutions for off-grid sites and for those on unreliable grids, and this will become an increasingly crucial requirement as MNOs deploy networks in remote areas. All three operators use acid lead batteries and generators as backup but they are all considering and testing new power solutions such as lithium batteries and renewable energy systems. For security, another key operational concern, they are also testing access control technologies and any alternative that can prevent vandalism and theft, from concrete walls to electronic lockers.

As most of the operators are in need of capital and everybody in the industry is struggling with permits and local regulators, Argentina also holds plenty of opportunities for private equity firms, banks as well as legal and finance advisors.

The Ministry of Modernization and telecoms regulator ENACOM are working on a few initiatives to improve the permitting process while MNOs are changing both their culture and strategy, becoming more open to the idea of working with tower companies. Argentinian economy is slowly recovering and MNOs are building again so we can expect great opportunities for infrastructure providers and vendors in the short term, although they will all have to deal with the particular complexity of working in the country.
Earlier this year, Bolivia finally welcomed PTI as the country’s first independent towerco and the company has sealed a sale and leaseback deal with Trilogy International Partners’ subsidiary NuevaTel for 600 sites. The deal will bring new opportunities for solution providers and engineering companies. As it normally happens after a SLB deal, capacity enhancements are likely as well as the implementation of site security solutions and an overall effort to rationalise the portfolio and make its management as efficient as possible.

Meanwhile, operators are expanding and upgrading their networks. State-owned MNO Entel is investing US$288mn in deploying 700 new sites and expanding its and fibre-optic networks this year, while Tigo has also announced a US$150mn investment to expand its 4G LTE footprint and HFC network.

Electricity is a state-owned business in Bolivia and over 60% of it is currently supplied via thermal generation, with the remaining 40% being produced thanks to hydropower. The Bolivian government is heavily engaged in providing universal access to electricity and over-producing in order to export. However, some energy solutions are likely to be needed when coverage plans extend to rural communities beyond the reach of reliable grid.
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<tr>
<td>Brazil</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>TIM Brasil, Vivo, Claro, Oi, Algar Telecom</td>
<td>American Tower, SBA Communications, Grupo TorreSur, Phoenix Tower do Brasil, CSS, Brazil Tower Company, AlfaSite, Centennial, QMC, Skysites, Highline do Brasil</td>
</tr>
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</table>

After a few quiet years, Brazil is re-emerging as one of the most dynamic and innovative telecoms market in the region and MNOs are firmly demanding flexibility and creativity from their infrastructure partners. Claro, who has recently consolidated its position with the acquisition of Nextel, is now focusing on network upgrades rather than deployment. The MNO is modernising its electronic equipment (rectifiers, lithium batteries and generators) to battle intermittency while investing in auto generation by developing the country’s biggest private renewable energy project to cut energy cost—a regional trend that the other MNOs are also exploring. Oi has closed a distribution agreement with Minas Gerais’ electricity company CEMIG to provide solar to its operations in the state, while the company develops a pilot solar project in São Paulo.

TIM and VIVO are also testing renewables, both through auto-generation and by closing PPA agreements with energy providers. Furthermore, the government is incentivising renewables deployment and private companies that develop solar projects can “sell” their surplus back to the grid, bringing opportunities not just for towercos to diversify their business, but also for vendors, turbine and panel manufacturers, ESCOs and battery providers. Pushed by the above, the majority of towercos operating in Brazil are now considering to offer energy management services, a real game changer after years of steel and grass operations and a huge opportunity for ESCOs and vendors in the energy space.

Investments in innovation are intensifying, with both MNOs and towercos eyeing opportunities to deploy smart urban solutions, new site typologies and small cells. Always at the forefront, PTB has recently acquired small cells firm K2 Towers and is likely to further diversify into het-net solutions.

Security remains a critical issue for both towercos and operators, who are actively seeking access control and remote monitoring systems to efficiently track their spread footprint across Brazil’s vast geography.

With Oi’s portfolio on sale and a few mid size towercos such as Highline do Brasil expanding their portfolio, there are also plenty of consolidation, M&A and investment opportunities.
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<tr>
<td>Chile</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Movistar, Entel, Claro, WOM</td>
<td>American Tower, Balesia, SBA Communications, Telxius, ATP Torres Unidas</td>
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| Chilean players have become quite creative when it comes to installing new sites, also as a function of the much discussed Tower Law. Since then, plenty of local and international firms have flooded the Chilean market with new options to overcome the limitations imposed by the law and still be able to proceed with densifying the national infrastructure network. New site typologies, concealed towers, DAS and small cells have all come into play in Chile. Currently, Chile is the 5G test bed for América Móvil’s trials in Latin America and the most advanced country on this front, which will result in enhanced opportunities for producers of infill sites such as lightpoles, shortpoles and beyond. Market leader Entel is investing US$210mn on upgrading capacity and coverage of its 4G networks, while also deploying independently and through BTS, focusing on lower sites and urban typologies.

Chile relies heavily on both thermal (approx 38%) and hydropower (approx 62%) for its electricity supply. The government has been involved in the construction of various new hydropower and coal-fired thermal plants as well as a 500MW solar power generation project. Around 99.6% of the population has access to electricity. |

| Colombia                   | Medium                | Medium | Low                                          | Medium                  | Medium                                              | Low     | Claro, Movistar, Tigo, Avantel | American Tower, SBA Communications, ATP Torres Unidas, Centennial, Golden Comunicaciones, Innovattel/Torresec, Torrecom, PTI, QMC, Tower One and various small developers |
|                           |                       |        |                                             |                        |                                     |         |                               |                                |
| Finally, the Ministry of Information Technology and Communications (Mintic) has invited MNOs to express their interest in the 700MHz, 1.9GHz and 2.5GHz spectrum auctions. The auction should take place in Q419 and could considerably boost the level of investment of MNOs after a few fairly slow years in terms of network deployment and tower builds. Good news for the many towercos active in the country! The auction is expected to drive more BTS activities and network upgrades. The country’s networks are generally underdeveloped although the QoS is relatively good. \n
The Colombian electricity sector relies mostly on hydropower (65%) and thermal generation (35%). The country is yet to fully explore its renewable potential while a transmission line connecting Colombia with Central America is currently underway. The government has created a system of cross-subsidies between higher income / large consumers and low income / low users of electricity (and water). Around 97% of the population has access to electricity. |
Last year’s spectrum auction and the entrance of Tigo (which is taking over Movistar’s assets) guarantee a busy 2019 for Costa Rica’s telecom market. Both Claro and Tigo should up their deployment games. In the meantime, State-owned Kölbi is currently deploying fibre across the country’s key cities.

In 2018, the country has run on 100% renewable sources for 300 days non-stop and 99.5% of the population have access to electricity in one of the most advance countries in terms of electricity across CALA and both MNOs and towercos are expected to continue increasing their renewable energy use.

Phoenix Tower International acquired Altice’s 1,000+ sites in the country in 2018 and is the market leader.

With the grid neither complete nor reliable, RMS and energy equipment suppliers could find plenty of business in the DR (and elsewhere in the Caribbean). In fact, PTI is partnering with ESCOs and cutting down energy consumption by 80%. Claro, the market leader, is actively exploring renewable energy solution for its infrastructure and has already installed solar panels in 40 sites. The MNO is also testing lithium batteries and access control systems to modernise its network and improve efficiency.

The Dominican Republic has been going through years of electricity crisis, blackouts and overall inefficiency of the sector. To date, 86% of its electricity is supplied by fossil sources and it’s been noted by the World Bank that the country’s overall economic growth depends greatly on the improvement of its electricity sector. Around 98% of the population has access to electricity but as said, the grid remains unreliable in many areas.
### Vendor opportunity matrix

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<tbody>
<tr>
<td>Ecuador</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Claro, Movistar, CNT</td>
<td>SBA Communications, Innovatel/Torresec, Balesia, Aplicanet, Ecuador Tower Company</td>
</tr>
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</table>

While Ecuador is a quiet market compared to the other Andean countries, it also also enjoyed some movements over the past few months. A few new towercos entered the market, hinting at enhanced levels of demand for BTS firms possibly also as a result of Claro’s investment plans (US$450mn by 2020) to improve its network and capacity. The Government is also looking at appointing a private administrator to run State-owned CNT. At the moment, CNT is the strongest builder and providing plenty of BTS opportunities to existing towercos.

56% of the country’s installed electric capacity comes from thermal power and around 33% from large hydropower with the remainder 11% split between various forms of clean energy. In 2011, the government has launched regulation 004/11, creating its first FiT (Feed-in-Tariff) initially benefiting mainly photovoltaic projects and then open to non-solar FiT. Around 97.2% of the population has access to electricity.

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<thead>
<tr>
<th>El Salvador</th>
<th>High</th>
<th>Medium</th>
<th>Medium</th>
<th>High</th>
<th>Low</th>
<th>Low</th>
<th>Tigo, Claro, Digicel, Red</th>
<th>SBA Communications, Phoenix Tower International, Continental Towers</th>
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</table>

After a two-year delay, El Salvador is currently undergoing a spectrum auction for 140MHz. In the meantime, Telefónica has sold both Guatemala and El Salvador units to América Móvil so towercos will need to tighten their belts and become even more efficient. Tigo has agreed to sell its 800 towers to SBA Communications while announcing a 4-year US$1bn investment plan while Digicel is committed to a US$450mn investment on 4G LTE. These news should bring plenty of opportunity to solution providers involved in tower manufacturing, turnkey services as well as backup energy solutions.

El Salvador is the N. 1 producer of geothermal energy in Central America. Its hydroelectric sector is mostly public while the other sources are in the hands of private companies. To date, 40% of its electricity is supplied via fossil sources and 60% thanks to hydroelectric and geothermal plants. The country is part of SIEPAC, a project aiming at integrating the electricity networks of Central American countries. Around 93.7% of the population has access to electricity.
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<tr>
<td>Guatemala</td>
<td>Medium</td>
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<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Tigo, Claro</td>
<td>SBA Communications, Torrecom, Continental Towers</td>
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After Telefónica’s acquisition, Claro will only compete with market leader Tigo in Guatemala, where the election is going to delay the auction of 1700MHz AWS frequencies that was scheduled for June as confirmed by the Ministry of Communications. The duopoly is a concern to towercos and the entrance of a third operator via the spectrum auction would be preferable.

In spite of the turmoil, towercos have enjoyed steady BTS activity in the country.

Guatemala’s electricity comes from fossil-based sources (46%), hydropower (26%) and other renewables such as small-hydro and biomass (29%). The country is part of SIEPAC, a project aiming at integrating the electricity networks of Central American countries. Around 78.5% of the population has access to electricity.
2019 has been a good year so far for Mexican towercos. This is mostly due to ALTÁN Redes' Red Compartida which has achieved its first deployment target (30% of the population by March 31) and started to utilise BTS firms after a first phase of co-locations. This is a great news not only for active towercos but also for tower manufacturers.

In the meantime, MX Towers has sealed a deal with Maxcom to acquire 72 telecom towers in a sale and leaseback deal. Another sign that the market is picking back up also on the deal front. PTI entered the fibre market with an acquisition in Q318 and currently deploying more fibre across Mexico. Players report good opportunities for In-Building Solutions (IBS) while small cells aren't growing as fast as originally expected.

TowerXchange is aware of several towercos eyeing energy management options to improve the efficiency of their sites and offer shared solutions to their tenants.

After freeing up the 5G-suitable 600MHz band, IFT has confirmed in late 2018 its intention to auction it alongside additional frequencies in the 1700MHz and 2.5GHz bands.

The Mexican constitution requires the electricity sector to be federally owned and the Comisión Federal de Electricidad is in charge of its organisation, while a lot of renewable energy providers are entering the market and offering alternative power sources to MNOs. The electricity sector is mainly focused thermal sources (75%) followed by hydropower (19%) and a small component of geothermal energy (2%) and nuclear energy (2.4%). Around 99.1% of the population has access to electricity.
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<tr>
<td>Nicaragua</td>
<td>Medium</td>
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<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Claro, Tigo, CooTel</td>
<td>SBA Communications, Torrecom, Continental Towers</td>
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<td>Panama</td>
<td>Medium</td>
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<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>Cable &amp; Vision, Claro, Digicel and Tigo</td>
<td>SBA Communications, Phoenix Tower International, Torrecom, Continental Towers</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

The major headline in the country has been the acquisition of Telefónica by Millicom, as part of the Spanish giant’s divestment of its Central American operations. Millicom is expected to consolidate the two units in the upcoming months. While towercos might experience a short-term slow down of activities, the merger is likely to generate new business opportunities, with a stronger and more competitive operator active in the country. Up until now though, MNOs have enjoyed steady growth thanks to a solid BTS pipeline and positive 4G densification activities.

In the meantime, the Nicaraguan regulator Telcor is currently looking at reforming the 1995 telecom law with new and improved terms that could mean good news for the local telecom sector.

Out of all countries in Central America, Nicaragua is the one with the lower levels of electricity generation and access to electricity. Its supplies rely heavily (75%) on fossil energy (oil) and only 25% on alternative sources such as hydro and geothermal. The country is part of SIEPAC, a project aiming at integrating the electricity networks of Central American countries. Around 77.9% of the population has access to electricity.

Thanks to its solid dollar-based economy, good electrification (over 80% of rural areas connected to the grid) and political stability, the country has become a new hub for towercos with the likes of SBA, Torrecom and PTI all active in the market. The country presents interesting BTS opportunities thanks to its high quality carrier landscape. Before the sale to Millicom, Telefónica signed a five-year PPA with a solar generation company to reduce power cost by 40%.

Panama presents plenty of opportunities for small cells and other new technologies especially in Panama City.
Paraguay has welcomed its first towerco with the sale and leaseback deal sealed last year between Tigo and American Tower but since then, no other towerco has entered the local market. This might be due to the fact that the country did not present critical deployment needs. However, following the January 2018 spectrum auction, awarded carriers (Tigo, Claro and Personal) might announce strong deployment plans which could lead to new towercos eyeing the market.

In recent months, Millicom has started to modernise its RAN infrastructure as well as its 2G, 3G and 4G sites. The MNO is getting ready to deliver 5G and IoT services and currently enabling 4x4 MIMO capabilities. Additionally, the company is deploying micro radios to boost hot-spot capacity.

The Paraguayan electricity sector is a public monopoly and the country is one of the world's largest exporters of hydropower, which is being exported to Argentina and Brazil. With less than 0.1% of its electricity being supplied via fossil fuels, the country enjoys some of the lowest tariffs in the region. The sector is still heavily affected by the lack of investment in both transmission and distribution. Around 98.2% of the population has access to electricity.
2019 was expected to be a big year of carriers’ investments for Peru but for now, the market has proven to grow slower than originally planned. This isn’t bad news though as carriers are reviewing their plans and starting to announce their plans, just a few months later than expected. Network upgrades and capacity enhancements will all become a necessity in the short term.

Since our last update, Phoenix Tower International entered the market via a private deal, SBA Communications acquired Torres Andinas’ sites (with the latter exiting the market) and Torres Unidas merged operations with Andean Tower Partners in a landmark deal for the Andean region. Peru remains one of the most exciting countries in the region and offers plenty of opportunities for solution providers in a variety of sectors. Small cells, DAS and alternative site typologies are one of the top priorities for local carriers involved in cell site densification projects, while towercos remain active on the BTS front. In the meantime, Telefónica, IADB, CAF and Facebook have created Internet Para Todos, a neutral infrastructure service provider that will provide connectivity to six million people across rural areas. The company will upgrade the 3,100 2G sites they received from Telefónica to 4G and will deploy 1,000 greenfield rural sites in 2020-2021. Meanwhile, Entel plans to keep expanding its footprint in Peru and the Chilean operator has announced investments of US$140mn for its network deployment and US$30mn for fibre expansion in 2019.

The country’s assorted geography brings some operational challenges and while the grid is good in urban areas, towercos and MNOs will require alternative power and storage solutions when expanding to rural and remote areas. Signal transportation is also a critical challenge and the government will keep investing in fibre to ease connectivity and reduce MNO satellite dependence in rural scenarios.

The Peruvian electricity sector has improved considerably since the 90s. In fact, access to electricity moved from 45% in 1990 to 88.8% in 2011, mostly thanks to the privatisation reform of the 90s. To date, fossil energy accounts for 52% of the overall production with 48% relying on renewable suppliers (hydropower). Around 91.2% of the population has access to electricity.
Who’s who in the global tower market

Part one: the world’s dozen largest towercos, with tower counts in excess of 20,000

Welcome to the TowerXchange who’s who of global towercos. In this new series of four reference articles, we will profile the 139 tower companies known to TowerXchange with a tower count in excess of 300. We’ll introduce each tower company and seek to differentiate them in terms of footprint, business model and ownership profile. Part one of this series covers the world’s 12 largest towercos, who between them own 55% of the world’s 4.55mn investible towers and rooftops. Note that the data in this article was compiled in March 2019.

Keywords: American Tower, Best of TowerXchange, Bharti Infratel, Business Model, CTC, Carve Out, Cellnex, China Tower Corporation, Crown Castle, DAS, Deutsche Funkturm, edotco, Fibre, GTL Infrastructure, IHS Towers, Indus Towers, KPIs, Market Overview, Multi-Region, Reliance Infratel, Research, SBA Communications, Sale & Leaseback, Small Cells, Tenancy Ratios, Tower Count, Towercos, Valuation, Who’s Who

Read this article to learn:
- The origins of the world's top dozen tower companies
- Their geographical footprint
- Which provide only “vertical real estate” and which provide power as a service
- Which are “pureplay independent” towercos, and which are 51%+ owned by parent MNO(s)
- A comparison of some of their key performance indicators: tower count, head count, revenue, EBITDA and margin

American Tower

Disciplined globalisation
Tower count: 170,996

One of the ‘founder’ U.S. towercos that originated the independent tower company business model more than two decades ago, American Tower (AMT) dates back to 1995. Originally a consolidator of radio assets, the founders of what was to become American Tower were quickly attracted to the recurring revenues generated by wireless companies leasing space on radio masts.

American Tower was spun off from then parent company American Radio in 1998, with the newly telecom infrastructure focused entity listing on the NYSE as AMT at a price of US$17.38 – today (March 2019) AMT stock is valued at over US$190, with a market cap of US$85.5bn, up over 33% in the last six months. AMT became a member of the Fortune 500 in 2017.

When last disclosed in their 2018 annual report, AMT had 5,026 employees.

While constantly vying with Crown Castle for the title of U.S. domestic market leader, American Tower has the most diverse geographical footprint of all the world's towercos, with a presence in 16 countries. International markets now generate ~45% of AMT’s site revenues. AMT's international expansion is driven by a disciplined investment thesis: while AMT has a lower cost of capital than many competitive bidders, the company will not overpay for towers, and seeks out assets in countries where rule of law can be relied upon.
### Key milestones in the last decade in the international telecom tower industry

**2007-2008**
- First towercos appear outside USA – in India, Indonesia and Nigeria

**2009**
- AMT enters India, large tower sale and leasebacks begin in India

**2010**
- First tower sales in Africa (by MTN, Millicom and Cell C)

**2011**
- Telefonica sells majority of their towers in Brazil, Mexico and Chile to SBA, Grupo TorreSur and AMT

**2012**
- Indosat sells towers in Indonesia to Tower Bersama
- KPN completes the first large scale tower sale in Europe
- MTN and Orange sell towers in Cameroon and Côte d’Ivoire to IHS

**2013**
- Brazilian MNO Oi sells its towers to SBA, BR Towers and Grupo TorreSur
- AMT buys the world’s leading private towerco GTP for $4.8bn
- Nextel sells its towers in Brazil and Mexico to AMT
- Telenor and Ooredoo licensed in Myanmar, rollout undertaken by 5 towercos who now own 70% of towers
- Launch of edotco, Axiata’s towerco, which is now in 7 Asian countries
- Creation of China Tower – Chinese MNOs no longer allowed to build towers
- Creation of Iranian Towers joint venture between MCI, RighTel and towerco Fanasia

**2014**
- Axiata sells towers in Indonesia to STP
- Airtel sells majority of their African towers to IHS, AMT, Eaton Towers and Helios Towers
- Cellnex completes the first of 7 major tower acquisitions in Europe
- Telefonica sells majority of their towers in Brazil, Mexico and Chile to SBA, Grupo TorreSur and AMT
- Cellnex successfully IPOs earning a US$3.6bn valuation
- Indus Towers and Bharti Infratel to merge, creating 164,000+ tower giant
- China Tower is world’s biggest IPO since 2016, raising US$7.5bn
- America Movil carves out its Mexican towers into towerco Telesites
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- AMT buys India’s second largest towerco Viom Networks for $1.18bn
- MTN sells towers in Nigeria, Rwanda and Zambia to IHS. Etisalat also sells to IHS in Nigeria
- Telefonica carves out Spanish, German and remaining LatAm towers to Telxius, sells 40% to KKR
- Telkom South Africa carves out Gyro Towers

**2015**
- Cellnex buys the world’s leading private towerco GTP for $4.8bn
- AMT buys India’s second largest towerco Viom Networks for $1.18bn
- Airtel sells majority of their African towers to IHS, AMT, Eaton Towers and Helios Towers
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- Telkom South Africa carves out Gyro Towers

**2016**
- AMT buys India’s second largest towerco Viom Networks for $1.18bn
- Tim Brasil completes sale of 5,873 towers to AMT

**2017**
- Telefonica carves out Spanish, German and remaining LatAm towers to Telxius, sells 40% to KKR
- Telkom South Africa carves out Gyro Towers
- Creation of Iranian Towers joint venture between MCI, RighTel and towerco Fanasia

**2018**
- 1st tower sale and leasebacks announced in MENA (Zain/IHS in Saudi Arabia and Kuwait)
- Indus Towers and Bharti Infratel to merge, creating 164,000+ tower giant
- China Tower is world’s biggest IPO since 2016, raising US$7.5bn
- Altice carves out their towers in France and Portugal
- 4 towercos licensed in Bangladesh – MNOs no longer allowed to build towers
- Valuation of US towerco giants AMT, Crown Castle and SBA passes a combined $150bn
- Vodafone, Telenor and several other MNOs planning to carve out towercos

**2019**
- Reliance Jio seeks to sell their towers and pole sites in India
- Cellnex announce 14,700 tower and BTS deal with Iliad
American Tower transaction history in the last decade

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Tower count</th>
<th>Deal value US$mns</th>
<th>Cost per tower US$</th>
<th>Deal structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Kenya</td>
<td>Telkom Kenya</td>
<td>715</td>
<td>Undisclosed</td>
<td>Undisclosed</td>
<td>SLB</td>
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<tr>
<td>2018</td>
<td>India</td>
<td>Idea Cellular</td>
<td>9,900</td>
<td>$592.7mn</td>
<td>$59,868</td>
<td>SLB</td>
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<td>2018</td>
<td>India</td>
<td>Vodafone India</td>
<td>10,200</td>
<td>$597.9mn</td>
<td>$58,172</td>
<td>SLB</td>
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<tr>
<td>2017</td>
<td>Brazil</td>
<td>TIM Brasil</td>
<td>5,873</td>
<td>$850mn</td>
<td>$144,730</td>
<td>SLB</td>
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<tr>
<td>2017</td>
<td>Mexico</td>
<td>Axtel</td>
<td>142</td>
<td>$56mn</td>
<td>$394,366</td>
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<tr>
<td>2017</td>
<td>Colombia</td>
<td>Millicom</td>
<td>1,200</td>
<td>$147mn</td>
<td>$122,500</td>
<td>SLB</td>
</tr>
<tr>
<td>2017</td>
<td>Paraguay</td>
<td>Millicom</td>
<td>1,400</td>
<td>$125mn</td>
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<tr>
<td>2016</td>
<td>Argentina</td>
<td>CyCSA</td>
<td>N/A [1]</td>
<td>Undisclosed</td>
<td>Undisclosed</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>India</td>
<td>Viom Networks</td>
<td>42,200</td>
<td>$1,180mn</td>
<td>Undisclosed</td>
<td>Partial acquisition</td>
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<td>2016</td>
<td>South Africa</td>
<td>Eaton Towers</td>
<td>300</td>
<td>Undisclosed</td>
<td>Undisclosed</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>FPS Towers</td>
<td>2,482</td>
<td>$697mn</td>
<td>$280,821</td>
<td>Company acquisition</td>
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<td>2015</td>
<td>India</td>
<td>KEC International</td>
<td>381</td>
<td>$13mn</td>
<td>$34,121</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2015</td>
<td>USA</td>
<td>Verizon</td>
<td>11,448</td>
<td>$5,053mn</td>
<td>$441,387</td>
<td>SLB</td>
</tr>
<tr>
<td>2014</td>
<td>Brazil</td>
<td>BR Towers</td>
<td>4,630</td>
<td>$978mn</td>
<td>$211,231</td>
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<td>2014</td>
<td>Nigeria</td>
<td>Airtel</td>
<td>4,717</td>
<td>$1,060mn</td>
<td>$244,719</td>
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<tr>
<td>2013</td>
<td>Brazil</td>
<td>Nextel</td>
<td>1,940</td>
<td>$349mn</td>
<td>$179,897</td>
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<tr>
<td>2013</td>
<td>Brazil</td>
<td>Z-Sites</td>
<td>236</td>
<td>$129mn</td>
<td>$546,610</td>
<td>Company acquisition</td>
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<td>2013</td>
<td>Brazil</td>
<td>Nextel</td>
<td>2,790</td>
<td>$413mn</td>
<td>$148,029</td>
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<tr>
<td>2013</td>
<td>Mexico</td>
<td>Nextel</td>
<td>1,666</td>
<td>$398mn</td>
<td>$238,896</td>
<td>SLB</td>
</tr>
<tr>
<td>2013</td>
<td>USA, Panama &amp; Costa Rica</td>
<td>GTP</td>
<td>15,700</td>
<td>$4,800mn</td>
<td>$305,732</td>
<td>Company acquisition</td>
</tr>
</tbody>
</table>

Footnotes
[1] Acquisition of CyCSA included “1,000 urban wireless sites and 2,500km of fibre”

Source: TowerXchange
## American Tower transaction history in the last decade (continued)

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Tower count</th>
<th>Deal value US$mns</th>
<th>Cost per tower US$</th>
<th>Deal structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Brazil</td>
<td>Telefónica</td>
<td>93</td>
<td>$18mn</td>
<td>$193,548</td>
<td>SLB</td>
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<td>2013</td>
<td>Mexico</td>
<td>Axtel</td>
<td>883</td>
<td>$250mn</td>
<td>$283,126</td>
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<td>2012</td>
<td>Germany</td>
<td>KPN</td>
<td>2,031</td>
<td>$440mn</td>
<td>$216,642</td>
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<tr>
<td>2012</td>
<td>Brazil</td>
<td>Telefónica</td>
<td>192</td>
<td>$33mn</td>
<td>$171,875</td>
<td>SLB</td>
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<tr>
<td>2012</td>
<td>Brazil</td>
<td>Telefónica</td>
<td>1,500</td>
<td>$225mn</td>
<td>$150,000</td>
<td>SLB</td>
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<tr>
<td>2012</td>
<td>Chile</td>
<td>Telefónica</td>
<td>558</td>
<td>$96mn</td>
<td>$172,043</td>
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</tr>
<tr>
<td>2011</td>
<td>Mexico</td>
<td>Telefónica</td>
<td>1,554</td>
<td>$323mn</td>
<td>$207,851</td>
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<tr>
<td>2011</td>
<td>Mexico</td>
<td>Telefónica</td>
<td>584</td>
<td>$122mn</td>
<td>$208,904</td>
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<tr>
<td>2011</td>
<td>Colombia</td>
<td>Telefónica</td>
<td>125</td>
<td>$18mn</td>
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<tr>
<td>2011</td>
<td>Colombia</td>
<td>Millicom</td>
<td>2,126</td>
<td>$182mn</td>
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<tr>
<td>2011</td>
<td>Uganda</td>
<td>MTN</td>
<td>962</td>
<td>$89.25mn</td>
<td>$181,912</td>
<td>Joint venture</td>
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<tr>
<td>2011</td>
<td>Brazil</td>
<td>Sitesharing</td>
<td>666</td>
<td>$585mn</td>
<td>$878,378</td>
<td>Partial acquisition</td>
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<tr>
<td>2010</td>
<td>Ghana</td>
<td>MTN</td>
<td>1,856</td>
<td>$218.5mn</td>
<td>$230,835</td>
<td>Joint venture</td>
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<tr>
<td>2010</td>
<td>South Africa</td>
<td>Cell C</td>
<td>1,400</td>
<td>$200mn</td>
<td>$142,857</td>
<td>SLB</td>
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<tr>
<td>2010</td>
<td>India</td>
<td>Essar Telecom Infrastructure</td>
<td>4,450</td>
<td>$432mn</td>
<td>$97,079</td>
<td>Company acquisition</td>
</tr>
</tbody>
</table>

Over the last decade, AMT has deployed almost US$11bn to acquire almost 110,000 towers outside the United States. AMT has been equally active in M&A in their domestic market, headlined by their US$3.1bn merger with SpectraSite, back in 2005, their acquisition of Global Tower Partners and their 15,400 towers for US$4.8bn in 2013, and the acquisition of 11,448 sites from Verizon for US$5bn in 2015.

AMT has called upon similar levels of discipline when it comes to diversification of its asset portfolio. Chairman and CEO Jim Taiclet has granted flexibility for AMT to diversify beyond macro towers, providing they stick reasonably close to their core business of co-locatable wireless infrastructure, spurring AMT to explore fibre partnerships and acquisitions in South Africa, Mexico and Argentina. A long-time leader indoor DAS, AMT is exploring opportunities in urban infrastructure, including provision of small cells,
AMT’s global footprint at 31 December 2018

Source: Company Reports, TowerXchange

- India 75,872
- Brazil 18,980
- Nigeria 4,760
- France 2,504
- Germany 2,208
- Mexico 9,318
- Colombia 4,945
- South Africa 2,652
- Argentina 40
- Paraguay 1,276
- Chile 1,316
- Peru 1,800
- Costa Rica 555
- Kenya 715
- Uganda 1,590

Total: 128,849
smart poles, IoT services and V2I. AMT are believed to be dabbling in edge data centres, but there are no projects yet in the public domain.

AMT is a pureplay independent towerco, although it does not own 100% equity in all its regional subsidiaries. AMT has 51% controlling stakes in three joint ventures: with MTN in ATC Ghana and Uganda, and in Europe with partner PGGM, a Dutch pension fund. AMT is registered as a Real Estate Investment Trust, securing significant tax advantages and committing to regular dividend distributions.

AMT operates a ‘steel and grass’ business model – meaning it provides only ‘vertical real estate’ not power – in all markets except India, Nigeria, Ghana, Uganda and Kenya, where AMT provides power-as-a-service. There are also a few pockets of managed power service provision in the U.S and Brazil.

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**Bharti Infratel**

*Benchmark operator-led towerco*

Tower count: 40,192 (92,301 if consolidated to include Bharti Infratel’s 42% share of Indus Towers)

Like many operator-led towercos, Bharti Infratel originated within its parent MNO’s organisational structure – as the tower management function within Bharti Airtel. Bharti Infratel was carved out...
as an independent tower company in July 2007, with sister company Indus Towers, in which Infratel owns a 42% stake, created in November of that same year.

In December 2012, Bharti Infratel debuted on India's National Stock Exchange, Mumbai at a price of Rs 210, a market cap of around US$7.5bn, and today (March 2019) trades at Rs 316, a market cap of US$8.76bn.

Today Bharti Infratel owns 40,192 towers across 11 telecom circles and 18 states, namely Jammu & Kashmir, Himachal Pradesh, Haryana, Uttar Pradesh, Uttarakhand, Rajasthan, Madhya Pradesh, Chattisgarh, Bihar, Jharkhand, Orissa, Assam, Meghalaya, Tripura, Arunachal Pradesh, Manipur, Mizoram and Nagaland. Bharti Infratel's tenancy on their own sits is currently 1.93x, down from 2.38x a year ago, reflecting churn related to MNO consolidation.

Bharti Infratel is registered with the Department of Telecommunications as an IP1 Infrastructure

<table>
<thead>
<tr>
<th>Year</th>
<th>Mar 12</th>
<th>Mar 13</th>
<th>Mar 14</th>
<th>Mar 15</th>
<th>Mar 16</th>
<th>Mar 17</th>
<th>Mar 18</th>
<th>Jun 18</th>
<th>Sep 18</th>
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<tr>
<td>Infratel towers</td>
<td>33147</td>
<td>35119</td>
<td>35905</td>
<td>37196</td>
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<tr>
<td>Indus towers</td>
<td>109325</td>
<td>111819</td>
<td>113008</td>
<td>115942</td>
<td>119881</td>
<td>122730</td>
<td>123639</td>
<td>123904</td>
<td>124230</td>
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<tr>
<td>Total towers</td>
<td>142472</td>
<td>146938</td>
<td>148913</td>
<td>153138</td>
<td>158339</td>
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<td>378176</td>
<td>367073</td>
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<td>307411</td>
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<tr>
<td>Combined tenancy ratio</td>
<td>1.92</td>
<td>1.94</td>
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<td>2.15</td>
<td>2.22</td>
<td>2.34</td>
<td>2.26</td>
<td>2.2</td>
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</tbody>
</table>
Provider, the conditions of which now enable the deployment of active infrastructure including small cells. Responding both to this opportunity, and the challenges represented by MNO consolidation, Bharti Infratel has diversified into smart city services, IBS, small cells, BTS hotels, DAS and fiberization, and has already deployed over 150 smart poles and a similar number of smart billboards, with smart city initiatives under way such as their project in Bhopal.

Bharti Infratel currently operates with an EBITDA margin of 44.4% on consolidated revenues of Rs 144,896 (US$2.075bn). Excluding its stake in Indus Towers, Bharti Infratel employs 1,227 staff.

Bharti Infratel provides power-as-a-service, and has reduced diesel consumption by 31% in the last three years thanks to installing over 14,000 green sites and 2,500 solar sites under its ZEN (Zero Emissions Network) and award-winning Green Towers P7 programme. Energy represents 66.67% of Bharti Infratel’s opex.

Bharti Infratel is currently merging with Indus Towers – see the sidebar “The merger of Bharti Infratel and Indus Towers.”

**Cellnex**

*European market makers*

Tower count: 23,440

Europe’s leading telecommunications infrastructure solution provider, Cellnex now owns 23,440 towers, and 1,592 DAS nodes, with a total of 33,860 points of presence, across six European countries: Italy, Netherlands, United Kingdom, France, Switzerland and Spain. Cellnex’s average tenancy ratio is 1.55x.

Cellnex, then Abertis Telecom, traces its origins back to the turn of the millennium, starting out as a Digital Terrestrial Television (DTT) pioneer and Emergency Response network provider. The company made its first forays into the creation of Smart Cities as long ago as 2011, and made its first purchases of telecom towers in 2012-13 from Telefónica and Yoigo. Following Cellnex’s successful IPO, their acquisition of 7,377 towers from VEON’s WIND in Italy cemented Cellnex’s leadership position and vision to create Europe’s first pan-European towerco, a vision that was fulfilled with subsequent acquisitions in The Netherlands, France, the UK and Switzerland. In May 2019 Cellnex announced a deal to acquire 10,700 towers from Iliad and Salt for €2.7bn. When complete, the acquisition, and an associated contract to build ~4,000 more towers, will double Cellnex’s revenues and EBITDA.

Cellnex has a deep commitment to providing a

---

**Cellnex’s European footprint at 31 December 2018**

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>8,308</td>
</tr>
<tr>
<td>Spain</td>
<td>8,589</td>
</tr>
<tr>
<td>Netherlands</td>
<td>801</td>
</tr>
<tr>
<td>UK</td>
<td>608</td>
</tr>
<tr>
<td>France</td>
<td>2,000</td>
</tr>
<tr>
<td>Switzerland</td>
<td>2,239</td>
</tr>
<tr>
<td>Switzerland</td>
<td>194</td>
</tr>
</tbody>
</table>

Counts exclude acquisitions from Iliad / Salt

Source: TowerXchange
## Cellnex transaction history

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Tower count</th>
<th>Deal value €mns</th>
<th>Cost per tower €mns</th>
<th>Deal structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>France, Italy &amp; Switzerland</td>
<td>Iliad / Salt</td>
<td>10,700</td>
<td>€2,700mn</td>
<td>€252,336</td>
<td>SLB [2]</td>
</tr>
<tr>
<td>2017</td>
<td>Spain</td>
<td>MasMovil</td>
<td>551</td>
<td>€40mn</td>
<td>€72,595</td>
<td>SLB</td>
</tr>
<tr>
<td>2017</td>
<td>Netherlands</td>
<td>Undisclosed</td>
<td>32</td>
<td>€12mn</td>
<td>€375,000</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2017</td>
<td>Switzerland</td>
<td>Sunrise</td>
<td>2,339</td>
<td>€430mn</td>
<td>€183,839</td>
<td>SLB</td>
</tr>
<tr>
<td>2017</td>
<td>Netherlands</td>
<td>Alticom</td>
<td>30</td>
<td>€133mn</td>
<td>N/A</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2017</td>
<td>France</td>
<td>Bouygues</td>
<td>3,000</td>
<td>€854mn</td>
<td>€284,666</td>
<td>SLB</td>
</tr>
<tr>
<td>2017</td>
<td>France</td>
<td>Bouygues</td>
<td>600</td>
<td>€170mn</td>
<td>€283,333</td>
<td>SLB</td>
</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>Bouygues</td>
<td>230</td>
<td>€80mn</td>
<td>€347,826</td>
<td>SLB</td>
</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>Bouygues</td>
<td>270</td>
<td>€67mn</td>
<td>€248,148</td>
<td>SLB</td>
</tr>
<tr>
<td>2016</td>
<td>UK &amp; Netherlands</td>
<td>Shere Group</td>
<td>1,004</td>
<td>€393mn</td>
<td>€391,434</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>Netherlands</td>
<td>Protelindo</td>
<td>261</td>
<td>€109mn</td>
<td>€417,624</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2015</td>
<td>Italy</td>
<td>Wind (VEON)</td>
<td>7,377</td>
<td>€693mn</td>
<td>€94,892</td>
<td>SLB [1]</td>
</tr>
<tr>
<td>2015</td>
<td>Italy</td>
<td>TowerCo</td>
<td>212</td>
<td>€94.6mn</td>
<td>€446,226</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2014</td>
<td>Spain</td>
<td>Telefónica/Yoigo</td>
<td>4,277</td>
<td>€385mn</td>
<td>€90,016</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>Spain</td>
<td>Telefónica</td>
<td>500</td>
<td>€45</td>
<td>€90,000</td>
<td>SLB</td>
</tr>
</tbody>
</table>

**Footnotes**

[1] Cellnex acquired 90% equity in the Wind (VEON) towers, acquiring the remaining 10% in 2017 for €77mn

[2] Deal announced not closed. Cellnex to acquire 70% equity in the French towers, 90% in Switzerland

Source: Company Reports
broad digital service proposition, evolving to meet changing requirements as Europe enters the 5G, smart city era. Cellnex operates Spain’s first and largest IoT network, and partners with SigFox in Switzerland. Cellnex acquired Italian small cell pioneer CommsCon back in 2016, and the following year announced a partnership with JCDecaux to leverage billboards and bus stops. Cellnex subsidiary Tradia acquired fibreco XOC in 2018. Cellnex exhibited its “Adaptive Edge” partnerships and vision at MWC19.

Broadcasting infrastructure continues to contribute 25.9% of Cellnex’s revenues, with telecom infrastructure up to 65% and ‘Other network services’ contributing 9.1%.

Cellnex shareholders as at 22 February 2019

![Cellnex shareholders chart]

China Tower Corporation

Co-build, co-share

Tower count: 1,948,000

With around almost two million towers (1.948mn at Q418), China Tower Corporation (CTC) has almost 50% more towers than the rest of the global tower industry combined. Established on July 18, 2014, CTC’s portfolio was expanded in October 2015 by the carve out and transfer of 1.4mn towers formerly owned by China Mobile, China Telecom and China Unicom. CTC has built over half a million towers and added over 1.2mn tenancies in less than five years.

The emergence of CTC was driven by MIIT’s “co-build, co-share” philosophy, designed to increase the efficiency of land use, capital deployment in telecoms, and to accelerate China’s rollout of 5G.

CTC is already piloting 5G on over 1,000 sites across 23 cities.

MNOs are no longer permitted to build their own towers in China, and 73% of the new towers built by CTC are shared.

Just under 70% of the equity in CTC is retained by China’s three MNOs, which is reflected in its lease rates and co-location discounting structure, which are among the most generous in the world.

CTC raised US$7.5bn in its landmark IPO on the Hong Kong main board, representing the world’s largest IPO since 2016. Since IPO, CTC’s market cap is up by more than 50% (through March 2019). CTC employs ~18,000 people.

CTC owns and operates 97.5% of China’s macro towers, and also has a small but growing stake in the 2mn+ Chinese small cell market. CTC had over 20,000 small cell, and a similar number of DAS sites, at the end of 2018. Small cell and DAS currently represents 3% of CTC revenues. CTC’s ‘Trans-sector site application and information’ business (which leverages sites to provide CCTV, outdoor advertising, satellite signal augmentation, earthquake, environmental and meteorological monitoring) currently represents 1.7% of revenues, but has grown more than 6x in the last year.

CTC leverages partnerships with provincial and city governments to provide access to over 7.5mn lamp poles, 1mn surveillance poles and 250,000 buildings, while partnerships with State-owned electricity
grid companies provide access to 3.5mn utility towers. CTC is also working with the China Railway Corporation to enhance mobile broadband service provision along over 18,000km of high-speed rail network.

CTC has suggested international expansion is a medium rather than short-term goal, although they have already made forays into Laos, with co-operation agreements governing infrastructure sharing and smart cities.

CTC provides power as a service, and has invested in operational efficiency measures such as online procurement and centralised remote monitoring to reduce the cost of maintenance from 10.3% of operating revenue in 2015-16 to 8.8% by 2017-18. CTC is also an energy innovator, and has leveraged recycled lithium-ion batteries from electric vehicles at over 70,000 cell sites to reduce reliance on peak rate grid power.

**Crown Castle**
*Pioneers of fibre and small cell diversification*
*Tower count: 40,039*

Founded in Houston in 1994, Crown Castle is another member of the US$150bn-valued triumvirate of ‘original’ U.S. public towercos (along with American Tower and SBA).

Crown Castle is increasingly differentiated by the diversity of its asset portfolio: the company has spent US$13bn acquiring 65,000 route miles of fibre, which has in turn enabled their rapid expansion into small cells – the company has 65,000 small cell
nodes deployed or in the pipeline. 34% of Crown Castle's site rental revenues now come from small cell, fibre and DAS, with the balance derived from their U.S. towers business.

Crown Castle's fibre acquisitions include Wilcon, Lightower, Fibernet Direct, Sunesys, and NextG Networks.

With 4,500 employees, Crown Castle has trebled in size since 2013.

Crown Castle has 40,039 towers, assembled through a combination of organic and inorganic growth, highlighted by acquisitions from AT&T (paying US$4.85bn for 9,708 towers in 2013), T-Mobile (paying US$2.4bn for 7,200 towers in 2012) and Global Signal, another independent towerco, in 2007. Crown Castle has a tenancy ratio of 2.2.

Crown Castle had a successful foray into European towers through the turn of the millennium, acquiring a £75mn revenue transmission tower business from the BBC in 1997, driving tenancy ratios to 2.9 and revenues to £233mn, and selling the business to the UK's National Grid for £1.1bn in 2004. Those assets are now part of Arqiva. While Crown Castle was the first U.S. towerco to open an office in Brazil, they have never established a footprint in Latin America, and the sale of Crown Castle Australia (in 2015 for US$1.6bn) represented Crown Castle’s exit from international markets.


Deutsche Funkturm

Deutsche Telekom’s silent giant towerco awakens

Tower count: 29,000

With 29,000 towers and rooftops, Deutsche Funkturm is Europe’s largest towerco. Deutsche Funkturm, often abbreviated to DFMG, was carved out of Deutsche Telekom in 2002. The original intent of the carve-out was as a precursor to the sale of DFMG but, despite announcements of intent to sell the company in 2007, and intent to sell a 49% stake in 2016, Deutsche Telekom still holds 83.33% of the share capital in DFMG, with the balance held by another Deutsche Telekom subsidiary.

DFMG’s parent MNO Deutsche Telekom remains the towerco’s anchor tenant, representing around

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Crown Castle new site leasing revenue breakdown (US$mns)

<table>
<thead>
<tr>
<th></th>
<th>Towers</th>
<th>Small cells</th>
<th>Fibre solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>105</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>2018</td>
<td>110</td>
<td>55</td>
<td>45</td>
</tr>
<tr>
<td>2019 (forecast)</td>
<td>125</td>
<td>75</td>
<td>165</td>
</tr>
</tbody>
</table>

Source: Crown Castle earnings materials

Crown Castle tenancy revenue split

- 26% AT&T
- 22% Verizon
- 18% Sprint
- 14% T-Mobile
- 20% Other US

Source: Company reports, Q318

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a third of DFMG’s tenancies. Approximately 8,500 of DFMG’s German sites are ground based telecom towers, and a further 500 are television towers. Those 9,000 ground based towers have a tenancy ratio around 2.3. Reflecting the rooftop-centric network design in Germany, two thirds of DFMG’s sites are rooftops, with a much lower tenancy ratio of 1.1-1.5. EMF regulation is one hindrance limiting the co-location of rooftops in Germany, but a more significant factor are the demands of landlords for incremental rental payments.

DFMG also owns Omega Towers, a portfolio derived from the transfer of 7,700 overlapping rooftop sites when Deutsche Telekom acquired E+ from Telefonica. That rooftop portfolio is being steadily decommissioned toward a target of 5,000 sites by 2020.

DFMG are embarking on a policy of rapid growth in Germany, aiming to double the number of ground based towers in their portfolio by 2022. DFMG added 1,300 sites in 2018, and aims to add 1,800 in 2019.

While DFMG offers the majority of their sites for co-location by competitors of parent company Deutsche Telekom, historically DFMG have not sold co-location as proactively as, for example, their competitors American Tower Germany. DFMG also reserves a small number of ‘blacklisted’ critical sites on which Deutsche Telekom’s competitors are not allowed to co-locate.

In early 2017, Deutsche Telekom restructured DFMG from a 100% owned subsidiary to a ‘sister

---

**Deutsche Telekom presence in Europe**

<table>
<thead>
<tr>
<th>Country</th>
<th>Opco</th>
<th>Stake</th>
<th>Direct/Indirect Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>Telekom Albania</td>
<td>99.79%</td>
<td>Direct</td>
</tr>
<tr>
<td>Austria</td>
<td>T-Mobile Austria</td>
<td>100%</td>
<td>Direct</td>
</tr>
<tr>
<td>Croatia</td>
<td>Hrvatski telekom</td>
<td>51%</td>
<td>Direct</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>T-Mobile Czech Republic</td>
<td>100%</td>
<td>Direct</td>
</tr>
<tr>
<td>Germany</td>
<td>Telekom Deutschland</td>
<td>100%</td>
<td>Direct</td>
</tr>
<tr>
<td>Greece</td>
<td>Hellenic Telecommunications Organisation (OTE Group)</td>
<td>40%</td>
<td>Direct</td>
</tr>
<tr>
<td>Hungary</td>
<td>Magyar Telekom</td>
<td>59.21%</td>
<td>Direct</td>
</tr>
<tr>
<td>Macedonia</td>
<td>Makedonski Telekom</td>
<td>51%</td>
<td>Indirect - shares owned by Magyar Telekom</td>
</tr>
<tr>
<td>Montenegro</td>
<td>Crnogorski Telekom</td>
<td>76.53%</td>
<td>Indirect - shares owned by Hrvatski Telekom</td>
</tr>
<tr>
<td>Netherlands</td>
<td>T-Mobile Netherlands</td>
<td>100%*</td>
<td>Direct</td>
</tr>
<tr>
<td>Poland</td>
<td>T-Mobile Polska</td>
<td>100%</td>
<td>Direct</td>
</tr>
<tr>
<td>Romania</td>
<td>Telekom Romania Mobile Communications</td>
<td>70%</td>
<td>Indirect - shares owned by OTE</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Slovak Telecom</td>
<td>100%</td>
<td>Direct</td>
</tr>
<tr>
<td>UK</td>
<td>BT</td>
<td>12.10%</td>
<td>Direct</td>
</tr>
</tbody>
</table>

*In December 2017 Deutsche Telekom and Tele2 announced plans to combine their Dutch operations. T-Mobile Netherlands’ towers will be retained as a separate entity.
company’, in readiness to deploy much of the capex on passive infrastructure for 5G through the towerco, thus lightening the burden on the MNO’s balance sheet.

DFMG generated revenues of €862mn (US$962mn) in FY18, virtually unchanged since 2017 (€864mn or US$965mn), with an adjusted EBITDA of €529mn (US$590mn), up from €510mn (US$569mn), in 2017, giving DFMG an EBITDA margin of 61% (up from 59% in 2017). DFMG has a staff of 800.

DFMG has recently extended the scope of its operations to include the T-Mobile towers in the Netherlands ahead of the merger with Tele2. DFMG are working on a similar strategy in Austria. There is scope for DFMG to expand further across the Deutsche Telecom footprint, which includes majority stakes in MNO opcos in a dozen countries, with minority stakes in two more. Given that Deutsche Telekom owns ~25,000 towers and points of presence outside Germany, and given that the company is gearing up for significant network infrastructure investment for 5G, it is conceivable that DFMG could have 50-70,000 towers and rooftops by 2022.

Since 2017, DFMG has added a number of DAS and small cells to their portfolio, while they have also been pioneers of Electric Vehicle charging, and have identified 12,000 potential locations for EV charging.

DFMG provides power to their tenants on around 3,000 sites, through another Deutsche Telekom subsidiary PASM a partner of DFMG.

**edotco shareholders**

<table>
<thead>
<tr>
<th>Shareholder</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axiata</td>
<td>5.4%</td>
</tr>
<tr>
<td>INCJ</td>
<td>10.7%</td>
</tr>
<tr>
<td>Khazanah</td>
<td>21.5%</td>
</tr>
<tr>
<td>Kumpulan</td>
<td>62.4%</td>
</tr>
</tbody>
</table>

**edotco**

*Digital infrastructure service innovator*

**Tower count: 29,837**

Renowned as the first and most innovative integrated communications infrastructure services company in Asia, edotco’s proposition spans traditional tower acquisition, build and co-location, operations and maintenance, small cell, in-building and smart city services and BTS hotels.

What really sets apart edotco from any other towerco in the world is its genuine ‘best of both worlds’ philosophy. Like its peers among other operator-led towercos, edotco is deeply committed to creating and sharing value with its MNO partners, driving edotco to expand their service proposition to meet changing needs. But the culture of edotco is as commercially-savvy and innovation-hungry as any independent towerco.

edotco was carved out of MNO Axiata in 2013. Despite Axiata retaining majority ownership, the MNO has only two of ten seats on edotco’s board, to ensure independent governance. Axiata sold a total of 37.6% equity in edotco between 2016-17 at a price which would have then valued the company at US$1.862bn. There has been growing speculation that edotco will list on the Kuala Lumpur stock exchange, seeking a ~US$2.5bn valuation.

Headquartered in Kuala Lumpur, edotco has a greater appetite for country risk than some of their peers in Asia, enabling them to expand across a footprint that includes 29,837 towers in Malaysia, Bangladesh, Cambodia, Myanmar, Pakistan and Sri Lanka. edotco has acquired an 80% stake in Mekong Tower Company with a view to entering Laos, and has signed an MOU with DICT indicating interest in securing a towerco license in the Philippines.
While the majority of edotco’s portfolio was carved out of local Axiata opcos, or built new, the company has some M&A history having acquired Digicel Myanmar Tower Company in 2015 (1,250 towers for US$221mn), and Tanzanite Tower in Pakistan (700 towers for US$88.9mn). A subsequent deal to acquire ~13,000 towers in Pakistan for just under US$1bn from VEON subsidiary Jazz fell through when regulatory approval was not received. Most recently, edotco acquired 325 towers in Cambodia from East Asia Telecom, and also acquired State-backed towerco Yiked Bina in Malaysia.

edotco provides power-as-a-service across much of their footprint, including for both their own 1,900 sites and a further 1,250 sites owned by Ooredoo in Myanmar, and is renowned for their ‘echo’ real-time monitoring service.

GTL Infrastructure

Indian turnaround play

Tower count: 27,707

Founded in 2004, GTL Infrastructure listed on the National Stock Exchange of India in 2006, debuting at a share price of Rs 39.95, with a market cap of US$3.1bn. In the heyday of the Indian MNO gold rush in 2008, GTL’s stock was trading at just under Rs 100. The company had raised US$1.8bn to rollout a portfolio of 23,700 towers, which they supplemented with the acquisition of 17,500 Aircel towers, with 21,000 tenants, for a further US$1.8bn. At the time, GTL was the largest independent tower company in the world.

However, much of the value in the Aircel deal

edotco’s footprint at 31 December 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Towers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td>10,096</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>9,948</td>
</tr>
<tr>
<td>Cambodia</td>
<td>3,626</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>3,397</td>
</tr>
<tr>
<td>Myanmar</td>
<td>1,900</td>
</tr>
<tr>
<td>Pakistan</td>
<td>870</td>
</tr>
</tbody>
</table>

Source: TowerXchange

edotco tenancy ratios FY17

<table>
<thead>
<tr>
<th>Country</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>1.41</td>
</tr>
<tr>
<td>Myanmar</td>
<td>2.24</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1.54</td>
</tr>
<tr>
<td>Cambodia</td>
<td>1.57</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1.69</td>
</tr>
</tbody>
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Source: Axiata Annual Report 2017

However, much of the value in the Aircel deal

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Source: TowerXchange

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<td>Malaysia</td>
<td>1.69</td>
</tr>
</tbody>
</table>

Source: Axiata Annual Report 2017

However, much of the value in the Aircel deal
was derived from future cash flows derived from a planned further 20,000 tenancies. The 2012 MNO market restructuring, which included the cancellation of 122 licenses, meant Aircel was unable to honour its commitments. The timing was disastrous for GTL, which had placed orders and paid advances for towers and other equipment, and had to short close their commitment to vendors. The company ran up substantial debts, and the net worth of GTL was fully eroded: you can buy a share today (March 2019) for a less than a rupee, and GTL Infrastructure’s market cap is currently under US$200mn.

While GTL has worked tirelessly to restructure its debt and turnaround its fortunes, in FY17-18 achieving all time highs of 51,587 tenancies, a tenancy ratio of 1.86x, and revenues of US$362mn, the company faces a new, perhaps even greater challenge in 2018-19. GTL Infrastructure has been cruelly hit by the effects of MNO consolidation in India, leading to unprecedented tenancy churn, with total tenancies down 46.4% by the end of 2018, and EBITDA forecast to plunge by more than 60% through FY18-19. GTL Infrastructure has been particularly exposed to the bankruptcy of Aircel and further affected by the exits of SSTL and RCOM, and the mergers of Tata Teleservices with Bharti Airtel, and Vodafone with Idea. GTL Infrastructure has 27,707 towers on its balance sheet, but by March 2018 only 14,490 of those towers were occupied.

We can only hope GTL Infrastructure will continue to demonstrate the determination to fight back against these unprecedented challenges.

As at March 31 2018, GTL Infrastructure had 432 staff on its payroll, plus 550 outsourced.

GTL Infrastructure provides power-as-a-service. The company has undertaken several cost reduction initiatives including installing free cooling units and charge-discharge batteries, reducing power, fuel and maintenance costs by 12% since FY15-16. Uptime has been sustained at 99.9%.

**IHS’s global footprint at Q318**

<table>
<thead>
<tr>
<th>Country</th>
<th>Tenancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria</td>
<td>15,828</td>
</tr>
<tr>
<td>Cote d’Ivoire</td>
<td>2,560</td>
</tr>
<tr>
<td>Cameroon</td>
<td>2,328</td>
</tr>
<tr>
<td>Zambia</td>
<td>1,629</td>
</tr>
<tr>
<td>Rwanda</td>
<td>931</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>8,100*</td>
</tr>
<tr>
<td>Kuwait</td>
<td>1,700*</td>
</tr>
</tbody>
</table>

* IHS has announced, but not yet closed, the acquisition of 8,100 towers in Saudi Arabia and 1,700 towers in Kuwait. IHS has also signed an MOU with the Department of Information Technology (DICT) in The Philippines.

IHS are renowned for unique engineering excellence, which can be traced back to 2001, and their origins as a trusted tower builder and managed services provider in Nigeria. That design, construction, operations and maintenance ability has enabled IHS to achieve uptime and efficiency

**IHS Towers**

Leading African tower aggregator goes global

**Tower count:** 23,276

Having established a footprint and reputation as the world’s premier emerging market towerco, aggregating over 23,000 sites in Sub-Saharan Africa, IHS has set its sights on globalisation, with pioneering sale and leaseback deals agreed in Saudi Arabia, Kuwait and an MOU signed in The Philippines.
levels that are frankly jaw-dropping, especially considering that they operate over 15,000 towers in the Nigerian market, where grid power is unreliable and where fuel theft had been rife. As such, IHS has become a pioneer and centre of excellence for energy efficiency and cell site monitoring and management. To date, IHS provides full power as a service across its footprint.

IHS’s appetite for innovation does stop at energy and operational efficiency. The towerco has IBS and DAS sites, and is licensed to deploy fibre in Nigeria, which could set them up to supplement tower cash flow with revenue from fibre and small cell solution provision as the countries it serves move from 4G rollout eventually to heterogeneous 5G networks.

IHS has been equally formidable in M&A, often going toe to toe with American Tower and emerging successful. IHS has deployed over US$2.3bn to acquire 17,779 sites in Nigeria, Cameroon, Cote d’Ivoire, Rwanda and Zambia, with a further US$813mn allocated to acquire almost 10,000 sites in the Middle East. IHS has announced, but not yet closed, the first tower sale and leaseback deals in

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Tower count</th>
<th>Deal value US$mns</th>
<th>Cost per tower US$</th>
<th>Deal structure</th>
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<tr>
<td>2019</td>
<td>Saudi Arabia</td>
<td>Zain</td>
<td>8,100</td>
<td>$647.7mn</td>
<td>$79,963</td>
<td>SLB</td>
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<tr>
<td>2017</td>
<td>Kuwait</td>
<td>Zain</td>
<td>1,700</td>
<td>$165mn</td>
<td>$97,059</td>
<td>SLB</td>
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<td>2016</td>
<td>Nigeria</td>
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<td>Undisclosed</td>
<td>Undisclosed</td>
<td>Partial acquisition</td>
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<td>Etisalat</td>
<td>555</td>
<td>Undisclosed</td>
<td>Undisclosed</td>
<td>SLB</td>
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<td>2014</td>
<td>Rwanda</td>
<td>Airtel</td>
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<td>Undisclosed</td>
<td>SLB</td>
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<tr>
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<td>Zambia</td>
<td>Airtel</td>
<td>949</td>
<td>$150mn</td>
<td>$158,061</td>
<td>SLB</td>
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<tr>
<td>2014</td>
<td>Nigeria</td>
<td>MTN</td>
<td>8,850</td>
<td>$984mn</td>
<td>$226,911</td>
<td>Joint venture [2]</td>
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<td>Nigeria</td>
<td>Etisalat</td>
<td>2,136</td>
<td>$485mn</td>
<td>$227,060</td>
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<td>2014</td>
<td>Rwanda</td>
<td>MTN</td>
<td>550</td>
<td>$48mn</td>
<td>$87,273</td>
<td>SLB</td>
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<tr>
<td>2014</td>
<td>Zambia</td>
<td>MTN</td>
<td>748</td>
<td>$57mn</td>
<td>$76,203</td>
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<td>2013</td>
<td>Cameroon &amp; Cote d'Ivoire</td>
<td>Orange</td>
<td>2,000</td>
<td>Undisclosed</td>
<td>Undisclosed</td>
<td>MLL</td>
</tr>
<tr>
<td>2012</td>
<td>Cote d'Ivoire</td>
<td>MTN</td>
<td>911</td>
<td>$141mn</td>
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<td>2012</td>
<td>Cameroon</td>
<td>MTN</td>
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<td>$143mn</td>
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<td>Nigeria</td>
<td>Visafone</td>
<td>800</td>
<td>$67mn</td>
<td>$87,750</td>
<td>SLB</td>
</tr>
</tbody>
</table>

Footnotes
[1] Acquisitions from Zain in Saudi Arabia and Kuwait have been announced but not yet closed, and remain subject to customary conditions precedent
[2] Joint venture with MTN in Nigeria initially structured as a 49:51% joint venture, MTN has since restructured this as a holding at group level

Source: TowerXchange
**The merger of Bharti Infratel and Indus Towers**

Announced in Q2 2018, the merger of Bharti Infratel and Indus Towers is expected to be completed in Q2 2019, pending approval from the telecom ministry and the National Company Law Tribunal (NCLT).

The merger will create the largest telecom tower company in Asia (outside China) with 164,261 sites and over 307,500 tenants, with a tenancy ratio around 1.87. The deal involves Bharti Infratel transferring 1,565 of its own shares for each Indus Towers share, valuing the latter at US$10bn. Prior to the merger, Indus Towers is 42% owned by Bharti Infratel, 42% by Vodafone, 11.15% by Idea group, and 4.85% by Providence. While two ownership models were proposed post-merger, it seems likely that Idea group and Providence with cash out, leaving Bharti Airtel and Vodafone holding 37.2% and 29.4% stakes respectively.

Publicly listed Bharti Infratel and privately held Indus Towers have very similar derived valuations (BloombergQuint suggested Infratel was valued at 8.7x FY18 EBITDA, Indus at 8.5x) doubtless due to the fact that Infratel incorporates a 42% share in Indus. The combined entity is forecast to generate revenues of Rs 255,351mn (US$3.66bn), EBITDA of Rs 105,191mn (US$1.51bn) for an EBITDA margin of 41.2%, and profit after tax of Rs 39,091mn (US$556mn).

As there is minimal overlap between the portfolios of Infratel and Indus (they only both operate in four circles: Haryana, Uttar Pradesh (West), Uttar Pradesh (East) and Rajasthan), the merger is not expected to prompt significant consolidation of assets, although it will generate improved RoE due to improvements in the capital structure, tax advantages and economies of scale. Also critical to the reasoning behind the merger is the removal of the holdco discount, which Indus and Infratel has suggested could lead to an implied theoretical uplift per share of 4.8-10.2%.

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**Indus Towers**

*The joint venture super-giant*

**Tower count: 124,069**

Indus Towers is a unique infrastructure sharing joint venture – a meeting of minds of Bharti Airtel, Vodafone and Idea Cellular – and proof positive that infrastructure sharing can accelerate mobile adoption and ultimately digital transformation. Indus Towers was conceived in 2006 as one of the most important products of “Project MOST” (Multi Operator Shared Towers), a cooperation between industrial stakeholders and the Ministry of Urban Affairs and Ministry of Communications, and the Government of India. Indus had a major impact from 2007-08, and had 70,000 towers from day one. In the subsequent 13 years, Indus Towers
Indus Towers has constructed over 50,000 new sites, leased up to achieve a tenancy ratio at time of writing 1.86. Indus Towers has 2,339 employees.

For data on Indus Towers’ tower count and tenancy ratio growth, see the infographic “Bharti Infratel and Indus Towers’ tower count and tenancy ratios” in the Bharti Infratel section of this article.

Indus operates in 15 of India’s 22 telecom circles: Andhra Pradesh, Delhi, Gujarat, Kerala, Rajasthan, Kolkata, UP East, UP West, West Bengal, Karnataka, Maharashtra, Mumbai, Punjab, Haryana and Tamil Nadu. Three out of five calls in India are made through an Indus site.

Indus is currently re-inventing itself in two important ways. First, it is merging with Bharti Infratel to create Asia’s largest tower company outside of China. Secondly, it is broadening the scope of its assets and services to realise the vision of Digital India.

Indus Towers is registered as an infrastructure provider (IP-1), the scope of which has always enabled deployment of both towers and fiber, but which was recently extended to allow deployment of active infrastructure such as small cells. This has enabled Indus Towers to ‘Put India First’ by creating public private partnerships (PPPs) with municipalities to create a replicable model for the digital transformation of thousands of Indian smart cities. For example, Indus’ partnership with the New Delhi Municipal Council involves a plan to deploy 3,000 aesthetically integrated, multi-functional smart poles that include Wi-Fi access points, LED lighting, digital billboards and, on selected sites, CCTV and air quality sensors. Indus Towers is also leveraging assets like bus shelters, water tanks, metro pillars, foot-bridges and toll plazas to develop solutions for smart lighting, smart parking and smart water metering.

Indus Towers provides power-as-a-service. By 2018 67,554 of Indus Towers’ sites were zero-diesel ‘green sites’, and the company aims to be diesel free by 2021, which will be a remarkable achievement when one considers the unreliability of India’s electricity grid.

Reliance Infratel
RCOM’s elusive tower legacy
Tower count: 43,263

Founded in 2001, Reliance Infratel is, or was, the captive towerco of Reliance Communications (RCOM).

Reliance Infratel was repeatedly put up for sale over recent years, with investors Tillman Infrastructure and Brookfield both securing periods of exclusivity to conduct in-depth due diligence on the business. No deal could be consummated, most likely due to concerns about the investibility of Reliance Infratel’s anchor tenant RCOM. Those concerns were validated when RCOM fell victim to the consolidation of MNOs in India and exited the wireless business, leaving in its wake substantial debts.

The recent apparent resolution of disputes over the claims of minority shareholder HSBC Daisy
Investments, and the settlement of those debts, may have cleared the way for the Reliance Infratel to be sold, perhaps to Reliance Jio, which is a tenant, albeit at a discounted rate, on around 32,000 of the 43,263 towers in Reliance Infratel portfolio.

If the reported Rs 180,000mn sale (US$2.5bn), (which includes the Reliance Infratel towers, plus fibre, spectrum and other infrastructure assets) to Reliance Jio closes, it remains to be seen whether the RCOM assets will be bundled with Jio’s own towers and fibre, for which they are believed to be seeking a buyer (see sidebar “Coming soon: Reliance Jio Infratel”).

SBA Communications

*Western Hemisphere pureplay towerco*

*Tower count: 29,564*

SBA Communications is renowned as a high quality wireless infrastructure business. SBA Communications builds and buys high quality towers; they are trusted by clients and shareholders alike. They are a towerco that is acutely aware of, and focused on, their core competencies in the business of providing vertical real estate. Today, SBA Communications’ margins are the best among their peers, and their market capitalisation, on a per tower basis, exceeds even American Tower, reflecting their investors’ faith in the purity of their Western hemisphere, traditional tower and rooftop focused portfolio.

SBA Communications has 29,564 towers spread across 13 countries in North, Central and South America. 80.4% of SBA’s core site leasing revenues are generated from their U.S. tower business, which remains a ‘cash cow’ generating tower cash flow at an 82.9% margin in Q418.

Then Steve Bernstein Associates, SBA Communications was founded in 1989 in Boca Raton, Florida, where the company is still headquartered. SBA Communications started out as a site-finding consultancy for carriers, negotiating with landlords, executing leases, getting zoning approved then supervising construction of towers and rooftops. By 1996 they had established a great reputation, and were the largest site acquisition and construction firm in the United States, at which point SBA Communications started the process to transition into an asset ownership model. SBA Communications acquired 12 towers in upstate New York in June, 1997 – the first of countless acquisitions from ‘Mom and Pop’ private tower owners.

<table>
<thead>
<tr>
<th>US$mns</th>
<th>FY14/15</th>
<th>FY15/16</th>
<th>FY16/17</th>
<th>FY17/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenue</td>
<td>947</td>
<td>694</td>
<td>939</td>
<td>527</td>
</tr>
<tr>
<td>Total operating expenses</td>
<td>563</td>
<td>402</td>
<td>439</td>
<td>428</td>
</tr>
<tr>
<td>Net profit / loss</td>
<td>-154</td>
<td>34</td>
<td>-85</td>
<td>-100</td>
</tr>
</tbody>
</table>

Source: RCOM Annual reports
Expansion at SBA Communications has always been driven by both organic and inorganic growth. In terms of organic growth, SBA Communications landed what is believed to be the first build-to-suit (BTS) construction contract with Bell South (a predecessor of AT&T), and SBA continues to secure substantial BTS contracts across their footprint. SBA Communications is also a disciplined buyer of towers, both through sale and leasebacks, and through the consolidation of small and large competitive towercos highlighted by the acquisitions of TowerCo in 2012 (3,252 towers for US$1.45bn) and Mobilitie in 2011 (2,300 towers for US$1.1bn).

Harnessing these twin growth drivers, in June 1999 SBA Communications listed on NASDAQ as SBAC, debuting at $9 per share. Like all the U.S. towercos, SBA Communications came under intense pressure when the Internet bubble burst – at one point their share price dropped to 19 cents and they had to sell 800 towers to become cash flow positive. But where some of their peers faltered, the experience made SBA Communications stronger. Three years later, SBA Communications bought back those 800 towers, and has since demonstrated remarkable growth. At time of writing (March 2019) SBA Communications stock was trading just under US$200, with a market cap in excess of US$22bn. Today SBA Communications is part of the NASDAQ 100 Index.

SBA Communications employs 1,347 people, generating annual revenues of US$1.866bn, with an adjusted EBITDA of US$1.305bn – an industry leading 69.9% adjusted EBITDA margin.

Since 2009, SBA Communications has been expanding internationally, starting in Canada, but then looking South into Central America, where SBA is the market leader with over 3,200 towers, and more recently into Argentina, Brazil, Chile, Colombia, Ecuador and Peru. 45% of SBA Communications’ tower portfolio is now outside the United States.

While SBA Communications is perhaps the most faithful tower company to the pureplay ‘steel and grass’ towerco business model, there are signs of an increasing interest in business model diversification, from initial forays into power service provision in Brazil, to an “exclusive asset” business which is exploring small cells, DAS and opportunities in CBRS. SBA deployed their first mobile edge computing site near Gillette Stadium, home of the New England Patriots American Football team.
SBA Communications’s global footprint at 31 December 2018

USA 16,249
Brazil 8,534
Canada 299
Panama 583
Chile 248
Nicaragua 493
Peru 298
El Salvador 738
Costa Rica 785
Guatemala 682
Argentina 56

SBA Communications U.S. tenancy revenue split

- AT&T: 27%
- Sprint: 17.9%
- T-Mobile: 16.4%
- Verizon: 14.7%
- Others: 24%

SBA Communications international tenancy revenue split

- Oi: 35.5%
- Telefonica: 26.4%
- Claro: 11.4%
- Others: 26.7%

Source: SBA 2018 Annual Report
### SBA Communications transaction history highlights in the last decade

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Tower count</th>
<th>Deal value US$mns</th>
<th>Cost per tower US$</th>
<th>Deal structure</th>
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<tbody>
<tr>
<td>2018</td>
<td>El Salvador</td>
<td>Millicom</td>
<td>800</td>
<td>$145mn</td>
<td>$181,250</td>
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<td>2017</td>
<td>Colombia/Peru</td>
<td>Torres Andinas</td>
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<td>Undisclosed</td>
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<td>2017</td>
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<td>Highline do Brasil</td>
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<td>Undisclosed</td>
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<td>Chile</td>
<td>CTR</td>
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<td>Undisclosed</td>
<td>Undisclosed</td>
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<tr>
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<td>Torresec</td>
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<td>Oi</td>
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<td>$321,375</td>
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<tr>
<td>2,013</td>
<td>Brazil</td>
<td>Oi</td>
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<td>2012</td>
<td>USA</td>
<td>TowerCo</td>
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<td>2011</td>
<td>USA</td>
<td>Mobilitie</td>
<td>2,300</td>
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<td>$478,261</td>
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<td>KEC International</td>
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<td>2015</td>
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<td>Verizon</td>
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<td>Brazil</td>
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<td>2014</td>
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<td>Airtel</td>
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<td>$1,060mn</td>
<td>$244,719</td>
<td>SLB</td>
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<td>2013</td>
<td>Brazil</td>
<td>Nextel</td>
<td>1,940</td>
<td>$349mn</td>
<td>$179,897</td>
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<tr>
<td>2013</td>
<td>Brazil</td>
<td>Z-Sites</td>
<td>236</td>
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<td>2013</td>
<td>Brazil</td>
<td>Nextel</td>
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<tr>
<td>2013</td>
<td>Mexico</td>
<td>Nextel</td>
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<tr>
<td>2013</td>
<td>USA, Panama &amp; Costa Rica</td>
<td>GTP</td>
<td>15,700</td>
<td>$4,800mn</td>
<td>$305,732</td>
<td>Company acquisition</td>
</tr>
</tbody>
</table>

Source: TowerXchange
Comparing the top 12 global towercos: scale key performance indicators and business model overview

<table>
<thead>
<tr>
<th>Towerco</th>
<th>Scale key performance indicators</th>
<th>Business model overview</th>
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<tbody>
<tr>
<td></td>
<td>Tower count</td>
<td>Tenancy ratio [1]</td>
</tr>
<tr>
<td>American Tower</td>
<td>170,996</td>
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<tr>
<td>Bharti Infratel</td>
<td>40,192</td>
<td>1.95</td>
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<tr>
<td>Cellnex</td>
<td>23,440</td>
<td>1.55</td>
</tr>
<tr>
<td>China Tower Corporation</td>
<td>1,948,000</td>
<td>1.55</td>
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<tr>
<td>Crown Castle</td>
<td>40,039</td>
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<td>Deutsche Funkturm</td>
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<td>~1.61 [3]</td>
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<td>edotco</td>
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<td>GTL Infrastructure</td>
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<td>IHS Towers</td>
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<td>2.29</td>
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<tr>
<td>Indus Towers</td>
<td>124,069</td>
<td>1.86</td>
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<tr>
<td>Reliance Infratel</td>
<td>43,263</td>
<td>N/A</td>
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<tr>
<td>SBA Communications</td>
<td>29,564</td>
<td>1.8</td>
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Footnotes
[1] Tenancy ratios are calculated in different ways by different towercos, and it is not always clear which method is used by each towerco. For example, some towercos count tenancies in terms of ‘BroadBand Equivalents’ (BBEs) where a tenant that takes significantly less space than a broadband MNO tenancy is counted as a partial tenancy. Some towercos count a multi-technology standard tenancy from a single operator as one tenancy (sometimes called a ‘point of presence tenancy ratio’), others count the ‘technology tenancy ratio’, where each overlaid technology (or ‘amendment’) is counted as a separate tenancy. Where multiple tenancy ratios are available, TowerXchange will record the technology tenancy ratio.
[2] Crown Castle number of employees is inflated, and the towers per employee number suppressed, because the company also has staff to operate 65,000km of fibre and 65,000 small cells (live and in development).
[3] Deutsche Funkturm tenancy ratio is a composite of estimated tenancy ratios of 2.3 on 9,000 ground based towers, 1.3 on 20,000 rooftops.
[4] The GTL Infrastructure tenancy ratio is suppressed by 13,217 zero tenant towers. The tenancy ratio on their 14,490 occupied towers remains around 1.9.

Source: TowerXchange, Company Reports
Explaining the business model overview section of the previous table

In the business model overview section of this table you will see an ‘at-a-glance’ index of business model variations. Here is a brief summary of what those filled, lightly shaded and blank cells mean.

“Steel and grass” indicates where the towerco provides only steel structures and real estate across a significant proportion of their portfolio. If the cell is filled then “power as a service” is not provided across the majority of the towerco’s portfolio. If the cell is lightly shaded then and the “Power as a service” cell is filled, this indicates that the towerco operates a “steel and grass” business model at a minority of sites, with “power as a service” in a majority of sites. If the “Steel and grass” section is blank, the towerco provides “power as a service” across their entire portfolio.

“Power as a service” indicates that the towerco is responsible for energy equipment and power availability as well as steel structures and real estate.

“Small cell and DAS”, where the cell is filled, indicates towercos which have made substantial investments in developing and deploying small cells and DAS, either indoor or outdoors, typically with 1,000+ nodes. Lightly shaded cells in this section indicate that the towerco has an earlier stage / smaller small cell and DAS business unit. Blank entries indicate that the towerco has negligible activity in small cell and DAS.

“Fibre”, where filled, indicates that the towerco has over 10,000km of fibre in its portfolio. Lightly shaded indicates that the towerco has a smaller fibre business, or both a license and intent to rollout fibre. Blank entries indicate that the towerco has negligible activity in fibre.

“Publicly listed” simply indicates towerco that are publicly listed, with lightly shaded cells representing towercos rumoured to be considering an IPO in the next 24 months, or towercos that are merging with another listed entity.

“Operator-led” indicates towercos where 51% of more of the equity is owned by one or more MNO parent companies. Often referred to as “carve-out” towercos, such entities often have rigorous governance structure to ensure independence.

“Pureplay independent” indicates towerco wherein the majority of equity is owned either by public shareholders, private investors, or management – MNOs do not have a controlling stake.

“JV infrashare” indicates joint venture infrastructure sharing companies where infrastructure assets are pooled and shared between two or more MNOs, often to the exclusion of other MNOs in the market.
Towerco scale comparisons

Source: TowerXchange, Company Reports
## Comparing the top 12 global towercos: financial key performance indicators and business model overview

<table>
<thead>
<tr>
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<td>6664</td>
<td>5786</td>
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<td>852</td>
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<td>6</td>
<td>1006</td>
<td>884</td>
<td>790</td>
<td>662</td>
<td>560</td>
<td>325 [2]</td>
<td>68%</td>
<td>63%</td>
<td>41% [2]</td>
</tr>
<tr>
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<td>10701</td>
<td>10231</td>
<td>8343</td>
<td>6224</td>
<td>6013</td>
<td>4866</td>
<td>58.20%</td>
<td>58.80%</td>
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<td>Crown Castle</td>
<td>53</td>
<td>5423</td>
<td>4356</td>
<td>3921</td>
<td>3141</td>
<td>2482</td>
<td>2228</td>
<td>57.90%</td>
<td>57%</td>
<td>56.80%</td>
</tr>
<tr>
<td>Deutsche Funkturm</td>
<td>~7 [3]</td>
<td>962</td>
<td>965</td>
<td>N/A</td>
<td>529</td>
<td>510</td>
<td>N/A</td>
<td>61%</td>
<td>59%</td>
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</tr>
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<td>edotco</td>
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<td>449</td>
<td>347</td>
<td>336</td>
<td>176</td>
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<td>~152</td>
<td>39.20%</td>
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</tr>
<tr>
<td>GTL Infrastructure</td>
<td>0</td>
<td>362</td>
<td>354</td>
<td>333</td>
<td>164</td>
<td>174</td>
<td>154</td>
<td>45.30%</td>
<td>49.20%</td>
<td>46.20%</td>
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<tr>
<td>IHS Towers</td>
<td>~10</td>
<td>1168</td>
<td>1107</td>
<td>905</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>61.7% [4]</td>
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<td>Indus Towers</td>
<td>11</td>
<td>2830</td>
<td>N/A</td>
<td>N/A</td>
<td>1165</td>
<td>N/A</td>
<td>N/A</td>
<td>41.20%</td>
<td>N/A</td>
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</tr>
<tr>
<td>Reliance Infratel</td>
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<td>939</td>
<td>694</td>
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<td>N/A</td>
<td>69.90%</td>
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</tr>
<tr>
<td>SBA Communications</td>
<td>22</td>
<td>1866</td>
<td>1728</td>
<td>1633</td>
<td>1305</td>
<td>1204</td>
<td>1123</td>
<td>69.70%</td>
<td>68.80%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Footnotes**

[1] Bharti Infratel values shown as consolidated figures inclusive of their 42% stake in Indus Towers

[2] Cellnex 2016 adjusted EBITDA and EBITDA margin shown pre-IFRS16

[3] Deutsche Funkturm valuation of €5bn (US$5.61bn) was mooted when a 49% stake was rumoured to be coming to market in 2016-17. Since then 2,000 towers have been built, while the valuation has been further increased to US$7bn based on an assumption that a substantial BTS contract would be included – Deutsche Funkturm has spoken of intent to double the size of their 9,000 GBT portfolio by 2022.

[4] IHS EBITDA margin derived from the results disclosed by IHS Netherlands Holdco B.V., a subsidiary which operates 27% of their portfolio

Source: Company Reports
Comparing revenue, EBITDA and valuation of top 10 global towercos

Source: TowerXchange, Company Reports
Regional analyses

The Central and South American telecom infrastructure industry has experienced considerable changes as the MNO landscape reshapes and towercos start exploring new business models, efficiency strategies and revenue streams. Brazil is finally out of recession, which means good news for acquisitive towercos, build-to-suit firms and innovative vendors, while Argentina remains a principal target despite the numerous challenges that the industry has to overcome. Operators and towercos are now seeking optimisation and efficient energy alternatives, which are prompting new synergies and collaborative models.

In this section, TowerXchange offers its readers analyses, editorials and roundtable reports on some of the key tower markets in CALA including Central America, Brazil, Argentina and Mexico.

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Argentina: the eternal promise
The sleeping giant could become one of the world’s greatest tower markets but there’s still a long way to go

Back in 2015, the hopeful arrival of Mauricio Macri and the first build-to-suit (BTS) contract inked by Innovattel painted a very promising picture for the tower industry to finally enter Argentina. Almost four years later, the reality has not come close to meet the huge expectations that everybody had for the country. The government is struggling to develop the necessary regulatory framework that can ease deployment due the strong power of more than 2,500 municipalities that coexist in the country, while high local fees, social opposition and the arduous permitting process are massively slowing down deployment for both operators and towercos. Regardless, Argentina remains the third largest CALA telecoms market by subscribers after Brazil and Mexico, and the country still holds enormous prospects for infrastructure developers and investors. I flew to the lively Buenos Aires to meet with key industry figures and further understand the barriers and opportunities that Argentina presents. Here is a report of my findings.

Keywords: Americas, Americas Research, American Tower, Argentina, Atis Group, Best of TowerXchange, Build-to-Suit, Claro, Co-locations, Editorial, ENACOM, Energy, Market Overview, MNOs, Patria Investimentos, Research, SBA Communications, Secretaría de Modernización, Telecom Argentina, Telefónica, Telxius, Towercos

Read this article to learn:
- An overview of the local telecom market and MNOs’ infrastructure strategies
- The still emerging Argentinian tower landscape
- Opportunities for infrastructure developers and vendors
- Crucial challenges and barriers to overcome in Argentina

Despite being the second largest country in the region, there are just around 17,000 towers spread across Argentina’s vast geography and the lack of infrastructure in rural and remote areas keeps slowing down the socioeconomic development of the Republic. The reality is that the country still needs 20,000 towers to achieve acceptable levels of coverage, and the number goes up to 50,000 to match the quality and capacity of neighbouring leaders Chile and Brazil. The Argentinian Agency of Investment estimates that the industry requires between US$2bn and US$5bn, and despite all difficulties, development banks, private equity funds and infrastructure players are all eyeing potential opportunities, while the three MNOs gear up to accelerate deployment and improve the level of coverage and capacity.

El mercado

2018 was a harsh year for Argentina. Its weakened peso experienced a historical devaluation, inflation overpassed 50% and consequently, its external debt increased massively, making access to credit very tough. Moreover, the biggest drought in the last 40 years contributed to what Macri called “the perfect storm” - and that storm inevitably hit the telecoms industry.

In spite of all of the above, it was not all bad news. After the merger with Cablevision, the cable broadband unit of Grupo Clarín, Telecom Argentina absorbed Nextel’s portfolio and the new consolidated giant announced a two-year
investment plan of US$5bn to boost connectivity through a considerable infrastructure upgrade and expansion. The MNO has since been exploring different investment tools and it recently received a US$450mn loan from the International Finance Corporation (IFC) to continue expanding broadband coverage, mainly in remote and underserved areas. Moreover, earlier this month, Telecom obtained another US$100mn credit from Santander and J.P.Morgan that will help the operator to finance a recent deal with Nokia, who will be supporting Telecom’s fibre and infrastructure expansions.

At the end of last year, Telecom Argentina became the market leader with a portfolio of 6,553 sites made of 5,084 owned towers and 1,469 co-locations. The company, who is very open to the idea of working with infrastructure partners, had some trouble in 2018, as towercos were only able to deliver 340 new sites out of the 1,000 concessions that the telco handed over. By the end of 2019, the company expects to have added over 700 new towers to its portfolio and the initial 30% of sites designated to towercos might increase, since the MNO is currently considering a shift on its deployment strategy.

América Móvil’s Claro was a pioneer as the first MNO to start working with towercos back in 2015. The MNO, which applied its regional strategy to Argentina, is outsourcing around 35% of its upcoming deployment to infrastructure developers - but that will not be more than 300 new towers, as Claro is currently focusing on modernising 1,000
sites that require a 700MHZ band upgrade for 4G integration. The company owns over 5,500 sites and works mainly with Torresec, Evotech, Atis Group and GME.

With a slightly smaller portfolio and more than 1,500 co-locations on its competitors’ sites, Telefónica has signed master agreements with both Telxius and SBA in the country, while also partnering with other independent players through individual agreements. Telefónica actually became the first and only Argentinian MNO to sell part of its portfolio to a tower company when they transferred 323 towers to Telxius. The operator plans to build only 100 new towers in the upcoming months and less than half will be deployed by towercos. However, before the year ends, the company is likely to open a bid for towercos but the actual number of sites and requirements have not been revealed yet.

**Permitting, scepticism and other barriers**

Towerco penetration among MNOs is relatively low compared to surrounding countries, but all three operators have now started to understand the benefits of outsourcing their sites’ deployment. Nonetheless, Argentinian operators are very used to the concept of allowing access to each other’s towers - and they even share electricity bills, as having your own meter is a complicated issue. We continue to see more and more collaboration within the industry, but there is still a certain reluctance against the adoption of the towerco model.

First, permitting obstacles are forcing operators to take risks and build sites without permits wherever they need to, as they cannot afford to fail to provide the service to their customers in such a turbulent context. Towercos, contrarily, are not always willing to assume those risks, at least independently and without a contractual guarantee from the operators. And indeed, there is a cultural barrier: although infrastructure is not telcos’ core business, they have been deploying sites for a long time and some executives are very reluctant to share responsibilities, they don’t trust third party standards or are afraid to lose their jobs. Furthermore, in early 2018, an infrastructure developer sealed an exclusivity building agreement with a municipality in Matanza, forcing MNOs to work solely with them for their local deployments and setting a rather dangerous precedent.

In Argentina, MNOs have expressed their objections for towercos to get involved in urban and innovative deployments and they prefer to deal with them only for traditional sites. On the other hand, towercos claim that they just receive assignments and search rings for the most challenging areas, where MNOs have previously failed to deploy due to excessive local taxes, long permitting processes or logistical issues.

The progress of the industry mainly depends on successful synergies across the value chain, and towercos, operators and turnkey providers will need to have a more collaborative and flexible approach, as working together seems the only way to unlock the multiple challenges that come up when building a site in Argentina.

**Further inhibitors to towerco penetration**

To this day, no towerco has been able to develop a significant footprint in Argentina, mainly due the high tax regime that has so far prevented any sale and leaseback deal. Towercos are building their portfolios organically, which requires both patience and strong financial capabilities in a country where deploying one single tower can take over six months.

The market is very fragmented and towercos own around 1,300 towers. Torresec is the market leader with 356 sites and 300 more under construction. After paying US$30mn to Telefónica for 323 sites, Telxius was able to build only six new sites last year, and they expect to deploy 40 more before the year ends. The company is exploring alternative revenue streams and has recently closed a deal with DIRECTV, a satellite and fixed broadband provider that will become a tenant on over 80 sites. The Spanish towerco is also collaborating with local IoT carriers to install light equipment on their towers for a small fee.

GME Alliance, one of the first market entrants, has a portfolio of over 100 sites and has 30 more under construction. Atis Group, who received a US$100mn injection from Pátria Investimentos, has successfully developed a portfolio of almost 100 sites, and they are hoping to build 150 more in the next few months. Contrarily, regional leaders American Tower, SBA Communications - who are historically more inclined to grow inorganically when entering a new market - are still possibly waiting for sale and
leaseback opportunities. Torresec, the first towerco to enter the market back in 2014, is said to have deployed around 100 sites.

Facing local opposition is common in Argentina especially due to the fear of radiation emissions and their impact on health. Educational and awareness programmes on the socioeconomic benefits of connectivity are much needed across the country.

One of the biggest hurdles is represented by the municipal fees asked for land use and inspection, making deployment not only slow but very expensive. Tower companies often fail to deliver their sites as fast as they would wish, and additional costs incurred throughout the process affects their balance sheets.

With so many unconnected areas, it is not difficult to identify signal gaps, so new players are now taking extra risks and building on those locations without an actual MNO order or a permit, assuming extra logistic and financial risks, without the certainty of finding tenants and exposing themselves to bureaucratic issues.

Both energy and land rent are a pass through, with the latter ranging between US$300 and 1,000 monthly and towercos charging an average service fee of US$800 on top of that.

**Embracing opportunities**

Greater Buenos Aires, which houses 16mn residents with a mobile penetration over 120%, is the main target for both towercos and operators but more opportunities can be found in urban areas such as Rosario or Cordoba. Towercos can also benefit by partnering with utility companies to gain the right to use their infrastructure and leveraging their pre-existing relationships with municipalities. Now, MNOs are using those utility’s assets to accelerate white cups and small antennas deployment so towercos should get creative to explore potential collaborations.

MNOs have stringent coverage obligations as part of their licenses and would benefit from the expertise of towercos to achieve their targets.

Operators deal with energy directly and all of them are already exploring more efficient alternatives to reduce their electricity bills. Argentinian telcos have traditionally relied on acid-lead batteries and diesel generators, but all of them are now considering a transition to lithium, for which the

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**Argentina - Estimated tower count**

<table>
<thead>
<tr>
<th>MNO captive towers</th>
<th>~16,000</th>
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</thead>
<tbody>
<tr>
<td>Torresec 356</td>
<td>Telxius 330</td>
</tr>
<tr>
<td>ATIS ~100</td>
<td>GME Alliance +100</td>
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<td>American Tower 56</td>
<td>Evotech 40</td>
</tr>
<tr>
<td>PTI 36</td>
<td>Others 100</td>
</tr>
</tbody>
</table>
initial investment is the main barrier. Renewable energy is also an attractive prospect for the industry and although the space requirements of solar and hybrid equipment are quite high, Telecom, Claro and Telefónica are testing various alternative solutions.

Towers continuously suffer from vandalism and theft, and every tower owner is actively exploring security solutions including monitoring and surveillance systems, alarms, access control and digital padlocks among others.

In addition, some towercos are also assessing the viability of digital maintenance and monitoring systems that can control and transfer data automatically, which can improve site efficiency while adding new services to their offer.

It hasn’t been enough

Regulation has to play a critical enabling role in driving the industry forward. The Secretaría de Modernización and its regulatory body ENACOM are pushing forward, but politics in La Argentina move at a very slow pace. The country has a decentralised federal regime with more than 2,500 municipalities that have their own jurisdiction over land use and infrastructure development so central power is very limited.

Last year, the Secretaría de Modernización launched a National Telecommunications Plan aimed at simplifying the permitting process. The government is trying to ease MNO access to state-owned buildings and educate the citizens on the necessity of infrastructure and connectivity among other initiatives. Moreover, ENACOM is trying to create a unique entity to centralise the permitting process and the initiative is currently under discussion in Congress.

As part of the Telecommunications Plan, the Secretaría is working alongside the Argentinian Investment Agency and developing three pilot tests across the country that aim to set successful precedents of collaboration across the industry to favour deployment.

Unfortunately, those efforts have not made the necessary impact, and since 2016 the ENACOM has managed to positively impact only 70 conflicts against municipalities. The 2019 general elections will take place in October and whoever assumes power will need to take a strong stand to strengthen the power of ENACOM, increase MNOs’ QoS capabilities and upgrade the current regulatory framework to recognise the importance of telecoms infrastructure for the country’s future.

Collaboration will be critical and the industry needs to strengthen its lobbying power towards a more reasonable and favourable regulatory regime. Towercos need to be brave and creative, as they will need to explore alternative revenue streams while assuming additional risks. For its part, MNOs need to continue embracing the many benefits of towerco collaboration and keep opening their mindsets, as they will not be able to achieve their mid-term coverage targets without the expertise and financial support offered by towercos.
Permits and taxation remain principle barriers to be overcome in Argentina

Understanding how we can work together to unlock towerco investment in Argentina’s emerging Digital Economy

Volatility remains an issue

While inflation in Argentina is targeted below 20%, it seems more realistic to expect it to float around 30%. So how can towercos overcome the intrinsic volatility of contracts, prices and leases?

Permits and taxation remain principle barriers to be overcome in Argentina

During the fifth edition of the TowerXchange Meetup Americas, Eduardo Wiñazky, telecom consultant and former Head of Municipality and Infrastructure Management at ARSAT, moderated a roundtable discussion on Argentina. Permitting and taxation were key themes, as the country’s pioneering towerco continue to endeavor to overcome barriers at municipal level from restricting Federal intent to stimulate investment in infrastructure for the Digital Economy.

Argentina needs more towers - how can we work together to ensure we can close the infrastructure gap quicker?

Keywords: Americas, Americas Insights, Argentina, Business Model, Country Risk, Infrastructure Sharing, Insights, Investment, Lease Rates, Leasing & Permitting, Market Overview, Regulation, Risk, South America, Tax

Read this article to learn:

- How to negotiate contracts and deal with inflation and volatility
- The acceptance of the towerco business model
- Permitting, NIMBY and other real challenges affecting the industry
- Should towercos create an industry association to lobby stakeholders and accelerate closing the infrastructure gap?

Volatility remains an issue

While inflation in Argentina is targeted below 20%, it seems more realistic to expect it to float around 30%. So how can towercos overcome the intrinsic volatility of contracts, prices and leases?

Volatility remains an issue

While indexation remains prohibited in Argentina, this doesn’t necessarily mean contracts have to be shorter - there are contractual work-arounds, and towercos are issuing ten-year contracts with clauses and conditions that insulate them from the effects of inflation. Some tower companies are dollarising their contracts with operators, although it was noted that this can put operators in a bad position in case currency devaluation gets out of hand. Other towercos have opted to take the risk and bet on the country’s economy settling down in the future. The risk linked to issuing contracts in local currencies seems bearable for now, as there isn’t significant M&A driving transactions of scale and, in any case, landlords are generally unwilling to negotiate contracts in foreign currencies.

The entrance of towercos in Argentina has led to an improvement of the contractual conditions of ground leases since they’ve been able to negotiate long term contracts that protect their new builds and the carriers’ activities. And while there remains a degree of scepticism on the part of Argentinian landlords around the security of long term deals, some towercos report ground leases of 15-20 years with renewal clauses.

Some towercos complained that landlord expectations in Argentina were at risk of rendering some locations uninvestible as the gap between...
what it would cost to lease the land and what the site could generate was too narrow to be financially viable. Other towercos suggested Argentina was as rational as any other market: “if a landlord will not agree a rational lease rate, you just go next door.”

**Sale and leasebacks remain unlikely in near term**
When it comes to M&A, taxation still poses significant limitations, indeed the transfer of sites between Telefónica and Telxius was made possible as an inter-company transfer, hence under special terms. With its captive towerco Telxius already on the ground in Argentina, Telefónica seems more likely to continue to carve out and transfer, rather than sell their towers. It remains to be seen whether Claro would spin off their Argentinian towers into Telesites, but TowerXchange would not be surprised to see Telesites in Argentina within the next two years.

**Is the towerco business model being accepted?**
Participants agreed that Telefónica and Claro have been easier to deal with in Argentina since many of their opcos in other countries are already working with towercos. But there are cases with Personal (mainly due to staff turnover) and in general across the MNO landscape where the towerco business model had to be explained from scratch.

One thing was apparent during the discussion: MNOs want more towers and they want them soon. In many instances, they are working with towercos in order to speed up the deployment of new sites but this isn’t easy for towercos either! As an example, Personal is working with towercos for 972 new sites but to date, only ~200 of those had been deployed in the year to date.

**Permits and taxes remain a critical issue**
The real bottlenecks are still permitting, municipal taxes and site acquisition with the addition, for some participants, of the complexity of sourcing qualified labour.

With each municipality issuing their own laws, it’s crucial for towercos not only to understand each layer of rules, but also to educate municipalities on the advantages of working with infrastructure companies.

Municipal fees and the time required to secure permits are key pain points and not easy to overcome. In fact, towercos agreed that to date, little progress has been made to push back on the disproportionate inspection fees that municipalities charge for each site. Fees that in some cases – e.g. in Buenos Aires – can reach as high as US$700pcm, representing a 70% tax on the prevailing lease rate! And this is particularly frustrating since in most instances these inspections never take place!

Disproportionate municipal fees have contributed to the fact that many legacy cell sites in Argentina are unpermitted. If the tower industry is to legalise such sites, and establish a new higher standard of permitting, then fees must be sustainable.

Towercos around the table came to the conclusion that one way to solve the problem is to agree on a fair fee and present this to the municipalities. It was suggested, for example, that the actual cost of a site inspection was US$65.

Since the entrance of towercos, and after years of negotiation and some successful legal battles against the inspection fees, MNOs have largely passed the problem to towercos, even though some contracts suggest municipality fees are the responsibility of the infrastructure owner, others refer to liability belonging to the owner of the antenna. However, towercos agreed that they have the right skill-set to solve this critical issue.

Towercos came to the conclusion that while they can work smoothly with some municipalities, the differences in rules from one jurisdiction to the next makes it extremely complex to streamline any process. Some towercos are already active in over 80 municipalities but there are 2,400 municipalities across Argentina! The group agreed that there are
Argentina’s municipalities have to understand that the telecom business has changed. Towercos are not MNOs - we represent only a small slice of the value chain - and a US$700 fee is disproportionate. The real cost to inspect a tower is around US$65 ways to push their agenda such as the creation of a towerco association to drive dialogue at the Federal level, or working with the right, well connected lawyers at local levels.

**Expected reforms versus NIMBY and other disruptive attitudes**

One positive aspect is that the current Federal government is supporting infrastructure sharing and the towerco business model as a way to improve quality of service and coverage across Argentina and enable the development of the Digital Economy. But while the support at a federal level is there, local governments can still torpedo the positive changes occurring in the industry.

The stereotypical “business as usual” mindset of many public entities across Argentina is jeopardising the efforts made to improve not only the telecom sector but the overall national economy.

And while towercos wait for game changers such as the Convergence Law – not due to until 2020 – to come into full force, they need to keep educating local authorities, lobbying and negotiating their way through the complexities of doing business in Argentina.

Some participants mentioned cases of successful lawsuits against local municipalities across CALA which led to positive results but for now, the idea is to try and push for the change without lawsuits. However, with Argentina agreeing a new US$50bn aid package with the International Monetary Fund this past June and the need to rationalise budgets, towercos agreed that municipalities will depend on their current revenues more than ever in the future. Another issue is the Not In My Back Yard (NIMBY) mentality still hitting hard in some municipalities. To please local communities, some municipalities have agreed to only allow one towerco to build in the area. A decision that flies in the face of fair competition and could lead to an increase in lease rates in the future.

The group touched upon an upcoming resolution on interconnection which will require public infrastructure owners (e.g. utility companies) to open their assets up for sharing. The rules are vague and will require towercos to sit with these companies and possibly strike private deals. And while the interconnection law aims at solving coverage problems across the country, once again the way it’s drafted causes confusion among telecom players. In one towerco’s words “Argentina is a major opportunity but hindered by this kind of chaos!”

**Permits and slow rollouts**

When it comes to obtaining permits, towercos admitted that while they are diligently seeking all the required paperwork, they might start a new build without all the necessary permits in place as long as “they see a path to full licensability”. In other words, they know they’ll be able to get the permits but the lengthy process pushes them to start deploying in the meantime. That is a risk but a risk that many towercos are willing to accept amid the complexities of the current permitting regime in Argentina.
MNOs – or towercos – are held accountable for slow rollouts when they often aren’t responsible. “You can follow all the rules, submit your package, get your pre-feasibility done, and you can still find the final permit is being held up as the municipality tests the community reaction,” said one towerco. The timeline to obtain pre-feasibility permits is such that consumers should stop blaming MNOs and start pressuring their mayor and municipality to improve quality of service by accelerating rollouts, not hold them up!

To date, most towercos seem to be focused on urban infill projects, rather than concentrating on rural sites. So while for the time being MNOs and towercos are working to densify urban coverage, they will need to start rural rollouts at some point – also to fulfil MNOs’ coverage obligations – and those projects might result in easier permit processes as some communities might welcome the idea of obtaining signal for the very first time.

Conclusions
The past twelve months have been tricky for Argentina at many levels. The country is once again dealing with macroeconomic challenges but the government is deeming the current economic slowdown as temporary and has been bullish about growth from Q4 onwards. The government is forecasting a 10% YoY increase in infrastructure spending in 2019, as a result of a Public Private Partnerships programme that is being approved, which could have a positive impact on the tower sector.

On the other hand, towercos report difficulties in doing business which are very typical of emerging tower markets and the inception phases of any new industry. Therefore, TowerXchange expects another tough year ahead for Argentina’s pioneering towercos, but expects success in the medium to long term.

There is a substantial infrastructure gap in Argentina - a huge need for network densification and extension - and towercos can finance and build new sites quicker than MNOs. Some municipalities are prepared to work together with towercos to negotiation new fees and ordinances that make taxation legally justifiable, sustainable, collectable and that puts an end to the historical practice of not permitting sites to avoid fees. But educating one municipality at a time is going to be a slow and painful process in a country of 2,400 municipalities. An industry voice is required at a Federal level.

A country like Argentina, with its complex rules and business environment which at times almost seems to incentivise a lax attitude to permitting, is a fertile field for undisciplined towercos and TowerXchange expects some of them to try their luck and get some new towers built. But a rational tower permitting regime and M&A market will eventually emerge in Argentina, and tower entrepreneurs will make the best returns if they abide by the fundamentals of the business model: building good towers in good locations, with (eventually) a full set of permits. Because at the end of the day, many will seek an exit and will realise the best valuations if their towers are a low risk acquisition for the likes of American Tower and SBA Communications!
Brazil’s comeback: the return of CALA’s giant

The macroeconomic recovery and its competitive MNO landscape bring the country back to the spotlight

Over the last decade, Brazil has been one of the most dynamic and prolific tower markets in Latin America but a deep recession mixed with an intense political crisis contributed to putting a halt to growth and creating a rather dejected telecom landscape for the past three years. Brazil is now back and holding huge prospects for organic growth, technology innovation, investment and acquisitions. Earlier this year, TowerXchange touched down in São Paulo and met with key industry figures to analyse the market turnaround and new prospects of the Latin American giant. This editorial explores MNOs’ latest moves and strategies as well as upcoming opportunities for towercos, vendors and investors.

Keywords: 4G, 5G, Americas, América Móvil, Brazil, Claro, Co-locations, ESCOs, Editorial, Energy, Energy Efficiency, Investors, Market Overview, Nextel, Oi, RANsharing, Regulation, Renewables, Research, Small Cells, South America, TIM, Telefónica, Vivo

Brazil is one of the most competitive telecom tower markets in Latin America. Its 209mn population, a high penetration and its competitive telco landscape are huge drivers for both greenfield deployment and co-locations. From an operational perspective, it can be considered an innovative market with all the main players exploring new business models, advanced technologies and alternative energy solutions. Financially, private equity funds, infrastructure leaders and even smaller independent investors can expect plenty of activity as the MNO landscape and tower market consolidate and mature against the backdrop of a recovering socio-economic scenario.

A very competitive playground

Telefónica’s Brazilian subsidiary Vivo leads the telco game with one third of the total subscribers. The company, which owns around 4,000 towers and operates 24,404 base transceiver stations including its co-locations, invested over US$2,000mn on fibre expansion and 4-4.5G network upgrades in 2018. Vivo has set ambitious deployment targets and aims to build 1,500 new sites per year between BTS, co-locations and new builds of their own in specific locations where they cannot find a suitable infrastructure partner. The MNO has previously sold many of its towers in the country and carved out more into Telxius when the towercos entered Brazil.

Since last November, Vivo’s operations have been fully powered by renewable energy and...
the MNO plans to achieve a 64% reduction on its CO2 emissions by 2020. It has developed different small hydroelectric plants in the state of Minas Gerais to power their assets and signed different PPA agreements across the country to complement their auto-generated supply. In addition, Vivo seeks to improve its operational efficiencies hence is implementing more than 20 initiatives to reduce energy consumption including network modernisation, the replacement of old equipment and the deployment of new technologies such as advanced cooling systems and batteries. Security is a big concern across Brazil and the telco has already installed 6,000 bluetooth locks, reducing thefts by 95% on those sites.

For years, TIM and América Móvil’s Claro competed for the second spot, but in March, the latter consolidated its position with Nextel’s acquisition, which will give Claro almost an extra 2% of the market share. América Móvil’s agreed to pay US$905mn to NII and Al Brazil Holdings BV but the transaction still needs to be approved by telecom regulator ANATEL.

With a portfolio of 11,000 macro towers and around 3,000 small-cells, Claro is the only Brazilian MNO that has not sold any of its assets to a tower company. The MNO owns the second largest portfolio of assets in the country, behind American Tower. However, that could change soon as the company is currently deciding whether they should continue with the current strategy or release some sites via a sale and leaseback transactions or through a carve out - hence via the creation of Telesites in Brazil. Claro has been heavily deploying over the past two years, in an effort to transition to 4G and even to 4.5G - with network innovation high up among the MNO’s priorities. The telco is now reviewing its capex allocation and exploring different alternatives to optimise its network use, including an infra-sharing initiative that will facilitate and boost other MNOs’ access to Claro’s towers when needed.

Energy is a huge theme for Claro Brasil. The company is now modernising its electronic equipment, installing new rectifiers, efficient generators and lithium batteries to reduce cost and emissions while improving efficiencies. As previously reported, the company is also developing the country’s largest private renewable energy generation project, while exploring automated monitoring and access control solutions that can reduce and control the impact of vandalism and theft.

Competitors have to keep up. In 2019, TIM has already invested over US$170mn out of the total
US$975mn that the company has allocated for its mobile broadband infrastructure expansion and the development of the fixed broadband business of TIM Live this year.

The Italian telco aims to become a global leader in 5G and has been exploring its deployment in Italy and Brazil. In fact, TIM Brasil is working alongside Huawei and conducting trials on the 3.5GHZ frequency in Florianópolis as the MNO seeks to explore applications related to smart cities, agriculture, self-driving cars and virtual reality.

With around 16% of the market share, Oi is still a strong competitor in the game, while the fourth player - Algar Telecom - retains less than 1% of the market. In June 2016, Oi filed the largest bankruptcy request in Brazil’s history and the company chose judicial reorganisation to preserve its holdings’ value and to continue serving its customers. A year later, the company reached an agreement with two creditor groups on a plan to exit bankruptcy protection and the company is now fully back on business.

Four years ago, Oi sold around 9,000 towers to SBA and America Tower and earlier this year the MNO hired Bank of America Merrill Lynch (BAML) to sell its remaining sites as well as its data centres. Although the company plans to sell its non-core assets, Oi is still building some sites, both directly and through BTS contracts as well as continue closing RANsharing agreements with contestants TIM and VIVO.

Like its competitors, Oi has reached an agreement with Minas Gerais' electricity provider CEMIG to power its operations with solar in the state and although their priority now is to purchase renewables through PPAs, they are developing a micro solar project in São Paulo to explore the benefits of auto-generation and hoping to replicate that in other areas. The company has also started its first 5G test in Buzios and plans to continue testing its possibilities and requirements. In preparation for that transition, Oi will invest over US$180mn on a fibre expansion initiative across 60 cities by the end of the year.

**Is the towerco renaissance real?**

New sites’ demand from MNOs is increasing and the huge need for new builds to improve capacity...
and coverage in new areas will guarantee organic growth again. SBA Communications and Phoenix Tower do Brasil remain optimistic and all the main infrastructure players are expecting large demand for macro sites as well as small cells, shorter poles and DAS as MNOs look at alternatives to densify existing networks in areas of poor quality.

Moreover, ANATEL is currently freeing up spectrum that was previously utilised by analogue TV providers and an auction should take place before the end of the year, which will further intensify 4G deployment efforts. The expected approval of the PLC 79, which the regulator is urgently pushing, will also free up capital spending toward wireless infrastructure and take a heavy burden off MNOs having a positive impact in the market.

Also on the regulatory front, ANATEL recently confirmed that the bidding for 5G spectrum - the largest auction in the history of the agency and a huge driver for new sites - should take place in Q1 2020. Conscious of this transition and its requirements, towercos in Brazil are acquiring fibre portfolios and concentrating in shorter and lighter urban-focused solutions. Along that line, niche smaller players such as Skysites - an infraco mainly focused on urban deployment - could find plenty of business with MNOs while becoming an acquisition target for some of the bigger infrastructure players that want to diversify their footprint. A recent example is the acquisition by Phoenix Tower do Brasil of small cell firm K2 Tower.

An innovative approach will be required, as operators are open to explore solutions that can guarantee cost reductions. From monitoring systems to rectifiers and access control software, towercos will find plenty of opportunities to improve their offer while vendors can monetise this need through towercos partnerships or dealing directly with MNOs.

Specifically, security remains a top concern and demand for surveillance systems, new alarms and sensors, solid cabinets and access control
alternatives will rise, while MNOs have started demanding a more proactive approach from towercos on this front too.

In addition, the push from MNOs to improve their services and the need of diversification to guarantee the expected returns to investors is certainly changing towercos approach to energy. Traditionally, they were very reluctant to any shift in their business model. Now, all the main towercos active in Brazil are at least analysing the potential benefits of integrating energy management in their business offer and some of them are even in talks with different ESCOs and RESCOs and considering partnership and beneficial collaborations. This is part of a bigger regional trend as CALA towercos are indeed going beyond steel and grass.

Back in March, an MNO infrastructure executive told TowerXchange that he’s currently dealing with over 35,000 bills, so having a single throat to choke that includes land, maintenance, energy and security fees would make his life much easier - and towercos’ offer way more appealing. In Brazil, the government wants to push solar and incentivise companies that develop their own renewable energy initiatives. Moreover, the law allows private entities to install their own plants and reinject their surplus back to the grid to sell it afterwards in any point of the country, therefore investing in renewables can bring interesting returns to tower companies while providing a competitive advantage.

Despite all those encouraging signs, the industry still has many challenges to overcome. As in most Latin American markets, land use and permitting are very complex in Brazil and the power of municipalities remains strong. In some cases, it can take months to get a building permit and the different rules, fees and requirements of each municipality complicate the creation of a national deployment strategy. Although the Brazilian economy has experienced a notable improvement, the currency continues to cause financing challenges to international towercos and investors.

Collaboration and RANsharing among telcos is very common in Brazil and towercos need to be very innovative and diligent to position themselves as the most reliable infrastructure partners.

Flexibility and a cooperative approach will be crucial. Demand will continue rising and the current coverage and site densification won’t be enough, especially with the prompt arrival of 5G. Consolidation in both the MNO and towerco front is expected in the near-term and as mentioned above, technology and strategic innovation will be necessary to survive in this competitive scenario.

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Brazil - Estimated tower count ~60,500

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Where to find co-location and BTS growth in Mexico

Latest Mexican roundtable reveals mixed views on ALTÁN and rural network extensions, continuing challenges with permitting

Moderated by Gonzalo Cornejo, now CFO at Mexico Tower Partners, the Mexico roundtable at the TowerXchange Meetup 2018 focused on future tower market growth expectations related to the continuing rollout of wholesale 4G network ALTÁN Redes, as well as AT&T deployment plans, permitting challenges and currency volatility, all in the light of the recent Presidential elections.

Keywords: 4G, ALTÁN Redes, AT&T, American Tower, Americas, Americas Insights, Build-to-Suit, Co-locations, Densification, Insights, Market Overview, Mexico, Telcel, Telefónica, Telesites, Towercos, Urban vs Rural

Read this article to learn:
- Political and economic implications of the election of Lopez Obrador
- Co-location growth from ALTÁN, coupled with concerns about BTS and their long term future
- Do the economics of rural sites in Mexico stack up?
- New site typologies: who is interested in urban densification sites?
- Continuing permitting challenges in Mexico

The impact of the Presidential elections

While the round of CALA presidential elections is creating uncertainty in Mexico and elsewhere, the newly elected leftist candidate Lopez Obrador (who hadn’t been appointed at the time of the TowerXchange Meetup Americas) is an advocate of expanding mobile coverage beyond urban centres, into rural and semi-rural areas. Hopefully this will lead to another wave of new deployments, especially since Mexico still lags behind compared to the rest of the region in terms of coverage.

There is hope that the newly elected President won’t change the direction of reform of the telecom sector and will keep moving in the current direction. At present, telecom policies have contributed to reducing the cost of telecom services and increasing coverage across Mexico.

While some agreed that the elections might bring the Mexican peso back up to its 2017 value, they also noted how currency fluctuation is irrelevant as long as they have long term (ten plus years) contracts in local currency, linked to inflation. Volatility increases if you negotiate contracts with less than five years duration.

Rationality returning to Mexican tower market

The entrance of AT&T heavily disrupted the Mexican market and not for the right reasons. In fact, the country saw a sharp increase in the number of towercos entering Mexico and some behaved in rather irrational ways, deviating from...
long-term contracts, not adjusting them to inflation or accepting risky cancellation terms. While the market overreacted to the perceived opportunity, only a few hundred sites were built following AT&T initial RFPs and some small towercos have subsequently decided to exit after selling the few towers they had built.

That consolidation phase led to a more rational shape of the market as it appears now. And the positive market restructuring is further corroborated by the activities of ALTÁN Redes...

**ALTÁN Redes: co-lo today, BTS tomorrow?**

For the second consecutive year, towerco participants at the Mexican roundtable confirmed that ALTÁN represented their primary source of co-location growth. While several towercos reported that they had been negotiating terms for BTS with ALTÁN over the past six months, no-one reported actually starting any build-to-suit for the wholesale operator.

To some towercos, ALTÁN is just another company leasing space to mount their equipment on their towers, albeit with a different financial risk profile. Others see ALTÁN as a prospective competitor of towercos. ALTÁN operates a RANsharing model, which means an MNO wanting to use an ALTÁN 4G site can use ALTÁN’s antenna instead of mounting their own equipment – it doesn’t replace their legacy 2G and 3G technologies though. “If ALTÁN are taking my co-location they’re a competitor – so I’m building for a competitor,” said one towerco. “Although I’m betting that carriers using ALTÁN will eventually generate enough traffic that they need to take their own tenancy.”

ALTÁN has to achieve 92% population coverage by 2022, which is going to draw them beyond urban and suburban co-location and into building new rural sites. Most roundtable participants anticipated that only Telcel would follow ALTÁN into rural areas, albeit unlikely to actually use the ALTÁN service themselves. “Telcel doesn’t need ALTÁN infrastructure or towers,” said one participant. “So if Telcel needs coverage in a third or fourth tier city, they will build their own sites through Telesites, they won’t use ALTÁN.”

Observers were similarly sceptical that AT&T would use ALTÁN nor that Telefónica would invest in significant rural expansion.

With finite potential to lease future rural ALTÁN sites to second tenants, will the economics add up for towercos? The prevailing view was that the lease rate for a rural site would have to be higher than for urban.

“If ALTÁN does achieve 92% population coverage, those last towers being built before the 2022 deadline may not be economic – or at least they will take a long time to mature,” suggested one participant.

“Those 2022 rural BTS sites will clearly have less co-location potential,” agreed another.

ALTÁN may attract more operator interest in using their services as they approach that 92% coverage mark – it’s unsurprising that Telcel, AT&T and Telefónica aren’t using ALTÁN whilst they are building parallel networks. The key to success for ALTÁN may be less predicated on attracting incumbent MNOs to use their services, more on enabling MVNOs and OTT players.
Interestingly, participants observed that ALTÁN was seeking sites often in close proximity to existing American Tower and Telesites sites—“no-one wants to build a single tenant tower 100m from an existing Telesites or American Tower site!” Exclaimed one participant.

AT&T were similarly rumoured to be commissioning some small sites in proximity with existing sites – while savvy towercos knew better than to build such sites, new entrants often proved willing, and rarely encountered zoning restrictions preventing them from doing so.

Backup power and other efficiency concerns

To date, each operator in Mexico takes care of their own backup power requirements but some group members agreed that this might change when deployments reach rural areas with limited energy provision. In that instance, towercos could get involved to rationalise energy management.

Site typologies: macro towers still most prevalent

The majority of new build sites in Mexico remain macro towers. Smaller lamppost sites can be challenging to secure, particularly as municipally owned street furniture may only be available on three year contracts, if permits can be attained at all. For this reason, there are few small cells in Mexico. “Only AT&T is talking about densification,” commented one towercos. “That and fibre is all they have budget for this year.”

Mexican municipalities would appear to remain reluctant to partner with the telecom industry to create smart cities, accelerating the deployment of urban sites and transforming them into smart sites.

“It will be challenging to rollout 5G in Mexico whilst it remains so difficult to get permits for infill sites and fibre from municipalities,” concluded another towercos.

Permitting in Mexico

When it comes to permitting, practitioners noted how the process hasn’t improved in over five years and while the Federal government has been discussing ways to enhance the involvement of municipalities in granting permits, no real change has occurred yet.

Some highlighted that if a mega project like ALTÁN, with its aggressive deployment targets, hasn’t been able to push the government to work with municipalities to simplify and accelerate permitting, then this suggests that change isn’t in the cards anytime soon.

Carriers need to enhance their networks and deploy sites, driven by consumer demand, but there isn’t a platform yet to create a constructive dialogue on how to develop a proper permitting structure.

Making a comparison with the U.S., towercos co-operated with their customers and created a platform to work and have a dialogue with municipalities. It took some time to shift from the idea that a tower devalues a property to the current mind-set of “no coverage, no value” and it in the U.S. it took a well resourced, professional association (the WIA) and plenty of discussions to identify a common ground with the municipalities.

What would help to improve the permitting process in Mexico is a “shot clock” rule, similar to that which was implemented in the U.S, requiring state and local authorities to review completed applications within 90 days for co-locations and 150 days for all other applications – in the absence of feedback to such applications, sites can be considered permitted, if they abide by mutually agreed conditions.

Some Mexican carriers still expect an unreasonable deployment timeframe from towercos. So how can towercos deal with it? In the U.S., carriers simply won’t lease space on an unpermitted tower, so Mexican operators must be wary of effectively encouraging towercos to shortcut the process as this can lead to legal costs as high as the construction of a tower.

In Mexico, the current state of legacy towers is quite complex in terms of permitting, and reportedly the sites acquired by AT&T upon its entrance in the market were only half permitted. AT&T are not alone in having a significant number of unpermitted sites in their portfolio, but the overall percentage of permitted sites is increasing. It is not rare in Mexico for municipalities to ask towercos to go ahead and build a tower without...
A significant infrastructure gap remains to be filled in Mexico, and data growth is widening that gap faster than network investment is closing it.

permits, only to grant them after the deployment. This poses the risk of the tower actually being shut down and the group agreed that in such cases, one often finds that carriers are better placed to fight for the tower to be licensed.

“Mexico needs a lot of structures, and at some point we’ll break through the permitting barrier,” concluded one towerco. “We have huge pent up demand in the country, but we need a platform to speak to Federal and Municipal stakeholders. We’ve spent money working through existing associations or trying to create a new one, but we need the carriers to join the debate. We made some progress when government properties were supposedly made available for cell sites, but even that didn’t really work. From five years ago to today, the number of permitted towers has increased – and we’re 80% permitted now – but it needs to increase faster.”

“With 3,000 municipalities in Mexico, we need to lobby at a Federal level, educate at a municipal level,” agreed another towerco.

**Conclusions**

Between the FX situation and the growth stimulated by ALTÁN Redes, now is a good time to buy towers in Mexico and there are still some opportunities with small developers looking to divest their assets.

A significant infrastructure gap remains to be filled in Mexico, and data growth is widening that gap faster than network investment is closing it. On the other hand, build-to-suit volumes haven’t been impressive, with Telefónica not increasing their new build requirements, Telcel primarily utilising Telesites for their rollout, and ALTÁN’s focus remaining on co-location as opposed to new sites, with some uncertainty continuing about their long term viability.

In fact, while ALTÁN is progressing in its coverage targets, for now it has only been able to attract three small customers. However, participants were unanimous in their view that even if ALTÁN failed, another entity would be awarded the ~US$1bn worth of 700Mhz spectrum they owned, and that entity would still need the sites... perhaps the risk that ALTÁN ultimately becomes a carrier competitive with Telcel explains why Telesites might be reluctant to lease sites to them?
Energy efficiency and security remain major headaches for MNOs in CALA

Operators demand creativity and commitment from towercos and solution providers

Something became evident during the efficiency roundtable at the TowerXchange Meetup Americas 2018: energy management and security remain the main challenges for operators in Central America—and they are demanding innovative solutions from both towercos and solution providers. This roundtable report highlights on how those energy and security challenges are manifesting in CALA, and some of the solutions being proposed to overcome those challenges.

Over 20 industry stakeholders and energy experts gathered at one of TowerXchange’s renowned roundtable breakouts at the TowerXchange Meetup Americas 2018 to analyse what keeps efficiency managers awake at night across the region. This dynamic discussion, which brought together MNOs, towercos, ESCOs, security experts and battery providers, explored some of the main efficiency challenges that the industry is trying to overcome.

Moderated by Jesus Eduardo Diez, Telefónica’s Manager for Efficiency and Planning across Central America, the session highlighted energy supply as well as security as the main operational concerns and many participants suggested that towercos should go beyond the steel and grass business model to offer power supply and maintenance services to their clients.

Understanding efficiency and its relevance for operators

What’s the real meaning of efficiency in a telecoms context? The central point of the roundtable was briefly addressed by the moderator on his opening statement. “Efficiency means reducing your opex, and in order to do so, cutting energy cost is absolutely critical in CALA.” Pretty straight forward, but it becomes trickier when you manage 5,800 towers in five different countries across Central America. From battery providers to torreros—as they are called in the region—all participants agreed on one point: power supply and security are fundamental aspects, and reducing energy expenses is critical in achieving efficiency.

Keywords: Americas, Americas Insights, Batteries, CALA, Capex, Chile, ESCOs, Efficiency, Energy, Insight, Market Overview, MNOs, Nicaragua, Opex Reduction, Renewables, Risk, Security, Supply, Telefonica, Towercos

Read this article to learn:

- What are the main efficiency challenges that the telecom industry is facing in CALA?
- The potential for collaboration between towercos, operators and vendors in energy management
- Security and its impact on MNOs across the region
- How towercos can adapt their business model to meet MNOs’ requirements
Operators like Telefónica are currently exploring various alternatives to cut down their energy bills. Self-generation is one of the solutions and renewable energy—mainly solar—is helping MNOs to secure power supply and reduce their site costs. Telefónica has achieved a 10% opex reduction by deploying 320 solar panels in Nicaragua, an initiative which aligns with its corporate policy. The company has a 50% renewable generation target by 2020, and aims to achieve a 100% by 2030, a trend becoming more and more popular among global telecom giants.

Solar seems to be the most reliable solution compared to wind, an option which is perceived as unstable and seasonal. However, solar still requires a complex hybrid system made of panels, batteries as well as a backup diesel generator that will ultimately require an expensive and complicated maintenance process. Additionally, installing solar panels requires more space and therefore significant extra investment from the operator. Both vendors and MNOs are now testing solutions to optimise the space and 3D solar panels are arising as an interesting alternative. Ironically enough, replicating the vertical model used by towers can become the optimal solution in terms of space use when deploying solar.

Energy generation though is far away from the core business of MNOs, who have been forced to explore those alternatives in order to save some pesos and relieve their balance sheets. In an ideal scenario, infrastructure operators should guarantee supply and energy maintenance on site, which would make operators life significantly easier, as it was agreed by several panellists. “We don’t really want to go there and we expect towercos to be more proactive and include power supply solutions along with the infrastructure,” stated one of the operators around the table. “Our business is not energy generation. We are energy consumers and we need to reduce the opex we allocate for that.”

In addition to the above, operators also need to monitor energy consumption for each of their sites; an exercise that can become a real hurdle in some CALA countries! In fact, some power suppliers refuse to digitalise their statistics and won’t provide digitalised consumption rates to operators. “In some areas we receive 150 different physical invoices and it’s almost impossible to have a precise record of the energy consumption in 20% of our regional operations, which is massively affecting our efficiency targets,” claimed one of the operators.

Most participants agreed that towercos should embrace additional services and go beyond leasing...
vertical real estate. Often in this region, operators are assuming all the risks and the market requires a shift. Towercos might want to consider offering a complete solution, which will drive energy efficiency but also overall operational efficiency.

**Towercos, energy suppliers and vendors: exploring potential synergies**

On the other side, evolving to provide power services is not an easy mission for regional and international towercos, and many towercos in the Americas remain reluctant. CALA is a very diverse market and each country is facing different issues including high electricity prices, tricky regulatory scenarios and political volatility that are posing challenges to their business and capabilities.

Complimentary equipment is another potential solution: efficiency can be improved by reducing the amount of times you perform maintenance site visits, which are one of the most expensive operations in the field. Additionally, modern equipment can reduce the amount of fuel used and solutions providers need to bring innovative and efficient solutions to the table.

Energy maintenance is expensive and complex, therefore collaboration and dialogue between vendors, operators and towercos is critical. In many cases, operators contract third parties to deal with the equipment maintenance, but those companies are not really familiar with the onsite tools. A dialogue is hence necessary and vendors might need to take a more proactive approach. Every battery or air conditioning system has different features so they have the power and responsibility to educate their clients on its uses and maintenance requirements.

Energy as a service could be the solution in many CALA markets, but are towercos willing to provide a full service that includes energy supply, management and maintenance for a fee? Again, dialogue and synergies between ESCOs and towercos could lead to innovative and favourable solutions for operators and ultimately push the market forward in Latin America.

**Increasing security, reducing expenditures**

Security has always been another major headache for the industry both in Central America and globally, and it is impacting onsite operational efficiency all around the world. Vandalism and burglary are a continuous threat to telecom infrastructure and everyone in the ecosystem is seeking innovative solutions to protect their property, prevent robberies and reduce damages at every level of the network supply chain.

Service providers, vendors and security companies who joined the discussion are focusing on this issue and currently testing alternative solutions to prevent site intrusion and thefts. Concrete cabinets, Bluetooth locks and underground vaults were some of the innovations highlighted, but replacing lead acid batteries (with high re-use value) with lithium batteries was the most commented on and popular alternative.

Operators and towercos are progressively replacing acid lead batteries with lithium batteries, which have proven less appealing for thieves. Acid lead batteries can be used for domestic applications...
such as boats and motorcycles and the sulphuric acid inside is used to process drugs in the region, so there’s a high risk of theft. That problem has disappeared with lithium implementation. “We have allocated around 1,000 lithium batteries in Central America and we haven’t experienced a single robbery,” commented one of the battery vendors, who also guaranteed the technology would provide better performance on hybrid, open applications.

“But what about the cost?” a participant spontaneously asked. Effectively, lithium batteries require a larger initial investment, but they do have a longer life and require very little maintenance, which at the end of the day is also translating into efficiency as mentioned earlier.

**How solution providers fit into the equation?**

Finally, we can’t forget about the role of vendors because they are the ultimate provider of all the equipment required onsite. Many roundtable participants pointed out that frequently, the onsite employees and maintenance managers themselves are responsible for a considerable amount if pilferage. “The onsite manager would come to the tower to refill the battery. Then he will take a picture and extract the liquid right after to sell it again,” said one of the experts. Now some battery providers are developing special equipment that won’t allow employees to extract the liquid, an important guarantee to the end user. And similar systems are being applied on solar panels to prevent robberies.

Business opportunities are arising for towercos, vendors and ESCOs in countries like Chile, where climate instability forces MNOs to have a reliable back up system in place in case of a shutdown or climate catastrophe. Security is definitely a priority, but securing supply is an additional challenge in some remotes areas and particular CALA regions.

**Food for thought**

The roundtable held at the fifth annual TowerXchange Meetup Americas highlighted some of the critical concerns of mobile network operators when it comes to partnering with towercos in both power and security assurance. On the other hand though, with the exception of very isolated cases, towercos seem reluctant to get involved beyond provision of structures and real estate.

TowerXchange wonders if there is an underlying opportunity for innovative towercos to explore synergies with their customers and a new, enhanced level of service offering which might result in a more complex business model but also, on the other hand, open up more business opportunities and revenue streams.

One thing is clear though, a couple of years back we’d hardly be able to engage in discussions related to power or added services with towercos while nowadays, the trend has shifted and some players are paying closer attention to the demands of their customers. Could this be the beginning of the power + tower business model taking root in CALA?
CALA towercos go beyond steel and grass
From Mexico to Argentina, fibre and energy become an increasing focus

The so-called “steel and grass” business model has always been the default for CALA towercos, especially for those entities with some roots or links to the U.S., the pre-eminent steel and grass tower market in the world. A simple model based on the premises that towercos only deal with the tower and the ground beneath it, with responsibilities including land acquisition, fencing, outsourcing of the engineering function and maintenance of the actual steel structure. A very different model compared to the complex tower + power that towercos handle across Africa or in certain Asian markets. But the wind has changed and TowerXchange reports for the first time on the diversification efforts finally being undertaken by various towercos across CALA.

Since the inception of TowerXchange, dozens of towercos have started operating in CALA. In light of the relative simplicity of the business model, the overall economic outlook for many of these towercos remains positive, driven by great coverage and densification needs.

In recent months, towercos across CALA have started to look beyond towers and entered new business segments including fibre, IoT and energy management. The examples are still relatively rare and TowerXchange is gathering insights that will be shared as soon as available, but one thing is sure: towercos across CALA are increasingly diversifying into fibre and small cells while also starting to engage with ESCOs and RESEs to provide energy efficient solutions to their MNO clients.

While for the first few years there seemed to be a distinct commonality in towerco business models (if not always in the nuances of the underlying contracts), it comes as no surprise that towercos have now started to differentiate by offering a more holistic set of services, driven by MNO demand for a more integrated approach to infrastructure management. In this editorial, TowerXchange reports on some early examples of diversification while inviting all readers to contact us to provide further insights.

Fibre, urban infrastructure and IoT

Brazil: American Tower – Cemig Telecom and LoRaWAN network

In November 2018, American Tower (AMT)
concluded the purchase of Cemig Telecom’s assets in São Paulo, Minas Gerais and Rio de Janeiro. The assets included around 14,000km of fibre-optic network and were part of the divestment put in place by Brazilian utility company Companhia Energética de Minas Gerais.

In December 2018, AMT announced that its Brazilian LoRaWAN network had surpassed 400,000 connected devices and the towerco is targeting two million or more by the end of 2019. AMT is deploying its network in partnership with LoRa maker Semtech and the rollout is particularly relevant for metering and IoT applications as well as smart city networks. By mid-2019, the network should cover 80 key cities across Brazil.

Mexico: American Tower – KIO Networks

Exactly one year earlier, in November 2017, AMT announced the acquisition of KIO Networks’ Mexican subsidiary, RedIT. At the time of the deal, the company owned more than 50,000 concrete poles and around 3,400km of fibre network across various key urban centres.

According to RedIT’s website, to date the firm runs over 4,500km of fibre optic network across 20 cities (Ciudad de Mexico, Monterrey, Guadalajara, Tijuana, Mexicali, Ensenada, Toluca, Queretaro, Aguascalientes, Celaya, Leon, Irapuato, Puebla, Merida, Xalapa, Veracruz, Villahermosa, Tuxtla Gutierrez, San Luis Potosi and Cuernavaca) as well as across the border to San Diego, Los Angeles, Phoenix, Chandler, El Paso, Dallas, Laredo, McAllen and Miami.

### Access to electricity and energy production in CALA

According to the World Bank, in 2016, 100% of the population in Argentina, Brazil, Chile, Costa Rica, Dominican Republic, Mexico, had access to electricity, 99% in Colombia, 98% in El Salvador, 95% in Peru*, 93% in Bolivia*, 92% in Guatemala*, 82% in Nicaragua*.

Grid availability though doesn’t solve all the problems as in certain countries, electricity prices have increased considerably over the past few years. Guatemala, Nicaragua, El Salvador have all seen an upward trend in tariffs as a function of drops in hydroelectric generation, the behavior of fuel prices or the decrease in rainfalls, depending on the main energy source.

In terms of production of clean energy, CALA is definitely at the forefront thanks to its historical development of hydropower and bioenergy. However, in recent years, the region is showing a diversification towards different types of renewable such as wind, geothermal and solar energy.

Chile is one of the ten leading producers of clean energy according to the International Renewable Energy Agency (IRENA) and aims at getting 90% of its electricity from renewable sources by 2050 (at 17% in 2017).

Uruguay is producing a surplus of energy which is being sold to Argentina and Brazil thanks to its mix of hydropower, wind and solar while a surge in energy investment is forecast in Brazil after its economy downturn.

CALA is home to some of the cheapest electricity grids as well as some of the most expensive ones. In perfect CALA style, the energy industry is complex and varied. If you are interested to find out more, we recommend you download the IRENA November 2016 report at this link: www.irena.org/DocumentDownloads/Publications/IRENA_Market_Analysis_Latin_America_2016.pdf

* With considerable differences between rural and urban electrification. For more information, visit https://data.worldbank.org/indicator/EG.ELC.ACCS.RU.ZS
Argentina: American Tower – CyCSA

In 2016, the towerco reached an agreement to acquire CyCSA, an Argentinian infrastructure firm which, at the time of the deal, held a portfolio of 1,000 urban sites and 2,500km of fibre optic network as well as exclusive rights to deploy telecom infrastructure across certain locations in Argentina.

Mexico: Phoenix Tower International – undisclosed seller

In Q318, PTI acquired 17 fibre rings, equaling to 974km of network, and is now deploying fibre across Mexico's key cities. Commenting on the deal, Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International said that “…the main driving factor [of fibre deployment] is the exponential growth of small cells' deployments expected in the foreseeable future. In the United States for example, it's estimated that over 800,000 small cells will be deployed by 2026... That's more than what has been deployed over the past 20 years!”

SBA Communications – looking beyond towers?

During the recent Q418 earnings call, the company’s President and CEO, Jeffrey Stoops, was asked about his “latest thinking on fibre” and replied that “we’re looking to expand the things that we do but in areas that we call exclusive real estate that will have some barriers to entry and our ability to control our destiny going forward.” While Stoops didn’t comment directly on fibre deals or deployment, the CEO hinted at a certain openness to diversify beyond towers.

Towercos entering the energy management game – some early examples

I recently attended the MWC in Barcelona and had many meetings with ESCOs, towercos and MNOs. Our conversations covered a variety of issues, but I was extremely surprised by the frequent reference to energy management projects being developed by Central and Latin American towercos.

Phoenix Tower International is said to be working with an ESCO in the Dominican Republic while its sister company Phoenix Tower do Brasil is assessing energy partners for sites across Brazil to reduce electricity bills at peak times. Two of Central America's fastest growing private towercos

**Towercos’ business model definition**

**Pureplay steel and grass**: manages only the real estate and tower structure, power is a “pass through” – which means it is a cost which remains the responsibility of the tenant.

**Full service powerco**: lease rate includes power and O&M, so the towerco is responsible for distributed generation, energy storage and managed services.

**Decommissioning**: towerco which at least in part specialises in acquiring and consolidating parallel infrastructure in over-built markets.

**Build-to-suit**: builds new towers in response to MNO search rings, often supplemented by the speculative acquisition of land usage rights at sites which may be of future interest to mobile network planners.

**Strategic buyer**: derives a significant level of inorganic growth through large scale sale and leasebacks or acquisitions of existing portfolios from other towercos.

**Rollup / consolidator**: drives inorganic growth through a series of acquisitions, consolidating the assets of other towercos.

**Broadcast hybrid**: makes significant proportion of lease revenue from broadcast tenants; broadcast towers’ height and dispersed locations make them ideal for MNOs' rural coverage and microwave backhaul, so many broadcast towercos are diversifying into telecom.

**Infraco**: towercos diversifying beyond macro-towers into DAS, microcells, small cells, fibre, data centres and/or subsea cable.

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havestarted projects with ESCOs at selected sites across their footprints. Even the big listed towercos in Latin America are believed to be exploring partnerships to offer energy services, or even offering backup power from their own battery banks. As you can tell, TowerXchange are not at liberty to name names yet, but the list of towercos looking for and evaluating ESCO and RESCO partners is much longer than we’ve hinted at already - one Brazilian MNO told TowerXchange that virtually every towerco in the country now offers energy services.

The reality is that Latin American countries are generally well connected to the grid, even in some relatively remote areas. While MNOs have hitherto had the responsibility of providing backup power for their equipment, creating duplicate battery banks at many sites, demand for towercos to provide these services has been growing. That pressure has been amplified by MNOs’ commitment to reduce their carbon footprints by exploring renewable energy, and by the rising cost of grid power. Quite simply, MNOs increasingly recognise that they should be cycling batteries not paying for peak rate grid power - and they want towercos to take responsibilities for those energy storage and renewable power projects. While towercos had long resisted this demand, it was always likely that when one relented, the others would follow.

It should be noted that CALA towercos’ energy service offerings are as likely to be ‘back to backed’ to an ESCO or RESCO as they are to be provided directly.

**Conclusions**

While this editorial just represents a mere introduction to the diversification efforts being undertaken by towercos across the region, this change comes as a breath of fresh air at a time when the tower transaction pipeline is slowing - there are simply less and less investible towers left to acquire in CALA, and less and less investible towercos to consolidate.

Operational efficiency might not be as sexy as a sale and leaseback deal, but it generates long term value for everyone involved. Additionally, towercos can create stronger and healthier relationships with their tenants by offering more and getting involved in reducing their opex.

Lastly, by partnering with one energy supplier rather than letting each MNO choose their own backup power vendor, towercos are lowering the amount of space required, and the number of accesses required to each site, hence decreasing the risks of theft and increasing the overall site security.

TowerXchange welcomes contributions from its readers on practical examples of towercos diversifying beyond steel and grass in developed markets. Contact Arianna Neri at aneri@towerxchange.com to submit any comment.

And don’t forget to sign up for the sixth annual TowerXchange Meetup Americas on 9-10 July to get actively involved in the discussion at our unique gathering of telecom infrastructure experts from across CALA!
Developing networks in Central America (and beyond)
Operational challenges, regulatory barriers and collaboration alternatives

At the 2018 TowerXchange Meetup Americas, different telecom experts and industry stakeholders with operations in Central America sat down together to analyse the main challenges that both towercos and operators are facing when developing their network and infrastructure in the region. Carlos Santiago Rodriguez Medina, one of the leading managers of Telefónica, led a conversation that dissected different scenarios in each Central American market and explored solutions and collaborative approaches to boost infrastructure development.

**Keywords**: 3G, 4G, Americas, Americas Insights, Brazil, Business Model, Central America, DAS, Dominican Republic, Energy, Guatemala, MNOs, Off-Grid, Opex Reduction, Regulation, Rooftop, Telefónica, Towercos

**Read this article to learn:**
- The main barriers that towercos and MNOs need to overcome across CALA
- Regulatory and operational differences of each Central American market
- Successful case studies of collaboration and community engagement
- What can operators, regulators and towercos do to push the industry forward

Exploring different scenarios

The discussion started at the very top of the Central American geography. The roundtable moderator initially addressed Guatemala, which faces a very common issue across all regional markets: “Infrastructure developers in Guatemala are facing one of the most frequent challenges in Latin America: regulation and permitting barriers.” As stated by various participants, the decision-making process in the country is decentralised and often, the state permits are not enough to move forward with new deployments. Instead, one would need to obtain local permits too and even when all the paperwork has been done, some local landowners might delay or stop the construction of the towers. “Telefónica has more than 2,500 sites in the country and many are on hold due to local opposition,” said Carlos.

In Salvador, the regulation is not as tricky but towercos and operators have their own issues. The moderator noted that: “There we have more flexibility as the regulation allows the construction of multiple sites in the same area, which drives competition among towercos. However, rent prices for the land tend to be higher than other neighbouring countries and local taxes are notably high, which hits our budget and economic plans.”

Meanwhile, Nicaragua has experienced a dramatic shift. Earlier this year, the country was living a very prosperous and stable period. The government was facilitating all the permits and Telefónica has been able to develop a solid, extensive infrastructure
network in the last few years. However, the situation dramatically changed in April, when social protest erupted. The economy has fallen and this is certainly affecting the telecoms industry, not just nationally. “The country is now blocked; you can’t transport any equipment or materials through Nicaragua at the moment and that is impacting other regional markets that have tight relationship with the country. The situation is toughening regional logistics,” stated one of the roundtable participants whose company has been affected by the Nicaraguan crisis.

In frontier Costa Rica, the central government sets up all the regulation. “Telefónica,” commented Carlos, “had a lot of issues when we first landed in the country back in 2012, but we have been able to develop a modern network thanks to the combined efforts of the tower cos and our team there.”

Panama was finally highlighted as one of the best and most flexible markets from a regulatory perspective. “Regulators are proactive, flexible and approachable.” The regulatory framework is well defined and rules are clear, which helps operators when developing their business plans. The country has seen a massive boost and increase in both data and capacity lately and is one of the most developed countries in the region.

Beyond towers

Panama is not just a good regulatory example, but also one of the most advanced countries in the region in terms of indoor solutions. DAS have massively evolved in the country and they are bringing a huge business opportunity for infrastructure developers. Huawei, one of the market leaders in Panama, has developed an underground network to provide services on the Panama metro.

However, expanding beyond towers present a huge challenge for the industry, not just in Central America. In Brazil, some real estate developers and promoters are already including DAS in their new buildings and malls, but both operators and tower cos complained about their high prices during the conversation. A participant from Brazil stressed that “The regulator forces MNOs to provide indoor signal and they will set up a penalty if they fail to do so. However, nobody regulates the fees that the building owner charges.”

A cooperative approach to business

As highlighted in other roundtables during the TowerXchange Meetup Americas, investing and
working closely with local communities is one of the best alternatives for operators and towercos to boost social acceptance and facilitate permits. “In both Nicaragua and Salvador, you need to get through the local authorities and they have a tight relationship with the local communities. If you include social initiatives in your project, you will be making a positive impact and smoothing the regulators,” commented one Nicaragua-based infrastructure developer.

One of the participants from Dominican Republic shared an interesting example. Some operators developed a very forward-thinking agreement and decided to share the Opex between them. A few local operators started coordinating diesel deliveries so they could share the transportation cost. The towers were close to each other so it was quite a straight-forward task from a logistic point of view, and finally they decided to use a common diesel generator. Moreover, they agreed to work with local contractors aiming to create a positive economic impact on the community and make them part of the projects.

Operators demand an end-to-end solution. “Infrastructure providers should offer a full, integrated service that includes the towers, the energy and the fibre optic access.” As we listened throughout the two days of the TowerXchange Meetup Americas, towercos need to be proactive and expand their offer. “Towercos in LatAm should follow the European and American examples and integrate more and more services, especially fibre,” one of the participants stated.

On the other hand, towercos demand higher fees: “We are willing to improve our offer, but that is obviously going to increase the rates.”

Risk sharing was one of the alternatives discussed. Towercos could get more involved from the beginning and share risks and revenues with MNOs. Ideally, operators aim for a joint approach, where towercos and MNOs can developed an integrated, collaborative business model. “Risk, Opex and revenues would be shared in a win-win solution.”

**Dialogue and education will be crucial**

Central America is way behind in terms of fibre development, grid access and regulatory frameworks. Additionally, operators are struggling to find a profitable business model for 5G development, and they have to find the best way to monetise the increasing use of free apps such as WhatsApp as well as the upcoming presence of free Wi-Fi in public areas. However, the market holds amazing opportunities and there is a long way to go in terms of network deployment and VAS.

Connectivity and modern networks will be crucial to drive economic and social development, especially in less mature markets across the region. The industry needs to play a didactic, informative role and educate both communities and regulators on the social and cultural benefits of telecom infrastructure, which is often perceived as a purely lucrative mean for operators and developers rather than a crucial component of economic growth.
An insightful discussion into alternative ways to densify networks in CALA

Innovation and local support will be crucial for infrastructure development

Data consumption and overall mobile penetration have massively increased in CALA over the last few years. Satisfying this positive boom requires considerable infrastructure efforts as well as innovative and forward thinking approaches. Traditional macro sites need complementary technology and regional governments and regulators will have to play a key role in supporting the necessary development to drive the industry forward.

Keywords: Americas, Americas Research, Americas Insights, Argentina, CALA, Community, Chile, DAS, Energy, Entel, Fibre, Infrastructure, MNOs, Operators, Regulation, Small Cells, Social License, Towercos

Read this article to learn:
- Alternative solutions being implemented by CALA operators and towercos
- Crucial challenges faced by the industry when deploying infrastructure
- What is the additional value that telecom infrastructure can bring to society?
- Examples of successful negotiations with municipalities and local entities

Telecom experts sat down in a crowded room at the TowerXchange Meetup Americas in Boca Raton to discuss what operators need to build in CALA. Many different Spanish accents but a clear common view: MNOs and towercos should work together to maximise the benefits that telecoms infrastructure can bring to the region— and to do so, they will have to be very creative.

Data demand is increasing among subscribers, who are pushing for higher quality services and new technologies, especially in urban areas. In theory, that is a very favourable situation for operators, but they are now struggling to develop the required infrastructure to satisfy upcoming demand.

In fact, building a tower is becoming an arduous and lengthy process in some locations across Latin America, due to permitting and other hurdles, and regional MNOs are actively seeking alternatives to speed up the process and facilitate infrastructure advancements. Moreover, new technologies such as small cells and fibre require synergies across the value chain as well as a very proactive approach from everybody involved.

“One of our main infrastructure concerns is dealing with municipalities and local permits. The lack of energy capacity and the need for backup solutions are additional crucial issue.” Roundtable’s chair Eduardo Concha from Entel Chile summarised two of the main barriers for operators and towercos when deploying traditional infrastructure in Latin America.
The energy efficiency roundtable, which TowerXchange summarised in this article, extensively covered how power supply has become an operational and financial headache for the telecom sector in CALA. And it is not the only one. Social opposition, long permitting processes and regional laws are slowing down infrastructure expansion.

“In historic districts like La Serena or Central Santiago, there are so many law restrictions that is almost impossible to build a tower. Nowadays macro towers are expensive and the approval process takes way too long,” said the moderator. “Entel,” he explained, “is not going to stop building towers, but we definitely need to actively explore Distributed Antenna Systems (DAS) as well as other alternatives.” Chile is a very restrictive environment where towercos and operators have to deal with the infamous Ley de 12 metros, a challenging piece of regulation that complicates the construction of any tower that overpass 12 metres in height.

Entel's representative shared a very interesting case study. Their existing infrastructure in Santiago did not have enough capacity to satisfy the area requirements and the local government would not allow the construction of another tower. They then suggested an agreement to the regulator where they would co-locate security cameras in their posts, which appealed to the municipality and accelerated the permitting process of a new site.

As highlighted by several panellists, municipalities are one of the first barriers that both operators and towercos have to face when creating a new initiative. “Local governments are making our lives very difficult. Their approval process often takes longer than what it should and they keep coming up with new fees and extra charges,” said one of the participants.

Contributors agreed that every small urban or rural jurisdiction in CALA has its own methods and it is very challenging for them to deal with each individual request. In some cases, even if you have the local government on your side and all the permitting is in order, local communities could try to stop your project.

Finally, urban areas present new additional challenges. In the effort to modernise cities like Santiago, local constructors are now using rooftops to build recreational zones and swimming pools, so any kind of telecom infrastructure does not fit in their plans.
Innovation as a key solution

“Take the attention out of the infrastructure itself and focus on the many benefits that is going to bring to the area and the local communities,” stated one of the participants. The extra services that the tower can add to both consumers and citizens can increase the operator’s revenue as well as help them in boosting social license to operate in specific areas.

Design innovations and functional features are another alternative. One of the manufacturers mentioned how their modern and visually-friendly structures are becoming more and more appealing. “We are developing innovative, sophisticated shapes, very different to the traditional tower infrastructure, and the reception has been great so far. We are also reserving small spaces that allow cameras and screen integration, which perfectly works in urban scenarios.” Creativity is the way forward and increasing the services that your tower provide can thus increase your revenue.

Adding new features to the infrastructure cannot just improve the portfolio but also help accelerating permitting processes. First, companies need to be able to bring real value to the community; then they need to explain, communicate and engage with community and authorities to highlight the infrastructure’s benefits. Consequently, reducing your permitting process will cut down your cost and improve your efficiency.

Urban furniture such as traffic lights or stop signs can also allocate alternative infrastructure. One of the participants shared a very original idea that his company successfully executed. They got in touch with the local municipality and convinced them to use the old phone booth to allocate transmission systems, and the process took much less than usual. As mentioned, the role of local government and regulators is critical and the effort of educating them is absolutely worth it.

Public Wi-Fi services and fibre connection were other alternatives suggested. They can definitely appeal to local authorities when they evaluate the extra value of any infrastructure initiative, and they could drive potential IoT projects in the future.

In terms of technologies, DAS are the obvious, most popular choice. However, in big malls like the Costanera Center in Santiago, they are not going to be enough to satisfy the demand. Complementary small cells will be required and operators have to deal with local stakeholders again. Partnership with third parties such as advertising companies were another debated option. It would allow infrastructure providers and operators to share risks and split the initial investment. The evolution from standard macro towers to shorter, lighter structures have been a positive sign so far.

Different realities across CALA

CALA is a massive region and as it becomes obvious in each roundtable, every country faces so many different and specific challenges.

“Most professionals that work on technology
areas in municipalities across Latin America are too focused on lighting and security, but telecommunications is out of their agenda,” mentioned one of the towercos. It might seem obvious, but nobody can question the crucial role of the internet in education, culture and overall social development. Towers and alternative infrastructure are a social need and operators must spend time and resources educating the society on their benefits. Lighting and security are two areas where synergies with telecommunications are not just possible but proven. Several participants mentioned cases where telecom infrastructure was used to allocate surveillance and lighting systems, which could work the other way around.

A well-experienced developer who has been operating in the region for years recognised the importance of social license to deploy infrastructure successfully: “The dialogue with the community is critical and we spend lot of time and resources dealing with social groups and authorities. We have a dedicated division that works with local communities and stakeholders.”

The towercos’ mission is not an easy one, as they also have to handle the pressure from MNOs too. “Operators usually demand the project to be ready quickly without taking into account the gruelling process of permitting,” stated one of the towercos, who later highlighted the need for dialogue and collaboration: “We indeed need to be more proactive and integrate new possibilities in the infrastructure. It would benefit operators and make a positive impact wherever the solutions are implemented.”

“In Argentina, the role of operators is key when deploying any infrastructure,” commented one of the interlocutors. “Operators are conceived as public service providers and in some cases, they are the only entity willing to take the risk of putting the infrastructure in place.” Going through the permitting process would be such a long, painful journey that Argentinian operators often skip the bureaucracy and choose to pay a sanction fee to the local authorities afterwards – which, by the way, will be reduced due the service to the public that they are providing.

What do operators need to build in CALA?
And most importantly, how are they going to do it? Dialogue, flexibility and innovation have to be the drivers to new and modern infrastructure in CALA. Towercos must consider new features and possibilities in their sites and operators have to engage in a proactive conversation to make them understand their requirements. The industry needs to spend time and resources in educating relevant stakeholders on the benefits and new horizons that infrastructure can open.

A long and very dynamic conversation in Boca Raton proofed that adding extra services to the equipment will improve your portfolio, ease the permitting process and increase efficiency in both sides. Operators and manufactures are open and already exploring cutting-edge solutions. How far are towercos willing to go? ■
How to (successfully) grow in CALA towers

Opportunities are there for investors able to nurture them

CALA is not an easy region to invest in. Some of its most attractive countries from a scale perspective are often affected by macroeconomic turbulence, political instability or high taxation, making it very challenging for tower companies and investors to find value. But CALA remains without a doubt an interesting and rewarding platform for those able to ride through tough times with discipline and business acumen. In this report, we explore some of the valuable insights from SBA Communication, Grupo TorreSur, Phoenix Tower do Brasil, ATP Torres Unidas’ regional representatives as well as investment experts from Cartesian Capital and the International Finance Corporation.

Keywords: Americas, Americas Insights, Brazil, Argentina, Ecuador, Chile, Peru, Colombia, Build-to-Suit, C-Level Perspective, Co-locations, Country Risk, DAS, Fibre, Small Cells, M&A, Energy, Greenfield, Investment, Private Equity, Towercos

Read this article to learn:

- Discipline still key to invest and succeed in CALA
- An overview of Brazil, Ecuador, Argentina and beyond
- Oi creating a before and after in Brazilian towers
- Why fibre is attractive to towercos and investors

CALA still makes sense

At a prestigious panel session at the TowerXchange Meetup Americas 2018, Jim Eisenstein, President of Grupo TorreSur, opened by stressing that operating in emerging markets can be as challenging as it is rewarding. Towercos need to have the means and know-how to deal with the operational, financial and regulatory issues that may arise, but the returns can be highly satisfying. He went on to say that cash flow growth in tough territories can be tremendous, as high as “20% on an organic basis”. And while the day to day can be extremely complicated, Grupo TorreSur has been enjoying strong growth in terms of co-locations, amendment revenue and via the acquisition of ground leases.

Eisenstein is also the Chairman of the Board of African towerco Eaton Towers and thanks to that experience he has knowledge of the tricky reality of running a pan-African operation. In his own words “the energy component of a towerco operation in Africa is a critical issue and we managed to turn it into a profit centre, but we had to learn how to do it.”

When it comes to power, IFC’s Erica Noda added that while in Africa and Asia energy management is a big issue, that is not the case in CALA, where grid availability is good almost everywhere and towercos don’t deal with backup power.

The absence of considerable power challenges in CALA has lowered the barriers of entry for towercos, which in turn creates a more competitive
build-to-suit environment. This is one of the key reasons why the CALA tower industry has been moving towards consolidation at a fast pace (and faster than other regions such as Asia).

PTB's CEO Mauricio Giusti offered the audience an interesting historical perspective on Brazil. “Between 2010 and 2014, M&A activities were very strong, while the last three and a half years have been very unstable not only for us but in general, for the national economy and politics. At the same time, the potential for BTS and lease-up is still huge and we are experiencing interesting growth in spite of adverse macro conditions.” He added that DAS and fibre are both buzzing in Brazil and small cells are starting to gain interest too.

When it comes to the need for fibre, “traffic is growing extremely fast. We are seeing 70% growth YoY and radio backhaul is a serious bottleneck for QoS. Sites will need to fibreised soon and this is a clear opportunity for towercos” concluded Giusti.

SBA's Kurt Bagwell offered an overview of the firm’s latest M&A activities and organic growth. In Brazil, the towerco sealed the acquisition of 900 sites from Highline via a privately negotiated deal. The portfolio consists primarily of new assets with a relatively low tenancy ratio - SBA reckoned it was acquired for a fair price as it still featured all the right components such as good paperwork, engineering features and thorough permitting. In Bagwell’s words, “these are good, young assets that will lease up over time.”

The Brazilian telecom tower market has been heavily affected by Oi’s bankruptcy, a two-year old saga which is finally seeing the light at the end of the tunnel. While towercos report that Oi maintained payments from day one of the bankruptcy, the process had considerable effect on the stability of the telecom and tower sectors, especially while liquidation was still a threat. On the other hand, by not honouring its bond payments, Oi has been able to invest more with towercos and in the overall quality of its service.

Oi is a testimony of the resilience and value of the tower industry. One of the largest bankruptcy in the history of Brazil left towercos mostly untouched and paid in full. That said, the bankruptcy created a precedent and a possible reform of the law is being discussed.

**Adapting to each market’s characteristics is key**

Talking about the opportunity for towercos to expand into new markets, SBA touched upon its entrance into Ecuador where it’s currently switching into scale mode and plans to have 500 sites by the end of 2019. Among the positive aspects of doing business in the country, the use of U.S. dollars zeroes the forex risk, while the country’s
MNOs are also quite active and creating a strong BTS pipeline. Back in 2017, the Government did threaten to regulate pricing for towers, among other initiatives; SBA and other entities pushed back against what would have been a considerable hindrance to their development. SBA noted that “by shaping the new rules in cooperation with the regulator, that came back as a benign issue.”

Shifting to Argentina, Bagwell discussed SBA’s entrance and the continuous changes occurring in the country. The towerco entered the market via the acquisition of 35 sites and then focused on BTS but since then, the economy has relapsed and the impact on currency has been huge. That said, the telecom and infrastructure markets remain heavily underinvested and the opportunities for growth are still there. Due to the unchanged federal taxation regime, Argentina represents predominantly a BTS rather than a sale and leaseback opportunity, which is in turn affected by onerous municipal fees due for each new greenfield site.

Talking about the flexibility needed to adapt to each market, Brian Gröll, who heads the M&A and Strategy for ATP Torres Unidas, added that the towerco is very nimble when it comes to understanding the peculiarity of each country where it operates. So while in Chile operations are mostly focused on expanding the company’s co-locations due to the complex regulatory and permitting environment and the stagnant build-to-suit market, in Peru carriers are now allowed to install sites on public land and without ground rental fees, which makes it very hard for towerco to incentivise co-locations. On the other hand, Colombian carriers are still waiting for the spectrum auction to take place and until then, towerco’s activities are somewhat muted. In spite of the challenges, ATP “remains positive with regards to its operations.”

The principles of the industry aren’t just buzzwords

Beth Michelson, representing Cartesian, recalled that at the beginning of its CALA investment, Cartesian sold 60 towers to SBA as a learning exercise to fully understand what needed to be built in order to achieve good multiples. And Michelson doesn’t think that the rules of the game have considerably changed since, “you’ll still get high multiples if you build the right type of towers.” A principle shared by the rest of the panellists.

The real threat to this simple equation sometimes comes from the carriers themselves who, in an effort to reduce their expenditures, opt to work with less experienced towerco who often agree to non-marketable terms. All resulting in their portfolios being less valuable and oftentimes not sellable at all.
With regards to the opportunity of single tenant towers, panellists agreed that while they aren’t anyone’s favourite projects, some of them do make sense as they create further opportunities with MNOs while also connecting communities otherwise underserved. On the other hand, disciplined towercos won’t accept projects that cannot be fully permitted which creates problems especially in markets with new, emerging BTS environments such as Ecuador, Argentina or Paraguay, where regulations are still very strict and unfriendly towards towercos.

**Beyond towers**

Michelson discussed the firm’s multi-dimensional approach to investments. “We have lots of experience investing in fibre but it’s not for everyone and not everyone should delve into it. We’ve committed to data centres and fibre before and then sold those assets to KIO Networks which now sold them to American Tower.” Michelson added that “in emerging market fibre is a necessity so now we’ve invested in a fibreco in Brazil and looking at the possible synergies between all the various companies we are involved in.”

With regards to fibre, Gröll added that most of it is currently in the hands of MNOs and was designed and deployed for their services. But now, the goal of filling cities with dense networks represents a great opportunity for towercos as MNOs has reduced investment capabilities. Fibre is scarce to find and designing robust metro networks will pay off in the long run.

**Conclusions**

TowerXchange has been exploring the dynamics of CALA towers for five years now and while the market is far from straight-forward, it’s a pleasure to see that wise entities and entrepreneurs are still going strong in the region, in spite of its tumultuous macro economic environment. Investors, towercos and MNOs operating in CALA know the rules of the game and should apply them in their day to day operations, as well as when making strategic moves to new countries. Some of the pioneers of the industry are always reminding us of why CALA is still attractive. In fact, in spite of its many challenges and downturns, “you’ll still get high multiples if you build the right type of towers.”
The search for a more investible regulatory and permitting framework

Educating to position towercos as a means of facilitating efficient infrastructure sharing and investment in Digital Economies

The regulation of the telecom tower industry might politely be described as a work in progress. In some countries, government appetite to attract investment into Digital Infrastructure and the Digital Economy translates into policies that attract network investment by MNOs and towercos alike, but well-intentioned policies often backfire due to the challenges enforcing policy and change at the municipal level. Indeed, it can feel like the dialogue between stakeholders in permitting and rights of way at a municipal level is the front lines of the tower industry – particularly in CALA where a significant proportion of cell sites are not fully permitted.

Keywords: Americas, Americas Insights, Argentina, Bankability, Brazil, Camouflage, Chile, Country Risk, Infrastructure Sharing, Insights, Leasing & Permitting, Mexico, Peru, Regulation, Risk, Smart Cities, Tax, Transfer Assets

Read this article to learn:

- Federal regulation that does (and doesn’t) attract investment in Digital Infrastructure
- The importance of taxation regimes that facilitate sale and leasebacks, releasing MNO’s capital for spectrum and network extension
- Why slow or unrealistically costly permitting has led to CALA’s problems with unpermitted sites
- The need for an independent industry voice to position towercos as the solution to many of these problems

Towercos are selective about capital allocation and have a wide range of countries in which they can invest US$billions into digital infrastructure. Some regulatory regimes render a country’s tower market uninvestible, others merely compromise the investibility of the country – unfortunately all too few regulatory regimes actually function to encourage tower companies to invest.

Towercos are similarly selective not just from one country to the next, but from one municipality to the next. How can Federal and Municipal stakeholders attract investment in telecom infrastructure from tower companies and MNOs alike? Let’s look at the regulatory and permitting issues towercos are facing in Central and Latin America as an example.

Federal level: best of intentions

There is growing recognition, increasingly enshrined in constitutions, that all citizens have the right to access the Internet. The benefits for economy, education and lifestyles are well documented.

Almost without exception, candidates in elections in CALA have advocated the improvement and expansion of cellular coverage. There is a growing recognition that there has been an underinvestment in infrastructure. Drafting policies to attract investment and take corrective action against market structural disincentives to invest is great, but implementation has been challenging, particularly in the context of the power enjoyed by
municipal governments in much of CALA (of which more later).

One of the first things a prospective tower investor will consider when evaluating whether to deploy capital into a given tower market is the attractiveness of the regulatory environment. A light touch regulatory framework, in which government encourages but does not mandate infrastructure sharing, and in which the government stands ready to resolve disputes but otherwise stays out of pricing, is generally thought to be more favourable. Some towercos like virgin markets where no regulation or licensing regime has been drafted specifically concerning tower companies or infrastructure sharing. More frequently however, towercos are discomforted by the risk of regulation where none exists, as this makes the market and their ROI unpredictable.

There are some towercos that believe the building of telecom towers should not be regulated or licensed beyond the extent that any construction activity is, while other towercos suggest that a fairly priced licensing regime, together with clarity around taxation and property law, provides greater certainty.

An example of a relatively lightly regulated tower market which became subject to a heavy-handed regulation comes from Chile, where the 2012 ‘Antenna Law’, while well-intentioned, forced tower companies to apply for concessions, and set onerous obligations in terms of site camouflage, fees, and minimum distances between towers and schools/clinics. The Antenna law has transformed the landscape in Chile for the worse in terms of towercos’ and MNOs’ ability to deploy investment, to the detriment of the development of the Digital Economy.

Federal governments also have an opportunity to intervene in taxation regimes to facilitate the sale and leaseback of their MNOs’ towers, thus releasing capital for MNOs to invest in spectrum or network extension. While the majority of MNOs’ towers in Brazil have been sold to tower companies, Argentina’s towers remain stranded on MNO balance sheets as they are almost fully depreciated yet would incur a capital gains tax of 35% if sold. Only Telefónica’s captive towerco Telxius has been able to overcome this barrier as the asset transfer of their towers was subject to special treatment.

Municipal level: permitting problems

Tower companies are thriving in Central and Latin America! But if the number two challenge cited by towercos in a recent TowerXchange survey was permitting and zoning concerns at the municipal level. (Before you ask, the number one challenge was that some towercos were agreeing unsustainable terms with MNOs).
Unnecessarily slow permitting processes, or permitting processes that come with unrealistic or unpredictable fees, represent a de facto incentive to build unpermitted sites – a problem rife in parts of CALA. We’ve even heard reports of instances where permit applications are deliberately slowed to allow time to ascertain whether residents respond positively or negatively to new cell sites being built, enabling local politicians to assess implications for their popularity. TowerXchange has encountered countries where as few as half the cell sites are believed to be fully permitted – although in general the percentage of permitted sites in CALA is increasing.

Corrective actions could include forgiving past (uncollectable!) debts if tower owners agreed to meet a sustainable fee structure in future, combined with a temporary amnesty on unpermitted sites, providing site owners commit to having sites fully permitted by a mutually agreed deadline.

 Unrealistic permitting fees simply will not stand up to legal challenge. This is exemplified by certain Argentinian municipalities who, prevented from taxing cell sites, charge as much as US$700 per month for an ‘inspection fee’ – an inspection that seldom actually takes place and, even if it did, would actually cost perhaps US$65 to fulfil! Towercos and MNOs don’t want to resort to suing municipalities, but if that’s what it takes to enable investment in digital infrastructure, they will resort to legal recourse – and there are plenty of precedents where they have been successful in doing so.

While an unpermitted tower obviously generates no revenues for the municipality, an unpermitted tower also has less capital value – it may in fact be worth less than it cost to build. As such, a poor permitting regime represents another significant disincentive to towerco investment in digital infrastructure.

Even with good permitting processes, zoning restrictions should protect a new tower from unnecessary parallel infrastructure being built nearby, to the detriment of skylines, environments and efficient land use.

There are some stark realities on the ground: “in certain municipalities if you ask for a permit it creates more of a problem, more risk, than if you don’t,” said one towerco.

“Other municipalities tell us we should build first, then they’ll issue the permit,” added another towerco.

“We analyse each site on it’s own merits, but we will make exceptions,” added a third towerco. “If we’ve done our pre-feasibility and gotten our environmental permit, we may break ground before we have our final permit, but we always like to have a clear path to full licensability.”

However the stakes are high – the ‘soft costs’ to bring a disputed tower online can be the same, if not greater, than the build costs.

The permitting challenge is not limited to macro towers, with many municipalities reluctant to partner with towercos and MNOs to unlock the value of street furniture as potential infill / small cell sites, while others have unrealistic valuations of the opportunity. Similarly, municipalities granting rights of way can be prohibitive to trenching or hanging fibre, another critical layer of the digital infrastructure ecosystem.

Policies and attitudes to cell site permitting are so inconsistent from one municipality to the
next – from one mayor to the next – that towercos increasingly seek to diversify to mitigate the risk. “I caution my teams to avoid building a whole host of infrastructure in one city,” said one towerco. “If you cross a mayor who then decides he doesn’t like poles being erected in his town, that investment can be put at risk.”

Here’s a thought that ought to send chills down the spines of Mayors and other municipal stakeholders that stand in opposition to the timely permitting of cell sites. Most countries in CALA have such an infrastructure gap that, if their municipality doesn’t welcome telecom infrastructure investment and the siting of towers, towercos and MNOs are happy to leave their citizens disconnected and move on to the next municipality where they might get a warmer reception. When a major employer locates their factory in a neighbouring town because that town’s superior wireless connectivity enables the necessary level of IoT-enabled automation, perhaps sceptical mayors will understand what is really at stake!

The challenge of delays at the permitting level can be exacerbated by MNOs demanding that towers be built in unrealistic timescales. Again, the risk here is that this encourages unscrupulous tower companies to cut corners on permitting or, worse still, cut corners on quality, health and safety.

Subscribers, MNOs and towercos must all be aligned in an understanding that it is detrimental to demand that a tower be built in 60 days – if it takes a year, expectations must be managed, and perhaps this can serve as an incentive for MNOs to join towercos in their efforts to educate municipal stakeholders and accelerate the process.

The specific goals of education of municipal stakeholders include helping them to understand and advocate the benefits of digital infrastructure deployment – from helping residents understand that connectivity enhances the local economy and land value, to supporting tower companies and MNOs in instances where the ‘Not In My Back Yard’ (NIMBY) mentality can erupt into violence – in worst cases, TowerXchange has heard of reports of permitted cell sites being set on fire, or shots fired at contractors.

“The most organisations recognise that we’re on the same team,” said one towerco. “We can help them build the digital infrastructure they need quicker, and we can help them draft ordinances that meet their needs and ours.”

However, in the five years TowerXchange has covered the CALA tower market, we are sorry to report that little has changed in terms of overcoming barriers to rollout at a municipal level. “Nothing is going to change while it’s not in the interests of municipalities to change,” opined one towerco at the TowerXchange Meetup Americas 2018. “Municipalities need the revenue they collect from cell site inspection fees, and they don’t want to lose control.”

The need for an industry voice

At several round tables at the TowerXchange Meetup Americas 2018 we heard the same cry for help we hear in Africa and Asia – that towercos need an independent industry platform through which to maintain a regulatory dialogue with government stakeholders.

While it would be challenging to agree on the detail, a reference document or a uniform siting rule template would be useful. Such templates exist, but are proprietary to towercos and thus difficult to position as independent. “We have a set of model rules which we share with government stakeholders,” said one towerco. “They go all the way to the technical standards defining what infrastructure should look like to be permitted, although in practice it doesn’t need to go to that level.”

An industry association could create and share a repository of best practices and case studies of smart regulatory frameworks, perhaps including a library of documents written to explain the tower industry to different stakeholders: Federal and Municipal governments, even consumers. Is it realistic to expect an industry association or similar platform to act at a municipal level, given that there are 2,400 municipalities in Argentina and a further 3,000 in Mexico alone? Perhaps not – that’s a lot of boots on the ground, and a lot of people to educate and influence. “You need a well-connected lawyer, not a trade association, to get things done at a municipal level,” remarked one towerco.

Targeting high profile, influential municipalities may be a more realistic goal, particularly if the
municipalities concerned harbour ambitions of building smart cities.

But if acting at a municipal level is unrealistic, what could an industry association strive to achieve at a Federal level? One desirable outcome is to lobby at Federal level for a ‘shot clock’ or similar, wherein municipalities would have perhaps 90-180 days to respond to a cell site permit application. If no response is received, and if the permit application and build specifications comply with pre-agreed criteria, the site is considered permitted and construction can commence.

While a shot clock regime was introduced in Brazil a couple of years ago, implementation and enforcement at municipal level has proved challenging. Similarly Colombia has decent regulation at national level that prohibits municipalities from slowing the deployment of infrastructure, but many municipalities don’t know how (or don’t want) to implement. This only reinforces the importance of educating stakeholders.

Peru provided a positive example of educating stakeholders. There, an association representing MNOs and some towercos launched a campaign to increase awareness of the need for infrastructure, and did so hand-in-hand with the government. The campaign helped, but it was a one-off initiative.

Meanwhile, Puerto Rico provided a negative example of the risks of failing to educate stakeholders. While hurricanes caused over 80% of wireless networks to fail in Puerto Rico, very few telecom towers collapsed – the downtime was primarily related to power. However, because this was not properly appreciated, the response has been to implement minimum distances between towers and to require public hearings which only make it tougher to build towers in the territory.

Besides education, another objective could be to seek to have selected government property made available as cell sites – from government buildings to post offices and transport infrastructure. Although again even here there is a downside: “rights of way on public property can be revoked, and thus lack the necessary long term certainty,” complained one towerco.

A note of caution: aggressive lobbying trying to force permitting and rights of way has been known to backfire, to the detriment of the tower industry. For example, moves in the U.S to secure public rights of way for telecom infrastructure operators left some municipalities feeling suckered, and there has been a backlash, most notably in California. In order to have the greatest chance of success, towercos must speak with a unified voice, and carriers must also contribute to the debate.

Conclusions

“We see a major market opportunity, and huge pent up demand, for new towers in CALA, but that opportunity continues to be hindered by permitting chaos,” complained one towerco. Regulation and, in particular, site permitting remain significant barriers to investment for most tower builders in the CALA, and indeed worldwide.

The challenge will be exacerbated as next generation networks are rolled out: 3G sites might have been 500m apart, 4G 200-250m apart, but 5G could require sites to be as little as 100m apart. Just moving from 4G to 5G is going to require at least four times as many sites. Permitting is a bottleneck. If we cannot resolve our challenges around cell site permitting, we may not be able to unlock the potential of 5G and all the benefits it brings to the Digital Economy.

The tower company business model is still not widely understood, but that in itself offers an opportunity to present ourselves as the solution, not the problem. Governments and municipalities don’t want three single tenant structures next to one another, cluttering the landscape and wasting valuable land resources – the tower industry exists to propagate a more efficient sharing model.

While permitting is clearly too complex, if permitting and zoning were too open there would be risk of overbuild and a proliferation of structures. It is incumbent upon all of us in the tower industry to raise this discussion to a higher level; to present tower companies as a means of cleaning up permitting, as the solution to parallel infrastructure, and as enablers of smart cities. As an industry we need to have a co-ordinated approach to regulatory dialogues, and we need to articulate a consistent message that the tower industry is not a cash cow for fees and taxation, but is a means of attracting investment into Digital Economies.
CALA towercos deal with reform, convergence and volatility

Trends in 2018 that are reshaping the market, and what is in it for towercos

During the 5th annual TowerXchange Meetup Americas, top executives from across the region got on stage for an overview of some of the changes and evolutions faced by the CALA tower industry. IFC’s Eric Crabtree moderated the session and was joined on stage by Peter Bendall from Macquarie, Eric Ensor, formerly in charge of Torres Andinas and now President of Quiet Water Associates, ATP Torres Unidas’ Diego Mahecha and David Porte from SBA Communications.

Keywords: ATP Torres Unidas, Americas, Bankability, Brazil, Business Model, Central America, Chile, Colombia, Country Risk, Cuba, Debt Finance, El Salvador, Exit Strategy, IFC, International Finance Corporation, Investment, Leasing & Permitting, Macquarie, Market Overview, Mexico, Paraguay, Private Equity, SBA Communications, South America, Torres Andinas, United States, Venezuela

A crucial year of elections across the Americas

Ten countries across the Americas will face or have faced elections in 2018 (see figure one for details). And in most countries those elections will have an impact on broadband policies for the years to come.

Panellists agreed that CALA is and will remain an exciting investment opportunity - with emphasis on Mexico, Brazil and the Andean region - despite the uncertainty caused by the political changes ahead.

With regards to Mexico, due to the very low levels of the Mexican peso, it was noted how any new U.S. investor eyeing opportunities in the country should seize them now.

Another aspect to take into consideration is that in many of the countries facing elections, there are not many centrist candidates that could win the rounds and many countries will find themselves with definitive left or right-wing winners.

One common aspect of most countries facing elections is that broadband and universal access are very much at the forefront of each political campaign, regardless of the country or party.

Broadband as a means to enhance social development is key and the political focus seems to be there, which might hint at possible future favourable regulatory reforms.

The three factors that are encouraging investments in CALA - one panellist noted - are the strong
political focus paired with population dynamics (e.g. a growing middle class) as well as the continuing increasing levels of smartphone penetration.

**Volatility and long-term perspectives**

With regards to the volatility across CALA economies, the panel noted how there is a definitive gap between small towercos and larger entities when it comes to their ability to effectively manage forex.

Smaller towercos in fact should pay more attention to currency exposure and ensure they have the right skillset in place when managing it. It will be particularly crucial for these organisations to include forex into their valuation model especially since large buyers do apply a forex depreciation model to their math (which will then influence any portfolio valuation).

That said, the panel agreed that CALA long term investors are generally protected by forex volatility.

Despite the macroeconomic uncertainty, SBA Communications’ Porte talked about the firm’s confidence in the CALA region and its growth potential. In fact, after having scouted opportunities across the world, SBA recognised CALA as the most investible tower market in the world, second only to the United States.

Unlike Africa, CALA presents less of the complexities associated with power, and operators are tough but rational. And in spite of the elections and the insecurity they cause to some markets, the fact that these countries hold democratic elections at all is a positive sign to take into consideration.

**The appetite for convergence**

When discussing convergence and the appetite of investors to diversify their portfolios to include alternative asset classes such as data centres or fibre, it was highlighted how convergence is a trend that must be born out of demand and that many CALA markets do present the right conditions. But while equity investors are more open to the idea of investing in converged digital companies (e.g. towercos offering FTTT or edge data centres), debt investors aren’t as easy to convince.

In fact, CALA tower companies are still involved in the process of educating local banks on the fundamentals of the tower business and tower cash flow. But the conversation between the two is still often irrational as local banks pose restrictive clauses to towercos’ financing requests (e.g. trusts to obtain debt financing), which means that banks still don’t grasp the full extent of the towerco business model and the quality of their credit.

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**Figure one: 2018, a year of elections across the Americas**

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
<th>Type of election</th>
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</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>October 7 / 28</td>
<td>Presidential and legislative / runoff</td>
</tr>
<tr>
<td>Chile</td>
<td>2017</td>
<td>Presidential (new president in office since March 2018)</td>
</tr>
<tr>
<td>Colombia</td>
<td>March 11 / May 27 / June 17</td>
<td>Legislative / presidential / runoff</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>February 4 / April 1</td>
<td>Presidential and legislative / runoff</td>
</tr>
<tr>
<td>Cuba</td>
<td>April 19</td>
<td>Presidential transition of power</td>
</tr>
<tr>
<td>El Salvador</td>
<td>March 4</td>
<td>Legislative</td>
</tr>
<tr>
<td>Mexico</td>
<td>July 1</td>
<td>Presidential and legislative</td>
</tr>
<tr>
<td>Paraguay</td>
<td>April 22</td>
<td>Presidential and legislative</td>
</tr>
<tr>
<td>U.S.</td>
<td>November 6</td>
<td>Legislative</td>
</tr>
<tr>
<td>Venezuela</td>
<td>May 20</td>
<td>Presidential</td>
</tr>
</tbody>
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One aspect to take into consideration when aggregating different businesses such as towers, fibre and data centres is that towers trade at higher multiples and are valued more than the other two. But the decision to add these industry segments to a tower business isn’t just about multiples, hence some tower companies across CALA are indeed becoming fully integrated digital businesses.

On that note, ATP’s Mahecha noted how the demand is crucial and must be related to rational, sensible business decisions. While laying fibre in Africa for example might not make sense these days, doing so across the Andean region could create considerable opportunities soon. And, in his own words, “the strategic question we need to ask ourselves is how we decide to adjust to the market and its needs.”

The challenges posed by certain regulatory environments have a direct impact on the way operators decide to densify their networks. And a market like Chile for example has become a pioneer in alternate site typologies as a result of the difficulties posed by the Antenna Law.

Towercos agreed that they need to come together and create a single strategy and message to approach regulators and push forward their agenda. Advocating consistency in regulatory frameworks across the region is key. Towercos wonder how they can keep pushing for the right changes to take place while also evangelising to regulators (as well as to new towercos) on the importance of understanding and respecting the fundamentals of their business model.

Lastly, an interesting aspect that stands out across CALA is that towercos were hoping to replicate the U.S. history of “being unnoticed” for many years before turning into such substantial and important stakeholders that it becomes impossible to ignore at a regulatory level. But in CALA tower companies have generally attracted the attention of regulators from a much earlier stage than in the U.S.

Who buys CALA towers?

Talking about who buys what in CALA, the pattern so far has been of four entities competing to consolidate selected private tower portfolios, those buyers being American Tower, Digital Bridge, Phoenix Tower International (and its
sister company Phoenix Tower do Brasil) and SBA Communications.

But now, some towercos that would historically scale and exit are looking at alternative ways of growing and re-capitalising their businesses. Some of them are considering IPOs which is definitely a long-term possibility but does pose significant challenges when it comes to the intrinsic volatility of emerging markets and the discount that their roots would cause to any valuation, especially if the U.S. is selected as the market where to perform an IPO.

Another possible buyer is represented by other industries’ infrastructure giants such as electricity companies, but previous examples such as the UK acquisition of Crown Castle towers by National Grid ended up with the latter divesting to Arqiva, which hints at the fact that these strategic buyers from other industries struggle to find long term value in retaining towers and “becoming or acting like a towercos.”

So for the time being, the so called “destination tier towercos” such as American Tower and SBA, those who will “never” sell their towers, are still the buyers of choice but they are now followed closely by a different - and relatively new - breed of towercos such as PTI, PTB and Digital Bridge.

Speaking about consolidation, Eric Ensor noted how Torres Andinas entered the market expecting to grow more than it actually did. But the company got to a point where it could sustain its structure without the need to build more (and without the need to accept irrational contractual terms that were common in Colombia just a few months ago).

But while Ensor candidly said that he would have enjoyed remaining in the market for a bit longer, Andinas’ investors decided to get the capital out and the firm sold its portfolio to SBA.

**Bullish about CALA**

Overall, the panel proved once again that CALA is a good investment and growth vehicle for both entrepreneurial and listed towercos, as well as for independent developers who stick to the rules of the game and seek for an exit at the right time.

While the macroeconomics of some countries, paired with political uncertainty and regulatory challenges, still represent a considerable challenges to growth, towercos recognise the potential for considerable future expansions in both maturing and new markets across the region.

Questions remain with regards to the opportunity for towercos to enter other infrastructure segments such as data centres and fibre. From our side, TowerXchange is keeping a close eye on the development of the model of innovative enterprises across CALA and will keep reporting on what seems to be a new trend that will break the boundaries of the pure towercos business model originally imported from the U.S. into CALA and shift to something different, more fluid and quite exciting.
Executive perspectives

In this section of the TowerXchange Americas Dossier 2019, we offer our readers insights from some of the leading experts in the CALA tower industry. Exclusive CEO interviews, MNOs insights and reports from the panels held at the 2018 edition of the TowerXchange Meetup Americas provide up to date perspectives on the regional industry, its future and opportunities.

A unique collection of strategic and operational updates from leading organisations across CALA including SBA Communications, Claro, Telefónica, Internet Para Todos, Inter-American Development Bank, Continental Towers, Grupo TorreSur, Torresec, BTS Towers, Mexico Tower Partners, Phoenix Tower International and many more.

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TowerXchange special feature: CEOs in CALA
Navigating the complexities of heading a towerco in the region

How do you become a towerco's CEO? What's the secret sauce to success in this competitive industry? And most importantly, how do you keep your clients satisfied? TowerXchange have caught up with seven CEOs from CALA towercos to find out what keeps them up at night and how they all ended up leading some of the most relevant telecom infrastructure firms in the region.

**Keywords:** Americas, Americas Insights, Blackstone, Brazil, BTS Towers, Central America, Continental Towers, Country Risk, Grupo TorreSur, Innovattel, Meetup Preview, MNOs, Mexico, Mexico Tower Partners, Phoenix Tower do Brasil, South America, Telefónica, Towercos, C-Level Perspective, Torresec

Read this article to learn:
- Profiling some of the key leaders in CALA towers
- The journey to becoming a CEO
- Top headaches and operational challenges of a towerco's CEO

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Jorge A. Gaitán, CEO, Central America, Continental Towers

TowerXchange: Can you describe your journey towards becoming the CEO of your company?

Jorge A. Gaitán, CEO, Central America, Continental Towers: I have been part of this group for more than 15 years, occupying positions in different areas, such as legal, real estate, budget control, compliance, and finally in the areas of financing and control of information. This experience equipped me with a 360° vision of the different business areas that would then allow me to effectively guide our tower operations. A deep knowledge of all the areas was the path.

TowerXchange: What would you say are the three things that keep the CEO of a towerco up at night these days?
Jorge A. Gaitán, CEO, Central America, Continental Towers: The first thing to think about “What else can we do?” In an excessively dynamic industry, we need to constantly ask ourselves how to improve our products and services, how to add and create value to what we have.

The second thought is what we call “the integrity of assets”. The wellbeing of each tower is based on the quality of the infrastructure, its contracts and its maintenance. We have to provide the best service to our customers and to preserve the value that shareholders expect.

The third thing that should occupy us, and equally important as the two above, is to keep highly motivated work teams. Each member of the team is important in the sustainability and growth of the company, and therefore, we must take special care of their welfare.

TowerXchange: How is it to run a towerco in CALA versus the previous experiences you’ve had?

Jorge A. Gaitán, CEO, Central America, Continental Towers: It’s fantastic. The towerco industry is crucial for everything we do in real life. We are a vital part of telecom networks and in an increasingly connected and automated world, the industry is becoming part of that evolution and globalisation. CALA is a region that needs to grow and develop. Telecommunications are indispensable in these development processes and it is great to be part of it.

TowerXchange: If you could say or ask anything to a carrier's executive, what would that be?

Jorge A. Gaitán, CEO, Central America, Continental Towers: What can we do together? Positioning ourselves as business partners of our customers has been a big part of our success. Our goal is that the sum of our efforts and that of our clients combined should be greater than any result as individuals.

Jim S. Eisenstein, Chairman & CEO, Grupo TorreSur: I got into the tower business in 1995 when I sold my radio stations to a company called American Radio. I didn’t include my four broadcast towers in the deal. But we agreed instead to create a quasi venture capital structure inside American Radio, into which we incorporated both my towers and the towers that American Radio had from all of its radio stations. We decided to call that company American Tower.

After retiring from American Tower eight years later, I decided to start a second tower company when the FCC mandated number portability. I thought that the mandate would force the wireless carriers to focus more on the quality of their networks, thereby requiring them to add a very significant number of sites. Fortuitously, we grew Optasite into the second largest privately held tower company in the U.S., and we sold it to SBA in July 2008.

Believing that the tower industry could also thrive in Latin America and that I could replicate the model we had created in the U.S., I started Grupo TorreSur at the end of 2010 in Brazil with the acquisition of a portfolio of towers from Telefónica. We have since continued to acquire and develop towers and now have almost 6,500 towers in Brazil.

TowerXchange: What would you say are the three things that keep the CEO of a tower company up at night these days?

Jim S. Eisenstein, Chairman & CEO, Grupo TorreSur: We are very fortunate to have a wonderful company, with great clients, very supportive investors and an excellent team. But I'm
always concerned about how to keep improving the way we serve our clients, how to keep investing and improving the return to our investors and how to keep our team motivated. We need to always be laser focused on our relationships with the wireless carriers, and to do everything we can to support them as they deploy their networks.

TowerXchange: How is it to run a towerco in CALA versus the previous experiences you’ve had?

Jim S. Eisenstein, Chairman & CEO, Grupo TorreSur: Compared with many other industries, the tower business is straightforward and relatively simple but it nonetheless has many nuances that have a significant impact on long term success.

In CALA, there are more variables and nuances to consider when planning a towerco’s long term strategy. Doing business in CALA is more complex, but while there are more risks, there is also the potential for greater reward.

TowerXchange: If you could say or ask anything to a carrier’s executive, what would that be?

Jim S. Eisenstein, Chairman & CEO, Grupo TorreSur: One of Grupo TorreSur’s core principles is “Understand our customers’ needs and satisfy them”. The question we should always be asking a wireless carrier executive is “What can we be doing to best help you achieve the deployment of your network in the most efficient and effective way?”

Manuel Avilés, CEO, Innovattel/Torresec

TowerXchange: How is it to run a towerco in CALA versus the previous experiences you’ve had?

Manuel Avilés, CEO, Innovattel/Torresec: As a towerco’s CEO, I have to wear all the hats myself. Running a towerco in CALA is indeed challenging and sourcing funds is probably one of the biggest difficulties.

TowerXchange: If you could say or ask anything to a carrier’s executive, what would that be?

Manuel Avilés, CEO, Innovattel/Torresec: How can I be a greater help to your organisation and how I can be part of you long-term strategy?

José Sola, CEO, Mexico Tower Partners

TowerXchange: Can you describe your journey towards becoming the CEO of your company?

José Sola, CEO, Mexico Tower Partners: I worked for Telefónica for many years as an M&A expert in LatAm so I had extensive experience in telecom transactions all around the region. Also, I got a
good grasp of the in-country social and economic dynamics and exposure to networking with local carriers and entrepreneurs here in Mexico.

I moved to work for GTP as Head of Corporate Development for LatAm, looking to expand the company's presence in other geographies, which implied valuing opportunities, executing deals and setting up local operations. My experience with GTP allowed me to absorb key concepts and best practices from a leading telecom infrastructure company with top class managers and clear ambition to grow. By the time I became CEO I was aware of the opportunities and challenges to operate a fast growing telecom infrastructure company.

TowerXchange: What would you say are the three things that keep the CEO of a towerco up at night these days?

José Sola, CEO, Mexico Tower Partners: First, I ask myself whether we have the right resources to respond to our customer needs and be ahead of rivals. Do we have the right talent, software platforms, processes, culture, behaviour and financial support? If we don’t, I better get busy in the morning.

How to keep growing and maintaining an entrepreneurial culture is another concern. Have a clear set of goals in mind: stay well positioned for the future, check out opportunities, move fast, think big but execute as a small company, take some risks and learn from failure. No matter if you run 200 or 20,000 sites, one needs to question everyday: are we still doing it with the same passion?

Finally, are we looking at the right business opportunities? Why, how, when? Does it help my clients? Will we get the right returns?

TowerXchange: How is it to run a towerco in CALA versus the previous experiences you’ve had?

José Sola, CEO, Mexico Tower Partners: I would say that in CALA you need to develop a deeper personal relationship with clients, developers, vendors, financial partners and employees so that you can build trust. Across CALA countries, the expression “win-win situation” is taken with scepticism, as there has been a consistent pattern - I would say for centuries - where the strongest takes it all. It is difficult to reverse that perception. When you make a business proposal to a developer or customer, often you need to overcome a first defensive reaction that can only be mitigated through personal relationship so that you are treated as a real partner.

TowerXchange: If you could say or ask anything to a carrier’s executive, what would that be?

José Sola, CEO, Mexico Tower Partners: Be selective and demanding with your infra partner, make sure they have the appropriate operating experience, financial resources, flexibility and long-term presence to meet your demands and expectations. Measure performance and assign projects based on track record. On the other hand, I would suggest they try to plan ahead, at least a little, which would allow us to provide better services and solutions.

Tatum Martin, CEO, BTS Towers

TowerXchange: Can you describe your journey towards becoming the CEO of your company?

Tatum Martin, CEO, BTS Towers: My journey has been a bit different from most CEOs. I come from GlenMartin, a family business that started manufacturing towers and slowly migrated to construction services. My family has always been well travelled and open to adventure, so when the opportunity came within GlenMartin to open construction services in Latin America I jumped at it.
After the 2008 recession, the company downsized and I had to reinvent myself, so I took all my savings and started a tower company in Haiti. I signed my first build-to-suit agreement with Viola Haiti and I had the great vision of building hundreds of towers in the country after the earthquake.

When Digicel acquired Viola I had to change my plans again. I started exploring opportunities in different markets across Central America and decided to launch NMS in Nicaragua in 2010, my second build-to-suit adventure.

From there I raised additional money from friends, family and private equity. At NMS we developed well over 600 towers across several markets and we ended up selling the portfolio in a few different deals. As we saw an end in NMS, both existing investors and I decided to develop BTS Towers and continue our expansion. Restarting a new towerco was indeed very challenging as getting a good MLA was complicated because we were the newest player to enter the market and we had to develop new contracts with all the MNOs. Now, BTS continues its growth with the aim of becoming better than our competitors.

**TowerXchange: What would you say are the three things that keep the CEO of a towerco up at night these days?**

**Tatum Martin, CEO, BTS Towers:** I have to say that I’ve been very blessed with a great team and a great industry, so I sleep very well every night. Though I think, the biggest challenge for every towerco is differentiating oneself from the competition. I have always positioned any of the companies I have lead as a builder and not a buyer; if you want it built on time and in a difficult area, call BTS.

Secondly, I would also say that keeping up with times is quite challenging as well. Networks are dramatically evolving and the need for smaller towers or poles is changing the traditional tower business model. The third biggest challenge is represented by dwindling single tenant returns, which leads to wonder whether co-location is meeting our expectations in some markets.

**TowerXchange: How is it to run a towerco in CALA versus the previous experiences you’ve had?**

**Tatum Martin, CEO, BTS Towers:** As I stated above, I think you have to be more nimble and always willing to run a tight ship. There are really only a few customers in the region and we have to catch the wave at the right time in each country. That means that we have to be willing to jump to the next country if the right opportunity arises.

**TowerXchange: If you could say or ask anything to a carrier’s executive, what would that be?**

**Tatum Martin, CEO, BTS Towers:** Not sure I would ask any question; smiling, I would definitely befriend him or her, and try to develop a long term relationship.

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Mauricio Giusti, CEO, Phoenix Tower do Brasil

**TowerXchange: Can you describe your journey towards becoming the CEO of your company?**

**Mauricio Giusti, CEO, Phoenix Tower do Brasil:** My telecom career began in management consulting at McKinsey during the process of privatisation of the sector in Brazil. The transformation of the sector was very profound in a very short time. Telefônica was my main client and after two years of McKinsey I went to work for the operator in their Strategic Planning department.

I stayed for ten years, where I was leading, in addition to Strategic Planning, the areas of Regulatory, Innovation and Quality. After ten years, I was invited to join PwC in consulting and strategy. I stayed there for two years working directly with the largest telecom operators.

In 2012, I received an invitation to lead a new tower
company that was being launched in the market by a Brazilian private equity fund (GP Investments), BR Towers. In two years we made four acquisitions and started a very aggressive build-to-suit program, reaching a total of 4,500 towers.

After the sale of the company, I was invited by Blackstone to lead Phoenix Tower in Brazil.

**Mauricio Giusti, CEO, Phoenix Tower do Brasil:** The biggest challenges are capturing growth opportunities that go beyond the traditional tower business, maintaining a high level of engagement of the company's talents and making PTB the first choice of our customers thanks to the quality of our services.

**Mauricio Giusti, CEO, Phoenix Tower do Brasil:** We need to act very quickly and flexibly and deal with a small and powerful number of customers.

**Mauricio Giusti, CEO, Phoenix Tower do Brasil:** How to redesign the business model so that the telecom operator can cope with the challenges of the digital world.

**Maria Scotti, CEO, Torrecom:** My journey began in the early nineties, as Manager of Engineering with a U.S. National Paging Company, Message Center Beepers (MCB), which then led to the creation of Message Center Management, Inc. (MCM), an early towerco with a portfolio of rooftops and towers. In the mid-nineties, there was very little knowledge regarding infrastructure sharing including towers, and very few were deploying rooftops.

I am very proud to say we were part of creating the towerco industry in the United States. We were in very early and played a very active role in what it has become today.

Fast forward to 2009 and 2010, we launched Torrecom, bringing our U.S. knowledge to the CALA region. At that time, being a co-founder and Managing Partner, I was focusing the majority of my time in the region and as our growth was really on the fast track and with very little industry knowledge in these markets, it was a natural fit for me to operate the helm of Torrecom as CEO in late 2012.

**Maria Scotti, CEO, Torrecom:** We are in markets that face a variety of things that are not in our control. My nightmares centre around those. They can impact the safety of our team members. They can affect our structures and wireless facilities which has an impact on the networks most widely used in the countries. We were an early entrant in these markets and the keywords used by those we spoke to was “You guys are really brave”. Looking back, we were.

My number one dream is the advance of the wireless technology and the consumers embracing its use. It is good for the carriers, good for towercos and good for the markets. With more solid towercos in some of these markets today, we should be building solid wireless infrastructure, striving for stronger permitting frameworks, educating the consumer and continually educating team members.
both internally and externally. This will take everyone involved in the game to work together to bring it to fruition. Recognising the value some of us bring to the market in achieving those is of importance. You can build cheap and for the today or you can build smart and build for the future... The sustainable future.

**TowerXchange: If you could say or ask anything to a carrier’s executive, what would that be?**

**Maria Scotti, CEO, Torrecom:** Baring in mind all that I mention above, I would dialogue with the executive about the value proposition some of us bring.

They can focus their capex on network development and bringing robust services to their consumers. We can focus on ensuring the network is built to withstand their growth and for years to come. We deal with the permitting issues, proper ground leasing documents, the risks related to building/constructing in difficult markets and a whole host of other items involved to providing proper wireless infrastructure. If they value their network, it should be important to them that they work with partners that value how the infrastructure that hosts them is built. Having been through almost 30 years in this space, this aspect is extremely important.

Most recently, I had a carrier express to us that they were extremely pleased with our ability to quickly get them co-located on sites because our structures were built properly from the beginning. They were not faced with delays to enter the markets. Music to my ears.

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8-9 October, Johannesburg

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19-20 May, Barcelona

**Meetup Americas 2020**
23-24 June, Boca Raton

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Argentina needs to build 50,000 towers in the next five years

A new initiative by the Agencia Argentina de Inversiones could remove crucial barriers to ease infrastructure deployment

Currently, Argentina has 16,000 active towers. With a 44mn population and a huge geographical extension, the country needs to duplicate that number, but bureaucratic barriers, social opposition and its complex economic situation have stopped the development of telecoms infrastructure in the country. Now, the Agencia Argentina de Inversiones y Comercio Internacional - alongside the Secretaría de Modernización and the Ente Nacional de Telecomunicaciones (ENACOM) - have started a collaborative initiative between towercos, investors and MNOs, which aims to eliminate the barriers that are slowing down the industry development and attract an investment of US$5bn to deploy the 50,000 towers that the country needs.

In this interview, Andres Tahta, Executive Vice President of the Agency, analyses the sector opportunities and discusses how this initiative can help unlocking one of the most promising markets in Latam for telecoms infrastructure deployment.

Keywords: Agencia Argentina de Inversiones y Comercio Internacional, Americas, Americas Insights, Argentina, CALA, Country Risk, ENACOM, Infrastructure Sharing, Investors, Investment, Market Forecast, Market Overview, Meetup Preview, MNOs, Network Rollout, Secretaría de Modernización, South America, Tower People, Towercos

Read this article to learn:
- The role of the Agencia Argentina de Inversiones y Comercio Internacional
- The new initiative to boost the development of the telecom infrastructure sector
- An updated overview of the Argentinian market and its opportunities
- How international investors look at Argentina

TowerXchange: Could you introduce the Agencia Argentina de Inversiones y Comercio Internacional and your role in the telecoms sector?

Andres Tahta, Executive Vice President, Agencia Argentina de Inversiones y Comercio Internacional: The Agencia Argentina de Inversiones y Comercio Internacional was founded in February 2016 after President Macri took office. The institution has two fundamental goals: on one side, we want to recover our SMEs’ export capacity and the other objective is to incentivise national and international investments. The Agency promotes the country’s opportunities and supports global investors throughout the whole investment process, from the first due diligence to the results examination.

We offer strategic support to investors and work closely with the central government, ministers and other key institutions to pave their way. Furthermore, we also offer administrative support by easing bureaucratic procedures and supporting enterprises with all the barriers that arise during their business venture in the Argentinian market.

Focusing on TMT, the Agency promotes data centres development as well as telecoms infrastructure deployment. So far, we have worked with 15 companies in the data centres initiative and some of them have already announced important investments in Argentina. In the tower deployment project, we work to eliminate the social and regulatory barriers that are slowing down the flow of investments. We are currently collaborating with 12 tower companies that are very keen in investing in the country to ease their activities.
TowerXchange: Argentina needs a considerable telecoms infrastructure effort in order to face the current demand and improve coverage and capacity. How many towers are needed? And how can that growth be achieved?

Andres Tahta, Executive Vice President, Agencia Argentina de Inversiones y Comercio Internacional: Argentina has 16,000 active sites. According to our estimates - based on conversations with towercos, MNOs and the Secretaría de Modernización - Argentina needs to duplicate that number in order to improve coverage, and even triple or quadruple it to reach the quality and service of most developed countries. Therefore, we estimate that the country needs to build between 20,000 and 50,000 towers over the next five years.

Greater Buenos Aires - formed by the Capital Federal and its huge province - presents huge opportunities due its high density and big population. The big province houses 16mn residents with a mobile penetration over 120%. The population is principally concentrated in the Capital Federal and other five big cities, where the existing infrastructure does not support the current demand.

Argentina is also the eighth biggest country in the world, but it has a very low population density so there is a big gap between rural and remote areas where there is no infrastructure. For instance, the popular and touristic Ruta 40, which crosses the country from north to south through the Andes, or the connection between Mendoza and Santiago, offer very bad coverage and require a huge investment to deliver a good 4G signal.

Moreover, last year the Secretaría de Modernización launched the National Telecommunications Plan that presents other specific opportunities for the industry. This initiative is driving infrastructure deployment and digital inclusion as well as seeking a regulatory framework improvement. The Plan is increasing the number of homes connected, doubling internet speed and improving 4G presence by 50% among many other progresses. However, there is still a long way ahead. The actual home speed in Argentina is around 14Mb/s, far away from European countries and the United States, and infrastructure deployment will have to play a huge role in the growth and development of telecommunications in the country.
TowerXchange: What are the main challenges that the industry is facing and what can regulators and MNOs do to enable its development?

Andres Tahta, Executive Vice President, Agencia Argentina de Inversiones y Comercio Internacional: If we focus on infrastructure deployment, the bureaucratic barriers are the main obstacle, mainly on a municipal level and in a smaller extend at a provincial level. The approval process for an antenna installation is time-consuming, arduous and very expensive because it sometimes includes prohibitive fees. Currently, 70% of the country’s towers are somehow breaching some municipal or provincial requirements. Argentina is a federal country, where the municipalities have strong power and they are now slowing down and even stopping infrastructure development, so it’s necessary to eliminate those bureaucratic barriers and accelerate the approval processes.

At the agency, we are offering our support to operators to drive collaboration and dialogue with the Government, the Secretaría de Modernización and the ENACOM, aiming to eliminate those investment inhibitors. The Government has to understand the challenges that both MNOs and towercos are facing, as well as the benefits that infrastructure development generates. We want to educate society and municipalities and eliminate mistaken conceptions.

TowerXchange: At the Agency, you are in direct contact with a number of international and local towercos. What are their vision and ambitions in Argentina and what is stopping their irruption in this market?

Andres Tahta, Executive Vice President, Agencia Argentina de Inversiones y Comercio Internacional: As mentioned, we are working and speaking with 12 tower companies, including big international players, regional and local towercos as well as some investment funds that recognise the opportunity and are evaluating how to enter the Argentinian telecoms markets. Towercos’ vision is simple: Argentina offers a huge opportunity as the country needs to double or triple its current number of sites. Infrastructure providers understand that, despite bureaucratic obstacles and market challenges, investing in Argentina is a great move for them. Hence, they have hired very experienced teams to address this opportunity and some of them are already negotiating sale and leaseback contracts with local operators to enter the market with scale.

Despite the current situation, all these companies are willing to invest, they want to double their bets and have the financial means to do it. They have big capitals ready, but there are still some obstacles that difficult the last step that will not just multiply international investment in the country, but will also change the life of the Argentinians by driving connectivity across the business sector, as well as improving coverage, digital services, education and eliminating the digital divide among many other advantages.

The investment opportunity ranges between US$2bn and US$5 bn and we are in conversations with two entities that could invest a thousand million each. Currently, neutral tower penetration is 2% so the opportunity is obvious. As I mentioned earlier, those bureaucratic barriers and difficult permitting processes are slowing down the deployment, and that is stopping investors, but we are convinced that this dynamic will change this year.

TowerXchange: On top of administrative and strategic support, the agency is developing an ambitious initiative to overcome the sector barriers and help operators, towercos and investor to unlock the market. Could you explain the project, its goals, results and expectation?

Andres Tahta, Executive Vice President, Agencia Argentina de Inversiones y Comercio Internacional: Indeed, we have launched an initiative that, as part of the national plan led by the Secretaría de Modernización, is developing three deployment pilot tests that aim to educate regulators, the industry and society on the benefits of telecoms infrastructure sharing as well as creating a precedent in the dialogue between towercos, MNOs, local institutions and social groups.

Argentina is a country that works mainly by contagion and we think that, if we succeed on these three pilot tests, we will convince and spread this to other provinces while we keep progressing at a national level.
The first test was launched in Mendoza and now we are launching a similar initiative in Jujuy. Buenos Aires province will welcome the third test and we are now talking with some institutions in order to secure political support.

To understand the project it is necessary to analyse its seven phases:

1. First, as we did in Mendoza, we need to review different municipal and national laws and in some cases, modify them to create a regulatory framework that does not stop or slow down deployment. We do not want to take the power away from the municipalities, but we want them to use certain standards that drive investment. We have analysed best practises from other regional countries and the U.S., and selected the most positive aspects of them. Additionally, on a national level, we have created a unique window at the ENACOM so towercos can start approval processes for their municipal sites through the national government.

2. We are also designing an optimal tower installation process, eliminating obstacles and unnecessary barriers as well as reducing fees and approval deadlines.

3. Moreover, we want to drive dialogue between provinces, municipalities and the ENACOM, and align the provincial projects with the national plan objectives.

4. We are proactively sharing the project with the key industry stakeholders, so they can observe the initiatives progresses. And of course this interview helps us on that front!

5. The fifth aspect is one of the most important ones. We want to hear the neighbours' views and understand why in many cases they are against infrastructure deployment. We are preparing an educational campaign on the benefits of towers for local groups. Despite what many people think, towers do not cause cancer and ironically, having your phone next to your ear while it is searching for a signal is way more harmful. There's plenty of options to avoid landscape disruption such as camouflaged towers and we have already deployed one with a palm tree shape that perfectly integrates with the environment in Mendoza.

6. We also want to help intendentes and local mayors - responsible for final decision - who sometimes can feel high-pressure from local groups. We have designed a value proposition that they can use to increase awareness on the benefits of towers and the value that towercos can bring to municipalities through free Wi-Fi systems or security cameras.

7. Finally, we have prepared a proactive contact plan and value proposition for the press, as journalist can play a key role on educating society through the media.

**Andres Tahta, Executive Vice President, Agencia Argentina de Inversiones y Comercio Internacional:**

2018 was certainly a bad year for all emerging markets and Argentina faced a tough situation. We had high commercial and fiscal deficits and we suffered the biggest drought in the last 50 years, which massively affected the agricultural sector, one of the main drivers of our economy. Until then, Argentina had a 3-4% growth and we are confident that we will go back to that growth after the second semester of 2019.

The government has a very serious economic programme, which seeks to resolve the imbalance in external accounts and public finances. It has taken very specific steps and the international market is putting its trust back to Argentina. They have prepared a new monetary plan to stabilise the exchange rate and they have stopped the flight of capital. Moreover, we see an inflation decrease and we have reached an agreement with IMF that guarantees the necessary resources for 2019.

During this year we’ll reach zero fiscal deficit and we will achieve surplus next year. Thanks to the exchange rate adjustment, Argentina has achieved its greater level of competitiveness in the last seven year and it has cleaned up its balance sheet, so we aim to return to that 3% growth that we had before the 2018 crisis. The exchange rate will also favour exports and some key sector for the country’s economy such as agriculture, tourism and oil and gas will massively increase during the year, generating a very positive impact in the financial situation of the country.
BALESIA TOWERS is the only towerco TowerXchange has tracked so far with existing or planned operations throughout the CALA region, from Puerto Rico all the way to Argentina. Its CEO, Mario Rafael Álvarez Gutierrez is an architect who specialised in a new, niche sector such as the telecom tower industry in the United States. In this interview, he shares with us his background as well as the rationale behind the creation of Balesia and his plans for the company’s expansion across South America.

Keywords: 4G, AT&T, AT&T Mobility, Americas, Americas Insights, Argentina, BALESIA TOWERS, Bolivia, Brazil, Central America, Chile, Clearwire Corporation, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Insights, LA Cellular, LTE, McCaw Cellular, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, South America, Towercos, United States, Uruguay, Velocitel, the Caribbean

Read this article to learn:
- BALESIA TOWERS: a build to suit firm with pan-regional aspirations
- Doing business in Colombia and Peru: what differs?
- Central America makes business sense if treated as effectively one country
- Balesia’s planned expansion into Argentina

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS

TowerXchange: Please introduce yourself and your career in the tower business.

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS: I am an architect by training, having graduated in the United States with a degree in architecture and a minor in business. After college, I immediately launched my firm thanks to the help of my father, Mario Rafael Álvarez, a civil engineer from Cuba.

My first client was the Los Angeles Cellular Company back in 1987. At the time, the company was owned by the McCaw brothers, who pioneered the cellular industry and founded companies such as McCaw Cellular (now part of AT&T Mobility) and Clearwire Corporation. Among my other clients, I designed and built towers for LA Cellular (now AT&T) and this is how I started working in the telecom sector. At the peak of my activity, I was a licensed architect in over forty-five states in the United States and also in Puerto Rico!

The firm was called Alvar Architects, Engineers and Builders and then changed its name to Velocitel LLC. Over a period of around fifteen years, we designed and/or built close to 35,000 sites for all major U.S. and Puerto Rican carriers. In 1999, I sold 70% of Velocitel to Willis Stein and Partners and became, along with my family, a private shareholder of approximately 30% of the business. Around 2001, I retired from the business and to date I still own around 20% of the company’s stock.

In 2013, I started BALESIA TOWERS with the
goal and vision to once more build towers but concentrating mainly on Latin America. BALESIA TOWERS’s corporate office is in Madrid and we have a regional office in Lima, Peru although I am mostly based in the United States.

TowerXchange: What is BALESIA TOWERS’s geographical footprint? What is the pedigree of your management team? Does Balesia focus on Build-to-Suit (BTS) only or is looking at acquiring portfolios as well?

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS: BALESIA is present in Peru, Ecuador, Guatemala, Colombia, Nicaragua, Costa Rica, El Salvador, Honduras, and Chile. And we are in the process of starting offices in Argentina, Bolivia, Paraguay, Uruguay, Dominican Republic, Puerto Rico, Brazil, Panamá, Haiti and the Caribbean.

Our personnel holds a combined 150-year experience in the sector and we have a very strong family culture within the company. We work extremely hard, striving to provide excellent customer service while making sure we take care of the team.

We focus on BTS but also look at potential portfolio acquisitions.

TowerXchange: What are the key challenges of operating in the Build-to-Suit market right now?

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS: The number one challenge we are facing today is the increased competition among tower builders. Other details are all very manageable!

TowerXchange: Why have you chosen to invest in your particular target tower markets?

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS: The rationale is very simple... With the deployment of 4G LTE, the demand for new towers in Latin America is going to be overwhelming for the next five years.

TowerXchange: Please tell us the differences of doing business in Peru vs Colombia.

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS: To date, Peru presents a very flexible set of laws that facilitate the installation of new towers. The process is much easier now than it used to be and there’s less competition among tower builders.

On the other hand, Colombia is experiencing a huge wave of competition among tower builders and we find that there are less opportunities for new business with the local carriers.

TowerXchange: And what about Costa Rica, Guatemala and Honduras - how do they compare?

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS: I tend to look at Central America as effectively one country. And this is why we have a few sites in certain countries and many in others... We treat the region as a whole which helps making sure that our local operations make business sense.

TowerXchange: What is your view on Argentina? Are you exploring opportunities in the country? And if so, how do U.S. investors feel about it?

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS: We have just hired our new General Manager in Argentina and are anxious to start building sites! And we’ve just received a green light from our banks to start a business in Argentina, as long as our contracts with carriers are stipulated in U.S. Dollars.

TowerXchange: Please summarise your vision for the future of your company.

Mario Rafael Álvarez Gutierrez, CEO, BALESIA TOWERS: My vision is the same that I had back in 1987. Back then, I wanted to build a large tower portfolio and hold on to it, full stop. But I wasn’t able to succeed at Velocitel since Willis Stein and I didn’t share a common vision and strategy.

Now I have the resources and partners to make sure I realise my dream and I am very excited about the future of BALESIA TOWERS.
Claro develops the largest private renewable energy generation project in Brazil

The operator seeks efficiency and cost reduction through renewable energy investment and infrastructure sharing

Reducing energy consumption is one of the main corporate priorities for Claro in Brazil and the company has started an ambitious auto generation initiative to reduce its operational cost and improve efficiencies. The operator has already developed nine green energy plants to power its operations and when the initiative is completed, 80% of its total energy consume will be sustainably auto-generated by the MNO. TowerXchange has spoken with João Pedro Correia Neves, Director of Financial Support to find out about the project’s details and discuss Claro’s infrastructure strategy in the country.

Keywords: Access Control, Americas, Americas Insights, Batteries, Brazil, Capex, Claro, Claro Brasil, DAS, Energy, Energy Efficiency, Infrastructure Sharing, Insights, Monitoring & Management, MNOs, Opex Reduction, Renewables, South America

Read this article to learn:
- How is Claro developing the biggest private renewable generation project of Brazil
- Main infrastructure management challenges for Brazilian MNOs
- Claro’s views on fibre, collaboration and future plans

TowerXchange: João Pedro, could you please introduce your role at Claro Brasil?

João Pedro Correia Neves, Director of Financial Support, Claro Brasil: My role consists in offering financial support to our technical operations, marketing and customer care as well as managing payments for our infrastructure fees. Additionally, I deal with our infrastructure vendors and providers and manage the company infrastructure assets.

My main goal is to improve efficiency across all company processes through simplification and automation. Moreover, the company is strongly committed to implementing digital solutions in our infrastructure in order to optimise our resources and improve sustainability. Our department is playing a key role overseeing the implementation of this initiative.

Specifically, we aim to improve our towers’ efficiency, reduce our energy cost and minimise our rental fees. We are implementing a digital initiative in our sites that aligns with those corporate goals.

TowerXchange: How many towers does Claro operate in Brazil and what is the company infrastructure strategy?

João Pedro Correia Neves, Director of Financial Support, Claro Brasil: At the moment we have around 14,000 actives sites and our priority is to improve the profitability of those assets.

During 2019, we will continue to build new sites but
the current priority is to reduce the operating cost of the towers and facilitate access to other operators in order to increase revenue. We are trying to develop and implement a simple process within the company that will allow other MNOs to access our sites. We are promoting communication with other operators in the market and exploring collaboration possibilities and potential synergies to optimise the use of technical solutions and minimise the costs associated with the maintenance and operation of our infrastructure.

Regarding towercos, we have a very good relationship with them and we will continue to use their infrastructure.

TowerXchange: What are the main challenges that the company is facing when deploying and maintaining its infrastructure in the country?

João Pedro Correia Neves, Director of Financial Support, Claro Brasil: The main challenges are related to energy cost and security, two variables that have historically been big issues for the Brazilian telecom industry.

In order to reduce energy consumption, we are developing a project for our low voltage sites and we have already started the construction of our own power plants that allow us to autogenerate and meet the necessary demand of those sites. Additionally, for medium voltage and bigger capacity sites, we are exploring all the energy purchase options in the free market and we are also betting on renewable energy.

On the other hand, we are working closely with all the company technical areas and developing different efficiency initiatives. On this note, consumption control is key and we are using telemetry to monitor it. We are also implementing several analytic and comparison tools to determine what would be the ideal consumption in each site and observe which specific aspects can be improve in each tower to reduce that energy cost.

Regarding security, we have a specific department that deals with that and we work very closely with them. As it happens in most Latin American markets, we suffer from vandalism and theft, which is a big issue for the company. We are using modern access control and surveillance systems that guarantee theft reduction and allow us to efficiently control and monitor our assets.

TowerXchange: Claro Brasil is one of the industry leaders in renewable energy integration to power its towers. Could you talk about your energy strategy, the role of renewables and your goals?

João Pedro Correia Neves, Director of Financial Support, Claro Brasil: We are indeed pioneers in developing alternative energy in Brazil and we have now the biggest distributed renewable generation project as a private company in the country. As mentioned above, we are developing several renewable generation plants to power our infrastructure.

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operations. We have a specific department that develops and oversees that initiative and we are collaborating with different national and global leaders.

We have already developed different wind, solar and hydro generation solutions as well as using biogas in order to secure power supply for our network. Our own development on this initiative is allowing us to long-term plan our energy strategy as well as generate energy in a sustainable and affordable manner.

By the end of the project, 80% of the total of Claro’s energy consume in the country will be generated and managed by the company.

TowerXchange: On top of tower deployment, is Claro considering new solutions and technologies such as small cells, DAS, fibre and other alternatives?

João Pedro Correia Neves, Director of Financial Support, Claro Brasil: Fibre is already a pivotal element for us to increase capacity and is playing a key role in both the company’s current and future growth plans. We are probably the operator with the largest fibre investment and portfolio in the country and we are now connecting all our towers.

We are also open to explore all those technologies and solutions and our investments are always driven to deliver the best solutions and offer an efficient telecom network to our customers.

See you at our future events!

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3-4 December, Singapore

Meetup MENA 2020
28-29 January, Dubai

Meetup Europe 2020
19-20 May, Barcelona

Meetup Americas 2020
23-24 June, Boca Raton
IDB Invest keeps supporting connectivity

The bank has financed Internet Para Todos while it continues investing in telecoms infrastructure to reduce the digital divide in CALA

Reducing Latin America’s digital divide, where more than 100 million people don’t have internet access, is one of the main corporate goals for the Inter-American Development Bank. Through its investment arm IDB Invest, the institution is collaborating with Internet Para Todos, Telefónica’s led infrastructure deployment model for rural areas that will provide internet access to six million people that are now disconnected.

TowerXchange has spoken with Aitor Ezcurra, Corporates’ Division Chief at IDB Invest to understand the project’s financial details and hear about the some of the initiatives to reduce the digital divide in CALA.

Keywords: Americas, Americas Insights, Business Model, CAF, Construction, Energy, Facebook, Greenfield, Inter American Development Bank, IADB, IDB Invest, Investment, Internet Para Todos, Meetup Preview, MNOs, Off-Grid, Renewables, Peru, Solar, South America, Telefónica, Transfer Assets, Urban vs Rural

Read this article to learn:
- IDB’s role and goals in Internet Para Todos
- What will be the project’s investment and main financial challenges?
- Recent moves and future planes for IDB Invest in Latin America

TowerXchange: IDB Invest has been fully involved in the Internet Para Todos project alongside Telefónica, Facebook y CAF. What is the bank specific role and why did you decide to join the project?

Aitor Ezcurra, Division Chief, Corporate, IDB Invest: First we need to explain and contextualise IDB Invest’s role as part of IDB Group. Our segment works directly with the private sector, offering financial and consulting solutions to other institutions. Among the several sectors that we work with, we have an special interest in telecoms with the goal of reducing the digital divide that we see in Latin America and the Caribbean. We have identified a lack of connectivity in the region, mainly in rural areas, and we are collaborating with different companies to find solutions and close that gap.

As part of this strategic goal, we joined the Internet Para Todos project, where we are playing a catalytic role: we collaborate with sponsors across the private sector to find solutions to the different problems we identify, in this case, the lack of connectivity.

Our second role is related to our experience bringing venture capital. We are a solutions bank that normally works with long-term debt products as this is our strength, but in this specific case we are providing private equity. We are also playing an honest broker role, linking the different companies
involved as we don’t have direct interests with any of them, which makes the shareholders feel very comfortable.

Why are we joining? As I mentioned, our main goal in this project is to help closing the digital divide, bringing connectivity to remote areas.

TowerXchange: The project unites four big corporations from different industries. How did it all start from an institutional and strategic perspective and how is the experience of coordinating a project with Telefónica, Facebook and CAF?

Aitor Ezcurra, Division Chief, Corporate, IDB Invest: For years we’ve had a great relationship with Telefónica. On top of being a solutions bank, we are progressively becoming a relations bank, working hand in hand with companies that believe in development and have goals that align with our strategy.

Specifically, we have been working with Telefónica for ten years. They were aware of our interest in this kind of projects and after speaking with Facebook they approached us to be part of IPT. Telefónica also knows that we are willing to take more risks than a traditional investor and here our role as solutions bank and our equity injection were instrumental.

From an institutional point of view, the project is led by its shareholders. IPT was created as an independent venture with four shareholders. Telefónica plays a key role as they are contributing with the highest number of assets, followed by Facebook, us and CAF with a smaller participation.

TowerXchange: What is the total investment that IDB is allocating in this initiative and how many new sites will be required to meet the connectivity targets?

Aitor Ezcurra, Division Chief, Corporate, IDB Invest: We are allocating between US$15 and 16mn as part of the project’s total US$100mn budget. Regarding the number of sites, we don’t have an specific target. Telefónica brings 380 traditional sites deployed in the area as well as 2,750 smaller sites. The total number of greenfield sites that we will deploy is currently being discussed and needs to be defined with the goal to connect six million people in mind.

TowerXchange: One of the project’s main goals is to create a deployment model that could be replicated in other countries with similar challenges in the region. Is the bank already considering similar initiatives? What other investments are you planning across CALA?

Aitor Ezcurra, Division Chief, Corporate, IDB Invest: At the moment, we are not evaluating anything like this as our priority is to guarantee that the path we are starting works well so it can be exported to other countries in the future. While talking with Facebook, Telefónica and other industry experts we realised that countries like Argentina, Brazil and Bolivia have important rural areas that need this kind of shared infrastructure solutions in order to offer connectivity to remote places.

Apart from IPT, one of our most recent investments in CALA was the US$60mn loan that we gave to Phoenix Tower for the acquisition of 600 towers from Trilogy in Bolivia. Additionally, we also helped them to finance the capex, as part of our huge effort in expanding connectivity across the region.

We are working in a couple project in the Caribbean and Argentina, trying to support two MNOs so they can keep deploying and expanding connectivity in both countries and we hope to be able to share more details of this potential partnerships very soon.

TowerXchange: What are the main financial challenges that you face in such a project and how does IDB proves its economic viability?

Aitor Ezcurra, Division Chief, Corporate, IDB Invest: The main risk comes from the fact that this is a completely new concept and nothing similar has even been deployed in the region. On the other hand, and apart from Telefónica, we have to attract other MNOs to maximise both the infrastructure use and the investment, and this brings its own complexities and certain risks.
Nevertheless, those are risks that we are willing to take as a development entity. We want to experiment and succeed on this initiative and our will for assuming risk is bigger than other traditional investors.

With regards to its economic viability, our team made a detailed and technical analysis of the project, its risk and the market. Later we did the financial analysis (cash generation, return, expenses, et cetera) and according to those analysis we made the final decision. The success of the project is critical to guarantee its impact, which is one of the main goals we set for ourselves when supporting this initiative.

TowerXchange: The social benefits that the project will generate are without a doubt its lifeblood but what are the main benefits of the project for you as an institution?

Aitor Ezcurra, Division Chief, Corporate, IDB Invest: I would highlight two main benefits. First a financial one, as our entity needs to achieve certain economic return and in this case we have very optimistic expectations. We don’t expect a 30 or 40% return as other funds, but we firmly believe in the financial feasibility of this project. The second one is also the main goal that we have previously addressed: bringing connectivity to rural areas in Peru so this particular projects success can be replicated and exported to other areas in Latin America and the Caribbean.

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Internet Para Todos, a new alternative to reduce the digital divide

Telefónica, Facebook, IDB and CAF drive an innovative model that will provide internet to six million people in Peru by deploying infrastructure in rural areas

In Latin America, more than 100 million people who live in rural areas don’t have internet access. The digital divide keeps slowing down the socio-economic development of thousands of communities located in remote locations, and the geographical barriers of those areas further complicate the much needed infrastructure deployment.

In order to solve this challenge, Telefónica, Facebook, IDB Invest and CAF have joined forces and launched Internet Para Todos, a rural telecoms infrastructure operator that will offer internet to six million people in Peru while trying to create a new deployment model that can be replicated in other rural areas across Latin America.

TowerXchange has followed this initiative closely and we recently had the chance to talk with Internet Para Todos CEO Teresa Gomes, who will also be presenting the initiative at the upcoming TowerXchange Meetup Americas, taking place July 9-10 in Boca Raton.

Keywords: Americas, Americas Insights, Business Model, CAF, Construction, Energy, Facebook, Greenfield, Inter American Development Bank, IADB, Investment, Internet Para Todos, Meetup Preview, MNOs, Off-Grid, Renewables, Peru, Solar, South America, Telefonica, Transfer Assets, Urban vs Rural

Read this article to learn:
- Internet Para Todos revolutionary business model
- Who are the key shareholders and what are their roles?
- What are the main challenges for rural rollout in CALA?
- Internet Para Todos’ current assets, deployment plans and technology requirements

TowerXchange: Could you please introduce yourself as well as Internet Para Todos?

Teresa Maria Gomes De Almeida, CEO, Internet Para Todos: Internet Para Todos was created thanks to an initiative by Telefónica that aims to “connect the non-connected”, allowing high-speed internet access to millions of people that are now disconnected.

In Latin America, over 100 million people are in this situation and just in Peru, six million don’t have internet access. High data demand, the big capital that this requires and some technologies that are not suited to attend low density populations are pushing operators to prioritise urban areas.

Internet Para Todos wants to address this issue and bring internet to those rural areas under the OIMR model (Rural Mobile Infrastructure Operator).

Our goal is to reduce the digital divide in Peru and integrate millions of people who live in rural and remote contexts into the digital world. This integration is key to guarantee the economic and social development of those areas as well as improve and transform their quality of life.

As the company’s CEO, I lead the team and coordinate all the actors involved in the project, while also driving the technology initiatives needed for its success. Additionally, I have to generate value for my clients - the MNOs - by offering a strong Quality of Service. Lastly, I have to explore synergies with the State and other industry players, as well as drive collaboration with electricity companies, fibre developers and other technology
and service providers that can support our deployment, while guaranteeing the business’ sustainability.

Prior to this role, I was the CTO of Telefónica in Venezuela. I believe that the experience I gained in such a complex environment is going to help me a lot in this project. In Venezuela I got used to make a lot with very little, maximising the resources and always finding a way to achieve our goals even in the most adverse situations. Peru’s conditions and context are indeed different, but the country and the project have their own difficulties that will require me to reinvent myself.

**TowerXchange: Who are the main players involved in Internet Para Todos and what are their specific roles?**

**Teresa Maria Gomes De Almeida, CEO, Internet Para Todos:** Internet Para Todos was a corporate priority for Telefónica, but the company quickly realised that they couldn’t execute the project without some strategic partnerships. Facebook, a leader on disruptive technologies development, came on board. Later on, CAF-Development Bank of Latin America and the Inter American Development Bank (IADB) decided to bring their financial support and knowledge and among all, we decided to create an independent entity supported by all the above leaders as shareholders.

All partners have a common goal which is to drive connectivity and reduce Peru’s digital divide.

Telefónica transferred its assets in rural areas and brought its knowledge and experience in network and technology deployment, supporting the project directly through its innovation and wholesale department. Facebook is offering strong technical support, facilitating the adoption of disruptive and innovative technologies and systems. Development banks CAF and IADB offer financial advice and support with the objective of driving the socioeconomic development of those areas. Furthermore, we would like to collaborate with other key players, including the Peruvian Government and private companies that can help us in maximising the number of people with internet access.

Just a few years ago, you could not imagine a collaboration between Facebook and Telefónica nor think of an MNO transferring its infrastructure and allowing access to other operators in this context. The project, that aims to create an example that can be followed in other rural areas across Latin
America, shows the drive to innovate, openness and strong commitment of these companies to push connectivity.

**TowerXchange: What infrastructure assets does Internet Para Todos own and manage at the moment and what are your plans and priorities for those assets in the short term?**

**Teresa Maria Gomes De Almeida, CEO, Internet Para Todos:** Among the assets we’ve received from Telefónica, we have 2,750 small stations that offer reduced radio coverage and 380 bigger stations that offer voice services over 2G technology. Additionally, Telefónica transferred its lease contracts to guarantee operational continuity. Our focus now is to deploy 4G technology on those 3,130 sites, which will guarantee internet access to 3.2mn Peruvians. Over the first two years, we will focus on upgrading those stations to guarantee 4G access. Most of those sites transport signal through satellite, so another priority is to deploy fibre or microwaves, depending on the needs of each area in order to improve services and reduce satellite dependance. Here, the synergies I mentioned earlier are fundamental as we would not be able to deploy all the fibre that we need to connect those sites ourselves. Our idea is to deploy in certain areas where there are gaps while accessing the existing fibre infrastructure when possible.

Furthermore, between 2020 and 2021, we will deploy 1,000 greenfield sites that will allow us to reach the goal of offering connectivity to six million people.

**TowerXchange: Telefónica is one of the main shareholders, but I appreciate that Internet Para Todos will collaborate with other MNOs. What is your strategy with operators and other potential partners?**

**Teresa Maria Gomes De Almeida, CEO, Internet Para Todos:** Indeed, we have the obligation of generating value for our customers, which will be the country’s MNOs. The main operational goal is to be a neutral operator that offers its services and infrastructure to allow Peruvian MNOs to increase their coverage in rural areas by efficiently using our infrastructure. This projects is based on the OIMR concept (Rural Mobile Infrastructure Operator), a unique business model defined by a law published in 2013 by the Peruvian Government that allows Internet Para Todos to offer infrastructure and connectivity services to the MNOs as a wholesale business despite not having any spectrum. Currently, Telefónica is our only client but our plan is to close deals with other operators to whom we’ll offer strong QoS and maintenance capabilities. This model allows operators to notably reduce their capex as they don’t need any investment neither have to pay maintenance fees. They just pay for their carried traffic.

**TowerXchange: Providing connectivity to rural and remote areas brings several operational challenges. What are the main deployment and maintenance barriers that you are facing?**

**Teresa Maria Gomes De Almeida, CEO, Internet Para Todos:** Transporting the actual data traffic is the main challenge at the moment due the complex geography of Peru - a vast country that has coast, high ranges and deep jungle. Here, Facebook is playing a key role, bringing different planning tools to optimise the deployment that are helping us in defining which transportation alternatives better adapt to each area. Additionally, the Government is supporting fibre deployment through different regional projects and we plan to access that fibre while we deploy in other key zones. We aim to exchange access, not just to fibre but also on the new sites we deploy.

Access also has its own challenges and our principal priority is to offer disruptive, affordable, flexible and open solutions that can host three operators and allow us to integrate new products into the technology that we install.

We have to deploy very fast, utilising the infrastructure that we have in place and reinventing ourselves to cut down cost to the maximum. We will work closely with local communities and we will use local labour during deployment, which will also promote employment.

At an operational and maintenance level, we will invest in automation and machine learning systems that allow us to detect network errors ahead, which will facilitate their automatic correction, preventing...
any issues on the systems. This element is critical since site visits and maintenance in certain sites generate high costs as some sites require trips of three or four days. This aspect helps us to reduce cost and increases service availability.

Lastly, we will also face electricity intermittence and some power cuts. We use lead-acid batteries mainly, although we aim to transition to lithium if possible. We also have a small number of off-grid sites where we have installed solar panels and we want to continue exploring innovative energy solution in our greenfield sites.

In conclusion, our main goal is to find low-cost, disruptive technologies and solutions to generate a sustainable and replicable model while welcoming millions of people to the digital world.

**TowerXchange: How much deployment does Peru need to offer connectivity on its rural areas and what are your specific deployment and investment goals?**

**Teresa Maria Gomes De Almeida, CEO, Internet Para Todos:** With the overlay of the 3,130 sites and the construction of 1,000 greenfield sites that will start in 2020, we aim to connect six million people in the next three years, a very important part of the country’s rural population.

Regarding the investment, we have allocated around US$100mn for these first three years and another US$100mn on opex that we hope to start reducing through several efficiency maintenance strategies.
Neutral Networks: an integrated approach to connectivity

The company is deploying 200 towers and will continue investing in fibre to boost coverage across Mexico

Even Group is one of the most active players in the Mexican telecoms landscape. Its infrastructure divisions Neutral Networks and Even Telecoms are quickly building a considerable tower portfolio in the country and its fibre footprint will boost connectivity and help MNOs on the 5G transition. TowerXchange has interviewed Even’s President Samir Kussaba to discuss the company’s portfolio of services and products, the current state of Mexican tower industry and Even’s growth plans.

Keywords: 5G, Americas Insights, Central America, Construction, Even Group, Even Telecoms, Installation, Meetup Preview, Mexico, Network Rollout, Neutral Networks, Rooftop, Towercos

Samir Kussaba, President, Even Group: Neutral Networks is a company that maintains and operates telecoms infrastructures and offers turnkey solutions through a totally neutral business model, as we don’t serve the enterprise market and we don’t compete with our clients. We are part of Even Group, a one-stop-shop business conglomerate that offers integrated solutions through capex and opex models, adapting to the particular needs of each client.

Our team has more than 20 years of experience in the telecoms market and we operate throughout Mexico with our own workforce. On top of our lease and co-location services, we enjoy the support of our sister company Even Telecom to offer design and construction as well as search rings activities and permitting support.

TowerXchange: Under the Neutral Networks brand, the group offers a wide range of telecoms infrastructure services. Could you summarise the different solutions you provide?

Samir Kussaba, President, Even Group: We are a neutral infrastructure provider and we work closely with our clients to plan, manage and maintain towers, rooftops and more. We offer three main products: BTS towers, dark fibre and ethernet.

Neutral Networks BTS towers are a simple and
affordable transmission solution with 42 metres and space for at least two MNOs. We boost our clients’ coverage, expanding their services as far as possible across Mexico through a portfolio of 280 towers in strategic locations. Additionally, we actively deploy new sites through our infrastructure construction arm Even Telecom.

Taking into account the great demand for additional capacity, we offer co-locations in towers and rooftops and we have 3,000 friendly sites, which are posts, buildings and small cells that we can also offer to our clients.

Through our Network Operations Centre (NOC), we offer real time monitoring with exclusive 24-7 employees, which guarantees the shortest response times in the market, matching international quality standards. Additionally, our dark fibre portfolio allows operators to complement their network operations.

Our ethernet is a carrier class service delivered through a metro fibre network, covering key locations across Mexico. Our network only serves MNOs not final users, so it has a typology that provides more stability to our customers. Towers are connected to smaller rings which themselves are connected to our main backbone network. Through our network, we serve two of the four biggest country MNOs: one uses 90% of it and the other 70%.

**TowerXchange: What differentiates your business model from other companies that offer similar services in the competitive Mexican market?**

**Samir Kussaba, President, Even Group:** We are a neutral host for all Mexican carriers, providing a unique infrastructure that supports their coverage requirements. We offer solutions to our clients in 26 states across the country and 70% of our towers are located in rural areas, where in many cases there is only one operator.

Moreover, we have a team of tower experts, fully specialised on site construction and maintenance through our sister company Even Telecom, which
allows us to advise our clients and provide the best expertise in locations, design, permits and deployment.

Our dark fibre product differentiates from others as it provides FTTx coverage, includes connectivity to wireless sites and is part of our metro fibre network. The network is less than three years old and provides ethernet carrier class services to the most relevant Mexican markets. Our network utilises different routes and enables high capacity without the risk of saturation.

TowerXchange: What are your views on the Mexican infrastructure telecoms market and what are the main business opportunities?

Samir Kussaba, President, Even Group: Mexico has a huge and ever-increasing need for digital services, which is driving demand for additional capacity that requires between 600 and 1,000 new sites per operator every year in order to co-locate antennas and relieve growing users’ consumption. In Monterrey, Mexico City and Guadalajara this trend will increase, generating a densification of cell sites, rooftops and small cells that will play a critical role in network planning.

Due to a 60% deficit of infrastructure coverage in the country, the market presents great business opportunities for towercos, and even more so now that Mexico is open to foreign investments. At Neutral Networks, we are aware of Mexico’s huge deployment need and we are cooperating to create a new digital ecosystem that will require ten times more fibre, towers and antennas. Matching the demand is key to enable new technologies and innovation such as smart cities and 5G networks.

TowerXchange: What are the main challenges that Mexican MNOs are facing and how are you helping them?

Samir Kussaba, President, Even Group: Permitting is still a huge challenge across Mexico and a limitation to the growth of the telecom industry. In Mexico, just 40% of the infrastructure demand is covered and we have plenty of regions where basic services such as mobile coverage are still missing. We have deployed towers in those remote regions to boost the coverage of our clients. In many of those areas only one MNO is active and there is no co-location potential for the time being.
Our portfolio enables MNOs to offer more coverage and capacity where needed and to do it fast thanks to our co-location opportunities.

We are exploring the use of billboards, where we plan to allocate small cells and antennas that open more coverage in areas of high density where consumers demand more bandwidth capacity to send and receive data. That is a huge business opportunity since all the operators are going to require access to those small antennas to sell their services.

**TowerXchange: Please sum up the competitive advantages and strengths of your company.**

**Samir Kussaba, President, Even Group:** Developing our projects alongside Even Telecom gives us a very strong competitive advantage and allows us to make a considerable tower deployment. We have planned to deploy 200 new towers.

Thanks to our FTTx topology we are working with a second MNO and connecting more than 250 new sites in less than four months. This international MNO decided to establish its network in Mexico and in less than two months it expanded its main backbone into three of the most important cities in the country. We have deployed 250 kilometres of fibre in less than three months thanks to our highly effective construction division.

We will close this year with a 33% growth in our tower portfolio and with a full range of connectivity services, including towers, metro fibre and more.
Brazil: strong organic growth and enhanced operational focus

Phoenix Tower do Brasil shares the latest from the largest CALA market

TowerXchange has caught up with Phoenix Tower do Brasil (PTB)’s CEO, Mauricio Giusti, for an update on the country’s tower market, macroeconomics and future perspectives. While Brazil hasn’t delivered many promising headlines over the past few months, Giusti shared positive considerations about the market and its strong growth pattern as well as news on the towerco’s possible move into energy management.

**Keywords:** 4G, ANATEL, Americas Insights, Brazil, Build-to-Suit, C-Level Perspective, Energy, Interview, Network Rollout, Off-Grid, On-Grid, Phoenix Tower do Brasil, Renewable Energy

TowerXchange: Can you give us some updates with regards to Brazil and PTB’s activities in the country?

Mauricio Giusti, CEO, Phoenix Tower do Brasil: PTB is still one of the fastest growing towercos across CALA and our build-to-suit volume has been very strong even in tough years like 2017-2018. In spite of the shaky macroeconomics of the past couple of years, we were able to perform extremely well. PTB is not only enjoying strong organic growth but also a good volume of amendment revenue, mostly driven by 4G.

TowerXchange: What is the status of 4G deployment across the country?

Mauricio Giusti, CEO, Phoenix Tower do Brasil: Most MNOs are still deploying 4G across Brazil but there are also areas where 4G is not yet available. ANATEL is currently freeing up spectrum that was previously utilised by analogue TV providers and the auction should take place in the second half of 2019. The spectrum allocation will further intensify 4G deployment efforts across the country.

TowerXchange: What are MNOs demanding in terms of site typology?

Mauricio Giusti, CEO, Phoenix Tower do Brasil: The largest demand still relates to macro towers but over the past 12-18 months we’ve actually seen an enhanced push for small cells as well as short poles (18-20m high). Typically, MNOs require these

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**Read this article to learn:**

- Brazil: still growing in spite of a tough couple of years
- Macro-towers, DAS and small cells: an overview of site demand
- Why is consolidation among towercos not happening?
- Beyond steel and grass: PTB considers energy as a service
We are getting involved with more operational aspects of the business, especially in the energy sector. In Brazil, there is a considerable effort to adopt cleaner sources of energy, in particular solar solutions, and we are talking to various players in the field to define a strategy that can add value to our customers while also reducing opex.

TowerXchange: In spite of much talking, we haven’t seen any consolidation happening beside the Highline-SBA deal. What is your take on the lack of towerco-towerco deals?

Mauricio Giusti, CEO, Phoenix Tower do Brasil: Some analysts did forecast consolidation to be a big theme in Brazil but for now, we’ve only seen the Highline-SBA deal. I think that the improvement of the overall economic conditions combined with more spending by the MNOs has changed the priorities for towercos, which are now seeing renewed organic growth opportunities across their Brazilian operations. Consolidation is still likely to happen but not in the imminent future.

TowerXchange: Is growth still in the cards in Brazil? And how is the market reacting to the new government?

Mauricio Giusti, CEO, Phoenix Tower do Brasil: For the next couple of years, Brazil is expecting further macroeconomic improvements. In fact, the country’s GDP is already growing and inflation is low, consumers’ confidence is quite high and we are expecting a better 2019-2020 than the previous couple of years.

The new government has just taken office and if all the plans and expectations are confirmed, we can project a strong year ahead. MNOs, just like everyone else, are waiting to see if the consumers’ spending will grow further and the overall conditions keep improving to hopefully announce even more investments.

TowerXchange: Several towercos are reporting deeper involvement in operational issues. Is this the case at PTB too?

Mauricio Giusti, CEO, Phoenix Tower do Brasil: We are getting involved with more operational aspects of the business, especially in the energy sector. In Brazil, there is a considerable effort to adopt cleaner sources of energy, in particular solar solutions, and we are talking to various players in the field to define a strategy that can add value to our customers while also reducing opex.

Just like with infrastructure, MNOs are inclined to outsource energy provisioning to companies like ours, able to ease the burden and offer streamlined, efficient solutions. While there are barely any off-grid sites across Brazil, this is relevant for on-grid sites whose energy sources are still fairly expensive.
The Caribbean adventure continues for Phoenix Tower International

PTI’s CEO on the company’s deals and future plans in the Caribbean and beyond

Earlier this summer, Phoenix Tower International (PTI) announced its agreement with Altice Dominicana (Euronext ATC, ATCB) to purchase 100% of its towerco Teletorres del Caribe, including a portfolio of 1,049 tower sites for US$170mn.

The transaction has expanded Phoenix Tower International’s footprint in the country, where the company operates around 1,700 sites, and will reinforce PTI’s position as the leading towerco across the Caribbean. TowerXchange sit down with PTI’s CEO Dagan Kasavana to discuss the acquisition and explore the company’s strategy in the Caribbean as well as future expansion plans across CALA.

Keywords: Americas, Americas Insights, Altice Dominicana, CALA, capex, Caribbean, Colombia, Cuba, Dominican Republic, Energy, French Antilles, Jamaica, Market Overview, Mexico, MNOs, PTI, Phoenix Tower International, Towercos

Read this article to learn:
- Details on the latest PTI’s acquisition in the Dominican Republic
- PTI’s strategy across the Caribbean and other CALA countries
- Which energy challenges do Caribbean telecom players face?
- What are the most attractive opportunities for infrastructure development across CALA?

TowerXchange: Congratulations on the latest deal in the Dominican Republic! Can you share some details about your total tower count in the country and across the other CALA markets where you are active?

Dagan Kasavana, CEO, Phoenix Tower International: Right now and pro forma for the pending closing with Altice, we will have around 1,700 sites owned or managed in the Dominican Republic.

We aim to build 450 towers or more over the next three years, putting us over 2,000 sites that we will own and market in the country. Our understanding is that Claro owns and operates around 1,000 towers and there are probably around 200 towers owned and operated by other carriers.

The Dominican Republic is a very important market for us and one that we are very excited to grow.

PTI currently owns and/or manages a total of 4,633 tower assets across LatAm and the United States and we expect to end the year with over 6,000 sites in 12 countries across the Americas.

TowerXchange: With operations in two Caribbean countries (DR and French Antilles), can you tell us how do you run the logistics and operations there? Are you treating the two countries “as one” for operating purposes?

Dagan Kasavana, CEO, Phoenix Tower International: We do treat the Caribbean as one operating region.
We also leveraged our people in the Dominican Republic and made it a central office for critical functions throughout Latin America. Our employees in the Dominican Republic are fantastic - very hard working, very knowledgeable and talented. We have achieved great results running various regional operations from our office there.

However, we always make sure we have day-to-day operations and sales people in each market we do business in because we need to be close to our towers and customers. We have the appropriate people on the day-to-day basis based in the French Antilles, DR and all of our Latin American jurisdictions that stay in front of our customers and close to our towers which is quite important to continue to grow our assets and business over time.

**TowerXchange: Towercos have been reluctant to operate in the Caribbean due to the difficulties in reaching scale and operating on islands. How is PTI making it work in the region?**

Dagan Kasavana, CEO, Phoenix Tower International: First, I believe that we can reach critical scale across the Caribbean, certainly across Dominican Republic and we see other opportunities to expand our presence across the region on a scale basis.

In term of operating, it all starts with getting the right people and seizing the right opportunities. We have really strong senior personnel located in the Dominican Republic that I am proud to work with every day. And having qualified personnel overseeing our assets and delivering strong results gives us the confidence to continue to expand throughout the Caribbean.

**TowerXchange: Are there significant energy challenges in the Caribbean?**

Dagan Kasavana, CEO, Phoenix Tower International: Backup power is very important in the Dominican Republic given that the grid does go out more than it does in some of the more developed markets we do business in. However, the customers typically have primary power established. You can establish a new meter in the tower, but it is a longer process. As a result, in many situations the second or third carriers will negotiate for power, either directly with the first carrier or through PTI so they can leverage the primary power source at the tower.

In the French Antilles, the grid is more stable and has less outages. Each carrier can have their own meters and the secondary power that is there is not as significant given the grid is more operational.

In both markets, we have found the ability to lease up to multiple carriers, as we do across LatAm and in the United States.

**TowerXchange: Beyond those two countries, are there other attractive markets to be explored? Or do you expect more tower sale by operators in the future?**

Dagan Kasavana, CEO, Phoenix Tower International: We see other opportunities to grow across the Caribbean and other Latin American countries and we are evaluating and moving forward with those opportunities, some of which we believe we will enter before the end of the year.

**TowerXchange: Can you tell us based on your knowledge the tower counts across the Caribbean? TowerXchange has tried to gather data there for a while so any insight would be great.**

Dagan Kasavana, CEO, Phoenix Tower International: I believe there are approximately 1,700 towers in Jamaica, approximately 3,000 in Dominican Republic, 1,700 in Haiti and approximately 1,100 towers in total in the three markets we do business in in the French Antilles (Martinique, Guadeloupe and French Guyana).

**TowerXchange: There was quite a biz of buzz around Cuba over the past couple of years but it seems to have cooled off. What are your views and what can you predict with regards to that market?**

Dagan Kasavana, CEO, Phoenix Tower International: Cuba could become a very interesting market if they liberalise their spectrum and third party multi-national operators enter the market. It is probably less likely now that it was a couple of years ago and I am not sure how quickly it may happen. If it does happen, we certainly have strong relationships with all the carriers operating in the Caribbean and we would be very interested to work with them in the country. However, whether that is two, five or twenty years from now, it is very difficult to predict.
TowerXchange: Are the financials of doing business in the Caribbean somehow similar to the rest of CALA? And if not, what are the key differences?

Dagan Kasavana, CEO, Phoenix Tower International: Insurance costs are a little bit higher based on the hurricane risk and as mentioned the power situation is slightly different in some markets. That being said, one of the great things of being a multinational tower company is that you really have the chance to look at the similarities of economics across all the jurisdictions we work in, from the United States all the way down to South America and beyond.

Tower economics are phenomenal when you have multiple carriers spending on their capex budgets to expand their wireless coverage. The Caribbean, like other markets across LatAm and the US, is seeing incredible capex spending from various wireless operators who are competing hard for subscribers.

Additionally, with significant revenue denominated in US Dollars there is more stability in the contracted cashflow for foreign investment than other larger markets across CALA denominated in local currencies.

The strong tower economics are very similar across CALA and that is one of the reasons we want to continue our expansion across the region.

TowerXchange: Finally, can you give us an overview of how your operations are going in the rest of CALA also in light of the elections taking place in various countries?

Dagan Kasavana, CEO, Phoenix Tower International: The operations are fantastic across CALA and we are ahead of our budget in terms of our lease up. We are expanding in every market we are in, both through build to suit directly for our customers as well as through additional acquisitions and partnerships with some of the best developers in the region. Moreover, we are expanding in both existing markets and new markets across CALA and we will continue to have announcements as we continue to expand.

In terms of the elections, Mexico is one of the new markets we are in and we are quite enthused about the future growth of wireless infrastructure across the country. We own 974km of fibre there and we believe this new administration will drive and create great opportunities for the infrastructure industry.

In Colombia, the election of Ivan Duque is also very positive for telecom infrastructure expansion and we are expecting new spectrum auctions that should be a catalyst for a new round of network deployments by the wireless operators.

We are excited about the years to come in the region and continuing to build on the momentum of the brand that Phoenix Tower International has achieved so far.

PTI’s latest moves

- Digicel tower acquisition: Earlier this month, PTI’s subsidiary Phoenix Tower Jamaica Limited closed a sale and leaseback transaction with Digicel to acquire the ownership or management rights relating to 451 wireless communication tower sites for US$90mn.

- Additionally, PTI has recently closed a US$485mn senior secured term loan facility to boost its international expansion. The transaction consists of US$290mn senior secured 5-year term loan and US$195mn delayed draw which will allow PTI to continue expanding internationally. The credit facility was led by Scotiabank, with Goldman Sachs, Deutsche Bank, Santander, ING Capital, Natixis, Banco General, Orix Capital, and Towerbank participating and is the first Pan-Latin America facility of its kind secured by infrastructure assets.

- New market entrance: PTI has recently acquired 20 towers in Guatemala. Further details will follow.

- Lastly, PTI entered Mexico where it now owns 17 fibre rings, equaling to 974km of fibre.
Phoenix Tower International: from towerco to infraco
The leading firm launches fibre activities in Mexico following a strategic acquisition

With operations across fifteen countries, Phoenix Tower International (PTI) is one of the fastest growing towercos in the western hemisphere and has proven to be very entrepreneurial in its geographical expansion. In Q3 2018, PTI acquired 974km (or 17 rings) from a carrier in Mexico and in this exclusive interview, Don van Splunteren, responsible for the company’s global commercial activities, shares with TowerXchange insights into its fibre projects and why this “new” segment makes perfect sense for towercos to complement the traditional tower business model.

**Keywords:** Americas Insights, Build-to-Suit, Co-locations, DAS, Fibre, Infraco, Infrastructure Sharing, Insights, Mexico, Phoenix Tower International, Sale and Leaseback, Small Cells

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**TowerXchange:** Please introduce yourself and your role within PTI.

Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International: In 2017, I joined PTI to serve as Global Vice President of Sales and Leasing. In this role, I oversee every commercial segment across fifteen markets, and I am responsible for the performance of PTI’s commercial initiatives around co-locations, lease-ups, build-to-suit, small cells, DAS and, lately, fibre.

Prior to my current role, I worked for NAAP Global Solutions, Ciena Communications as well as Nortel Networks in various executive roles. Over my 20 years of experience in the telecom industry, I became deeply acquainted with the carriers’ needs including their expectations in terms of technology as well as infrastructure, which is very helpful in my current professional endeavour.

**TowerXchange:** Please share with us the drivers behind PTI’s investment in fibre.

Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International: The infrastructure business is slowly evolving from the traditional steel and grass model but the change is accelerating. PTI believes that towercos will soon play a broader role within the infrastructure industry and can successfully get involved in fibre as well as in some of the active equipment segments. Fibre fits well as it is modelled as a telecom infrastructure asset in the same way that towers are.
With regards to the demand for fibre, the main driving factor is the exponential growth of small cells’ deployments expected in the foreseeable future. In the United States for example, it’s estimated that over 800,000 small cells will be deployed by 2026... That’s more than what has been deployed over the past 20 years!

While mesh infrastructure can be utilised temporarily, fibre is essential to ensure that small cells work properly so every single site will require fibre connectivity in the future. At the same time though, carriers are becoming much leaner in their operations and focusing on their core business so the deployment of fibre, just like the towers one, is likely to get outsourced to infrastructure companies, or infracos.

Towercos, with their infrastructure-related know how, can definitely help carriers with more value adding solutions such as fibre. Whenever I am referring to fibre, I am talking about dark fibre whose behaviour both as an asset and financially is quite similar to the towers’ one.

TowerXchange: How did PTI sell the fibre opportunity both internally and to its investors?

Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International: It’s been an exciting journey and while it took us some time to get there, we were quick in seizing the first opportunity to acquire some existing fibre assets.

Phoenix Tower International’s portfolio (as of June 2019)*

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>2,019**</td>
</tr>
<tr>
<td>United States</td>
<td>650</td>
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<tr>
<td>Colombia</td>
<td>796</td>
</tr>
<tr>
<td>Panama</td>
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<tr>
<td>Ecuador</td>
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<td>Dominican Rep.</td>
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<td>El Salvador</td>
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<td>Bolivia</td>
<td>400</td>
</tr>
<tr>
<td>French West Indies</td>
<td>234</td>
</tr>
</tbody>
</table>

* Includes 373 small cell sites acquired via K2
** 982 km of fibre

Source: PTI and PTB
from one of the carriers in Mexico, when they became available.

All it took for us to take the leap was to identify an opportunity that matched both our customers' needs as well as satisfied our investors from a financial standpoint. Once those two aspects were met, we went ahead without hesitations.

After the acquisition in Mexico, we are now deploying fibre and, similarly to the tower model, looking at leasing up our assets. The ROI in fibre is modelled similarly to the tower one so we are seeing good returns from day one and strong growth potential. While the sharing of fibre is a relatively new concept, we found Mexican customers to be very receptive to the model and we are sealing several interesting partnerships and collaborations.

Fibre is a great opportunity on its own and even more so, in combination with the traditional tower business. PTI is always interested in products and solutions that can add value to our customers and to our bottom line and fibre is definitely not a mitigation strategy. We are continuing to grow at a fast pace in the tower space, and fibre can provide more benefits to our customers and, in return, to us.

TowerXchange: Do you foresee fibre becoming an essential component of the towercos’ portfolio? And what does that mean in terms of competition among different players?

Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International: With regards to the competition among towercos, I definitely think there’s the potential for more companies to get involved and some are already deploying fibre such as Crown Castle in the U.S. and American Tower across Mexico and Argentina for example. However, I don’t think smaller towercos will necessarily see fibre opportunities. Fibre, just like towers, requires scale and a different skill-set and smaller towercos might opt to focus on the latter for the time being.

TowerXchange: Could you explain how the fibre ecosystem works and what role does PTI play?

Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International: PTI is involved in the so called “outside plant” component, meaning the deployment of fibre required to connect Points of Presence (PoPs) of our customers. The outside plant is where infracos usually own the physical fibre cable, ducts, posts, to deploy and operate these assets.

Plenty of players operate in the ecosystem, from service companies who build and maintain the fibre for us to the manufacturers of posts, if aerial fibre is being installed, as well as the cable and hardware solution providers.

Infracos don’t usually own the active equipment but just the cable, hardware and rights leading to the various PoPs where carriers and the other customers install their own equipment. The key PoPs for us are obviously towers and small cells. Customers can be carriers but also other fibre providers who are interested in providing capacity to their own customers in cities where we operate. We are also working with partners who manage smart cities and other municipal projects and PTI is always interested in getting involved in this type of activities.

TowerXchange: What are the pain points of fibre deployment? And the key opportunities?

Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International: Fibre is a similar model to the tower one. But the challenge relates to its execution and if you ask me, what “keeps me awake at night” is how to create and execute flawless fibre projects and make the experience for our customers as easy as possible. There aren’t many innovations in the technology horizon that would change these models, but the competitive edge lies in making it easy for our end users to decide to outsource their fibre to us.

The macroeconomic context helps us nowadays as carriers are definitely under more pressure than they used to and also want to keep quality of their service as high as possible and at the quickest time-to-market. For infracos, this is a great selling point.

TowerXchange: Do most carriers own fibre portfolios? And do you foresee them divesting fibre assets like they did (or didn’t) with towers?

Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International: Most carriers do own fibre across CALA and I believe they will treat
their fibre portfolios similarly to their tower ones. The strategy of divesting versus retaining could be applied to fibre too and build-to-suit in the fibre space will soon become the norm, and not only for the last mile but for larger projects too.

It took quite a few years for towers to stop being seen as a competitive advantage, and some carriers still treat them as such. Fibre will follow a very similar path and many carriers will soon see the advantage of operating under an opex model for their fibre projects. That’s when sale and leaseback will become more popular. It’s only a matter of time!

TowerXchange: Beside fibre, how do you see the tower market evolving across CALA?

Don van Splunteren, Global VP of Sales and Leasing, Phoenix Tower International: These are exciting times for CALA towers as well. Many changes are happening including some consolidation and acquisition among MNOs and this creates plenty of opportunities for growth. In fact, whoever ends up owning the spectrum following any consolidation or acquisition will need to leverage it and monetise it, which in simple terms equals to more antennas and more towers being required that ultimately will need fibre for back or front-haul.

I don’t see that equation changing anytime soon and at PTI we remain optimistic about CALA and its tower industry. For any company that exits the market, there will be others that will invest even more than before.
TowerXchange: Kurt, I would like to start with an overview of key dynamics across the markets where SBA operates in CALA. Could you please share latest dynamics and insights into each of them?

Kurt Bagwell, President – International, SBA Communications:

Central America

SBA started building sites in Central America over ten years ago and now owns over 3,500 sites in the five countries we operate in – Panama, Costa Rica, Nicaragua, El Salvador and Guatemala. Those five markets have been steady and growing for many years and generally, they have good networks that have been densifying with demand and converting over to 4G. Lots of fibre is being installed at the towers, and we are seeing increasing demand for shorter sites (mini macros) as well as full size macros and rooftop installations. A mix of capacity sites and coverage is being added.

I would say these markets are at a medium maturity level – smaller countries where good investment has been made for many years, but there is still plenty of work to do. We enjoy a US$ tenant environment in these markets as well, with all of our tenant leases denominated in US dollars. Most major costs are also denominated in dollars due to the close economic link to the United States.

The latest big news is Telefónica’s departure from the region, which is partially finalised as of this...
writing – completed in Guatemala and Nicaragua, pending in Panama, Costa Rica and El Salvador. In some cases, this is a consolidation (Guatemala and El Salvador), in some it is just an ownership change (Nicaragua, Panama, Costa Rica). Overall, we feel TIGO, Digicel, Cable & Wireless and Claro will be more aggressive in these markets going forward given the refreshed landscape.

We have a dominant position in all five markets and enjoy the benefits of scale in each. We have local offices and local employees, with some centralised support from our HQ in Florida - where many of our employees are bilingual and even trilingual (Spanish, English, Portuguese), which gives us tremendous efficiency when sharing support.

The primary focus of my teams in these markets each day is professional site management of existing sites and maintaining growth both organically and inorganically, through lease-up, amendments, ground lease buyouts and the building and buying of new sites.

The amount of M&A in Central America is somewhat limited going forward given what’s available, and due to our past history of consolidation. We have completed 24 M&A transactions over the past ten years, in addition to building over 1,600 new sites. New tower builds remain strong but competition is strong as well, so we are always challenged to perform well from a “time to deploy” perspective, creatively from a “find solutions that work” perspective, and “efficiently” from a cost perspective so we can offer competitive rates that still work for us and win the business.

These markets all have unique attributes in terms of economic and political activity and a variety of zoning and land use challenges. Overall though, the business environment, land-use attributes and continued demand for more wireless infrastructure in these markets overrides most of the country macro issues. In some severe cases, like the political turmoil in Nicaragua going on this past year, it has slowed network growth somewhat, but not completely. Wireless services are an invaluable, high growth commodity and a staple of everyday life regardless of the macro environment. Of course, we prefer quiet and growing environments the most, free of political or economic issues, but in any case, the networks must continue to grow and evolve.

Overall, each of these five countries have been solid performers for SBA and we are happy we entered them long ago.

Andean Region

We arrived later in the Andean Region. We started about five years after our Central American investments began. We currently operate in Colombia, Ecuador, Peru and Chile. We have completed 13 M&A deals and continue to actively
evaluate others. Build-to-suit is a core activity in these markets as well, with a good backlog of sites in process in each of these countries right now.

We always like a mix of M&A and developer deals – for volume – and BTS – for lower cost, high quality sites, which produces a steady flow of fresh inventory to keep organic growth high. In Ecuador, we have a dominant market position and in the other three countries we have good solid portfolios while we continue to add more scale. Ecuador uses the US$ as its main country currency, while Peru and Chile have generally stable local currencies. Currency fluctuations in Colombia have been more common and something we watch closely.

Networks across these markets are in varying stages of development, but all four countries have significant needs for capacity and coverage, with multiple years of cell densification left in front of them. Economically and politically these markets have been generally stable, especially as it affects our sector, and have good growth prospects long term.

These markets have a very high level of competition, as many towercos have been attracted to the growth prospects. As a long-term owner/operator/builder/consolidator of sites, we feel these markets will continue to grow far into the future. Again, the challenge for my teams is to stay energetic, be creative and perform well for the clients to maintain and grow our position. Competition is always tough, but it keeps us on our toes and remain very engaged in the latest ways to achieve success in this business.

There are no major carrier ownership changes or consolidations in the recent past or predicted for the near future in these four markets. Each carrier is working hard to balance growing their networks with managing costs, and the challenge to the towercos is the same. Politically and economically, these four markets have seen their share of changes up and down, but nothing of any degree to cause a major shift in the wireless sector. Again, wireless services are such a basic and growing commodity that they are more immune to fluctuations from economic and political highs and lows.

One other main focus in the region, and really throughout all of our markets, is the quality of the land rights we have underneath our towers. At SBA, we have been in business 30 years, with a long vision for our sites, and we take ground leases very seriously. They are the building block of any good tower business, and we have multiple employees, including in-house legal staff, in every market working full time on improving the longevity and quality of our ground leases.

At SBA, we have been in business 30 years, with a long vision for our sites, and we take ground leases very seriously. They are the building block of any good tower business, and we have multiple employees, including in-house legal staff, in every market working full time on improving the longevity and quality of our ground leases.
provide quiet enjoyment of the assets our tenants have leased from us, and stabilizing and de-risking the ground leases is a critical element.

**Brazil**

One main theme – “on the rebound.”

We entered the Brazilian market with a sale and leaseback purchase of 800 Vivo towers at the end of 2012. Since then we have purchase over 7,000 additional sites in eight transactions and built over 700 sites. We have a centralised office in São Paulo with a full-service staff to perform all functions.

The customer base includes Vivo, TIM, Claro, Oi and others. Since our entry into the market the country has had its ups and downs politically and economically. The end of the Lula/Dilma era coincided with the country entering a two-year recession, with high inflation and currency depreciation, but it is now back on a growth track with a new government settling in. While the currency (Real/BRL) continues to cause us challenges, the market for wireless infrastructure is very active and growing.

One piece of pending legislation we think will pass within the next 12 months is PLC 79, which deals mainly with carrier concessions and technical requirements. Altering the legislation as proposed will free up capital spending toward wireless infrastructure and take a heavy burden off a few of the wireline carriers involved. Overall, we feel this bill will have a very positive impact in Brazil telecommunications.

Land use in Brazil is more complex than many countries, as is the permitting environment. We work long and hard to improve our ground lease and land use rights and approvals. We are buying and extending our land rights constantly with a full team of employees. The market situation with the carriers is similar to the U.S. – four carriers, in various stages of subscriber growth and financial condition, with some struggling to balance growth and profitability more than others. Given the sheer market size (209mn people), we feel it can sustain four major carriers, but time will tell.

We work constantly with all four carriers on a variety of initiatives – M&A, new tower builds, new co-locations, and technology amendments. It is a very competitive tower environment and generally a tough market to do business in from a regulatory standpoint. We feel confident in our long-term prospects due to our seven year and growing history of success, and our long-term focus. Brazil has been one of the most challenging and rewarding markets I have worked in during my 30 years in this business. You've got to stay sharp and active to succeed there. There is a lot left to do as the site densification and coverage is not nearly sufficient for the demand, which leaves much room for continued growth.

TowerXchange: Many CALA countries are undergoing elections. What is the likely versus hoped impact across the key markets where SBA operates such as Argentina and Guatemala?

Kurt Bagwell, President – International, SBA Communications: In Argentina we have a small operation, mainly focused on build-to-suit. We entered the market after the last change of the government, and while things are getting better, there is still a long way to go. We will continue to be cautious in this market as the future is still uncertain. But the market demographics bear out why we are there – a highly educated population, incredible natural resources and future economic opportunity that can be viewed as tremendous. With a large population of over 44mn and vast underinvestment in the three major networks to go along with surging demand, we want to be positioned in this market to seize upon this opportunity.

Panama and El Salvador recently had elections, but we do not expect major shifts in these governments that will affect our business. Brazil’s new government could have the most impact directly affecting the wireless industry given the potential PLC 79 bill mentioned above.

The only market with potential political concerns for our business is Nicaragua. Given the stalemate occurring right now between the current government and the business community it is hurting tourism and foreign investment badly. Again, our business has seen little impact, only that of slower growth, but over time we want this to get
worked out and put Nicaragua back on a growth track. The country was doing very well before all of this started one and a half years ago.

TowerXchange: How is the exit of Telefónica from Central America impacting SBA’s operations? And any thoughts on the wave of MNO consolidation (sometimes failed) across the region?

Kurt Bagwell, President – International, SBA Communications: Overall, we feel there will be a net positive from TEF’s exit in Central America, long term.

TIGO is coming into three markets fresh and excited. Claro is consolidating a carrier in two markets, but they are not the market leader in those, so they are on the prowl to move up the ladder. We will see some churn in Guatemala and El Salvador where this amounts to carrier consolidation. But those markets are still growing, in coverage and capacity/usage, so long-term financially healthy carriers are good for us. In the three other markets where Telefonica’s departure, and TIGO’s entry, is just an ownership change, we expect higher growth and no churn.

TowerXchange: Has the licensing / permitting environment improved at all across CALA?

Kurt Bagwell, President – International, SBA Communications: Licensing/permitting is constantly evolving in Latin America. Generally, it is getting more difficult every day in most countries to build sites – that’s the general course right now, it really never gets easier.

We are proactively working in many countries to help them adopt quality siting legislation. We have full time personnel now in several markets working the regulatory front and helping communities through understanding our business and shaping laws around this is critical.

TowerXchange: What is SBA’s long-term vision for CALA, expectations for towerco consolidation, possible new markets to keep an eye on?

Kurt Bagwell, President – International, SBA Communications: As for new markets, I don’t see many possibilities in CALA for SBA going forward. We have entered into all the major markets that met our criteria. There are a couple of others that with the right opportunity might fit the bill. The Caribbean is less likely given the small size of the opportunities, multiple jurisdictions and limited growth prospects.

That said, the countries we are in have huge potential for us for a long time. We have plenty of build-to-suit, M&A, developer deals, small cells, and other growth potential left in each. We are a 30-year-old company this year, have been operating outside of the U.S. for over ten years, and given our business model, resources and long term focus, we see a long runway in front of us.
Telefónica bets on renewables, efficiency and collaboration with towercos in Central America

The Spanish telecoms giant seeks 100% renewable energy use and optimisation—and infrastructure partners can play a big role

Over the years, Telefónica has positioned itself as one of the telecom world leaders thanks to its global footprint and its innovation strategy. The company is strongly pushing efficiency, infrastructure optimisation and clean energy use to power its operations, and its Central America unit is a great example.

From Panama, the Planning and Economic Control Division manages, among other aspects, the MNO efficiencies and infrastructure optimisation initiatives in Central America. In this interview, Carlos Santiago Rodriguez Medina, the Division’s subdirector, addresses the company’s ambitious take on renewable energy and analyses how new business models, technological innovation and collaboration between operators and towercos can help unlocking the different barriers that are still slowing down infrastructure development in the region.

Keywords: 5G, Americas, Americas Insights, Access Control, Active Equipment, Air Conditioning, Batteries, Built-to-Suit, Capex, Central America, El Salvador, Energy, Energy Efficiency, Energy Storage, ESCOs, Guatemala, Hybrid Power, Lithium-Ion, Managed Services, Meetup Preview, MNOs, Monitoring & Management, Nicaragua, Outdoor Equipment, Panama, Passive Equipment, Renewables, Site Management System, Solar, Telefónica, Towercos

Read this article to learn:
- Telefónica’s strategy across Central America
- MNOs’ operational and financial challenges in CALA
- What are Telefónica’s energy needs and priorities?
- The company’s future: renewables, fibre and new technologies

TowerXchange: Carlos, could you please explain your role at Telefónica and summarise the company’s infrastructure strategy across Central America?

Carlos Santiago Rodriguez Medina, Regional OPEX Budgeting & Efficiency Leader, Telefónica Centroamérica S.A: My role has the particularity that our department integrates a multidisciplinary efficiency team that has the goal of identifying opportunities for simplification, efficiency and synergies across all the other company’s departments. This efficiency team, that works under the Economic Control Department, has achieved an annual saving rate of US$35mn for the five operations of Telefónica Centroamérica, which integrates Guatemala, El Salvador, Nicaragua, Costa Rica and Panamá.

One of the singularities of Telefónica’s operational model in Central America is the implementation of a so-called Operative Costs Control area that integrates professionals with technical-economical profiles, which enables an integral management of all the network deployment resources and includes a Site Management unit. This unit participates in the strategic design of the infrastructure deployment models by choosing the most suitable economic conditions, depending on the technical needs of each deployment processes. Based on the network design, our Site Management Unit negotiates and allocates the search rings to tower companies, depending on the capabilities of those towercos and in accordance with the different commercial conditions that have been previously set during the framework agreements between companies.
In Telefónica Centroamérica, we use the built-to-suit (BTS) model for our network deployment so we can focus our investments in last generation technological equipment in order to lead the market and offer the best possible service to our clients. We trust our deployment partners as they have proven their experience and capacity over the last decade. Currently, over 80% of our equipment in Central America is installed on towercos’ infrastructure.

TowerXchange: What are the main operational and financial challenges that the company is facing when developing and maintaining its infrastructure?

Carlos Santiago Rodriguez Medina, Regional OPEX Budgeting & Efficiency Leader, Telefónica Centroamérica S.A: In January, 2016, the IASB (International Accounting Standard Board) published a new rule on the accounting of lease contracts called International Financial Reporting Standards 16. That rule, that became effective on January this year, will have considerable accounting and economic impacts on MNOs. In summary, when you increases a company’s assets and debt, lots of measures and ratios are affected - from the Return of Assets (ROA) to the EBITDA. In general, companies will appear as more indebted and consequently, they might breach a number of covenants related to the level of leverage. Additionally, we could see relevant market changes related to lease agreements, where we expect less sale and leaseback contracts and shorter commitment clauses.

On the operational and maintenance side, we expect an increase of integrated services and more as a service models for energy, climate and access that guarantee continuity and availability of those services that are supported by the infrastructure.

TowerXchange: Can you talk about Telefónica’s energy strategy in Central America?

Carlos Santiago Rodriguez Medina, Regional OPEX Budgeting & Efficiency Leader, Telefónica Centroamérica S.A: Both Telefónica Centroamérica and Telefónica Global focus our efficiency efforts in two aspects; energy consumption reduction and renewable energy use. For that reason, we have set some general premises that applied to all the company divisions and are based in four essential pillars for the next five years: opex and energy consume reduction and control, emissions reduction and control, auto generation and renewable energy use. Based on those pillars, we have set several actions in different areas:

**Energy management:**
- Unifying the consumption and energy expenditures databases as well as improving the billing management that comes from electricity service companies
- Optimising site management, creating a consumption profile based on theoretical data
Audits in high consumption sites and using big data analysis tools.

Energy purchase:
- We are purchasing energy under the PPA (Power Purchase Agreement) model on those countries where regulation allows us. Particularly, we have recently signed a contract of 4,850Mwh per year for the biggest telephone centre in Panama, which will use solar energy backed by hydroelectric power, generating a 18% reduction on the final bill.
- Additionally, we have implemented different hybrid systems in remote and rural sites in countries like Nicaragua. Those systems use solar panels, batteries and generators, where solar is the main source, backed by batteries and ultimately by the generators that enable continuity and battery recharge.

Equipment modernisation:
- We are betting on data centre consolidation and the virtualisation of our platforms.
- Modernising our cooling equipment, replacing obsoleted terminals and installing high-efficiency equipment as well as replacing equipment with refrigerant R-22 for R-410A.
- Installing free-cooling equipment in sites where the exterior temperature allows a combination of external air and air conditioner to reduce energy consumption.
- Replacing energy and backup equipment for more efficient alternatives and also installing generators that consume less fuels.
- Finally, we are pushing lithium instead of acid-lead batteries, which improves backup performance and batteries lifecycle on top of reducing contaminating waste.

Unified infrastructure monitoring systems:
- The continuous network growth requires real-time monitoring systems implementation, which allow us to control energy and fuel consumption as well as observe any operational failure. Those unified monitoring systems allow us to automatise our activities based on tickets and reports. Moreover, they allow us to directly communicate with the workforce on the field and enable interaction between sites and centralized systems through mobile apps that can be used by technical employees. Finally, those systems enable the creation of second level structures as well as remote assistance and field workforce support.
- On the other hand, monitoring of administrative and operational buildings and their different components - from refrigeration and rectification systems to backup systems - allows us to control peak consumption points, automatizing those variables for energy consume reduction. A good example is the variation on the temperature set point on AC’s at the offices, shops or sites, where refrigeration demand is a relevant aspect of the general consumption.

Legacy equipment shutdown:
- Obsolescence shutdown and replacement of the network and refrigeration equipment for others that are more efficient and modern is part of our energy optimisation strategy. We can highlight the evolution of the cabinets access equipment, where internal radio systems have been replaced by inclemency instalment equipment, which reduces heat load and cooling needs, and therefore notably reduce electricity bills.
- We have to add the strategy of compaction for TDM central and/or IP conversion, where we have considerably reduced the quantity of cabinets in telephone centres.

TowerXchange: Telefónica has set very ambitious renewable energy implementation targets. How are you contributing to this corporate goal and what initiatives have you started?

Carlos Santiago Rodriguez Medina, Regional OPEX Budgeting & Efficiency Leader, Telefónica Centroamérica S.A: On a global level, Telefónica has committed that 50% of its total energy consumption comes from renewable sources by 2020, becoming 100% by 2030. In Germany, we have already reached that 100%. In Central America, achieving that goal is a little bit more complex due to the regulation in some countries, which does not allow us to subscribe contracts with renewable energy generators and distributors, despite the big presence of hydro and solar providers.

In Panama, regulation does allow us to sign contracts with generators but the distribution and transportation agreements are regulated. In this context, Telefónica Panamá is signing a PPA with a solar generation company that will also be backed by hydro and wind, which means an important investment in power generation through renewables. As mentioned, this contract will last five year and generate a 40% reduction
in generation, taking into account all billing components—generation, transportation and distribution—and an 18% reduction in the total cost. Moreover, we will increase our renewable energy use in Panama by 8%.

In Costa Rica, based on the country’s energy matrix, we are consuming 99% of renewable energy. Additionally, we have objectives per production unit, which are based on the amount of energy required per data unit. Telefónica Global has set a 50% reduction of mWh/Pb (Megawatts per hour/Peta Bytes).

On the other hand, we aim to reduce energy opex globally by US$109mn between 2016 and 2020, of which US$10mn correspond to Central America. Another pivotal goal is greenhouse emissions reduction that will have to be cut by 30% in 2020 and by 50% in 2030. On top of renewable auto generation and contract subscriptions, the reduction of fuel consumption on sites and company vehicles will also play a key role. With regards to generators, we are implementing energy as a service projects to replace them with energy services based on lithium batteries.

TowerXchange: Efficiency is an absolute priority for CALA MNOs. What are the other options that Telefónica is exploring to optimise your assets in the region?

Carlos Santiago Rodriguez Medina, Regional OPEX Budgeting & Efficiency Leader, Telefónica Centroamérica S.A: In addition to the initiatives that I have already explained, we are looking for smaller size equipment, radiant systems and more efficient technologies. We are also exploring collaboration agreements with other operators where we would share radio access equipment (RAN sharing), centralised platforms and multi-vendor platforms. This is a natural evolution of the new deployment models that will increase their presence in the Latin American telecoms market.

TowerXchange: What are your views on the role of fibre and how can towercos benefit from its integration?

Carlos Santiago Rodriguez Medina, Regional OPEX Budgeting & Efficiency Leader, Telefónica Centroamérica S.A: Fibre deployment is one of the most important aspects for telecoms progress and a pivotal element for the implementation of new technologies such as 5G. These technologies will require bigger transmission capacity as well as capillarity in the connectivity between base stations, which will be supported by the infrastructure. Therefore, having fibre will become as important as having energy. This is something to seriously take into account, since during the construction of new sites, there could be synergies in the development of grid lines that could couple the deployment of fibre, being compatible with the infrastructure that supports it, posts, overhead cables and underground pipes.

Offering a service of fibre connectivity as an integral part of the site infrastructure adds value for MNOs, as we would have a better time to
market when launching services. Definitely, fibre deployment will better position towercos that invest in this asset, increasing their competitiveness.

TowerXchange: Next July, Telefónica will be back at the TowerXchange Meetup Americas in Boca Ratón. What are you most looking forward at the event?

Carlos Santiago Rodríguez Medina, Regional OPEX Budgeting & Efficiency Leader, Telefónica Centroamérica S.A: For us as operators, joining the event is a great opportunity as we can meet and share experiences that improve our relationship as partners with other MNOs and infrastructure providers. We want to hear new propositions and learn about more integrated and innovative services across the region. There are still plenty of differences between continents and in some regions, infrastructure providers are already providing centralised power under energy as a service models, and in some case, they even offer multi-operator fibre connectivity that can be used by all the clients collocated in the same site.

We also want to discuss and explore the huge collaboration possibilities between operators and towercos in order to present creative solutions for Latin America, where there are still plenty of barriers that are slowing down the much needed infrastructure development. Finally, we want to explore new solutions that can highlight the real importance and positive impact that infrastructure makes in the evolution and development of society, in order to strongly position ourselves in front of regulators and social groups.

See you at our future events!

Meetup Africa 2019
8-9 October, Johannesburg

Meetup Asia 2019
3-4 December, Singapore

Meetup MENA 2020
28-29 January, Dubai

Meetup Europe 2020
19-20 May, Barcelona

Meetup Americas 2020
23-24 June, Boca Raton
The devil is in the detail – the detail of painstakingly constructed and hard negotiated Sale and Purchase Agreements (SPAs) and Master Lease or Service Agreements (MLAs) that define the main terms in any tower transaction. Jeff Eldredge and Rob Dixon, Partners at Vinson & Elkins, have advised on numerous sale and leaseback transactions in the last few years across Africa, Asia and Europe. Rob and Jeff kindly agreed to meet with TowerXchange and to provide us with an overview of tower sharing SPAs and MLAs.

Keywords: Anchor Tenant Privileges, Due Diligence, Infrastructure Sharing, MLA, Novation of Leases, Regulations, SLA, Service Level Agreements, Transfer of Assets, Vinson & Elkins

Read this article to learn:
- The conditions precedent that need to be fulfilled before assets are transferred
- What happens to towers that aren’t transferred in the first close
- Why the real value lies in the MLA
- How critical towers are sometimes treated differently

The buyer will require a certain number of towers before the deal is economically viable. Typically, therefore, the deal will be structured so that closing does not happen unless and until a certain number of towers are ready to be transferred (i.e. the tower-specific conditions precedent are satisfied or waived).
Jeff Eldredge, Partner, Vinson & Elkins: One key point in the process is the extension of ground lease terms. Towers deals can involve thousands of different parcels of land. Different ground leases will expire at different times, giving uncertainty on future costs. The buyer will therefore seek to have the ground leases extended for a reasonable period as part of the transfer process.

Rob Dixon, Partner, Vinson & Elkins: As a result of that and certain other conditions taking time to satisfy, there are typically a number of closings as the tower-specific conditions are gradually satisfied. In the interim, the buyer might take over the operation of the non-transferred towers on a managed services basis. Different deals are of course structured differently – some deals go further to synthesise the buyer’s ownership of non-transferring towers from first closing.

TowerXchange: What happens to any towers for which the CPs cannot be satisfied?

Rob Dixon, Partner, Vinson & Elkins: The treatment of ‘stub sites’ depends on the deal. The operator is unlikely to have the ongoing capability (or desire) to maintain and operate the sites so the towerco may agree to manage the sites (with the operator retaining ownership). The buyer is likely to conduct legal diligence on a representative sample of sites so that it has a reasonable idea of the position before signing the deal. The SPA is, of course, only one part of a sale and leaseback deal. It’s relatively short-lived compared with the MLA which will often govern the parties’ relationship for many years. The MLA needs to be as future proof as possible.

TowerXchange: So tell us about the critical consideration when drafting Master Lease Agreements.

Jeff Eldredge, Partner, Vinson & Elkins: The MLA is where the real value is for the tower company and where most of the real complexity lies in a deal. It’s a long term contract (with a significant initial term and then options to renew) and a large value contract. The operator needs sufficient flexibility to manage its needs to deploy and maintain equipment, while the towerco needs sufficient control to maximise the co-location opportunities and create a robust long term revenue stream – that’s how they build value. Thus, there’s a natural tension that needs to be resolved to everyone’s satisfaction. Effective governance mechanisms are important.

The MLA is an umbrella agreement which – traditionally – defines the operator’s rights as anchor tenant in terms of leasing space and capacity (wind load) on the transferring towers and the towerco’s obligations to the anchor tenant in terms of such space and capacity (including the service levels which apply). Different rights and obligations typically apply to different towers. For example, network planners can get very nervous about sharing particularly critical towers with other operators and therefore a small number of the towers might be identified as exclusive to the anchor tenant.

Rob Dixon, Partner, Vinson & Elkins: The service levels for different classes of towers are also likely to vary and be closely negotiated. These will typically be set out in a service level agreement, which may form part of the MLA. The impact of IFRS16 on the way in which tower companies provide services is a key topic. There are also of course other agreements which are important in most towers deals – for example the Build to Suit Agreement – but perhaps all of that is for another time!
Meetup Americas 2019

The sixth annual retreat of the top CALA telecom infrastructure elite

New for 2019:

Vendor briefings

TowerXchange Meetup Americas preview: attendee list, sponsors and exhibitors profiles

Diamond sponsor:

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# Attendee list as of June 21

## Independent towercos, infracos and small cell companies
- A1 Torres SAS
- American Tower
- Atis Group
- Advanced Wireless Communications
- BALESIA TOWERS
- BTS Towers
- Comba Telecom Inc
- Continental Towers
- GTD Grupo Teleductos
- Grupo TorreSur
- Highline do Brasil
- IHS Towers
- Innovattel/Torresec
- K2 Towers
- Neutral Networks
- Mexico Tower Partners
- Phoenix Tower International
- Phoenix Tower do Brasil
- RG Towers, LLC
- SBA Communications
- SKY/SITES
- Telesites
- Telrad Networks
- Torrecom
- Tower One Wireless
- Tillman Global Holdings
- Urbanpoles

## MNOs
- Bitel
- Entel Chile
- Entel Peru
- Internet Para Todos
- Telecom Argentina
- Teléfonica
- Trilogy International Partners
- Yego

## Energy companies
- Ascot Industrial
- Caban Systems
- Camusat
- Crossflow Energy
- Gencell
- Generac
- Halo Energy
- Hybrico Energy Systems
- NantEnergy
- NorthStar Battery
- Polar Power Inc
- SerEnergy
- STULZ USA
- Voltalia
- ZHU HAI COSLIGHT BATTERY CO LTD

## Investors, law firms and advisors
- Albright Capital Management
- Alvarez and Marsal
- AMP Capital
- Analysys Mason
- Antin Infrastructure Partners SAS
- Barclays
- Cartesian Capital Group
- Citi
- Credit Suisse
- Digital Colony
- Goldman Sachs
- Inter-American Development Bank
- International Digital Infrastructure Alliance
- International Finance Corporation
- Macquarie Group
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- OPIC
- Peppertree Capital Management Inc
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- A-Prime Engineering LLC
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- Chengdu Hizima Technology Co., Ltd
- CIEM
- CS Tower
- Delmec
- Ersan Company
- Flash Technology
- GUZMAN NACICH S.A.I.C
- KLEOS
- LOTOI
- Sabre Industries Inc.
- Seccional Brasil S/A
- Signify
- Valmont® Structures

## Service, solutions and equipment providers
- Abloy Oy
- Acsys International Ltd
- Accruent
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- Galooli Power
- Sitetracker
- vHive
- Zinier
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SBA Communications

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

In our site leasing business, SBA leases antenna space on our multi-tenant towers to a variety of wireless service providers under long-term lease contracts. SBA owns and operates over 30,000 towers across North, Central and South America. We build our towers at the request of wireless carriers, leveraging our in-house experience in site acquisition, zoning and construction. Our ability to offer carriers a comprehensive portfolio of communication sites is complementary to our tower ownership business. Currently, SBA manages approximately 5,000 communication site locations on behalf of third-party landlords.

Through our site development services, SBA offers wireless service providers assistance in developing their own networks. Our services include site identification and acquisition as well as obtaining zoning approvals and permitting for networks representing all technologies. SBA also provides a broad range of cell site equipment installation, optimization and integration services. Our extensive site development experience includes participation in the development of more than 120,000 communication sites.

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**Accruent**

Siterra, an Accruent Product, addresses the software needs of tower companies to sell co-locations, upgrade capacity, build-to-suit, maintain accurate asset registers, manage maintenance, and collaborate with vendors operationally as well as consolidate and integrate tower-related software technically. Sixteen of the towercos and infracos that TowerXchange tracks are current Siterra customers, spanning 18 countries and five continents. The first version of the Siterra site management platform was released in 2001. 100,000 users later, Siterra has become the industry standard, must-have operating software for tower companies today. Accruent works with its leading towerco customers to jointly develop new features that are deployed regularly through the SaaS platform to constantly improve customer value. Accruent has developed global process standards with local flexibility to pair with best-in-class software functionality.

Accruent’s telecommunications division serves some of the world’s largest mobile network operators and service providers in addition to tower companies, helping link employees from different organizations in the industry to collaborate to projects. Accruent is the largest independent provider of commercial property management software, serving the telecom, manufacturing, retail, education, healthcare, and corporate markets with over 10,000 customers in 150+ countries.

[www.accruent.com](http://www.accruent.com)

**Acsys International Ltd.**

Acsys International is a global technology company specialized in security and access management of critical infrastructure through the emerging field of remote access management solution. Instigated in 1999 from the technologies of two French defense contractors, Acsys International provides remote access control using both smart-key and keyless solutions. The signature Intelligent Access Management System (iAMS) is a platform that brings together smart-padlocks, smart-keys and management software to provide a powerful means to control who goes where and when, indoors and outdoors.

Our highly specialized and international team of engineers develops world-unique and patented solutions from the Code Generation System (CGS) and Keypad Key to remote staff management via the mobile App. This modular, and solution-oriented approach sets Acsys International apart from other security solution provider in the market. With presence in 64 countries, our clients are global leaders from different industries, including telecommunications, power, mining, logistics and more.

[www.acsys.com](http://www.acsys.com)

**BALESIA TOWERS**

BALESIA TOWERS is a leading independent owner and operator of telecommunication towers, initial operations footprint in Peru has expanded across North and South America. Experiencing one of its best moments BALESIA is operating and expanding its potential markets in countries such as: Perú, Guatemala, Costa Rica, Nicaragua, Ecuador, Uruguay, Mexico, Bolivia and Argentina. With an existing portfolio of more than 500 towers and under development, with a pipeline of more than 1,500 projected for next two years. The industry experience of BALESIA’s management team and their longstanding relationships with decision-makers of leading cellular operators, combined with BALESIA’s reputation for timely delivery of high quality sites, assures continued award of BTS sites for the foreseeable future.

[www.balesia.com](http://www.balesia.com)

**Continental Towers**

Continental Towers is a regional telecommunications infrastructure provider dedicated to understanding and exceeding carrier requirements and managing the largest private portfolio of sites throughout Central America, Colombia and Peru. With more than a decade of experience across the various markets, the company has consistently demonstrated an undisputed track record of providing solutions to the needs of carriers, communities and
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neighbors in all the market in which we operate. Combining our international scope, individual market presences and strong collaborative approach with local partners and providers, the company has emerged as one of the most important and versatile towercos in Latin America.

www.continentaltowerscorp.com

KLEOS

KLEOS specializes in designing and building advanced wireless communication systems. It provides the world’s most powerful LTE/4G+ base station, PEGASUS. PEGASUS is a platform that empowers operators and enable them to achieve higher profitability by providing a more ubiquitous coverage, higher capacity, an exceptional performance in combating interference and an unprecedented simplicity and flexibility in deployment. This wireless superiority coupled with our unique IoT platform capabilities and smart Virtual EPC, position our solution as the ultimate path for both, Commercial and Public Safety operators, in their evolution towards the new era of 5G.

www.kleos.net

Phoenix Tower International

Phoenix Tower International (“PTI”) own and operate towers and other wireless infrastructure and related sites throughout the United States, including Puerto Rico and the US Virgin Islands, Costa Rica, Panama, El Salvador, Guatemala, Colombia, Peru, Mexico, the Dominican Republic, French West Indies, Jamaica, Argentina, Ecuador, and Bolivia.

https://phoenixintnl.com/

Signify

Signify, formerly known as Philips Lighting, is the world leader in lighting for professionals, consumers and lighting for the Internet of Things.

BrightSites by Signify delivers an innovative smart pole solution that promotes city livability, connectivity, and enables mobile network operators around the world to deliver Wi-Fi, 4G and 5G LTE as well as IoT applications to the citizens while maintaining the city’s aesthetics. This smart infrastructure supports multiple wireless platforms and provides a standardized, aesthetically pleasing, solution with all components enclosed and obscured from public view.

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Sitetracker

Sitetracker, Inc. powers the successful deployment of critical infrastructure. As the global standard for managing high-volume projects, the Sitetracker Platform enables growth-focused innovators to optimize the entire asset lifecycle. From the field to the C-suite, Sitetracker enables stakeholders to perfect how they plan, deploy, maintain, and grow their asset portfolios from towers to small cells.

Before a tower is in the ground, every step of planning from the prospective site evaluations to site development, construction bids, and total budgeting is located in Sitetracker. During deployment, maintain organization and empower field workers with Sitetracker Mobile. Once the tower is built, Sitetracker makes it easy to maintain sites, and make data-driven decisions for the future. Market leaders in the telecommunications industry — such as Tillman, Vertical Bridge, Verizon, Nokia, and Panasonic — rely on Sitetracker
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to manage millions of sites and projects representing over $19 billion of portfolio holdings globally. For more information, visit our website.

www.sitetracker.com

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Founded in 2010, Torrecom is a leading developer, owner and operator of wireless communication sites in Latin America having secured over 2,000 sites through Sale Leasebacks (SLB) and Build-to-Suit Agreements (BTS) in the region over the past four years. Torrecom currently has over 800 sites in operation and continues to expand its portfolio through BTS and SLB’s in Mexico, Guatemala and Nicaragua.

Torrecom is your most complete resource for wireless telecommunications sites. Carriers in all countries that Torrecom operates rely on Torrecom to identify and deliver the right site. Including Towers, Building Rooftops, DAS, Indoor Solutions and alternate site locations to help carriers provide full coverage to their customers.

Our background gives us the unmatched ability to determine a site’s true potential to serve as a viable and effective wireless telecommunications location. Torrecom is intimately familiar with the technical complexities of today’s modern networks, as well as the maze of regulations that apply to telecommunication sites in each market that we participate. No other company is as qualified to guide you through the complicated process of identifying and activating a wireless telecommunications site.

The time has come to make Torrecom your partner in identifying, developing and deploying wireless telecommunications sites.

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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 M&A transactions, including in respect of towers, data centres, fibre, wireless and wireline technology.

We have significant industry experience, advising on telecoms transactions in numerous countries, including across Europe, Africa, Asia, the Americas and the Middle East and our team is well recognised for such transactions worldwide. 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, site marketing and service level arrangements, fibre IRUs and other complex commercial contracts.

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Abloy Oy

Abloy Oy is one of the leading manufacturers of high quality locks, locking systems and architectural hardware and the world’s leading developer of high security electromechanical locking technology. For decades Abloy has delivered security solutions to protect telecommunications sites and assets. At its simplest level, the CLIQ® system eliminates the risks and expense caused by lost or stolen keys.

The web managed system also facilitates financial savings, reduces CO2 emissions and provides significant time saving with ‘smart’ infrastructure integration, generating a fast pay-back and high ROI. Abloy operates in all continents and several major companies have chosen ABLOY as their trusted advisor and the solution provider in the rapidly developing and changing telecom industry.

www.abloy.com

Chengdu Hizima Technology Co., Ltd.

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combination of the both which are secure and flexible for many different applications. Our solution satisfied several telecom customers in the past years and we are confident that we can offer you even better product and service in the near future. Always remember HIZIMA when you have a need for Smart Locks.

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EXHIBITOR:

Crossflow Energy

Crossflow Energy Company is a UK-based developer of affordable and reliable integrated energy solutions (IES), providing firm clean power for off and weak-grid applications. With containerised components for security, Crossflow's remotely deployable units focus on reliability, cost-optimised operational services and energy security. The inclusion of a robust, long life, low maintenance and quiet Crossflow wind-turbine within the IES unit allows for 100% renewable energy generation at an affordable price. Ideal for rapid network extension or technology upgrades Crossflow IES are the ideal option for MNO's and Telco Tower owners to improve reliability and reduce both energy costs and environmental impacts in remote locations.

www.crossflowenergy.co.uk

EXHIBITOR:

Ersan Company

Ersan is a steel structure manufacturing company located in Turkey with the annual capacity of 50K tons of Steel and 70K tons of galvanization employing 250 personal. Ersan has a great growing momentum from moment of the establishment in 1998 till now and exported its products to 82 countries in 5 continents. Years of experience in the telecommunication market brings ERSAN's experience forward with its design and engineering team highlights its innovative attitude while carrying out its aesthetic and universal design works. ERSAN designs and manufactures bolted and welded tower lattice or monopole design together with innovative solutions.

www.ersancompany.com

EXHIBITOR:

Generac

Generac is a world leader in designing and manufacturing backup power generation equipment. Generac has the widest range of backup power products in the market, standing out in diesel and gas gensets manufacture with ranges up to 100 MW.

www.generac.com

EXHIBITOR:

Polar Power Inc

Polar Power, Inc. (POLA), designs, manufactures and sells direct current, or DC, power systems, lithium battery powered hybrid solar systems for applications primarily in the telecommunications market. Polar's systems provide reliable and low-cost energy for applications for off-grid and bad-grid applications with critical power needs that cannot be without power in the event of utility grid failure. Our systems integrate DC Generators, Solar PV, DC Air-conditioning, and batteries. Our Hybrid Solar Systems provide reliable power with very low maintenance and operational costs. Our Prime Power DC Generators provide very low fuel consumption, low maintenance with 3,000-hour oil change interval and long generator life. Our Backup DC Generators provide compact, lightweight, minimum fuel storage providing long reserve.

www.polarpower.com

EXHIBITOR:

LOTOI

Founded in 2017, LOTOI is an Argentinian engineering and construction firm specialised in metal structures. The company has recently opened a new factory in Paraguay and aims to expand across other CALA markets.

EXHIBITOR:
Sabre Industries, Inc.

Sabre Industries, Inc. is the leading manufacturer of communications towers. As one of the largest tower providers in the world, Sabre engineers and manufactures guyed towers, self-supporting towers, monopoles, concealment products, Small Cell/DAS products and tower components. Sabre's custom-engineered structures are designed to carry light to heavy accessory loads for the towerco industry. Sabre has experience in shipping to countries throughout the world. 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, Elm trees and flag poles.

www.sabreindustries.com

SerEnergy

SerEnergy Provides green power for the future for backup and offgrid/Hybrid solutions. We use a Methanol fuel cell technology, that provides a silent, clean and sustainable energy source which can be available for anyone and anywhere.

SerEnergy’s story began in the year 2006 and is today one of the leading manufacturers and developers of methanol fuel cell systems. Being a part of German based Fischer Group with 2500 employees, we have a strong financial base for further developing our business.

From our headquarter in Aalborg, Denmark we have built a worldwide customer base with hundreds of working units installed.

http://serenergy.com

STULZ USA

STULZ is a leading global high energy efficiency solutions provider for all telecom and mission critical applications. Our expertise is in designing and manufacturing the precision temperature and humidity control solutions. STULZ offers a full line of precision air conditioners, air handlers, ultrasonic humidifiers, desiccant dehumidifiers and custom solutions following our philosophy of “User Driven – Custom Designed – Purpose Built”.

Data centers, clean rooms, Edge, Telecom and Tower applications and Industry 4.0, no matter your application, STULZ has a solution. STULZ has developed fully loaded Micro and Modualr Data Centers specifically for the Telcom and Tower Application.

Please visit our website for more information or email us info@stulz-ats.com

www.stulz-usa.com

Valmont® Structures

Valmont® Structures earned its global leadership position through engineering expertise, manufacturing process honed over time and a reputation for product durability that is decades in the making. The reliability of your network can’t afford anything less. No matter how your wireless network grows and changes over time, Valmont offers the structures to evolve with it.

We supply self-supporting towers, guyed towers, portable and monopole towers as well as our industry leading SitePro1 components. Valmont also has the most robust selection of engineered small cell solutions for any application. At Valmont we are building structures for the next generation of communications.

www.valmontstructures.com

vHive

vHive is the only software solution that enables enterprises to deploy drone hives to digitize their field operations and assets.

From mission planning and execution to data processing, vHive enables non-expert users to fly low-cost, off-the-shelf drones and successfully complete surveys of any shape or size.

vHive works with some of the world’s largest tower companies, successfully digitizing thousands of towers, generating accurate, measurable 2D, 3D, 360 degree and analytics results for both engineering and for inspection.

vHive ensures the safety of your staff, reduces operational costs by an order of magnitude and generates data and insights like never before.

http://www.vhive.ai/
Voltalia

Voltalia is an international renewable energies company producing electricity from many sources (wind, solar power, hydropower and biomass combining storage solutions), with 1GW of installed capacity by 2020.

It also provides services to independent customers. Voltalia operates in 20 countries over 4 continents and is able to act worldwide on behalf of its customers. Voltalia has defined local development as a key element in its relationship with all its partners.

This core characteristic enables Voltalia Group to build long-term relationships based on mutual trust with all the stakeholders involved in its projects, from development right through to operation.

www.voltalia.com

Asentria

Asentria provides solutions for mobile network and tower operators to manage power, security, and environmental issues at remote cell sites from their network operations center.

Telecom sites are evolving to include many new intelligent subsystem controllers for DC rectifiers, generators, cameras, access controllers, and HVAC. Asentria securely integrates these sub-systems into our hardware based site controller to present a single interface for management of power, security and environment at remote sites. Beyond simple alarming, Asentria generates data for comparative site analysis and provides remote access to the underlying systems for OPEX reducing cell site optimization.

www.asentria.com

Camusat

Camusat is one of the global leaders in the telecom infrastructure service industry, with over 2,900 employees and operations across five continents working on 5 business lines (telecom site construction and installation, power systems & renewable energy, active equipment installation, fixed & fiber networks deployment and managed services).

In 2017, Camusat formed Aktivco, its in-house financial vehicle with capabilities to deploy its investments in energy projects. In this interview, Thibaut De Rodellec, Chief Investment Officer at Camusat and CEO of Aktivco, shares his perspectives on the ESCO (energy service company) model, its applicability to the CALA telecom industry and the type of savings customers can expect.

https://www.camusat.com/

Caban Systems

Caban Systems designs and manufactures software enabled energy storage systems for the telecommunications industry. The systems are vertically integrated and can accept power produced from solar and wind. We serve remote areas and urban areas supporting critical infrastructure.

Caban Systems is unique to the market, as a battery manufacturer our systems last over ten years - which consequently reduces cost and maintenance. Our software enables clients to monitor and manage the use of energy remotely. Caban’s approach is to centralize the use of power for towercos, yielding to collocation of power in a single site. Caban has a strong impact, not only social but also environmental.

https://cabansystems.com/us

Neutral Networks

Neutral Networks is a neutral owner and operator of telecommunications assets in Mexico, providing neutral solutions via three main services: BTS towers, ethernet, and dark fiber. Our expanding portfolio includes 265 towers across 27 states and over 3000 friendly sites.

With our tailored collocation solutions and leasing spaces on towers, we provide a reliable way for carriers and operators to increase their network, developing infrastructure according to their needs. Neutral Networks is part of Even Group, leader in telecom infrastructure development and operation in Mexico.

For more information, visit our website.

www.neutralnetworks.mx

www.neutralnetworks.mx
Mixing solutions to achieve top security levels

An update from leading access control firm Abloy Oy on its Latin American operations

Innovation doesn’t always mean utilising the latest technology but also – and foremost – being able to mix cutting-edge electronic solutions with old fashioned and yet highly reliable mechanical ones. In this interview, Juan Carlos Noriega, Telecom Vertical Specialist at Abloy Oy, shares with TowerXchange the latest from the company’s LatAm operations and reviews some of the unique features of Abloy Oy’s products.

Keywords: Abloy Oy, Access Control, Americas, Brazil, CALA, Capex, Colombia, Logistics, Mexico, Operational Excellence, Opex, South America

Read this article to learn:
- Abloy Oy’s operations and footprint in Latin America
- The importance of finding the right balance between innovation and safety
- Hackers: a new threat to be aware of
- Key differences in demand between rural and urban sites in CALA

TowerXchange: Can you refresh our readers’ memory and introduce Abloy Oy, its activities and updated footprint across CALA?

Juan Carlos Noriega, Telecom Vertical Specialist, Abloy Oy: Abloy Oy is one of the leading manufacturers of locks, electronic locking systems and architectural hardware and the world’s leading developer of products in the field of electromechanical locking technology.

Abloy Oy has been growing at a very good pace in CALA, helping to protect customers’ critical infrastructure in a variety of industries such as telecom, utilities, finance, logistics and transportation, mining and more.

Our footprint is extending day by day, led by our core team based in Abloy Oy’s LatAm offices in Mexico, Colombia and Brazil, and thanks to our local partners across the rest of the region.

TowerXchange: Since the inception of your activities, how has the demand for security products changed? And what has been happening in terms of innovation and R&D?

Juan Carlos Noriega, Telecom Vertical Specialist, Abloy Oy: Abloy Oy has more than 110 years of experience providing high quality products to customers all around the world. That long-standing activity in the field equates to in-depth know-how and skills, matched with our ability to learn and understand new technologies and trends.
Abloy Oy never slows down and is constantly striving to innovate and investing in R&D. This is true since the very first mechanical solution we offered back in the old days and remains valid these days, as we provide 100% electronic solutions to our customers. And our customers can expect the same high level of service, attention and quality as in the past.

Most of our customers are really excited to implement new technologies to protect and control their infrastructure. However, we really believe that the deployment of a new technology requires a strict control of production to protect them from the latest threat in the locking industry – hacking. Hackers have the power to disrupt brand new electronic locks and this is why we are extremely careful when adopting new technology.

**TowerXchange:** Are you serving towercos and MNOs mainly or also fibrecos and other types of infrastructure providers? And if so, how does the demand for solutions differ between the various segments of the ecosystem?

Juan Carlos Noriega, Telecom Vertical Specialist, Abloy Oy: We serve to the whole telecom and tele-media ecosystem. We protect infrastructure, optimise operations and improve efficiencies of towercos, fixed and mobile MNOs, fibrecos, data centre service providers and beyond. Abloy Oy core business is to protect critical infrastructure, with telecom being one of our top sectors.

**TowerXchange:** How can your clients get the best out of Abloy Oy solutions? What are some of the most common pitfalls they incur?

Juan Carlos Noriega, Telecom Vertical Specialist, Abloy Oy: Our main activities are focused in the B2B segment and our key customers are global companies who usually have a global framework that they then locally adapt to each market and its characteristics.

One of the top features we offer to our customers is our professional consultancy service, tailored to the needs of each industry and requirements. So while we are able to adapt to each local market, regulations and specific industry, we can also benefit from our global and interdisciplinary experience, which we offer to our customers as a consultancy service.

**TowerXchange:** How does the demand differ between different CALA countries/environments (eg. Rural versus urban)?

Juan Carlos Noriega, Telecom Vertical Specialist, Abloy Oy: Definitely the demand changes between countries, environments and type of infrastructure. In Latin America for example we have to work with different international standards, such as the ANSI from the U.S. and the EN coming from European markets such as Spain, France or the UK.

The demand for a certain solution or another also depends on the criticality of each site, which will determine the durability and security level of the chosen product.

Nowadays, telecom sites have dozens of locking points and customers are used to control electronically just a few of them. Many traditional base stations use a combination of mechanical and electronic solutions and this is why Abloy Oy always strive to select the best technology fit for each customer and project.
Accruent’s SaaS site management solution delivers for towercos

Siterra helps optimise key tower management tasks, and the service is constantly evolving to meet client needs

Accruent’s Siterra provides a platform much like a dedicated ERP for towercos and MNOs – they are experts in helping clients clean up and organise their data, making the solution ideal as companies scale their operations across multiple regions and countries. In the latest of a series of interviews exploring the capabilities of Siterra, TowerXchange focuses on the merits of using a native SaaS platform, and on data accuracy and standardisation, critical to accelerating time to market for tenants, and critical to driving tenancy ratio and valuation growth for the towerco or MNO.

*TowerXchange: Please introduce your company – where do you fit in the telecoms infrastructure ecosystem?*

*Jason Day, VP of Telecom, Accruent: We have developed an enterprise-class Software as a Service (SaaS) product for tower companies which encompasses the full site life cycle from site construction to co-location and the decommissioning of towers. Our software facilitates efficient operations and drives strong revenue growth for tower operators and managed service providers. Think of us as an Enterprise Resource Planning (ERP) provider for tower companies and MNOs. We have the capacity to manage the entire ecosystem that surrounds tower infrastructure.*

Co-location is one area we have a special focus on; most tower companies want to increase their co-tenancy ratio. What makes our company unique is that it has the capacity to manage the entire process from marketing through to fulfilment and operational management.

*TowerXchange: The first question our readers will want to know is ‘how proven is your solution in the field?’ Can you please tell us about the performance of your solution the field – who is using it and what results have been achieved?*

*Jason Day, VP of Telecom, Accruent: Our solution has strong credibility in the market. Thirteen of the top 121 tower companies listed by TowerXchange are already current Accruent customers. At present, we*
operate in twelve countries across five continents and have a particularly strong focus for 2016 on Europe and Central and Latin America. We are constantly adding new portfolios for our current customers and carrying out implementations in multiple countries.

At first, many of our clients purchase our solution to use it in a particular territory. However, once they have the solution installed, they realise that they can achieve operational efficiencies by rolling it out across all of their countries and portfolios, and we can support them in this endeavour. If a company wants to roll out our solution to multiple countries, we can help them standardise processes including reporting, colocation, license management, project management, vendor management, and inspection management.

One of the selling points of our solution is that it cleans up and standardises data. It puts data into a much more efficient site-centric format, which makes it easier for MNOs and tower companies to buy, integrate and market their assets. What’s more, by handling data in a digestible manner, tower companies and MNOs can make towers available on the market faster and more cost efficiently, thereby increasing tenancy ratios.

**TowerXchange: How does your solution help manage different stakeholders within the tower supply chain from tenants to subcontractors?**

**Jason Day, VP of Telecom, Accruent:** The solution can help tower companies handle leads and administration models. In addition, the asset register and customer portal integration that sits at the heart of Siterra’s colocation solution can be used to provide up-to-date information on colocation. For example, a tower company may wish to inform an MNO of open towers that are available for rent. They will be able to do this through our portal.

Our solution can also be used to support contract and service provider management. In fact, Siterra uses a permissions-based model. If an operator or tower company wants to give a contractor or service provider access to the system it can do so very easily. The contractor or service provider can then carry out a task and post a photo to provide proof that the project has been completed. Siterra offers sophisticated tools for project managers to efficiently review work submitted for accuracy and quality. What’s more, the system has built in security features so that each contractor’s access and visibility is limited to only the assets, tasks, and sites that are necessary for their work.

**TowerXchange: How can your SaaS platform be configured to adapt to different towercos’ unique business processes and workflows?**

**Jason Day, VP of Telecom, Accruent:** We are constantly developing and upgrading our platform to suit the needs of tower companies. As things currently stand, Siterra provides for more than 90% of tower companies’ needs straight out of the box. The remaining 10% can be easily configured on the platform so customers can adapt it to meet their specific requirements. We come to the engagement with our customer with best practices available to immediately drive efficiency based on our knowledge of the industry.

We’ve also developed many feature requests in partnership with our clients. A client will typically come to us with a request for a particular feature. Once we have developed that feature we will incorporate it into later versions of our platform so that other customers can take advantage of it.

Thanks to our focus on long term partnerships and successful product co-development, we’ve been able to create a stable platform for tower portfolios. However, we notice that many companies in the market continue to invest in custom software. We feel that this is a failed strategy because, over the long term, companies end up wasting IT resources and limiting the potential to make long term efficiency gains.
TowerXchange: How can a robust approach to asset registers and asset lifecycle management improve the valuation of tower assets?

Jason Day, VP of Telecom, Accruent: The main benefit comes in being able to understand the condition of the assets and the inventory associated to those assets. Being able to keep track of inventory is a benefit, particularly for large, international tower companies. Smaller companies, on the other hand, are looking to maximise their tower valuation for strategic buyers. That’s exactly where the site-centric focus of our software comes into play. Our platform can provide complete access to maintenance records, site information and pictures of site equipment. This makes it extremely useful for strategic buyers and companies that are seeking to sell their assets.

For example, it isn’t really feasible for a strategic buyer to use manpower to inspect four thousand towers when purchasing a portfolio. By using Siterra, buyers and sellers can perform clean searches without digging through files and records to get access to the right information. We find that most buyers and sellers prefer to use Siterra to carry out the portfolio valuation process – at the end of the day our system reduces acquisition risk for acquirers and improves return on investment for sellers.

TowerXchange: Please sum up how you would differentiate your solution from your competitors?

Jason Day, VP of Telecom, Accruent: Our annual product investment is larger than most of our competitors’ revenues – that in itself differentiates us from our competitors. On top of this, Siterra is a SaaS platform, so we have benefited from the shift towards cloud applications. Unlike many other solutions on the market, our SaaS application was not built from scratch based on an on-premises application – all of our incremental investments have been to enhance its functionality. Total costs for the customer can escalate quickly if a solution needs to be re-built over time or requires extensive support. That’s why it makes much more sense to purchase a proven SaaS solution like Siterra.

With some solutions on the market, users tend to become beholden to professional service teams after deployment. That’s not the case with Siterra. Once a customer has bought the solution and implemented it, they’re up and running. They don’t need to constantly check in with our professional services department. Of course, our professional services and customer teams are always available if needed, but we are strongly of the opinion that our customers should not be dependent on us for their daily business needs.

There’s also a huge amount of functionality built into Siterra that allows customer system administrators to modify workflows, create new reports and manipulate site data on a large scale within the administration console. Users don’t need to receive any code or help from Accruent to make these changes.

In summary, our market share, our investment, and our product functionality significantly outweigh our competitors’ products, and over the last fifteen years, we have successfully brought the best of the best when it comes to industry best practices and knowledge.
Enhanced security and operational efficiencies through improved access control

An interview with leading access control provider - Acsys

Poor access control can not only lead to security concerns but it can also have a significant impact on a company's operational efficiency and bottom line. In this interview, we speak to leading access control system provider, Acsys, to understand how the telecom tower industry has been affected by poorly managed access control and discuss the advantages that mechatronic locks can bring to the sector.

Keywords: Access Control, Acsys, Africa, Health & Safety, Job Ticketing, KPIs, Logistics, Masts & Towers, MLA, MNOs, Monitoring & Management, NOC, O&M, Operational Excellence, RMS, Site Level Profitability, Site Surveys, Site Visits, SLA, Towercos

Read this article to learn:
- Limitations with mechanical locks
- Challenges in controlling access to NOCs
- The importance of access control in enforcing SLAs
- How mechatronic locks can contribute to increased efficiency
- Safety and security benefits afforded by mechatronic locks

TowerXchange: Please can you describe some of the limitations of mechanical locks and keys?

Rani Ariss, Vice President Sales EMEA, Acsys: There are several limitations in the use of mechanical locks and keys; keys can be copied, lost and forgotten or unreturned and the cost of replacing the lock is often higher than the lock itself. In managing keys, operators need to employ numerous amounts of workers who require training and the wrong keys can be given to the vendor. With traditional mechanical lock and key there is no way to prevent collusion, and users can forget to close sites (intentionally or not).

Regular audits need to be undertaken to ascertain the amount of keys in use and the keys’ location and the management of keys and locks requires dedicated space and security. Managing keys on weekends or during an emergency is a problem as staff will not be present, it is critical to be able to respond quickly to downed sites but if access is prevented in the absence of keys then the only way is to cut the locks which will require a lock replacement and sites can stay unsecured for quite some time.

When keys are copied it is difficult to detect when a theft or loss occurs and with picking and bumping there is no proof of break and entry and as such there are high insurance premiums. The result of these inefficiencies is that some vendors eventually make their own copies of the keys to gain access.
TowerXchange: In relation to controlling access and NOCs, what are some of the operational challenges faced?

Rani Ariss, Vice President Sales EMEA, Acsys: The NOC deals with a complex set of equipment that is scattered around a region and is impossible to control efficiently with mechanical locks. The NOC also deals with a large amount of vendors, who are responsible for site maintenance. It is hard for the NOC to respond efficiently to emergencies as they don’t know where the vendors are located and false alarms can cause disorder.

Access to the NOC is impossible to control. Vendors are requested to do maintenance and only do it when they are able to do it, not necessarily when the NOC has requested that they do it. When sites are down it can be difficult to find the vendor, the NOC then needs to call other support to get someone to the site

The NOC is looking for a solution whereby tickets are issued and acted upon as quickly as possible in a first phase. In a second phase the NOC needs to know when the vendor has arrived, what he has done, whether the problem is fixed and when he has left the site. NOC operations need to rely solely on the vendors assertions

TowerXchange: What challenges can poor access control systems have on SLA implementation and adherence?

Rani Ariss, Vice President Sales EMEA, Acsys: MNOs and towercos will have SLAs in place with their vendors to regulate site maintenance. These SLAs have escalation clauses that dictate when a vendor should arrive on location. It is hard for the NOC to see when vendors are going to the sites and if they completed the job correctly making SLAs redundant.

The lack of data prevents an operator from setting operational KPIs to benchmark the performance of the various vendors between each other. The fact that there is no or little data from the performance on the SLA also means that the NOC and operator need to rely on the vendor to obtain performance information which creates a conflict of interest. SLAs fees are being paid when the services that need to be provided aren’t being carried out. Vendors invoke the problems of collecting and returning keys as a valid reason for non-compliance with SLAs.

TowerXchange: What are the advantages of implementing mechatronic locks for remote site management?

Rani Ariss, Vice President Sales EMEA, Acsys: Mechatronic locking systems cannot be picked/bumped, hacked, copied or corrupted in any way. Telecom customised software enables the NOC to manually or automatically control where users can go, for how long wirelessly and in real-time with minimal cost.

Mechatronic solutions allow the NOC to control precisely what assets can be opened and when. All keys and locks memorise the last thousand actions giving an incorruptible record of the user’s actions, providing the NOC and operator with valuable operational data.

The mechatronic locks combine four important solutions into one system; a wireless and real-time access control system, a high security lock and key solution, a time and attendance solution and a key management solution

TowerXchange: What are some of the basic practical advantages of mechatronic locks?

Rani Ariss, Vice President Sales EMEA, Acsys: The solution is a standard padlock and Euro-Din cylinder configuration meaning that no modifications are required to install them. The padlocks and cylinders can be fitted on all equipment and no maintenance is required. The stainless steel plating prevents corrosion on the padlock body and cylinder and what’s more anyone can use the solution.

The operational advantages of using mechatronic locks are instantly visible after deployment and lasting over time, uptime is increased and the solution prevents keys being copied, stolen, lost or unreturned, locks being picked, issues around collecting and returning keys, the requirements for lock and key audits and unauthorised access.
**TowerXchange: How do mechatronic locks contribute to increased efficiency?**

Rani Ariss, Vice President Sales EMEA, Acsys:

Users can service more sites in one day and a user's position and length on site is controlled and monitored. The NOC can have a real-time view of site status looking at the number of sites, which sites have guards and are they present or not, which site is in need of maintenance and for what reason and which and how many vendors are on the site.

By implementing mobile apps, the NOC is now able to receive real-time site information and user performance, such as when did the user receive the task, accept the task, arrive on and leave the site. This system can also monitor what the user did on the site (watermark GPS pictures) and can also receive information on whether the user closed the locks after leaving the site.

This data has significant value to determine SLA adherence because the tower owner can now see exactly what is happening on their site. Being able to understand who is going where and for how long means that the owner can make smarter business decisions. Data collected by mechatronic locks gives concrete undisputable data on whether the vendor has been meeting the SLAs. Furthermore, upon additional analysis of the data, site operators can create and negotiate more suitable SLAs using the information collected.

**TowerXchange: How do mechatronic locks increase site and user security and reduce theft?**

Rani Ariss, Vice President Sales EMEA, Acsys: With regards to safety and security, as the NOC knows who is on the site and for what reason, in the case a vendor does not request a locking code (because of a fall or injury) the NOC is able to act on that.

In relation to thefts, most thefts are caused by people who had a mechanical key at one stage and copied it. The mechatronic keys can have an embedded feature that monitors where the key is being used, if the user tries to fraudulently use the key three times, the key will automatically block themselves thereby forcing the user to go back to the NOC or programmer to update his key.

**TowerXchange: What information can be collected to monitor behavioural patterns and how does this translate into more cost effective operations?**

Rani Ariss, Vice President Sales EMEA, Acsys:

The NOC will be able to download the access logs stored on the key through programmers and study what sites or assets were accessed and when, how long the vendor spent on each site, whether the user tried to access sites or assets without authorisation and on which day, time or location.

By collecting data on user performance the NOC and operator are now able to obtain site maintenance benchmarks which in turn allow them to set KPIs for certain tasks.

In addition, mechatronic locks allow for increased flexibility. When a technician is unavailable, another can be called as a substitute with no wasted time or resources. A temporary access can be instantly granted ‘on the fly’ for a site normally outside of this technician’s work zone.

By collecting data on behavioural patterns, the financial department is also able to control how much time was spent on site by users, thereby gaining a better control over payment of billable hours to vendors.

**TowerXchange: How will the data that mechatronic locks provide influence the way in which the telecoms sector works?**

Rani Ariss, Vice President Sales EMEA, Acsys:

Using the data that mechatronic locking systems provide effectively will lead to more efficient access policies, enhanced SLA agreements and increased productivity. The data collected does not only benefit the site owner, but is also valuable for tenants and vendors. The data helps build relationships between the ecosystem by aiding their understanding and giving evidence of site activities. The more a database is built and the further it is integrated the more valuable it becomes to its users.
Camusat unique integrated approach to energy management

Why combining operational know-how and financial resources makes sense

Camusat is one of the global leaders in the telecom infrastructure service industry, with over 2,900 employees and operations across five continents working on five business lines including telecom site construction and installation, power systems and renewable energy, active equipment installation, fixed and fibre networks deployment and managed services.

In 2017, Camusat formed Aktivco, its in-house financial vehicle with capabilities to deploy its investments in energy projects. In this interview, Thibaut De Rodellec, Chief Investment Officer at Camusat and CEO of Aktivco, shares his perspectives on the ESCO (energy service company) model, its applicability to the CALA telecom industry and the type of savings customers can expect.

Keywords: Active Equipment, Aktivco, Camusat, Central America, Dominican Republic, ESCOs, Energy, Energy Efficiency, French Guyana, Interview, Meetup Preview, O&M, Off-Grid, On-Grid, Operational Excellence, Opex, Passive Equipment, Renewables, South America

Read this article to learn:
- Camusat’s operations, footprint and capabilities
- Why the ESCO model makes sense for CALA telecom players
- The savings and benefits of partnering with an ESCO
- Camusat’s presence in CALA and plans for future expansion

TowerXchange: Could you please re-introduce Aktivco and yourself to our CALA readers?

Thibaut De Rodellec, Chief Investment Officer, Camusat and CEO Aktivco: Group Camusat is a telecom service provider with operations in 32 countries, 20 of which are in Africa and 12 in other geographies. The Group has been active for over 20 years now and two years ago, we decided to create a fully owned subsidiary, Aktivco, which serves as our investment vehicle for ESCO projects. Today Aktivco is the largest ESCO in Africa with over 2,000 sites across four countries in our portfolio and we target to manage 10,000 sites in the coming three years. We have a clear strategy to bring every day more renewable energy sources on telecom sites to decrease fuel consumption, operational needs and carbon footprint.

TowerXchange: What is an ESCO and how does it operate?

Thibaut De Rodellec, Chief Investment Officer, Camusat and CEO Aktivco: First of all, there are quite a few “ESCO-like” entities that don’t operate under the proper model. For us, an ESCO is a company entirely dedicated to energy services. An ESCO is usually in charge of supplying 100% of the energy to a given telecom site and delivering very demanding SLAs to our final customers.

For MNOs and towercos, the main drivers to work with an ESCO are to get rid of the complexities of energy management operations, to outsource other
aspects such as security or maintenance while generating strong savings, such as the cancellation of the invested capex over ten years and significant opex decrease. Last but not least, ESCOs allow operators to considerably reduce their carbon footprint by minimising the need for gensets and fossil fuels in general.

In a nutshell, the ESCO model is all about operations and efficiency. This is why in Africa, there are very clear reasons for MNOs to adopt this model and up to date, five leading operators already launched the ESCO model across that continent.

**TowerXchange: What are Camusat’s strengths? And why should MNOs and towercos select you as a partner?**

Thibaut De Rodellec, Chief Investment Officer, Camusat and CEO Aktivco: Camusat Group is one of the market leaders in the implementation of telecom infrastructures and one of the most experienced companies in fixed and mobile networks deployment. We support telecom actors to efficiently build and optimise their network development by integrating the very latest telecom technologies through our operational company Camusat. In addition, we offer energy infrastructures outsourcing solutions thanks to our dedicated investment vehicle, Aktivco.

This integrated approach combining a full scope of telecom services for MNOs and towercos, together with energy services, is unique and the founding principle of our ESCO offer.

**TowerXchange: What are the typical characteristics of an ESCO contract?**

Thibaut De Rodellec, Chief Investment Officer, Camusat and CEO Aktivco: There are some common criteria to any ESCO contract, no matter the counterpart. They are long term (10 years or longer), include very high level of SLAs (power uptime, time to repair, site access, et cetera), and aim at maximising energy sources while ensuring network efficiency.

On top of that, customers often choose to include other services, such as maintenance of the tower equipment, security of the sites and the maintenance of active equipment. For them, we can definitely become a reliable single point of contact (SPOC).

**TowerXchange: What kind of savings can you guarantee to your customers?**

Thibaut De Rodellec, Chief Investment Officer, Camusat and CEO Aktivco: The investment and savings for on-grid sites aren’t the same as those of off-grid ones.

In Africa, 30% of the sites we manage are on-grid and for those, we are able to provide backup solutions plus solar (if possible) to optimise energy consumption and monitor the efficiency of the site. In fact, most of those sites and their power operations aren’t properly managed. Consumption is often too high or the selected backup isn’t right.

For off-grid sites, savings can depend on the characteristics of each site but on average we are able to decrease the TCO of a site by 30%.

**TowerXchange: Please share your plans with regards to Group Camusat expansion across Latin America.**

Thibaut De Rodellec, Chief Investment Officer, Camusat and CEO Aktivco: We already run operations in the Caribbean, where Camusat is a strong player in telecom and fibre deployment as well as energy equipment installation. We have over 700 employees in the region and enjoy a very deep knowledge of its complexities and opportunities.

There is a very strong demand for our traditional telecom activities in Latin America from MNOs. Such demand is reinforced by our will to duplicate our successful ESCO African model. Discussions with both MNOs and towercos are ongoing and negotiations are in process. Our African experience can serve to show potential customers the feasibility of this model and how skilled we are in handling complex projects in Latin America and beyond.
From China to CALA: Chengdu Hizima Technology

The company brings its access control solutions to Americas after a successful ride in Asia

What do CALA’s and Southeast Asian telecom industries have in common? Their security issues. Theft and vandalism have been impacting MNOs and towers’ operations and balance sheets for decades and security has become one of the main industry challenges across multiple geographies. Hizima’s smart and integrated locking systems have successfully helped telecom leaders to overcome those challenges across Asia and the company is now eager to expand its portfolio to Latin America - another region severely affected by vandalism and theft.

Keywords: Access Control, Americas, Asia, Chengdu Hizima Technology, China, Health & Safety, Outdoor Equipment, Site Management System, Southeast Asia

TowerXchange: Could you please introduce Chengdu Hizima Technology to our readers?

Zhou Guoquan, General Manager, Chengdu Hizima Technology: Chengdu Hizima Technology Co., Ltd is a professional provider of smart locking systems. Founded in 2014 and located in Chengdu, China, we have a strong focus on R&D and export our smart lock products - certified by ISO, CE, FCC and RoHS - globally.

Hizima counts with an experienced technical team with a strong expertise in hardware design, security chip encryption, large-scale software development and project integration. Our team has developed several intellectual property rights and 28 domestic and foreign patents, including six national invention patents. The quality of our smart lock products has reached the world’s most advanced levels and our mission is to provide the most suitable access control solution to our customers.

TowerXchange: What is your experience within the telecoms sector globally and specifically in Latin America?

Zhou Guoquan, General Manager, Chengdu Hizima Technology: In the global tower industry, there are a large number of unattended outdoor assets with extensive geographical distribution, and a considerable number of those sites still rely on conventional mechanical locks, which are not very safe as the keys are easily duplicable. The keys are usually transferred between multiple people so they...
become untraceable. The attendance cost is high, key registration and key management are required and the efficiency is very low. In addition, once a key is lost, it is hardly traceable.

We work closely with many telecom partners across China and Southeast Asia and we are replacing their existing mechanical locks with modern IoT and automated information technologies to solve those problems and deliver a cost-effective solution. During our initial communications with some telecom companies in Latin America, we found that their pain points are very similar to our partners’ in the Asian market and I think our extensive experience in Asia could be a competitive advantage when entering CALA.

TowerXchange: What are the main security challenges and inefficiencies that you see in the region and how can your solution help MNOs and towercos in overcoming those challenge?

Zhou Guoquan, General Manager, Chengdu Hizima Technology: As in most other regions, the security problem that both MNOs and towercos face is the loss of outdoor assets as well as the destruction of locks and fences, mainly due to theft by the hands of internal personnel that simply duplicate the keys. Theft by contractors or third parties is another big issue. Poor key management also causes inefficiencies as many towers still use conventional mechanical locks so it can take a lot of time to collect and return the keys, which also increases transportation cost.
Our solution integrates a management centre, a smart phone app, a smart key and a variety of smart locks. The smart key and locks are remotely managed through our app. Maintenance professionals only need to apply for a ticket that gives them unlocking permission while the manager can monitor when and who accesses the site, which ensures safety and convenience.

The central management system also keeps track of every operation. On this basis, our clients can perform data analysis while evaluating their workforce KPIs.

**TowerXchange: What differentiates your offer and solutions from your competitors’ and what is unique about your value proposition?**

Zhou Guoquan, General Manager, Chengdu Hizima Technology: First of all, we provide a wide range of passive smart locks, keyless smart locks and even a combination of the two.

The passive smart locks we produce are idling design. Many people think that when an unpaired key is inserted into a lock, it won’t turn, but our locks are the opposite. No matter whether the key is correct or not, it can be turned after you insert the key into the lock. The difference is that if the key has unlock permission, the lock can be opened, otherwise the key will keep rotating without opening. One obvious benefit of this design is that if someone tries to drill a lock by inserting a tool through the keyhole, it is hard to find a force point and it is more resistant to violent unlocking.

Secondly, our locks are easy to install, especially for the cabinet locks used in the telecom industry, which are very difficult to replace. We have easily solved these problems through a clever design, so that the overall cost of replacement is very low.

Although we have various types of smart locks and keys, they all run under the same management centre and smart phone app, which means that we have a rich hardware layer under a unified software and user layers. We provide different types of locks, enabling different customers to choose according to their own particular needs and applications. We know that each customer’s needs are different, so our software can be adjusted depending on their actual requirements.

**TowerXchange: Where do you see the main opportunities in CALA and what has been the response from key players so far since you start exploring the market?**

Zhou Guoquan, General Manager, Chengdu Hizima Technology: Security and access control challenges in telecoms are very similar all around the world. CALA is one of the regions that most suffer from theft and vandalism and they are now exploring and investing in smart access control solutions so we see plenty of opportunities regionally.

We have an extensive experience in the industry and our solutions have successfully helped our customers globally. We have been in contact with some telecom players in the region and they have a strong interest in our solutions, which is certainly encouraging.
HYBRICO: a strong ESCO born in Central America

The Guatemalan company on the complexities of offering “energy as a service” in the region

HYBRICO is one of the first energy companies to land an ESCO contract in Central America. The energy provider has successfully deployed its hybrid system for an operator in a very challenging region of Honduras, reducing energy cost, increasing site uptime and minimising operational hurdles.

TowerXchange talked with Luis del Cid, HYBRICO’s CEO and Co-Founder, about the company’s vision and ambitions as well as the energy challenges faced by regional telecom players.

Keywords: Americas, Batteries, Capex, Central America, ESCO, Energy, Energy Storage, HYBRICO, Honduras, Investment, Managed Services, Meetup Preview, Off-Grid, On-Grid, Renewables, South America

Luis del Cid, Co-Founder & CEO, HYBRICO Energy Technologies

HYBRICO is one of the first energy companies to land an ESCO contract in Central America. The energy provider has successfully deployed its hybrid system for an operator in a very challenging region of Honduras, reducing energy cost, increasing site uptime and minimising operational hurdles.

TowerXchange: Could you please introduce HYBRICO and yourself to our readers?

Luis del Cid, Co-Founder & CEO, HYBRICO Energy Technologies: HYBRICO designs, assembles and operates hybrid power and storage solutions for off-grid and on-grid telecom sites with a state-of-the-art monitoring system. We offer our services both with a capex model (where we offer a turnkey EPC for the installation of our systems) or as an end-to-end “energy-as-a-service” solution.

In terms of my personal background, I’ve been active in the telecom industry for approximately 15 years. I ran Claro’s operations in Honduras and launched Costa Rica’s subsidiary. After that, I was the CEO of Telesoluciones, which at the time was the largest provider of O&M services for active and passive infrastructure in Central America, with over 7,000 sites under management.

TowerXchange: What are HYBRICO’s strengths and competitive advantages? And why should MNOs and towercos select you as a partner?

Luis del Cid, Co-Founder & CEO, HYBRICO Energy Technologies: HYBRICO is one of the first movers in Latin America providing full end-to-end “energy-as-a-service” and “battery-as-a-service” solutions for off-grid, bad-grid and on-grid sites. We design our own technology and have deep expertise in R&D, O&M and finance. We are one of the very few players with a critical mass of installed sites in the
region with demonstrable energy cost savings and excellent site uptime.

_TowerXchange:_ Could you describe your business model and share some success stories in Latin America?

_Luis del Cid, Co-Founder & CEO, HYBRICO Energy Technologies:_ Under our “energy-as-a-service” solution, our customer does not have to make an upfront investment. HYBRICO retains ownership of the assets and bills the customer a fixed monthly fee under a long-term contract subject to a very high uptime SLA. This allows the customer to reduce energy costs, focus its scarce Capex budget on its core telecom business and leave the management of site energy to experts.

In terms of success stories, we can point to our installation of hybrid systems for a major multinational MNO in the island of Roatan and the Mosquitia region of Honduras. Prior to the installation of our solution, our customer was experiencing high energy costs, low site availability and complex operational challenges. These regions were the worst in Honduras, due to the terrain, climate conditions and poor technical capabilities of local contractors. With our solution, our customer has significantly reduced energy costs, increased site availability and minimised operational complexity, transforming these regions into one of the best performing in the country in terms of uptime and cost efficiency.

We have also been very successful in raising capital from international institutional investors to fund our energy-as-a-service business. Our shareholders and investors today include the Inter-American Development Bank and Empresas Publicas de Medellin, a leading Latin American multi-utility.

_TowerXchange:_ What are the main energy challenges that operators and towercos are facing in the region and how are you helping them?

_Luis del Cid, Co-Founder & CEO, HYBRICO Energy Technologies:_ We generally say the challenges are the typical ones in emerging markets, but the reality is different. The real differentiator is one’s capacity to implement plans simultaneously in economically volatile countries that lack technical
Having a cost-effective solution in CALA is not that easy, because you’re competing against the grid, not only against diesel.

Luis del Cid, Co-Founder & CEO, HYBRICO Energy Technologies: At present we only operate in CALA, but I would say that compared to other regions such as Africa or India, CALA faces important differences due to scale of operations, geographic dispersion, regulation and grid penetration. MNOs face cost and uptime challenge in all regions, only as a result of different factors that must be addressed in a customized manner. Having a cost-effective solution in CALA is not that easy, because you’re competing against the grid, not only against diesel. HYBRICO has developed efficient solutions for every scenario, capable of guaranteeing high SLAs through flawless field execution to deliver green uptime.
LOTOI expands beyond Argentina to serve CALA towercos and MNOs

The Argentinian tower manufacturers on its expansion plans and the evolution of site demand

After proving itself as one of the main tower manufacturers and providers in Argentina, LOTOI has opened a new production plant in Paraguay, which will allow the company to export its structures to other regional markets such as Peru and Chile among others. TowerXchange talked with the company’s Vice President, Ariel Semeraro, to find out more about their plans and discuss the evolution of site typology demand.

Keywords: Americas, Argentina, Chile, Construction, Ecuador, Installation, LOTOI, Masts & Towers, Meetup Preview, Paraguay, Rooftop, South America, Transphina

Read this article to learn:
- LOTOI’s background and expansion plans
- Which site typologies are towercos and MNOs demanding?
- Business opportunities and bottlenecks in Argentina and Paraguay

TowerXchange: Please introduce LOTOI to our readers

Ariel Semeraro, Vice President, LOTOI: We are an engineering and construction firm that manufactures metal structures for different industries including telecom. LOTOI’s adds Transphina’s expertise, our sister company, which has been serving the tower industry for years by installing structures and their necessary equipment.

During 2018, we saw an increasing demand for tailored site solutions so we decided to make a considerable investment in the necessary technology and equipment to provide personalised solutions to our clients.

TowerXchange: In such a competitive market, how do you differentiate yourself from other tower manufacturers? What advantages do you offer to towercos and operators?

Ariel Semeraro, Vice President, LOTOI: We integrate the engineering process in the construction of structures and deliver a product of excellent quality at highly competitive prices. Contrarily to other manufacturers who offer standardised tower models, we sit down with our clients and produce tailored structures for their specific needs.

In addition, we offer the shortest delivery times to guarantee a fast and efficient deployment, while ensuring flexibility to meet our clients’ demands.
TowerXchange: You have recently opened a new factory in Paraguay. Where do you see the main opportunities for expansion across Latin America?

Ariel Semeraro, Vice President, LOTOI: We started in Argentina, where we currently provide around 200 tons per month. Indeed, we have recently opened a new production plant in Paraguay, which includes the hot-dip galvanizing service and allows us to offer our structures across the whole region with a monthly production of 1,000 tons. We see plenty of potential and demand from Argentina and Paraguay but we also aim to expand across other regional markets as the industry is growing.

Many towercos that we were working with in Argentina launched their services in Paraguay, and they started demanding new structures for the operations there, so we were “dragged” to this great opportunity. Moreover, Paraguay’s tax regime eases our export to other markets such as Ecuador, Bolivia, Peru and Chile, which we couldn’t have attended from Argentina as the export fees are too high to be competitive against other regional providers.

TowerXchange: How has site demand evolved and what are your expectations for the future?

Ariel Semeraro, Vice President, LOTOI: 2019 started very well for us if you take into consideration the complex economic situation in Argentina. The market was stable during the first quarter and it is now steadily growing. Paraguay’s telecom market is very established and there is also a big demand for electricity infrastructure.

TowerXchange: How is the industry evolving in terms of typologies and new sites?

Ariel Semeraro, Vice President, LOTOI: We always work alongside towercos and operators in order to provide the best solution for each site. Demand for traditional, high macro sites has dramatically decreased and the market now mostly demands sites of between 24 and 36 meters. All the players are now shifting towards smaller sites and monopoles and they do not want to deploy as many traditional macro towers.

Ironically, many clients request “towers that don’t look like towers” which is obviously very tough to produce. However, we are investing and focusing our resources towards that goal, as reducing the visual impact of the sites is crucial for boosting social license to deploy across Latin America.

TowerXchange: Argentina is one of the markets with the biggest potential in Latin America. What is stopping its development and what are the main challenges that you face?

Ariel Semeraro, Vice President, LOTOI: The main issue that the industry faces here is the social opposition and the strong power of municipalities, which is slowing and sometimes even stopping deployment.

We are working very closely with towercos and MNOs, visiting different municipalities and educating the population on the benefits of telecom infrastructure. It is important to clarify certain misconceptions and avoid any future issues before you start the deployment process.
Methanol fuel cells making inroads into the telecoms sector

An interview with SerEnergy, provider of silent and emission free power solutions for telecoms

SerEnergy is one of the largest methanol fuel cell manufacturers in the world and a pioneer in powering telecoms infrastructure with this kind of solution. TowerXchange speaks to the company’s Sales & Marketing Director, John Lindegaard Kjær to understand where fuel cells can bring real benefits to telecom sites regardless of the grid conditions.


Read this article to learn:
- SerEnergy’s footprint, activities and production capacity
- The different use cases of fuel cells and comparison with other sources of power generation
- Serenergy’s fuel cell efficiencies and space requirements for indoor and outdoor scenarios
- How to install and maintain fuel cells
- The positive impact of fuel cells on emission reduction

TowerXchange: Please introduce SerEnergy, its activities and footprint.

John Lindegaard Kjær, Sales & Marketing Director, SerEnergy: SerEnergy has been in the market since 2006, developing and manufacturing power systems. We focus on the stationary market for backup, supplementary and primary or hybrid power sources. We distribute our systems globally.

SerEnergy's products are based on High Temperature PEM fuel cell technology that improves our clients efficiencies around 40-45%, while reducing cost and replacing conventional, pollutant technologies such as diesel generators.

With a green mindset SerEnergy aims to contribute to the world’s transition from fossil fuels to renewable energy, as well as overcoming some of the obstacles within the renewable sector such as flexibility and availability.

Headquartered in Aalborg Denmark, SerEnergy is a leading fuel cell manufacturer. Owned by German company (Fischer Group) we have 2,500 employees, strong financial capabilities and the ability to support our customers globally.

TowerXchange: Fuel cells have not been spoken about much in the TowerXchange Journal, can you explain what grid situations they are most suited to and how extensively they have been deployed?

John Lindegaard Kjær, Sales & Marketing Director, SerEnergy: There are various types of methanol fuel cells making inroads into the telecoms sector.
fuel cell systems, but in general they can be used for backup power, supplementary power or primary power.

**Backup power**

A lot of customers around the world need to be able to run communications systems at all times, which puts more stress on the reliability of the systems and on grid availability. This means that even if you are based in areas where loss of grid (down time) only happens every second year or less, you still need a backup system that is always able to provide power so that your systems keep running. If you need longer than six or eight hours of backup time, batteries typically become too heavy, space demanding and expensive.

Traditional diesel generators offer longer backup time, but for systems that are not running very often they still need to be maintained, and you need to make several startups per year to make sure they can run in a backup situation. Our fuel cells offer great advantages in those cases, since they are able to be used for both short and long backup time. At the same time, they are more or less self-maintaining and even if they are not in use, the systems are able to be kept in optimal conditions through self-test programs and automatic start-up cycles.

Core telecom sites and security networks are some good examples, and we could also highlight systems located in regions where you often see extreme environmental conditions such as earthquakes or typhoons that cause long grid blackouts.

**Supplementary power**

In many situations and regions, you need a supplementary power system which is able to take over when the primary power source is not running. The system could run several hours per day or per week. This could be for regions with unreliable grid, but it could also be part of a green installation with solar panels, wind turbines or other energy sources where the fuel cells can ensure that the system is running 24/7. In many parts of the world, especially Asia and Africa, the grid is highly unreliable and in order to keep telecom sites up and running you need either an alternative to grid power or a system that can run several hours a day or per week due to outages. Methanol fuel cells offer an ideal solution to conventional power sources like diesel generators due to low fuel cost and less maintenance requirements.

**Primary power**

Methanol fuel cell systems are also a great alternative to traditional diesel generators when it comes to providing power for off-grid sites. There are large investments involved in connecting remote sites to the grid, so together with the low operation cost and the relative little investment, the fuel cell system can offer large cost benefits for the customers. Both maintenance and fuel cost are in most cases much lower when operating a methanol fuel cell system if you compare them with diesel generators.

TowerXchange: What advantages do fuel cells offer above other sources of generation?

John Lindegaard Kjær, Sales & Marketing Director, SerEnergy: The fuel cell technology has a number of advantages compared to batteries and diesel generators. First of all, the fuel cell system is a technology that offers up to 70% reduction of CO2-emissions. Besides that, the fuel cell technology offers several clear advantages compared to diesel generators. Especially in densely populated areas where the surroundings are quite sensitive to noise, vibrations and harmful emissions. Diesel generators will give you all three at the same time, while the fuel cell system can offer you low noise, no vibrations and no harmful emissions due to the nature of the technology. This allow customers to set up the base-stations where the coverage is best, and it also makes it easier to get the required approvals from the owner of the property as well as the authorities.

Fuel cell solutions offers a very compact design per kW. It can be installed in either an outdoor cabinet next to the actual telecom equipment or it can be integrated into an existing indoor solution. In an outdoor solution, the footprint for up to 15 kW is typically not bigger than 1×1 metre including cabinet, modules and tank while in an indoor installation offers an even smaller footprint integrated into e.g. a 19” rack system. Not only is it convenient on existing sites but it also saves money on rental cost and installation.

Our fuel cell system is fully monitorable, not only when it comes to power output but you are also able to monitor the state of the inside of the system e.g. fuel cell stack, reformer et cetera. At the same time
the system is running fully automatically and will be more or less self-maintaining and conditioning. The monitoring system also allows you to monitor fuel levels, state of the grid and alarms making it possible for the customers to respond faster to alarms, service requests etc.

The efficiency of the fuel cell system is another area where it outperforms existing technologies. The fuel cell system is dimensioned according to the exact needs of the customers and it runs at a very high efficiency no matter if it is delivering 30% of its capacity or 100%. The electrical efficiency rate is typically between 40-50%.

Methanol fuel cell offers a cheap fuel source. Methanol fuel cells runs on a blend of water and methanol which is easily accessible in most parts of the world and at low rates. At the same time the use of methanol offers a CO2-neutral alternative to traditional fuels, depending on the source of the methanol.

TowerXchange: How robust is the system and how simple is it to install and maintain?

John Lindegaard Kjær, Sales & Marketing Director, SerEnergy: Fuel cells offers a robust design, meaning that the technology is equipped for the most extreme conditions. The installation of the fuel cell system is quite easy and in most cases, offers more flexible and faster installation options than traditional power sources – like the options for integration into existing enclosure solutions. The fuel cell system is a compact and lightweight design which is a big advantage for base stations with limited space and also for installations in city areas on rooftop sites, in buildings et cetera.

TowerXchange: What kind of opex reductions can fuel cells provide and how does TCO compare to other sources?

John Lindegaard Kjær, Sales & Marketing Director, SerEnergy: Our methanol fuel cell systems offer low maintenance because they are self-conditioning and maintaining, and the systems can be monitored remotely, resulting in large savings in terms of service cost, unplanned site visits et cetera. As mentioned, previously methanol is a cheap fuel source and, in most cases, and in most parts of the world methanol is cheaper than traditional fuel sources.

TowerXchange: How do SerEnergy differentiate themselves from other fuel cell providers in the market?

John Lindegaard Kjær, Sales & Marketing Director, SerEnergy: SerEnergy was established back in 2006 and has since then worked intensively with the implementation of the technology into stationary applications like telecommunication. That also means that the SerEnergy fuel cell systems have been tested and deployed in many markets and with many customers giving a proof of concept which not many competing companies can match. SerEnergy is committed to serving our customers commercially and technically meaning that we support our customers remotely and locally in a way that not many of our competitors are able to offer.
Signify partners with towercos to realise Smart Cities

Collaborating with the wireless industry and municipalities to design and deploy aesthetically pleasing urban smart poles

We all know that we’re going to need a lot more urban cell sites to densify wireless networks for 5G. We also know that there tends to be a lamppost every 10-30 metres in a city. A significant proportion of the world’s lampposts are designed by Signify so TowerXchange spoke to the Manager of the Americas Icity Venture to find out how they are developing products and partnerships to facilitate and accelerate the deployment of Smart City infrastructure.

Keywords: 5G, American Tower, Americas Insights, Camouflage, Infill, Infrastructure Sharing, Insights, Masts & Towers, Multi-Country Partner, Multi-Operator, Multi-Region, Network Rollout, Signify, Site Visits, Small Cells, Smart Cities, Steelwork, TFN, The Future Network, USA

Bill McShane, Director, Americas Icity Venture, Signify

TowerXchange: Please introduce Signify to our readers.

Bill McShane, Director, Americas Icity Venture, Signify: Signify, formerly Philips Lighting, is the world leader in lighting. We are known throughout for combining high quality, energy efficient LED lighting with cutting-edge technology to help city leaders transform how they operate, manage resources and improve services to their citizens. Our new name embraces the future of LED Lighting products, systems, and services. It reaffirms the powerful purpose of everything we do, to unlock the extraordinary potential of light for brighter lives and a better world.

TowerXchange: Who typically owns the site, the structures, and the rights to exploit those structures for provision of wireless connectivity?

Bill McShane, Director, Americas Icity Venture, Signify: When we started out our model was to lease our poles to the cities of Los Angeles and San Jose: we owned the structures, we permitted and leased the sites. We have since sold those assets to the cities, but retained permission to work with MNOs in the provision of connectivity. In North America our model now is to partner with multiple neutral providers utilising their expertise and leadership to deal with carriers and lease space on the sites. We bring our unique technical capabilities and manufacturing of advanced, custom smart poles, and as an example
of this technology leadership we have developed a unique, award-winning multi-tenant pole. We share responsibility for maintaining excellent relationships with cities and municipalities.

So our business model varies from one market to the next, and because no two municipalities are the same.

In North America we work with numerous neutral host providers and or directly with the mobile network operators to develop and or deploy Smartpoles, but it is possible in other geographies we may choose different partners and different models – we’re open to any model which helps cities improve infrastructure for their citizens.

**TowerXchange:** We’ve all heard the hyperbole about the IoT and 5G requiring 10-100x as many cell sites to densify the network, but what products and partnerships are Signify developing to ready yourselves to play a role in unlocking the value of street lighting as a key enabler of smart cities?

**Bill McShane, Director, Americas Icity Venture, Signify:** We need to start with what is driving the demand. The main driver is that society is changing and becoming a technology-driven data-oriented society. This new hyper-connectivity drives new lifestyle choices and preferences for individuals as employees, shoppers, residents, or students. Cities of the future need critical infrastructure to enable the flow of information and data. Digital infrastructure is as important to future growth as roads, bridges, and highways were in the past.

We have the ability to approach municipalities with public-private partnerships. We are working with tower companies and other investors to explore new business models, while building on our existing relationships with utility companies, service providers, and contractors. By doing so, we can integrate our lighting control systems as one of the various verticals into a single smart city dashboard.

In terms of products and solutions, we develop telecommunication-enabled light poles for scalable, aesthetical, and hassle-free deployments. Furthermore, our connected lighting solutions enable applications beyond illumination. Think for example about asset tracking or smart parking applications through connected LED luminaires.

**TowerXchange:** What are the guiding principles for combining aesthetics and functionality of street furniture?

**Bill McShane, Director, Americas Icity Venture, Signify:** Cities are looking for a trusted advisor to deliver high quality products and services as street furniture evolves into functional elements of the modern city of tomorrow. Even though technology becomes ubiquitous, that does not mean that all sorts of communication equipment and antennas need to clutter up our urban environment. At Signify we pursue a vendor agnostic and open design with as little visual impact as possible through concealed solutions, as well as hassle-free maintenance for all potential tenants to allow for scalable deployment.

Signify has a long history of working with municipalities around the world. We have a thorough understanding of their needs related to delivering energy efficiency lighting, controls technology, and developing light pole solutions. We are now combining this knowledge to allow cities to maintain their identity and aesthetic appeal, while offering new services and systems to residents, businesses and visitors to enable a smart, connected city of the future.
TowerXchange: Is there a trade-off between ease of maintenance and concealment?

Bill McShane, Director, Americas Icity Venture, Signify: We understand that with the explosion in the number of cell sites required, continuing to attach equipment to the outside of existing poles is simply not scalable without cluttering the urban environment.

There are multiple trade-offs, for example locating telecom equipment at street level makes it easier for maintenance, but locating the equipment at height is better for RF performance.

Ultimately the key to these trade-offs is ensuring that all stakeholders are happy – we have to meet the requirements of all stakeholders from municipalities and their citizens, to towercos seeking accessibility to ease maintenance, and MNOs who need to avoid interference in multi-tenant solutions.

TowerXchange: How can we ensure smart poles are quick and easy to deploy and maintain?

Bill McShane, Director, Americas Icity Venture, Signify: Acquiring and deploying individual sites, as is done with macro sites, will not scale for small cells. Instead, we at Signify believe that cluster permitting, where a municipality provides a concession for an entire area rather than site-by-site, will accelerate smart pole deployment.

When it comes to ease of maintenance, city planners must incorporate all future infrastructure requirements of smart city applications into their large-scale renovation projects already today. Some of these requirements include 24/7 availability of power for non-lighting applications, and availability of transmission capability such as fibre to at least the power cabinets, if not every single light pole.

TowerXchange: What is the optimal opportunity to switch out legacy street lighting for smart poles? And how long does it take to install smart poles?

Bill McShane, Director, Americas Icity Venture, Signify: Sometimes the timelines align such that we can replace legacy street lighting with LED with a single truck roll, but at other times these are on different schedules. For example, some advanced cities that have already converted to LED are only now looking at solutions for 4G/5G densification.

We might typically have to close a street for just one to two hours to replace existing street lights with smart poles.

TowerXchange: What is the typical service interval?

Bill McShane, Director, Americas Icity Venture, Signify: The service interval depends on the functionality of the pole. A light pole has its own maintenance regime – all luminaires degrade over time, then there are reactive visits such as those caused by collision impacts. Telecom equipment has a different maintenance and technology lifecycle, so there is no single answer to defining the service interval for a smart pole.

TowerXchange: Cell sites have most usage and consume most power during the day. Street lighting comes on at night – how do we combine these simple facts to maximise the energy efficiency of smart poles? And in simple terms, what is the power source for smart poles, grid, battery, renewables or a combination?

Bill McShane, Director, Americas Icity Venture, Signify: The transformation of street lighting systems from conventional to LED results in substantial energy savings for the city, while freeing up load capacity for the installation of additional devices on the existing street lighting grid. Smart poles are a good example. So essentially the city can support more applications on the same existing grid.

There are cases where the existing street lighting grid may be very old or not well maintained. This could limit the deployment of EV charging solutions without upgrading the power cables. In these cases, smart poles with integrated batteries and power devices for additional capacity next to IOT and connectivity solutions can play a crucial role in addressing these limitations.

TowerXchange: Should smart poles be designed to host one MNO or many?

Bill McShane, Director, Americas Icity Venture, Signify: We believe there is a need for both...
single-tenant as well as multi-tenant pole designs. Especially as densification increases in the urban core, sharing the infrastructure among multiple MNOs makes a lot of economic and aesthetic sense. However, it is important to understand that MNOs are not the only parties interested in light poles for their small cells. The guiding principle here is that the smart pole needs to flexible and provide multiple layers of functionality. Cities will have various needs throughout all areas of the city to meet the demands of the residents. A smart pole deployment will have the greatest success if the pole can be designed to accept newer technologies as they continue to develop.

TowerXchange: What can you tell us about Signify’s partnership with American Tower?

Bill McShane, Director, Americas Icity Venture, Signify: Signify entered into an Alliance Agreement with American Tower in the U.S. to co-develop a dual tenancy smartpole with two fully integrated antenna solutions for the North American market. It’s a concealed solution that fits into the aesthetic of the modern urban environment. This will allow the mobile network operators to densify their 4G LTE networks.

Signify designed and manufactures the smartpole, neutral host operators leases up the sites to MNOs, and we share relationships and dialogues with municipalities – our organizations have complementary capabilities.

TowerXchange: What has been your progress to date in the partnership with American Tower and with similar initiatives?

Bill McShane, Director, Americas Icity Venture, Signify: Our partnership with American Tower is confined to the North American market so far, but we hope to leverage that partnership to build a relationship with American Tower’s international businesses.

We launched the dual tenancy smartpole with American Tower at MWC Americas in Los Angeles a few weeks ago. The first commercial deployment is planned for Huntington Beach, where we’re in advanced stages of site selection and design.

Signify has had substantial smartpole deployments in Los Angeles and San Jose for several years.

TowerXchange: What else can and should a smart pole do besides provide lighting and wireless coverage?

Bill McShane, Director, Americas Icity Venture, Signify: Smart street light poles will evolve into the necessary infrastructure or backbone of the connected city of the future. These poles provide power, elevation, and location in order to allow wireless broadband technology to be delivered to relevant communities and user groups. Smartpoles will host various technologies such as IoT applications, Wi-Fi access points, fibre hubs, EV charging stations and USB charging stations. We are only limited by our imagination here!

TowerXchange: There are a lot of poles in the urban environment – is the vision that different poles will have different specialist functions, or that selected poles will combine all these applications?
Bill McShane, Director, Americas Icity Venture, Signify: While multiple combinations can work in a single pole, there are physical, thermal and power limits. The likely result is that we combine some applications in one pole and some in another.

Street light poles are ubiquitous in dense urban areas, typically 10-30m apart, so we don’t have to cram everything into every pole.

TowerXchange: The potential for partnerships between Signify and towercos and MNOs is obvious, but how can you work together to bring the other critical stakeholder – the municipalities – to the table, and how can you work together to create win-win-win relationships?

Bill McShane, Director, Americas Icity Venture, Signify: Bringing municipalities to the table is one of the main benefits Signify will bring into any partnership with towercos and MNOs. Signify is already a very well-known company by many municipalities in countries across the globe for the quality of our products and services, next to the innovation we bring to the industry. The collaboration between towercos, MNOs and Signify will only accelerate the adoption of new technologies to address the current and future needs of communities and cities. These parties can work together to offer their innovation, finance, operations, design, and engineering capabilities to municipalities to achieve an all-around winning result for all the stakeholders involved.

TowerXchange: The fourth key stakeholder are owners of metropolitan and last mile fibre, whose participation is critical to enable backhaul from smart poles. Again, how can you create a win-win with the fibre network operators?

Bill McShane, Director, Americas Icity Venture, Signify: Signify believes that the deployment of these types of newer technology is a win for all stakeholders, including fibre companies. Through an aesthetically pleasing deployment, the Signify smart pole portfolio provides a means for mobile network operators to achieve their goal of small cell densification. But small cell densification is not possible without fibre densification moving in lock step. For the fibre companies, the evolution towards 5G provides the drive for expansion of their existing network while providing a new revenue stream. When deployments are undertaken in a collaborative manner, all stakeholders in the ecosystem benefit. With such a diverse stakeholder network coming together, municipalities can play an enabling role by establishing simple, transparent and standard processes for permits and site acquisition.

TowerXchange: Finally, please sum up your vision of how towercos and MNOs can partner with Signify to play a critical role in Smart Cities.

Bill McShane, Director, Americas Icity Venture, Signify: Signify can offer our products, solutions, and services globally thanks to our presence in more than 70 markets. We can address the specific needs of the entire stakeholder field thanks to our innovation capabilities in products and services. At Signify we are very excited about this opportunity, and we invite tower companies and MNOs to team up with us and collaboratively design clever ways to realise this tremendous Smart Cities opportunity.
Embracing complexity: how Sitetracker is helping infrastructure owners level up their assets

Sitetracker’s platform can help MNOs and towercos in the race to 5G

Working with high profile clients like Verizon, Nokia, Cox Communications and Alphabet is testament to Sitetracker’s results and usability. Now more than ever, telecom infrastructure owners need to understand and manage their assets to plan, deploy, maintain and grow the value of their portfolios. As the number of points of presence globally proliferates at a huge rate, the processes of construction, colocation and maintenance become increasingly complex. We spoke with Sitetracker CEO Giuseppe Incitti, to find out more about how their solutions can help infrastructure owners manage complexity and position themselves for 5G success.

Keywords: 5G, Alphabet, Asset Lifecycle Platform, Asset Register, Co-locations, DAS, Energy Efficiency, Europe, Fibre, Monitoring & Management, Nokia, Operational Excellence, Site Level Profitability, Site Management System, Site Surveys, Site Visits, Sitetracker, Small Cells, Smart Cities, Verizon, Wi-Fi

Read this article to learn:
- Who Sitetracker are and what they have delivered to date
- Why having control and insight into assets is critical for MNOs carving out towers
- What tower owners need to consider when preparing for 5G rollout
- Which smart city solutions Sitetracker has got up and running

TowerXchange: Please introduce Sitetracker, your company, and footprint.

Giuseppe Incitti, CEO, Sitetracker: Our mission is to power the successful deployment of critical infrastructure. As the global standard for managing high-volume projects, the Sitetracker Platform enables growth-focused innovators to optimize the entire asset lifecycle. From the field to the C-suite, our software enables people to perfect how they plan, deploy, maintain and grow their capital asset portfolios. Our customers are market leaders in the telecommunications, utility, smart cities and alternative energy industries, including Verizon, Nokia, Cox Communications, Alphabet, and Tillman Infrastructure. They rely on us to manage millions of assets and projects representing over $19 billion of portfolio holdings globally.

TowerXchange: Tell us about your solutions – can you give any examples of what you’ve delivered in telecoms to date?

Giuseppe Incitti, CEO, Sitetracker: We work with companies across the telecommunication industry, including fibre, engineering, small cell, DAS, and tower companies. Some of our telecommunications customers include Verizon, Cox Communications, ISCO International, and Tillman Infrastructure. Our tower customers, for example, use Sitetracker to manage assets, leasing, co-location, site acquisition, maintenance, and more. So, we’re working with leaders in tower construction, site and tower asset maintenance, and site acquisition who have embraced change and are ready to succeed at this inflection point in the telecommunications industry.
TowerXchange: Sitetracker works across many verticals within critical infrastructure. Can you tell us about some of the similarities and differences between telecommunications and other verticals you work in? What does it tell us about the telecoms market?

Giuseppe Incitti, CEO, Sitetracker: We work with other industries, including utilities and smart city companies, which, similar to the telecommunications industry, have very unique challenges that lay ahead. Utilities are looking at issues like load growth and integrating renewable and distributed resources into the grid. These challenges will result in increased project complexity for the utility industry, so that's definitely a parallel between telecom and utilities, but that's not the whole story.

Telecom companies are facing an unparalleled shift in the types of projects needed and how those projects need to be executed. 5G and network densification are completely new challenges that changes the dynamic of the industry. At this critical juncture, it’s imperative that industry telecom leaders embrace change. The race to 5G is a uniquely telecom-related challenge.

Explosive growth in mobile data traffic means companies must make an important choice about their operations. The telecom industry is at an inflection point. As our communities become more connected, the volume, velocity, and variety of telecom-related infrastructure projects are exponentially increasing. Leaders in the industry are adopting purpose-built software to effectively plan, deploy, maintain, and grow the value of their asset portfolios. In order to keep up with the rate of innovation and increasing connectivity, successful companies are improving their operations with technology built for the management of site-based, repeatable projects like new tower construction, co-location, and tower maintenance.

These projects still require roughly the same end-to-end process for planning, deploying, and maintaining assets, including site identification, acquisition, regulatory approvals, design, construction, testing, validation, and more. But, instead of being vertically integrated, mobile network operators are increasingly relying on third-party service providers, who may, in turn, contract-out work to specialists for different project phases. More parties working on a higher project volume means higher complexity, making effective collaboration more crucial than ever before.

Throughout the industry, inadequate technology fails to offer live interaction between project managers and field workers, lacks the agility to handle the increasing variety of projects, and scatters mission-critical information across disconnected systems. We’re seeing this across a lot of other industries, too.

TowerXchange: With so many towers in Europe changing hands or being carved out at the moment, where can Sitetracker add value for tower owners?

Giuseppe Incitti, CEO, Sitetracker: There are over 600,000 towers in the Europe right now and, increasingly carriers are selling their towers to independent tower companies. This provides many benefits to carriers, but it does increase complexity by increasing the number of parties involved in co-location and leasing. Carriers must now work more with tower companies. If we had to sum this all up, we’d say that the industry is facing the greatest level of complexity it has ever seen and we believe the only way to navigate the complexity is through finding operational improvements on your way to operational excellence. That’s where we add value.

TowerXchange: Tower owners are starting to evaluate their macro assets ahead of the load and support changes which will come into play as 5G rolls out – can you give us examples of some of the things tower owners will need to bear in mind, and how that information can best be used?

Giuseppe Incitti, CEO, Sitetracker: As 5G begins to roll out, tower owners will need to maintain and optimize their towers. Tower owners will need to embrace the changing telecommunications landscape and ensure that the pillars of telecommunication, towers, are in the best shape possible to support 5G. This means rigorous maintenance and upkeep, as well as coming up with new ways to make the most of existing towers.

The second thing I would say tower owners need to think about is how co-location will take place in the future. Some carriers are starting to work together
on new builds, investing in the same, shared infrastructure. This means that tower companies could have multiple stakeholders from the outset of a new tower build. Managing complexity like this requires tower companies to embrace new planning and deployment technology in order to adapt to this new era.

TowerXchange: As well as telecoms, you also have a Smart City solution – can you talk to us about the scope of that offering? Do you find it is converging with your telecoms offering as tower companies and Mobile Network Operators begin to move into this vertical?

Giuseppe Incitti, CEO, Sitetracker: So, one example I'll give is LinkNYC. The City of New York partnered with Intersection to create LinkNYC, a pioneering smart cities program to convert over 7,500 public payphones to kiosks and create the largest and fastest free wifi network in the world. This project lives at the convergence of telecommunications and smart cities. Beyond the challenge of creating an all-new, purpose-built fiber optic network, each kiosk deployment requires approximately 450 tasks, spread across 15 teams, from start to finish. Not only was Intersection deploying kiosks in New York City, but they also took on this project in the UK through their LinkUK program.

In New York, they were able to simultaneously manage over 4,000 kiosk builds effectively in phase one of the project, including coordination across 15 teams and the city government, shorten time to revenue for a $500 million opportunity in digital advertising over 12 years, efficiently forecast project completions, and share deployment progress with all stakeholders through dynamic maps.

Intersection recognized that they were embarking on a new, innovative kind of program and needed a correspondingly innovative way to manage it. Sitetracker enabled the entire LinkNYC team — from Intersection’s project managers and executives to vendors’ field workers and city representatives — to instantly see the status of all of their projects through easy-to-use reports, dashboards, and dynamic maps. Sitetracker keeps the public informed, too: a map of Link locations on LinkNYC’s website, showing in real time which kiosks are online and coming soon, is a standard Sitetracker feature.

In addition to this kind of tracking, the LinkNYC team is able to understand the maintenance status of all of their assets and keep a schedule of maintenance projects, ensuring that kiosks kept in working order. The Sitetracker Platform also enables Intersection to perform work management for each of these projects, ensuring that the right people with the right skills are in the right place at the right time.

We see Sitetracker as a solution for companies looking to embrace change, whether that means new types of projects at the intersection of telecom and smart cities or a new way of managing projects to scale with demand.
Scalable solutions for a converging infrastructure landscape

STULZ is building on a strong pedigree in cooling to offer shelter and edge solutions to evolving customers

As tower owners face increasing pressures to improve efficiency in their passive infrastructure and prepare for 5G rollout across their networks, STULZ have leveraged their 40 year history in providing cooling solutions for MNOs, towercos, datacentre providers and other infrastructure owners to offer modular, scalable solutions which meet modern infrastructure needs. TowerXchange caught up with Johann Mater, Global Key Account Manager at STULZ, to find out more about how STULZ has seen the market developing and how their new solution will help infrastructure owners avoid costly mistakes.

Keywords: 5G, Air Conditioning, Energy Efficiency, Europe, IoT, Operational Excellence, Outdoor Equipment, Passive Equipment, Rectifiers, STULZ, Site Visits

TowerXchange: Please introduce STULZ, your footprint and background.

Johann Mater, Global Key Account Manager, STULZ: STULZ was founded in 1947, and has been providing solutions for mission critical cooling since the 1970s, so we look back to more than 45 years of experience in this area. Though being a family business in the third generation, we are a truly global company, with a footprint in over 140 countries, by which I mean more than just a sales office or box movers: we can cover a full cycle of services, working through tenders, preparing shipments, installing and maintaining equipment in each country where we operate. The further developed idea of this holistic approach can also be found in our claim, which at the same time reflects our philosophy. “ONE STULZ. ONE SOURCE.” stands for the comprehensive range of our portfolio – From Room Cooling and chillers to Airhandling Units and self-developed DCIM software to our EDGE solutions called "True Edge".

TowerXchange: STULZ is a global brand, with operations all over the world. Tell us more about the specific dynamics of the European market and what your European clients are looking for?

Johann Mater, Global Key Account Manager, STULZ: For MNOs we've seen a huge increase in demands for mission critical cooling, particularly in terms of hyperscalers entering the European market and changing the way they see cooling requirements. The scale of their needs is much bigger and influenced by ideas we have seen over the last two to three years in America and Asia.

Awareness of the TCO is also becoming more and more important. If you look back five years, all of...
the conversations we had were about CAPEX, we were always finding the most effective solutions and training our partners and consultants to look at the TCO but procurement teams were only paying attention to CAPEX. They didn’t pay the electricity bills so they had no awareness or personal interest in going for the most efficient units. Over the past couple of years this attitude has changed a lot, the hyperscalers and big datacentres are using so much power that we’re talking about a cost difference of six figures in some cases, so it’s playing a much bigger role. Europe still has cooling with a raised floor but new ideas are coming from datacentres and we will see this change soon.

TowerXchange: We find European tower owners are starting to pay much closer attention to squeezing operational cost savings/efficiency out of their networks. Tell us how STULZ can deliver measurable results to mature tower portfolios?

Johann Mater, Global Key Account Manager, STULZ: We’ve worked with European MNOs for many years. Eight years ago we set up a joint development with an MNO partner to help them become the most efficient telecom operator in terms of towers. We provided specialised equipment for shelters with integrated free cooling to cope with efficiency requirements in non-urban areas. Through this joint dev we were able to save up to 95% of energy costs per container by using a unit paid off within half a year. Joint dev allows us to dev what companies really need.

TowerXchange: The European market has changed rapidly over the last five years and 2019 is set to evolve further. Do you see a distinct difference in the way MNOs, towercos and other infrastructure providers approach the way their portfolios are managed?

Johann Mater, Global Key Account Manager, STULZ: They have always been quite focussed on energy, the awareness was always there, but it’s increased recently. I actually don’t see a big difference, I see that people are more looking at serviceability and service capabilities, and specialised service is playing a big role as well.

TowerXchange: As 5G rolls out we’re going to see new equipment placed on towers and much higher demands placed on the network. How ready do you think European tower infrastructure is, and what advice would you give to tower owners wanting to prepare their networks?

Johann Mater, Global Key Account Manager, STULZ: The challenge with 5G is that there are no fixed parameters and definitions yet. I would really like to see what the speakers say about it at Meetup Europe. Nevertheless, 5G is a great opportunity for us: it’s the start of IoT, connected vehicles etcetera, and we are looking forward to creating a future with 5G companies and helping them find the right solutions. With our True Edge system we are perfectly prepared for the requirements of providers and towercos that are specialized on 5G and Edge development. The STULZ portfolio offers everything from cooling on a component level up to turnkey solutions. At the moment, we are just waiting for our customers to give us the go-ahead so that we can start planning and realizing their projects.

When it comes to the demands of 5G, everything is going to change: densities in shelters will increase, telecoms equipment has new requirements, cooling equipment will need to change. Particularly looking at the energy efficiency trend and evolution of cooling equipment over the last few years – if it’s over five years old it might be worth considering new technology. It might even make sense to think about a holistic conversion towards a turnkey solution. STULZ can help with their tools to identify the TCO and ROI of these new systems.

TowerXchange: We’re seeing a shift towards infill and convergence between communications infrastructure networks, particularly in urban areas. How has this affected your offering and what can clients expect from you in future?

Johann Mater, Global Key Account Manager, STULZ: Our portfolios starts with cooling solutions from 500W to 2MW, so we can offer anything from watts to kilowatts to megawatts. The full range is there and can be implemented into our turnkey solutions. When it comes to infill and convergence, we have edge solutions so we can go from one solution with fire suppression, UPS backup and cooling up to a full datacentre made of modules. Scalability is important as customers want to start small and pay as you grow. Scalability is a given. We have been working on this solution for the last three years and 2019 is the year when we will bring the whole solution to market. Despite the fast pace of the 5G market, our “True Edge” solutions are scalable and modular, so they are designed to meet the needs of our customers in an ideal way – for every conceivable scenario. By combining the customer’s expectation with our expertise, we will be able to customize our solutions to make it fit for their environment – turnkey means you can scale what you like instead of re-inventing the wheel each time.
Valmont: 5G creates synergies between multiple infrastructure segments

Utility, traffic and lighting sites are just a few of the suitable candidates for 5G rollouts

Valmont is one of the global leaders in the tower design and manufacturing industry – a sector undergoing radical changes in light of the advent of 5G and its urban densification requirements. In this exclusive interview, Jeff Syslo, Valmont’s Business Line Manager for its Engineered Support Structures unit, shares with our readers unique insights into what 5G means for the infrastructure industry, new types of collaboration and partnerships required to succeed and considerations on the evolution of the site sharing business model.

Keywords: 4G, 5G, Americas, Business Model, Capacity Enhancements, Construction, Decommissioning, Infrastructure Sharing, Interview, Loading, Masts & Towers, Meetup Preview, Regulation, Site Surveys, Site Visits, Steelwork, Valmont Industries

Read this article to learn:
- Valmont’s footprint and activities in the wireless industry and beyond
- The evolution of site typology demand and infrastructure sharing approaches
- How 5G is reshaping the industry and creating new synergies
- Which sites can be used for 5G rollouts across urban areas?

TowerXchange: Please introduce Valmont and yourself to our readers.

Jeff Syslo, Business Line Manager, Global Communication Systems, Engineered Support Structures, Valmont Industries, Inc.: Valmont is a public company (traded on the NYSE, ticker symbol VMI) founded in Valley, Nebraska in 1946 and operates in four primary business segments, namely:

- Engineered Support Structures
- Protective Coatings
- Irrigation
- Utility Support Structures

Valmont has been providing antenna structures to the global wireless communications industry for the past 70 years. The range of products we offer include all types of structures such as macro-towers, rooftops, monopoles and camouflaged sites. We also supply a full line of network infrastructure components and hardware through our SitePro1 business.

I began my career in the wireless industry over 25 years ago with Valmont and my current role is Business Line Manager, Global Communication Systems. My primary responsibility is growing our telecom segment through developing new markets, new products and expanding our global reach within the industry.

TowerXchange: What’s the company’s footprint and key business areas?
Jeff Syslo, Business Line Manager, Global Communication Systems, Engineered Support Structures, Valmont Industries, Inc.: We manufacture products in over 85 different facilities spread across six continents and do business in over 25 countries.

We are a leading producer and distributor of products and services for the infrastructure and agricultural markets. The Engineered Support Structures segment is our key division, which includes products for the wireless, traffic/lighting and transportation businesses. The other three segments are utility structures for the electrical industry, our protective coatings business and irrigation systems for agriculture.

With annual revenue of US$3bn, we currently employ 12,000 people worldwide and generate 65% of our sales in North America (Canada, U.S. and Mexico) and 35% from other regions around the globe including, Europe, Asia, Africa, South America and Australia.

TowerXchange: How has the demand for traditional macro-towers evolved to new site typologies over the years?

Jeff Syslo, Business Line Manager, Global Communication Systems, Engineered Support Structures, Valmont Industries, Inc.: Every region has its own characteristics and challenges based on population, topography, regulations, et cetera.

North America was one of the first regions to adopt infrastructure sharing and this practice is now very common, but 30 years back, towercos didn't exist and MNOs used to invest in building their own networks. The region is very towerco-centric, but this cannot be said of other markets where we operate, which are just now starting to embrace sharing initiatives. In those markets such as North America, where site sharing is common, we typically see larger structures due to having multiple operators on the same sites.

4G has been a great testbed for this change as antennas got larger and the capacity increase was great. We've performed many structural analyses, upgrades, reinforcements and, when required, complete replacements. In fact, sometimes it's simply more economical to just replace a site rather than re-engineer it. The increased loading requirements has also led to new products such as heavy-duty antenna mount systems and network infrastructure components.

The aptitude of our customers has definitely changed too. Years back, no one used to build with the idea to future-proof their sites to new technologies and requirements. Now we are working with a different mindset and are fully aware that larger loads are and will be needed.

Nowadays, we are starting to ship 5G structures to China and across North America. These new sites are much stronger to support extra equipment and we are doing everything for the very first time as there's no blueprint for 5G structures.

TowerXchange: What are some of the most innovative sites your clients are requesting these days?

Jeff Syslo, Business Line Manager, Global Communication Systems, Engineered Support Structures, Valmont Industries, Inc.: We have done all types of custom structures depending on...
the site location and requirements. Local zoning requirements and regulations dictate what type of structure may be allowed at a particular location.

Our Valmont-Larson division has been providing camouflaged site solutions for over 25 years. Some examples include structures disguised as cacti, all types of trees, highly decorative lamp-posts and architectural solutions on buildings including decorative cupolas, working clock towers and church steeples.

We continue to see increased demand for innovative and creative site solutions. We say if you can dream it, we can build it.

**TowerXchange: How do you foresee the advent of 5G to change the demand for your products?**

**Jeff Syslo, Business Line Manager, Global Communication Systems, Engineered Support Structures, Valmont Industries, Inc.:** We are already seeing a demand for new and innovative solutions with the initial rollouts of 5G in Asia and North America.

5G technology, especially in the mmWave frequency bands, creates new challenges and opportunities. This is the biggest business opportunity we’ve seen in the past 25 years and have a dedicated team solely focused on developing and implementing 5G site solutions.

The volume of new sites will be quite large and we see the need for all types of site solutions. Urban areas will require a high density of sites, with the majority of them being innovative designs such as lampposts, rooftops, street works, et cetera.

We have extensive experience and knowledge with all types of engineered structures such as lampposts, traffic signalling, street works, rail and tramway structures. Many of the 5G sites will be implemented using this existing infrastructure and we have great know-how in these areas.

**TowerXchange: Are you seeing synergies between utility towers, lighting sites and telecom towers?**

At Valmont, we have a very large global footprint of utility, wireless and traffic sites and decades of experience in planning and analysing complex networks of infrastructure. We are also aware of the existing infrastructure available across multiple markets.

Our knowledge and experience in the lighting and utility structures industry certainly give us an advantage. We are able to analyse the existing infrastructure to determine if it is suitable to accommodate a 5G site. If it is, we have products we offer to allow MNOs and towerco to add their equipment.

In cases where the existing infrastructure may be overstressed due to the proposed 5G equipment, we can offer a replacement solution that will match the existing design and aesthetics required.

The level of coordination required among all parties involved in 5G rollouts and planning is great. MNOs, municipalities, towercos, utility companies...
and system integrators and more all need to come together. Certain 5G tests currently running across Europe are involving as many as seven different companies at a time... And these are just tests!

Other parties that can come into play include security firms, police units and edge computing companies, as a result of all the different functionalities that 5G enables. In summary, the traditional business model that worked in the past simply won’t work with this complex environment.

TowerXchange: Are towercos starting to deploy small cells and DAS? Are they finally positioning as neutral hosts?

Jeff Syslo, Business Line Manager, Global Communication Systems, Engineered Support Structures, Valmont Industries, Inc.: Yes, we are already seeing towercos such as American Tower, Crown Castle and WIG acting as neutral hosts for small cell and DAS networks.

There are several different models that are being utilised and the approach many times is on a case by case basis. I think ultimately the main driver that will continue to push more and more towercos into pursuing opportunities within this space is economics. MNOs simply won’t be able to bear the cost of rolling out, managing, owning and operating such networks, especially with the substantial investments required for 5G. There may be new models employed such as consortiums with various stakeholders. The main driver however will be how to decrease and manage costs through neutral hosting.
How can drones make towercos and MNO’s lives easier?

vHive is changing the way the industry inspects and obtains data on towers.

Traditionally, tower inspections and surveys have been an expensive and dangerous headache for operators and towercos. Now, drones integration is minimising risks while offering a more detailed coverage of the towers that translates in intelligent data while increasing operational efficiency and reducing cost. vHive has been a pioneer in developing software solutions that allow tower owners to easily deploy drones and obtain data from their assets. In this interview, vHive’s CEO Yariv Geller explains how towercos and MNOs can benefit from drone integration and the key benefits and features of their solution.

Keywords: Business Case, Health & Safety, Managed Services, MNOs, Monitoring & Management, Multi-Region, Operational Excellence, Opex Reduction, Site Management System, Site Surveys, Towercos, vHive

Read this article to learn:
- How can drones create value for tower owners?
- What do companies need in order to integrate drones in their operations?
- What have tower companies achieved with drones?
- What kind of data do drones provide and how?

TowerXchange: Could you please introduce vHive to our readers?

Yariv Geller, CEO, vHive: vHive has been around for two and half years now. Our software solution enables enterprises to deploy drone hives to digitise their field operations and assets.

We work with companies that have substantial field operations, so telecom is a very typical use case for us. Our clients own thousands of telecom towers spread out over an entire country. We help towercos and MNOs to gather operational information on their assets for surveying and inspection purposes; we enable them to digitise their entire asset base, making it easily accessible, creating a continuous digital data flow from the field to the company.

Typically, towercos have been using tower climbers, which is a dangerous and expensive job: they use a camera, a measuring tape or a clinometer to capture very sporadic pieces of information and fill them into a written report that goes to the engineering and QA teams, who use it to make decisions.

Our solution enables towercos and MNOs to equip their field personnel with drones so that they can safely inspect from the ground while getting a detailed, 360 degrees coverage of their towers in about 30 minutes. We provide them with both 2D and 3D models of the tower that they can use for engineering and measurement as well as for QA and inspection purposes.
TowerXchange: For those who aren't familiar with this technology, how can drones help towercos and MNOs?

Yariv Geller, CEO, vHive: Drones are great in systematically collecting high-resolution information from dangerous, radiation exposed and inaccessible places. Drones obtain a bird's eye view from any position in 3D space, as opposed to a more limited view that a person would have from the ground or even when climbing the tower.

You can now buy highly capable, low cost, off-the-shelf drones that democratise high-quality data rather than relying on satellite imagery, airplanes or people climbing to dangerous places. And so, over the past two to three years, many organisations started exploring the benefits of drones as part of their daily tool set. Many of them started with a person in the company who was a drone enthusiast, or perhaps they brought an external third party with the proper expertise. Enterprises quickly realised that drones were a very powerful tool to obtain high quality data and started seeking ways to expand drone operations throughout the company.

The focus has now turned to enterprise scalability, which requires several capabilities.

The first requirement for scalability is autonomy, meaning autonomous flight controlled by software. This way, the company does not need to rely on a highly trained individual to fly the drone. Instead, you have a computer that is piloting the drones with precision and a person in the field operating a mission and monitoring safely. This approach enables your entire field operations staff to operate drones easily, with the press of a button.

The second requirement is the ability to intelligently manage the drone’s data acquisition in a way that fits the use case. It is not just about a drone flying from one place to another but also directing the drone to cover telecom infrastructure in a very deliberate and precise way: capturing imagery around the tower at multiple angles and multiple altitudes with precise overlap, in a way that generates a coherent set of data that fully covers the tower. The solution also needs to handle typical telecom structure types such as monopole, lattice and guyed wire towers and events such as radio communication interference, safe navigation around the tower and manage drone battery swaps when needed.

Once data is captured, you need an IT infrastructure to manage the vast amounts of data, especially when covering a large number of sites and performing repeat surveys. You need a system that manages this amount of data allowing you to retrieve it, analyse it and compare it over time.

Finally, risk mitigation and adhering to regulation are critical for our customers. We address the issue from two perspectives. An audit trail: we always log what drones are in the field, what they have done, where and when, who’s operating them, what events may have occurred et cetera. The second part is enforcing regulations and not allowing human errors. For example, the system creates a geofence around the tower preventing the drones from going outside that area or above a certain altitude or...
near a no-fly-zone. The system also ensures field operators go through enterprise checklists and are fit to operate.

We provide a cloud-based platform that enables our customers to manage the entire data flow from the field; it enables telecom companies to easily plan missions, autonomously execute them with drones in the field and get reconstructed 2D and 3D data products. We also provide a workspace for analysing the data in different useful ways.

**TowerXchange: Can you explain the concept of aerial surveys and how is the data that you collect helping telecoms companies?**

**Yariv Geller, CEO, vHive:** We provide full, precise visual coverage of the towers by generating a 3D model and linking it to imagery with a resolution of up to three to four millimetres per pixel. We also have tools to provide high accuracy in the models that are generated so you can perform engineering measurements, whereas previously you had to bring costly surveyors to the field to do that kind of work over a much longer period of time.

**TowerXchange: How can your solution be used in the different phases of a telecom infrastructure project?**

**Yariv Geller, CEO, vHive:** Our solution can be applied already in the site construction stage. We work with civil engineering firms providing them with the means to do area site surveys. Similarly, towercos and operators can survey sites they plan to deploy their equipment on for planning purposes.

The site survey would generate a full coverage map, the topography and a full 3D model of the area where you would be constructing on. Then, you can precisely measure location, distances, volumes of land et cetera. That is all in the pre-construction planning phase.

Later, we provide additional surveys along the construction process tracking progress against the original plan. Finally, we provide a site survey capturing the site “as-built” in a full 3D model view, documenting the site in the system, covering the entire workflow of the construction process.

In the operational phase, we provide repeated surveys and inspections. Whenever you add or change a feature on the tower or add a new piece of equipment it requires engineering checks and approvals this can now be easily done. Another type of activity is a post-disaster survey. If you have a storm or hurricane you would need to verify the tower and see that the equipment is aligned as well as checking if there has been any damage to the site which needs to be repaired. QA teams can also inspect the tower for any wear and tear or even birds nesting in the antenna.

**TowerXchange: How do you translate the data you gather into actionable intelligence and how does it ultimately drive operational efficiency?**

**Yariv Geller, CEO, vHive:** We bring a full, manageable, online dataset vs the many small pieces of information that our customers typically get, in a format that is hard to manage. We bring high-resolution imagery and a way to manage it. We don’t just bring a pile of photos, we bring oriented, multi-angle photos with a 3D navigation interface, linked to an accurately measurable 3D model.

We also provide tools like a 360 photosphere for line-of-sight analysis and means to compare surveys over time to identify change.

**TowerXchange: What are the advantages of your aerial surveying and inspection system compared to other traditional monitoring, on site solutions?**

**Yariv Geller, CEO, vHive:** We are enabling the personnel to avoid climbing towers, safely stay of the ground and to capture information that is an order of magnitude more detailed than a person measuring specific features. We are taking the industry a leap forward by providing a digital documentation and analysis platform for field operations.

**TowerXchange: How does aviation regulation affect your operations and how this varies on the different countries you operate?**

**Yariv Geller, CEO, vHive:** We operate in the United States, Europe and Asia. By now, in many parts of the world, the law is fairly accommodating in the sense that there are proper regulations in place and it is clear which guidelines companies need to follow to use drones as part of their operations. The regulations are not restrictive to anything required in order to survey cell towers.
Typical regulation does not allow flights above 100-130 metres, which is more than enough for tower surveying needs. You should not fly in densely-populated areas either, but again towers are typically located in private, remote or unpopulated areas, so this is not a problem. You are not allowed to fly in “no fly zones”, which are the vicinity of airports and other restricted areas such as military bases. Finally, the person in the field needs to see the drone and maintain a line of sight with the drone. None of these requirements present an obstacle for tower surveying.

Most countries require a very simple certification process for your employees such as an online test to ensure they understand regulations and requirements.

The US FAA defined such regulatory requirements last year and the rest of the world is now following suite. Just recently, India who had restricted drones until now, has defined a drone policy, opening the sky for drone operators.

From vHive’s perspective, we can work in any market. You buy low cost, off-the shelf drones (we can recommend which), connect them to our software platform and you are good to go. All you need from us are user names and password and our mobile app so you can operate in the field.

TowerXchange: Can you share some success stories?

Yariv Geller, CEO, vHive: We work with two of the largest cell tower companies in the United States. They have tens of thousands of assets that need to be surveyed several times every year. Our clients wanted a digital transformation in their organisations, moving from the long lead-time, cost and limited data provided by current techniques to a fully digitalised database of their assets. The goal is for anybody in the company to be able to go online, type the number of the tower and get a full 3D model of the asset with measurements, annotations and precise high-resolution information.

This is a revolution for them because it massively reduces their operational cost as well as improves productivity - there’s a big difference between having somebody climbing the tower with the associated high insurance costs and small pieces of information collected to having a drone in the field that safely collects all available data within 30 minutes. These companies now have a digital representation of the tower infrastructure online, so they can review, measure or inspect every aspect of the tower using a web browser at any time.

We are seeing this approach as a growing practice across the industry. We see how our different costumers appreciate the fact that they can now use very affordable hardware with our system to do the task and easily train their field technicians to use drones as part of their toolset. We’ve built a very user-friendly system, requiring only half a day training to a group of people in the existing workforce. These people now have the power to accomplish much more in the field, doing things faster while generating smart and effective results.
Voltalia on its new Brazilian power plant and plans for telecom projects

The French energy company in talks with regional MNOs and towercos

After years of successful clean energy production across the globe, Voltalia launched its first ESCO project in Myanmar in 2018, working closely with MNTI. Since its creation, the leading energy firm is very active in Latin America. Recently it has inaugurated the Oiapoque power plant (Brazil), serving the off-grid city with a mix of energy sources. In this interview, Michel Faivre, Key Accounts Director at Voltalia, shares with TowerXchange the company’s plans to serve telecom players across CALA and an overview of its projects and strengths.

Keywords: Americas, Brazil, Colombia, ESCOs, Energy, Energy Efficiency, French Guyana, Hybrid Power, Interview, Investment, Logistics, Mexico, O&M, Off-Grid, Opex, Pass-Through, Renewables, Solar, South America, Unreliable Grid, Voltalia, Wind

TowerXchange: Could you please re-introduce Voltalia and yourself to our CALA readers?

Michel Faivre, Key Accounts Director, Voltalia: Voltalia is a French renewable energy producer with a total capacity of 921MW either in operation or construction worldwide as of today. Voltalia is also a service provider, assisting its investor clients active in renewables at each project stages, from conception to operation and maintenance. We’ve been active for more than fourteen years and run operations in eighteen markets across Europe, Africa, Asia and the Americas. Our mission is to improve the global environment, by reducing the use of fossil fuels, but also to foster the local development in each country where we operate.

Four years back, we decided to enter the telecom sector and help operators and towercos with their energy management needs, especially moving from fuel to green energy, and since then, we’ve successfully launched an ESCO project in Myanmar, one of the most challenging and dynamic telecom markets in the world.

With regards to Latin America, we have leading positions in wind production in Brazil, with 724MW currently in operation or construction and in French Guyana, where we are active in hydro, biomass, solar and storage. To date, we employ more than 120 people in the region and

Read this article to learn:
- Voltalia’s footprint and activities across four continents
- The characteristics of the recently launched Oiapoque’s power plant
- An overview of the Myanmar ESCO project
- Voltalia’s competitive edge and strong regulatory knowledge
we already have local teams in Mexico and Colombia.

**TowerXchange: Please describe the different business models offered by Voltalia.**

**Michel Faivre, Key Accounts Director, Voltalia:** At Voltalia, we offer various business models that can flexibly adapt to the requirements of our customers. We operate under three main models for telecom operators: 1) the energy as a service (ESCO) model 2) the private Power Purchase Agreement (PPA) model and 3) the Net Metering solutions model.

Currently, we are investigating the needs of telecom players across LatAm, and among the various models we offer, we are assessing which one is the best for them.

One key finding is that the situation in CALA is quite different from other regions where gensets are the main source of energy for many sites, hence the need for a pure ESCO proposition.

In fact, since the quality of the grid across LatAm is generally good, the ESCO model might not be the appropriate one but what we are sure of is that MNOs are keen to shift to greener sources of energy. A good approach to offer could be a mix of ESCO and PPA or pure private PPA.

The bottom line is that, at Voltalia, we are able to effectively offer and manage all these models.

**TowerXchange: Can you tell us more about the Brazilian power plant that Voltalia recently completed?**

**Michel Faivre, Key Accounts Director, Voltalia:** In Brazil, we have many ongoing projects in wind, but one recent project is truly illustrative of our know-how in off-grid: Oiapoque.

Oiapoque is home to 24,000 inhabitants and not connected to the national electricity grid. In 2014, we won a tender with plans to produce electricity using a 12MW thermal unit, that is already in operation since 2015, and a 7.5MW hydropower plant to be built by 2021. In 2018, we have commissioned a 4MW solar unit, in addition to the existing program.

This solar plant is optimising the existing infrastructure and operating costs of the plant by reducing the use of diesel fuel for electricity generation.

In the long run, Voltalia will provide electricity to the entirety of this isolated city thanks to a 90% renewable production. Of course, we build, operate and maintain all of these plants.

**TowerXchange: What are the requirements of telecom players across LatAm? What can you tell us about the initial conversations you are having in the region?**

**Michel Faivre, Key Accounts Director, Voltalia:** We have initiated several promising discussions with MNOs and towercos across the region. All of them are very interested to find out more about new approaches and models that can optimise energy management operations, but they aren’t sure yet on how to proceed. My perception is that most players would be happy to outsource the majority of their operations to experts and this is where Voltalia can surely help them.

**TowerXchange: What is Voltalia’s competitive edge?**

**Michel Faivre, Key Accounts Director, Voltalia:** Voltalia is a renewable energy company, this is what we do and what we are good at. We have a strong track record across multiple geographies and an in-depth knowledge of the sector, its dynamics and requirements. We are experienced in any source of renewable energy such as solar, hydro, wind, biomass as well as hybrid sources.

Our company already enjoys a solid presence across Latin America and a deep understanding of its markets and regulatory environments. Additionally, we have strong ability to finance and invest as required by PPA projects. We’ve already succeeded at it in Brazil, Mexico and Colombia among others.
Lastly, we’ve launched our ESCO project in Myanmar in 2018 and for that, we are working with towercos, which has given us a strong understanding of their requirements and business model.

**TowerXchange: Can you share further details with regards to the regulatory challenges applicable to renewable energy projects?**

Michel Faivre, Key Accounts Director, Voltalia: Much depends on the type of model we select. The ESCO model is not very regulated yet so we don’t encounter too many issues. On the other hand, the private PPA one is a lot more complex and requires us to analyse the applicable rules in each market. In some cases, like Brazil, we need to take into consideration that the permit to manage utilities is granted for each individual state (due to the fact that Brazil is a federal republic).

With regards to the net metering option, this is a very interesting model that allows the surplus of produced power to be reinjected into the grid and provides a rebate in return. This is a very efficient model, but some countries don’t actually allow it.

Thanks to our long-standing global experience, we are also able to liaise with regulatory bodies and offer consulting services to our customers. Discussions with the regulators can be quite complicated and touch upon sensitive issues and Voltalia can play a great problem-solving role.

**TowerXchange: What are the key challenges and opportunities of the Myanmar project?**

Michel Faivre, Key Accounts Director, Voltalia: Myanmar is a great example of our ability to overcome complicated situations. Due to its weather and the presence of heavy rain season, we couldn’t adopt a 100% solar model and we also had to take into consideration some crucial logistics and operational challenges.

One of the main concerns was to find trained staff to employ and to begin with, we had to find foreigners willing to take on the challenge. We also had to understand the complexities related to taxation, import of goods, foreign investments versus the use of local currency.

We are very glad to be working in Myanmar, which has proven an extremely receptive market and a very positive venture for us. But the challenges we faced and continue to deal with are considerable. Possibly one of the most complex one is the fact that MNOs and towercos operate under pass-through contracts whereby the MNOs pay a base fee for the initial investment and the maintenance and a pass-through fee (for the cost of the energy actually issued) to the towercos and we are now helping out our towerco customers to restructure the contracts to better serve the dynamics of the renewable ESCO model.

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