Facilitating the evolution of communications infrastructure in Europe

3rd Annual TowerXchange Meetup Europe, 17-18 April, Business Design Centre, London
With special thanks to the TowerXchange “Inner Circle”

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Alexander Chub
President
Russian Towers

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 bi-weekly 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.

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TowerXchange Meetup calendar

- TowerXchange Meetup Europe, April 17-18, 2018
- TowerXchange Meetup Americas, June 20-21, 2018
- TowerXchange Meetup Africa, October 9-10, 2018
- TowerXchange Meetup Asia, December 4-5, 2018
MNOs, towercos and JV infracos

Alticom, Sales Manager
Arqiva, Programme Delivery Director – Telecoms
Arqiva, Managing Director Telecoms
ASTEM, Managing Director
Axion, President
BT, Director of Converged Networks & Innovation
Cellnex Telecom, CEO
Cellnex Telecom, Strategy Advisor
Cellnex Telecom, Director Innovation & Product Strategy
Cellnex Telecom, International Business & Marketing Director
Cellnex Telecom, Head of Mergers and Acquisitions
Cellnex Telecom, Representative
Cellnex Telecom, Representative
Cignal, CEO
Cignal, Chairman
Deutsche Telekom, Head of Investment Management
EE, Principal Solutions Architect
Emitel, VP & President of the Management Board
ESB Telecoms, Representative
ESB Telecoms, Representative
ESB Telecoms, Representative
ESB Telecoms, Representative
Global Tower, CEO
Global Tower, CFO
Global Tower, Director
Global Tower, Head of Investor Relations

Hibernian/Britannia Towers, Company Director
Hibernian/Britannia Towers, Company Director
Hutchison 3G UK Ltd, Director of RAN & Connectivity
INWIT, CEO
INWIT, Head of Investor Relations
Liberty Global, Director
Liberty Global, Director of Technical Real Estate Strategy
Liberty Global, VP Real Estate Strategy
Logycom, Investment Advisor
MBNL, CEO
MBNL, Head of Property
NOS, Mobile infrastructure specialist
NOVEC, Director Business Development
NOVEC, General Manager
Oman Telecom, Senior Expert – M&A
Orange, IHS Contract Manager
Russian Towers, President
Russian Towers, Board Member
Russian Towers, Chairman
Russian Towers, Head of Strategy and Marketing
Russian Towers, Commercial Director
Saudi Telecom Company, GM of Strategy
Saudi Telecom Company, Technology Synergies Director
SBA Communications, VP International
Service Telecom, CEO
Spydersites, Director
Sunrise Communications, Network Director
TASC Towers, Director
TDF, Public Affairs Advisor
TDF, CEO
Towercom, Business Development
Towercom, Director
Towercom, General Manager
TowerTel, CEO
TT Networks, CFO
TT Networks, Site Manager
Vertical, CFO
Vertical, General Director
Vertical, Head of Infrastructure
Vodafone Procurement Company, Category Manager, Property
Wireless Infrastructure Group, CEO
Wireless Infrastructure Group, COO
Wireless Infrastructure Group, Director
Investors, investment advisors, law firms and consultants

Allianz Capital Partners, Managing Director
APG Asset Management, Senior Portfolio Manager
Arcus Infrastructure Partners, Partner
Barclays, Telecoms Equity Research Analyst
Brookfield, Managing Partner
Clifford Chance, Partner
DekaBank, Executive Director
EY – Parthenon, Director – TMT Strategy
IFC, Chief Investment Officer
New Street Research, Representative
New Street Research, Representative
SPO Partners, Partner
UFG Asset Management, Partner
Vinson & Elkins RLLP, Partner
Vinson & Elkins RLLP, Partner
Vinson & Elkins RLLP, Representative

Managed services, engineering and consultancy

Allied Consultant Engineering, Director
Electronic Control Systems, CEO
EY Parthenon, Director
Faraday Partners, CEO
Hardiman Communications, Managing Partner
Hardiman Telecommunications, Representative
Md7, Head of Business Development
Md7, Site Acquisition Manager, Europe
Telelink UK, General Manager
ZAID International FZE, Director
ZTE Corporation, Regional Marketing Director

Technology providers

3 Tech, Regional Manager
Abloy Oy, Representative
Accruent, VP Telecom
Accruent, Senior Account Executive
Acsys Technologies Ltd, Representative
Acsys Technologies Ltd, Representative
Asentria, General Manager, EMEA
Asentria, Director of Sales & Marketing
Bladon Jets, VP Market Development
Enertika, Key Account Manager Telco
Flexenclosure, Sales Director
Flexenclosure, Sales Director
GSM Towers, CEO
HIMOINSA, EMEA Region Director
HIMOINSA, Network Development Manager
Intelsat, Representative
Intelsat, Representative
Intelsat, Representative
Intelsat, Representative
MediPower, Representative
MediPower, Representative
MSA Latchways, Utilities & Telco Specialist
NorthStar Battery, Director, Global Site & Solution Engineering
NorthStar Battery, Senior Sales Manager Europe – Reserve Power
Schréder, Representative
SOLID, Inc., Director
Tarantula, CEO
Tarantula, COO
Tarantula, VP Sales
Tarantula, Head of Product Marketing
Vertiv, Representative
Vertiv, Representative
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- Project Management
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Introduction to the TowerXchange Meetup Europe

Dear Colleague,

Once again we are delighted to bring together over 250 of Europe’s leading tower execs for the TowerXchange Meetup Europe 2018.

Over the past 12 months I’ve been in and out of the offices of some of Europe’s leading towercos and MNOs, interviewing their senior management teams and digging into their strategies for the coming years. I’ve noticed that the commitment towards 5G infrastructure is becoming deeper, although expectations in terms of timelines seem to be pushing back.

External pressures, such as the impending needs of 5G rollout, the consolidation of towercos in Europe and revisions to legal and accounting regulations are forcing towercos to question their role as real estate providers, renting simple space to tenants. To meet the needs of a rapidly changing market, European towercos are undergoing significant change and evolving to become an essential service partner for their customers as they embark on 5G rollout.

For a developed market with a huge amount of infrastructure, there’s still plenty of growth for European tower owners. TowerXchange currently tracks 46 independent towercos in Europe and in such a diverse and fragmented market there’s still room for significant consolidation. Build to suit is still a growth area, with extensive new build projects in France, Germany and Turkey already underway. The opportunity for the sale and leaseback of towers from European mobile network operators is growing, with all eyes on the sale of the Altice assets in France and Portugal in the short term. And finally, the opportunities for growth through future network infrastructure, such as DAS, small cells, fibre and data centres is proving exciting for the more entrepreneurial European towercos.

I am delighted that already we will be joined by more than 25 of Europe’s leading towercos at the TowerXchange Meetup Europe 2018 this April, including 14 of the top 19 towercos with over 1,000 towers under management in Europe. Taking place at the Business Design Centre in London on April 17-18, the event is the culmination of 12 months of research and will feature panels, roundtables and working groups across all of the major challenges and opportunities in the European market.

Visit www.towerxchange.com/meetup/meetup-europe for more information and to register your place.

Kind regards,

Frances Rose
Head of Europe, TowerXchange
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## TowerXchange Meetup Europe Agenda

**London | Day one - April 17, 2018**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Break outs</th>
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</thead>
<tbody>
<tr>
<td>9:00</td>
<td>TowerXchange analysis of the European Market: <strong>Kieron Osmotherly</strong>, MD and Founder, TowerXchange and <strong>Frances Rose</strong>, Head of Europe, TowerXchange</td>
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| 9:45   | **CxO panel: Towers and wireless infrastructure 2030**  
  **Alex Mestre**, International Business and Marketing Director, Cellnex  
  **Nihat Narin**, CEO, Global Tower  
  **Scott Coates**, CEO, Wireless Infrastructure Group  
  **Alexander Chub**, President, Russian Towers  |                                                                             |
| 10:30  | Debate: MNO-led towercos vs independent towercos, which adds more value?  
  **Oscar Cicchetti**, CEO, INWIT, **David Porte**, VP International, SBA Communications  |                                                                             |
| 11:00  | Fireside chat with **Tobias Martinez**, CEO, Cellnex                                                                                                                                                    |                                                                             |
| 11:20  | Networking break                                                                                                                                                                                        |                                                                             |
| 11:50  | **Roundtable Session 1**                                                                                                                                                                               | Buyer briefing 1                                                             |
| 12:50  | Lunch                                                                                                                                                                                                  |                                                                             |
| 13:50  | **Roundtable Session 2**                                                                                                                                                                               | Working Group 1 - The operational challenges of moving from a real estate to a service model |
| 14:50  | Networking break sponsored by [Tarantula](#)                                                                                                                                                           |                                                                             |
| 15:20  | Fireside Chat with **Olivier Huart**, CEO, TDF and Chair, EWIA                                                                                                                                       | Buyer Briefing 2                                                             |
| 15:50  | Panel: Investing in European towers: opportunities for growth  
  **Jack Colbourne**, Partner, Arcus Infrastructure Partners  
  **Eric Crabtree**, Chief Investment Officer, IFC  
  **Suruchi Ahuja**, CFO, Tillman Infrastructure  
  **Bruno Candès**, Partner, InfraVia Capital Partners  |                                                                             |
| 16:30  | **Champagne discussion forums, featuring the speakers from the relevant panels throughout the event:**  
  Towers 2030, MNO-Captive vs independent towercos, Broadcast towercos, Investment in European towers, The tenants’ perspective, Women in Towers, Is the neutral host business model still in vogue? Are managed services the best solution for network development? |                                                                             |
<p>| 17:30  | Informal drinks reception                                                                                                                                                                             |                                                                             |
| 19:00  | Dinner                                                                                                                                                                                                  |                                                                             |</p>
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<thead>
<tr>
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<th>Session</th>
<th>Break outs</th>
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<tr>
<td>9:00</td>
<td><strong>Panel: 5G and future networks - a summary and a roadmap:</strong></td>
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<td></td>
<td>Oscar Pallarols, Director of Innovation and Product Strategy, Cellnex</td>
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<td>Alexander Chub, President, Russian Towers</td>
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<td>Nikolay Berdin, CEO, Service Telecom</td>
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<tr>
<td>9:45</td>
<td>Keynote Presentation: The impact of 5G: what will the towerco of the future look like?</td>
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<td>Marc Ganzi, CEO, Digital Bridge</td>
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<td>10:15</td>
<td><strong>Panel: the tenants’ perspective</strong></td>
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<td>Pat Coxen, CEO, MBNL</td>
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<td>Michael Martin, Network Director, Sunrise</td>
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<td>11:05</td>
<td>Networking Break sponsored by <strong>Accruent</strong></td>
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<tr>
<td>11:35</td>
<td><strong>Roundtable Session 3</strong></td>
<td>11:35-13:00 Wireless Infrastructure Regulatory Working Group Meeting</td>
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<td><strong>Rising Stars session led by Chuck Green</strong></td>
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<tr>
<td>12:35</td>
<td>Lunch</td>
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<td>13:35</td>
<td><strong>Roundtable Session 4</strong></td>
<td>Buyer Briefing 2</td>
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<tr>
<td>14:35</td>
<td>Networking Break</td>
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<td>15:05</td>
<td><strong>Broadcast towercos: is the gap between broadcast and mobile assets broadening or narrowing?</strong></td>
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<td>Jorge Alberto Jimenez, CEO, Axion</td>
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<td>Maciej Staszak, Vice President, Emitel</td>
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<td>Carlo Ramella, CEO, TowerTel</td>
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<tr>
<td>15:45</td>
<td><strong>Panel Discussion - who will own and operate the networks of the future?</strong></td>
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<tr>
<td>16:30</td>
<td><strong>End of Meetup</strong></td>
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TowerXchange roundtables

40+ roundtable discussions, including:

- Oscar Cicchetti, CEO, INWIT: Italy
- Michele Vitale, Head of IR, INWIT: Evaluating the value of telecoms towers
- Carlo Ramella, CEO, EI: Small scale acquisitions to drive portfolio growth
- Alexander Chub, President, Russian Towers: Russia
- Scott Coates, CEO, WIG: The role of towercos in fibre rollout
- Nikolai Berdin, CEO, Service Telekom: Inorganic growth: how to play to your strengths through integration
- Jorge Alberto Jimenez, CEO, Axion: The role of broadcast towers in 5G infrastructure
- Nihat Narin, CEO, Global Tower: Turkey
- Colin Cunningham, CEO, Cignal: Ireland
- Chuck Green, Director of edotco Group: Comparing towers in Europe, Asia and Africa
- Jack Coborne, Partner, Arcus: What drives value for European investors?
- Jonathan Dann, Managing Director, RBC: IPOs in Europe - what works?
- Johnny Ekstrom, CFO, TT Networks: Reducing operating costs
- Rikke Josephsen, Site Manager, TT Networks: Standardising operations across a tower portfolio
- Arthur Akopyan, Managing Director, UFG: The investment landscape in Russia and the CIS
- Marc Perusat, Managing Partner, TASC: Towers in the Middle East
- Sergey Pliassak, Investment Advisor, Logycom: Towers in the CIS
- Zardasht Khalid, Senior Manager, Korek Telecom: Rebuilding a telecoms network in Iraq
- Andrey Glukhov, CFO, Vertical: Moving from a real estate to a service model
- Donal O’Shaughnessey, Chairman, Cignal: Making the business case for rural towers in Europe
- Alex Mestre, CCO, Cellnex: Sale and leaseback in Europe: what are the benefits?
- Oscar Pallarols, Director of Innovation and Product Strategy, Cellnex: Prioritising technologies for towerco investment
- David Porte, Vice President - International, SBA: Comparing the US and European tower markets
- David Crawford, CEO, Arqiva: Is there a place for the ‘real estate’ towerco model in the future network?
- Eric Crabtree, CIO, IFC: Wireless infrastructure in emerging European markets
- Juliette Wallace, Business Planning & Property Director, MBNL: Landlords and leasing
- Rustem Umerov, MD, Astem: Identifying opportunities in Europe’s emerging markets
- Dmitry Shevchenko, CFO, Megafon: Carving out Russia’s largest towerco: internal buy-in, obstacles and opportunities
- Joerg Weber, SVP Investment Management, Deutsche Telekom: Topic TBC
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What’s new at Meetup Europe 2018?

Champagne discussion forums
Rather than waiting with your hand in the air at the end of a panel discussion, we’re introducing discussion forums at the end of Day One, to allow you to put your questions directly to our panelists in an informal and off the record environment. Featuring the keynote panelists from throughout the event, as well as bringing together focus groups in specialist areas, including Women in Towers, this relaxed format will allow you to put your questions directly to the most senior experts in the industry.

Working Groups
Working groups are designed to address some of the key operational and strategic questions faced by European tower owners, such as how towercos are making the shift from a real estate to a ‘service’ model and dealing with land owners and leasing. These in depth sessions will help drill into the opportunities as well as the stumbling blocks presented by these issues and participants will come away with agreed action points as well as insight into how the industry at large is approaching the issues.

Rising Stars
TowerXchange is committed to encouraging growth and diversity in the tower industry in all forms. With this in mind we’re delighted to launch our first ever ‘Rising Stars’ editorial in Issue 22 of the TowerXchange Journal, featuring Chuck Green, Director of edotco and formerly of Crown Castle. Nominations are open to up-and-coming execs in towercos and MNOs.

Buyer Briefings
Introduced at our African event and immensely popular, Buyer Briefings allow tower owners to set out their needs and expectations to the suppliers and solutions providers in the ecosystem. Encompassing everything from power to small cell roll out, asset management to drones; and delving into procurement processes, the buyer briefings give tower owners a platform to challenge the industry to offer the solutions they need.
Praise for TowerXchange Meetup Europe 2017

THE industry meeting ground to explore the evolving TowerCo business of Small Cells - Patrik Jakobson, Head of Network as-a-Service, Ericsson

The TowerXchange Meetup in London was an excellent event this year. Really well organised and in particular a great attendance of Industry players, Suppliers and advisers Well done to all the team involved. Looking forward to next year already - Colin Cunningham, CEO, Cignal

TowerXchange MeetUp is a must attend event to be at the cutting edge of tower industry - Alexey Podryabinnikov, Marketing Director, Russian Towers
Praise for TowerXchange Meetup Europe 2017

TowerXchange Meetup Europe - a must attend event - **Janusz Skrzypkowski, Chairman, ECS**

A unique meeting point for investors, MNOs and Tower CXOs to understand and exchange information - **Torbjorn Teigen, CEO, Norkring AS**

One of the best sessions I have come across over the years. Innovative and very informative. High quality attendees. - **Joris Fleerackers, European Sales Manager, Deltanode Solutions**

The unique meeting focused on wireless infrastructure that exceeded expectations - **Paolo Crocetti, Director of Institutional Affairs, EI Towers**
How can I join?

270 passes available for 2018
All previous Meetups have SOLD OUT: Register early to avoid disappointment

Conditions of entry

1. Attendance is restricted to Director level or higher
2. Vendors (with the exception of MSPs) are restricted to a maximum of two delegates per company in order to balance the ratio of buyers to sellers (to enquire about increasing your presence through sponsorship or exhibition contact Annabelle Mayhew)

Register today to guarantee your involvement

| www.towerxchange.com/meetup/meetup-europe/apply-to-attend |
| amayhew@towerxchange.com |
| +44 (0) 7423 512588 |

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<th>Pricing</th>
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<td><strong>Standard pass</strong></td>
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<td><strong>Mobile network operators</strong></td>
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<td><strong>Sponsorship and exhibition</strong></td>
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*Discount codes to be supplied on application to Annabelle Mayhew at amayhew@towerxchange.com. Please note these will only be supplied to qualified MNOs and independent towercos.
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The first quarter of 2018 hasn’t seen a huge amount of deal activity, but the past few months have laid the foundations for potential shifts in the European landscape with towercos, broadcast towercos and mobile network operator portfolios coming to market, and more IPOs mooted for 2018.

In the broadcast vertical, the dust is still settling from the cancelled sale and abandoned IPO of Arqiva in late 2017. There’s no doubt the asset was highly sought after, but it seems that finding a valuation agreed on by buyers, markets and shareholders proved more tricky. French broadcast towerco TowerCast is believed to be still on the market, but owners NRJ may find that their ambitions of inflating the value of the towers through potential telecoms colocations have been burst by the excitement for a much larger and more valuable asset in the SFR portfolio, owned by Altice. Finally, Finnish broadcast towerco Digita appears to be reaching the end of a bidding process, although the latest rumours suggest that owners First State Capital may be more inclined to consider an IPO if the bids don’t match expectations. Although Digita is a relatively small towerco, their investment in IoT and datacentre solutions makes it an attractive asset in a solid market.

Aside from Digita, we are keeping our ears to the ground for other European IPOs. With three towerco IPOs expected in Africa in 2018 market interest will be piqued, and further benchmarks for valuation could prove useful for less developed markets. For example, Turkey’s Global Tower, who postponed their own IPO in late 2016, have yet to officially declare their plans for the continuation of this process.
We expect more towerco consolidation to take place in 2018, with Cellnex continuing to gain ground in new markets, American Tower continuing to explore their options and the possibility of new players from outside Europe showing an interest in the market. We may also see some long-awaited consolidation in the Irish market as well. In Italy, rumour has it that the INWIT sale, cancelled in 2016, may also be back on the cards for this year, which could lead to a deal of a scale to test the digestive capacity of acquisitive towercos who are keen to make the most of other European opportunities as well.

It feels like the European operators are beginning to feel more open towards the idea of a sale and leaseback of their assets, both through necessity (as they refocus their capital and energy on 5G rollout needs) and as we see some successful relationships between European towerco and MNOs bearing fruit. Altice have announced the planned sale of their Portuguese assets (around 3,000 towers) and are widely expected to put their ~5,000 French towers on the market in the near future. Swedish operator Telia has declared an interest in offloading passive infrastructure assets as well, although no process has been formally announced to date.

All in all, 2018 looks set to see an acceleration of European tower deals and in the evolution of the tower landscape. Make sure you find out further information first hand at the TowerXchange Meetup Europe 2018, on April 17-18 at the Business Design Centre in London.

The current state of play in Europe
Let’s review the current state of the European tower industry country by country. A couple of caveats before you start reading: firstly, TowerXchange includes Russia, Turkey, the CIS and former CIS States in our definition of Europe. Secondly, our definition of a “tower” is slightly different in Europe – when presenting tower counts, we are always interested in sites and structures that can accommodate multiple tenants, and which towerco might consider investible. While our tower statistics on emerging markets focus on ground based towers, in Europe we are equally interested in counting rooftop sites, but we exclude multi-tenant DAS, microcells and small cells from headline counts, at least until a single small cell can be shared and monetised to multiple tenants.

TowerXchange tower counts are the result of qualitative market research and the aggregation of our own and other research firms’ work – as such they should be treated as estimates. We assert copyright over data sourced to TowerXchange – you will need to request our permission to quote our data and there may be a charge to do so.

CIS
Until this point the CIS has been relatively low on tower activity. In 2017 VEON decided to bring over 12,000 towers to market in Ukraine, Kazakhstan, Armenia and Georgia. We did believe that this deal was quietly scrapped after the sale of VEON’s Russian towers was cancelled in May 2017, but are now aware that VEON may be courting a new buyer with experience in the region.

Emerging from recession after political instability, Ukraine is a growth market with 3G yet to be extensively rolled out and 4G still on the horizon, meaning a potential 2,500 PoP could be added in the next three years.
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In 2016 Turkcell carved out and transferred 811 lifecell towers to UkrTOWER, the local subsidiary of their captive towerco Global Tower. UkrTOWER’s current site count is 1,201, including a number of in-building solutions, and the company boasts a healthy tenancy ratio. Outside of UkrTOWER, there are multiple structures available for colocation in the market, so there is a significant margin for error in our site counts. While all parties agree VEON has around 3,500 sites, around 60% of which are rooftops and 40% ground based towers, our best estimate is that Kcell owns around 5,500 towers and rooftops, with Altel and Tele2 combining a total of around 4,200 towers and rooftops. Third party structures make up around 30% of Kazakhstan’s mobile networks, and total at least 1,500, perhaps significantly more.

Georgia and Armenia consist of around 3,000 and 2,200 sites respectively. Around 65% of sites are rooftops, but less alternate site typologies are used than in Kazakhstan: just a handful of broadcast tower co-locations.

**Belarus**
Global Tower has recently taken control of Turkcell’s towers in Belarus, where they have owned subsidiary BeST since 2008. Global Tower currently operates 828 towers in the country under the name BelTower.

**Czech Republic**
With an ongoing project to decommission 35-40% of the country’s parallel infrastructure, TowerXchange estimate there are around 10,200 active cell sites in the Czech Republic’s telecom network, of which only around a quarter are ground based towers, with the balance being rooftops and IBS.

CETIN (Česká Telekomunikační Infrastruktura), an infraco carved out of O2, has 4,800 towers and 750 micro sites. CETIN’s business model includes all the physical assets which used to belong to O2, including active equipment and 38,000km of fibre, the MNO having been acquired by PPF and the infrastructure business spun off. CETIN absorbs O2’s RANsharing venture with T-Mobile, which operates under the MORAN model.

**Denmark**
Infrastructure sharing is second nature in Denmark, where Telia and Telenor formed active infrastructure sharing joint venture TT-Network. There are around 4,500 towers in Denmark, with co-location management agreements managed through KPR Consult. Falck operates a small towerco in the country with around 75 towers, while Teracom operates the country’s broadcast towers.

There is little possibility of sale and leasebacks in Denmark in the short term, but don’t discount the possibility in the medium to long term, with TT Networks working to streamline operations quite possibly in advance of a divestiture.

**Finland**
There are around 10,000 towers in Finland, around
half of which are owned by incumbent operator Elisa, with the balance distributed across the other MNOs Telia and DNA. An active infrastructure sharing joint venture between Telia and DNA increases the efficiency of providing coverage to the sparsely populated Northeastern region.

Digita operates Finland’s broadcast network, with 27 high masts and 530 smaller masts and is currently assessing several bids for a sale while also believed to be considering an IPO to add to 2018’s clutch of flotations.

**France**

There are just over 25,000 ground based towers in France, of which 55% remain operator-captive. The remainder are divided among three independent towercos: broadcast-telecom hybrid TDF has 4,865 telecom towers, ATC Europe (formerly FPS Towers) has 2,484, and Cellnex have bought into the French market with 2,300 existing Bouygues towers and a further 1,200 in the pipeline. In addition to the 25,000 ground base towers, there are a further 7,500 alternative ground based structures and ~15,000 rooftops. TDF and ATC France currently provide 10% of those rooftop sites, but both are positioning themselves to play a larger role in this segment of the ecosystem, and Cellnex’s most recent acquisition will make a total of around 1,450 new rooftops available for colocation.

Altice, owner of French opco SFR, has recently announced the planned sale of its towers in Portugal, and we await a similar announcement for the French market. All three of the key French players: TDF, Cellnex and American Tower, could be interested

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**What is the breakdown of the high sites used by the French telecom industry? And who owns them?**

**Ground based towers**

1. **Orange 8,100**
2. **SFR 5,300**
3. **TDF 7,728**
4. **ATC France (formerly FPS Towers) 2,472**
5. **Cellnex (acquired from Bouygues) 4,100**
6. **Free 350**
7. **Other structures not belonging to towercos or MNOs 2,900**
8. **Other ground based structures 7,500**

**Rooftops structures with telecom equipment**

9. **Rooftops sites sourced directly by MNOs 13,090**
10. **Rooftop sites provided by TDF 301**
11. **Rooftop sites provided by FPS Towers 159**
12. **Rooftop sites sold to Cellnex 1,450**

**Rooftops without telecom equipment installed, but for which a towerco has a commercialisation agreement:**

13. **TDF 2,985**
14. **FPS Towers 20,000**

Sources: TowerXchange research, ANFR, FPS Towers, TDF
Funkturm operates over 34,700 sites in Germany, of which around 8,000 are ground based towers with the rest being rooftops. Subsidiary Omega Towers manages 7,700 further sites (mostly rooftops) transferred from Telefónica in July 2015.

Deutsche Funkturm report that they are building “a significant number of new macro locations per year”; with three to four years of LTE rollout still to come, followed by 5G, there are drivers for modest organic growth.

We recently discovered that the jump in American Tower’s German site count in Q216 was due to the very low profile acquisition of 186 transmission towers from German broadcaster WDR. Although the cost of these towers was not publicised, we estimate that American Tower probably paid around €35-50mn for the towers. Rumours that they were seeking third party investment turned out to be grounded, with Dutch pension fund PGGM paying €250mn for a 49% stake in their German operations, resulting in a joint venture, ‘ATC Europe’ which has already made an acquisition in the shape of France’s FPS Towers. With Deutsche Funkturm cooling on the idea of an IPO, it may be that there is potential for American Tower to consolidate their position in the German market.

In these assets, as well as newcomers to the French market who are keen to get a foothold in Europe.

There has also been recent activity in the broadcast vertical of the French market. With TDF acquiring ITAS for a reported €100mn (420 towers) and NRJ seeking a buyer willing to part with €300mn for their 500-tower asset Towercast.

**Germany**

The German tower market may be characterised by slow growth, but it is entering a period of rapid change.

Telefónica transferred 2,350 German towers into their towerco Telxius in 2016 in a deal valued at €587mn. After pulling their IPO due to low investor interest, Telefónica has since sold a 40% stake to investor KKR for €1.3bn.

Meanwhile, Deutsche Telekom were rumoured to be gearing up to monetise their towerco Deutsche Funkturm, but with enthusiasm for an IPO cooling after the cancellation of similar flotations recently, and no word of a strategic sale, it seems they may hang on to the asset a little longer. Deutsche Funkturm operates over 34,700 sites in Germany, of which around 8,000 are ground based towers with the rest being rooftops. Subsidiary Omega Towers manages 7,700 further sites (mostly rooftops) transferred from Telefónica in July 2015.

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Just 16,558 of Germany’s 70,162 cell sites are ground based towers – the rest are rooftops.

There are a total of around 23,000 co-locations in Germany, most being on Deutsche Funkturm and American Tower’s ground based towers.
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with tenancy ratios estimated at 2.5 and 1.8 respectively. There are few co-locations on German rooftops as demands for supplementary payments from landlords ruin the economics.

**Greece**
While there are no independent towercos in the 12,000 site Greek market at present, tough economic conditions and the dominance of market leading Cosmote may prompt a sale and leaseback in the medium term.

Cosmote’s competitors Wind may have an appetite to monetise their towers, while the other MNO in Greece, Vodafone has less financial incentive. Joint venture infraco VICTUS Networks currently manages Vodafone Greece and Wind Hellas’ sites. There are around 10,500 tenants on VICTUS Networks’ 7,000 sites. Decommissioning could see VICTUS Networks’ site count fall to 6,000 and the tenancy ratio rise accordingly.

Broadcast towerco Digea owns 156 towers in Greece.

**Ireland**
60% of Ireland’s 4,000 cell sites sit in the hands of the country’s three MNOs: Vodafone, Meteor and 3.

A network sharing partnership between Meteor and O2 (Mosaic) is in place with 3 joining the alliance, putting downward pressure on current and prospective future tenancy ratios.

With little prospect of sale and leasebacks in Ireland, the most likely source of tower

---

**Who owns Ireland’s 4,000 towers?**

- 3 + O2 (Hutchison): 1,100
- Vodafone: 800
- Meteor (Eir): 500
- Towercom: 400
- Shared Access: 377
- ESB Telecoms: 201
- Cignal: 150
- 2RN (RTE): 100
- CIE: 100
- Highpoint (Obelisk): 70
- Hibernian (Britannia): 50
- Wireless Infrastructure Group: 377

Source: TowerXchange

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**Who owns Italy’s 47,218 telecom and broadcast sites?**

- INWIT: 11,400
- Vodafone: 8,933
- Cellnex: 8,757
- Hutchison: 2,000
- Wind: 11,000
- TowerTel: 1,000
- Others: 8,000
- EI Towers: 2,300
- Rai Way: 2,300

Source: TowerXchange
transactions remains consolidation among the many independent tower companies, broadcast operators and public sector players. Irish towerco Cignal seems keen to consolidate further after their acquisition of Cellcom in early 2017, and larger European players seem to be turning their attention to this small but interesting market as well. We anticipate seeing some smaller scale consolidation between existing Irish towercos in the short term, followed by the entry of a larger towerco in the medium term.

**Italy**

With the merger of 3 and WIND now complete, and Iliad confirmed as a new entrant into the Italian market, all eyes are on how this will play out. Already, Iliad owner Xavier Niel, known as the enfant terrible of the French telecoms sector, is locked in a war of words with the incumbent operators, who fear the introduction of new business models and aggressive price wars. Although no set plan of action is in place for Italy’s infrastructure, it’s widely believed that Iliad’s requirements will ‘free up’ around 5,000 towers, which may well come to market in the coming months and which will be of interest to several parties.

Currently, INWIT, Cellnex and EI Towers’ TowerTel lead the telecom tower market in Italy, where towercos own just under half the total sites, and where decommissioning may outstrip organic growth in the coming years.

TIM retains a 60% equity stake in INWIT, with the balance having been floated on the Milan Stock Exchange in June 2015, and had initiated a process to sell some or all of their retained equity in 2016 which was then halted ostensibly because the TIM management team believed that several value adds had yet to reach fruition and were not yet reflected in INWIT’s valuation. The latest rumours imply that the INWIT sale may well be back on for 2018, with Cellnex tipped as the most likely buyer, although the interest of several other investors and towercos means it is far from a done deal.

In the last year INWIT has decommissioned around 200 sites, bringing their Q117 site count to 11,000. By the end of 2018, INWIT forecasts driving tenancy ratios to around 1.9, decommissioning 800-1,000 more sites, and building as many as 500 new sites, primarily for TIM’s 4G rollout.

The continent’s largest pan-European towerco, Cellnex, has rolled up several small towercos in Italy, but the lion’s share of their portfolio comes from the acquisition of Wind’s towerco Galata, and their 7,377 towers, for €693mn in 2015. At the end of Q317, Cellnex operated 8,933 sites in Italy, with build-to-suit slightly outstripping decommissioning.

Both INWIT and Cellnex remain bullish about the potential of small cells in Italy, highlighted by Cellnex’s acquisition of CommsCon for €18.65mn in June 2016.

The other key player in the Italian market is EI Towers, whose telecom-focused subsidiary TowerTel has built and acquired a portfolio of 700 telecom towers with an aggregate EV of up to €55mn, ~300 of which have been added through several small acquisitions.

**The Netherlands**

Only 20% of The Netherlands’ 15,204 cell sites are macro cell sites, with the balance being rooftops, DAS and small cells.

Cellnex has acquired Protelindo’s 261 Dutch towers for €109mn, (and is now marketing the towers under the name ‘Towerlink Netherlands’), and a further 460 as part of their deal with Shere Group. There is no duplication between the two portfolios. Following the small scale acquisition of local towers, Cellnex now owns 758 towers, or 24% of the macro towers in The Netherlands, where 1,781 (59%) of the country’s 3,031 ground based towers are already owned by towercos. Cellnex’s acquisition of Dutch broadcast towerco Alticom in 2017 will give them a further 30 towers in the country, as well as securing them high-quality infrastructure to support 5G rollout in the Netherlands.

Open Tower Company has around 850 towers, plus access to over 1,000 electricity pylons and is rumoured to be looking for buyers in 2018. UK headquartered Wireless Infrastructure Group is also present in The Netherlands.

KPN sold their towers in four tranches between 2008-12, while Vodafone and T-Mobile retain around 1,250 towers between them. New entrant fourth MNO Tele2 has few if any towers, preferring to rely on co-location and a RANsharing deal with T-Mobile.
Poland
There are around 22,000 telecom structures in the Polish network, a little under half of which are towers, with the rest being rooftops.

Poland has more subscribers per tower than the majority of other countries in Europe, indicating both potential demand for more towers, and indicating the extent of decommissioning that has already taken place in the country. A balanced, competitive MNO market amplifies the attractiveness of the Polish market to towercos.

T-Mobile and Orange share passive and active infrastructure in Poland through 50-50 joint venture NetWorkS! Initiated in 2011, the partnership was intended to last 15 years, but there has been speculation that one or both party might wish to exit the venture and sell towers to a third party. While NetWorkS! operates around 13,000 towers, the assets remain on T-Mobile and Orange’s own balance sheets. Outside of the NetWorkS! venture, as little as 2% of Poland’s towers are shared between multiple MNOs.

Alinda Capital Partners owned Emitel is the Polish broadcast towerco, operating 377 sites and diversifying into telecom.

Turnkey infrastructure provider ECS is leveraging new capital from CEE Equity Partners to move into tower ownership and leasing.

Portugal
The Portuguese tower market is one of the hottest
in Europe after Altice’s announcement that they intend to sell the macro towers of their Portuguese asset MEO/Portugal Telecom. With around 3,000 towers in Portugal, MEO is the market leading MNO in the country and a solid prospective tenant. As well as Cellnex, who have expressed their interest in the towers, this portfolio should garner interest from a number of European and international towercos and investors. Watch this space!

Romania
Romania hosts a competitive four MNO market, with no independent towerco activity to date. Orange and Vodafone Romania operate a joint venture infrastructure sharing company called Netgrid Telecom (formerly Ovidiu Telecommunications).

Despite being one of the poorest countries in Europe, ARPU is relatively high in Romania at around €20, which means there is little financial imperative for the country’s MNOs to monetise their towers.

Russia
TowerXchange estimate there are around 58,900 ground based towers and 65,400 rooftop structures across the vast Russian landscape. Each of Russia’s four MNOs is utilising tower company business models, but in contrasting ways.

VEON’s creation of ‘National Tower Company’, into which they have injected their ~13,000 Russian towers, was hailed as a precursor to the sale of the assets to an independent towerco. However, the company decided to pull the plug on the sale process in May 2017, leaving it unclear whether the towers would be reabsorbed into the opco or would continue to operate as a towerco in competition with the independent players in the market.

MegaFon has carved out ‘First Tower Company’, which they are gearing up to monetise in 2018 and with a possible view to a future sale to a strategic buyer. MTS has injected part of their portfolio, 5,500 towers, into ‘MTS Towers’ with a view to making the towers available for co-location, but has declared an intent to retain ownership of the venture. Meanwhile, rumours persist that Tele2 Russia are selling their ~9,000 towers.

Leading local towercos Russian Towers and Vertical, as well as the Russian Direct Investment Fund, are all expected to be prominent bidders as Russia’s towers come to market, with Tele2’s towers the most likely up for grabs. Russian Towers is also undergoing a period of sustained organic growth, growing from ~2,300 towers to ~3,100 over 2017. Newcomer Service-Telecom is also keen to expand organically and recently acquired Link Development, a Russian towerco with around 200 towers in the St Petersburg region. A new

<table>
<thead>
<tr>
<th>Ground based towers:</th>
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</thead>
<tbody>
<tr>
<td>1. First Tower Company (MegaFon) 15,500</td>
</tr>
<tr>
<td>2. National Tower Company (VEON) 13,000</td>
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<tr>
<td>3. MTS Towers 5,500</td>
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<tr>
<td>4. MTS retained towers 11,000</td>
</tr>
<tr>
<td>5. Tele2 Russia 9,000</td>
</tr>
<tr>
<td>6. Russian Towers 3,100</td>
</tr>
<tr>
<td>7. Vertical 2,300</td>
</tr>
<tr>
<td>8. Service-telecom (including acquisition of Link Development) 1,000</td>
</tr>
<tr>
<td>9. Sotka Vysotok 200</td>
</tr>
<tr>
<td>10. Other towercos 250</td>
</tr>
<tr>
<td>11. Rooftops 65,400</td>
</tr>
</tbody>
</table>

Source: TowerXchange
Estimated ownership of Spain’s 48,997 telecom and broadcast sites

<table>
<thead>
<tr>
<th>Company</th>
<th>Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellnex</td>
<td>12,500</td>
</tr>
<tr>
<td>Axion</td>
<td>584</td>
</tr>
<tr>
<td>Orange</td>
<td>7,423</td>
</tr>
<tr>
<td>Telxius</td>
<td>17,500</td>
</tr>
<tr>
<td>Vodafone</td>
<td>11,000</td>
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</table>

Source: TowerXchange

In 2016, Telefónica transferred 11,000 Spanish towers and rooftops to their towerco Telxius for an undisclosed sum ahead of ahead of their planned IPO, however, the IPO was scrapped in October 2016 due to lack of interest in the market. Telefónica has since completed the sale of a 40% stake in Telxius to investment firm KKR for €1.3bn.

AMP Capital has agreed a deal to acquire 100% of Axion from current owners Antin Infrastructure. Axion operates 584 broadcast towers, with some telecom co-location, 70% of which are in Andalucía.

**Switzerland**

Cellnex acquired 2,339 towers from Sunrise in May 2017, creating Switzerland’s first fully fledged towerco Swiss Towers AG. Working with partners Swiss Life and Deutsche Telekom Capital Partners, the Cellnex-led consortium paid €430mn for roughly 20% of Switzerland’s 11,300 towers, mostly in

**Sweden**

There are no independent tower companies in Sweden, largely because network sharing is efficiently managed through three network sharing joint ventures.

**Slovakia**

Broadcast towerco Towercom, which has around 700 sites, was acquired by Macquarie Infrastructure Fund in 2013. Towercom turns over in excess of €50mn annually and includes O2, T-Mobile and Orange among their customer base. Towercom completed the roll up of TBDS, RK Tower and Rádiokomunikácie in 2008.

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Managed service provider Konsing Group, which also owns a portfolio of 47 sites, counts all three MNOs among their client base (Telekom Serbia, Telenor and Telekom Austria).

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39% of the 48,997 broadcast and telecom towers and rooftops in Spain are owned by towercos, led by Telefónica’s Telxius and European market-maker Cellnex.

Cellnex has seen fast growth in its telecoms arm, deriving €471mn of its €789mn 2017 revenue from telecoms, an increase of 23% yoy. In 2017 they entered the Swiss market, as well as acquiring Alticom in the Netherlands.

Russian towerco has also recently come onto the TowerXchange radar: Stoka Vysotok. Based in Tatarstan, Sotka Vysotok is believed to have around 200 towers centred mainly around the regional capital, Kazan.

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SUNAB is a 50-50 3G joint venture between Tele2 and TeliaSonera which runs the MOCN RANsharing model; Net4Mobility, another 50-50 joint venture, runs Telenor and Tele2’s combined 2G and 4G network; and 3GIS is a joint venture running Telenor and 3’s 3G network outside of Sweden’s largest cities.

Teracom operates Sweden’s broadcast tower network. There are a little over 10,000 sites in Sweden.

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rooftop locations. With future build to suit as well as 200 DAS nodes agreed in the deal, Cellnex sees a chance for significant growth through data usage and 5G rollout in this central European country.

**Turkey**

Turkcell, Turkey’s largest mobile network operator, announced plans to list their towers unit, Global Tower, in April 2016. However in October 2016 Turkcell decided to postpone the IPO at the eleventh hour, citing global political uncertainty and the possibility of cyber attacks. TowerXchange believes that Turkcell planned to list 25% of the business and was perhaps hoping for a more Cellnex-like valuation multiple than was likely to be achieved. With Turkcell making ambitious plans to support revenue growth through expansion into overseas markets, an IPO or sale is certainly not off the agenda.

Established in 2006, Global Tower has 8,067 ground based towers among a portfolio of over 23,000 sites in Turkey. Of these macro towers, TowerXchange believes that Global Tower owns around 3,400 and leases around 2,390 from Turkcell, for which they only receive revenue from co-locations. In addition they manage a portfolio of around 2,215 towers on behalf of Turkcell, for which they just receive maintenance fees.

Turkey is also home to one of the world’s largest government-owned universal service networks, called ‘Universal Services Project’ and implemented by the Ministry of Communication and Transportation. Phase one of the project was auctioned in 2011, with Turkcell implementing 1,100 rural sites following a successful bid. Phase two was recently auctioned and will see Vodafone and Turk Telekom creating a joint venture to build a further 2,500-3,000 RANsharing sites in rural areas.
Who owns/operates the UK’s 36,000 active cell sites?

**United Kingdom**

The UK has a tower market structure unlike any other in the world. Independent towercos, headed by Arqiva, Wireless Infrastructure Group and Shere Group (recently acquired by Cellnex in 2016), own 38% of the 38,500 active towers in the UK. The balance are contained within two joint venture infracos: CTIL, which operates Vodafone and O2’s network (Telefónica), and MBNL, which performs a similar function for EE (now BT) and 3 (Hutchison). CTIL and MBNL are both the primary clients of the UK’s independent towercos, and site sharing businesses in their own right. Their business models differ in that the tower assets are actually on CTIL’s balance sheet, while MBNL is a management company with the assets retained by the MNOs. CTIL is a passive infrastructure sharing play, while MBNL’s model extends to active infrastructure and transmission sharing.

The UK’s broadcast tower operator Arqiva has been through many changes of identity and ownership (BBC, Crown Castle, National Grid to name a few), and was initially believed to be close to closing a sale to a consortium of buyers led by Brookfield, before a short-lived attempt at an IPO in Q417. It remains to be seen whether Arqiva will revisit the option of a strategic sale, or give themselves some breathing room to try and show that their improving EBITDA is sustainable in order to close the gap between their expectations and market valuation.

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**Major European towerco equity deals and listings since 2016**

<table>
<thead>
<tr>
<th>Year</th>
<th>Seller</th>
<th>Entity and # towers</th>
<th>Buyer/Stock Exchange</th>
<th>Equity%</th>
<th>Deal value in €</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Telefonica</td>
<td>Telxius 16,000</td>
<td>KKR 40%</td>
<td>1,300,000,000</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>American Tower</td>
<td>American Tower Germany 2,197</td>
<td>PGGM 49%</td>
<td>Undisclosed</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>Antin Infrastructure Partners</td>
<td>Axion 584</td>
<td>AMP Capital 100%</td>
<td>Undisclosed</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>New equity investment</td>
<td>Wireless Infrastructure Group 2,000</td>
<td>3i Investments</td>
<td>Undisclosed</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Telecom Italia</td>
<td>INWIT 11,200</td>
<td>MIB 40%</td>
<td>875,300,000</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Abertis</td>
<td>Cellnex 15,091</td>
<td>MCE 66%</td>
<td>2,138,000,000</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Coillte</td>
<td>Telecoms assets 300</td>
<td>InfraVia Capital Partners 100%</td>
<td>70,000,000</td>
<td></td>
</tr>
</tbody>
</table>

Source: TowerXchange
## European tower deals since 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Tower count</th>
<th>Deal value €</th>
<th>Cost per tower €</th>
<th>Deal structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Netherlands</td>
<td>Mom and Pop</td>
<td>Cellnex</td>
<td>32</td>
<td>12,000,000</td>
<td>375,000</td>
<td>Company acquisition</td>
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<td>2017</td>
<td>Netherlands</td>
<td>Alticom</td>
<td>Cellnex</td>
<td>30</td>
<td>133,000,000</td>
<td>443,333</td>
<td>Company acquisition</td>
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<td>2017</td>
<td>Switzerland</td>
<td>Sunrise</td>
<td>Cellnex, Swiss Life and DTCP</td>
<td>2,339</td>
<td>430,000,000</td>
<td>183,839</td>
<td>SLB</td>
</tr>
<tr>
<td>2017</td>
<td>France</td>
<td>Bouygues</td>
<td>Cellnex</td>
<td>3,000</td>
<td>854,000,000</td>
<td>284,666</td>
<td>SLB</td>
</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>ITAS TIM</td>
<td>TDF</td>
<td>420</td>
<td></td>
<td></td>
<td>Company acquisition</td>
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<td>2016</td>
<td>Germany</td>
<td>WDR</td>
<td>American Tower</td>
<td>2,482</td>
<td>697,000,000</td>
<td>280,821</td>
<td>Portfolio acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>Antin/FPS</td>
<td>American Tower</td>
<td>2,482</td>
<td>697,000,000</td>
<td>280,821</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>UK &amp; Netherlands</td>
<td>Shere Group</td>
<td>Cellnex</td>
<td>1,004</td>
<td>393,000,000</td>
<td>391,434</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>Bouygues Telecom</td>
<td>Cellnex</td>
<td>230</td>
<td>80,000,000</td>
<td>347,826</td>
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</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>Bouygues Telecom</td>
<td>Cellnex</td>
<td>270</td>
<td>67,000,000</td>
<td>248,148</td>
<td>SLB</td>
</tr>
<tr>
<td>2016</td>
<td>Netherlands</td>
<td>Protelindo</td>
<td>Cellnex</td>
<td>261</td>
<td>109,000,000</td>
<td>417,624</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>Germany</td>
<td>Telefonica</td>
<td>Telxius</td>
<td>2,350</td>
<td>587,000,000</td>
<td>249,787</td>
<td>SLB</td>
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<tr>
<td>2016</td>
<td>Ukraine</td>
<td>Lifecell</td>
<td>UkrTower</td>
<td>811</td>
<td>47,820,000</td>
<td>58,964</td>
<td>SLB</td>
</tr>
<tr>
<td>2016</td>
<td>Spain</td>
<td>Telefonica</td>
<td>Telxius</td>
<td>11,000</td>
<td></td>
<td></td>
<td>SLB</td>
</tr>
<tr>
<td>2015</td>
<td>Ireland</td>
<td>Coillte</td>
<td>Cignal</td>
<td>113</td>
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<td>Portfolio acquisition</td>
</tr>
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<td>2015</td>
<td>Germany</td>
<td>Telefonica</td>
<td>Deutsche Telecom/ Omega Towers</td>
<td>7,700</td>
<td></td>
<td></td>
<td>Asset Transfer</td>
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<td>2015</td>
<td>Italy</td>
<td>Tecnorad</td>
<td>EI Towers</td>
<td>134</td>
<td>17,000,000</td>
<td>126,866</td>
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<td>2015</td>
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<td>Wind (VimpelCom)</td>
<td>Cellnex</td>
<td>7,377</td>
<td>693,000,000</td>
<td>93,941</td>
<td>SLB with 10% equity</td>
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<td>2015</td>
<td>Italy</td>
<td>TowerCo</td>
<td>Cellnex</td>
<td>212</td>
<td>94,600,000</td>
<td>446,226</td>
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</tr>
<tr>
<td>2014</td>
<td>Spain</td>
<td>Telefonica/Voigo</td>
<td>Cellnex</td>
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<td>90,016</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>France</td>
<td>Bouygues Telecom</td>
<td>FPS Towers</td>
<td>2,166</td>
<td>185,000,000</td>
<td>100,400</td>
<td>SLB with 15% equity</td>
</tr>
<tr>
<td>2012</td>
<td>Germany</td>
<td>KPN</td>
<td>American Tower</td>
<td>2,031</td>
<td>393,000,000</td>
<td>193,501</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Protelindo</td>
<td>261</td>
<td>75,000,000</td>
<td>287,356</td>
<td>SLB</td>
</tr>
<tr>
<td>2012</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Shere Group</td>
<td>460</td>
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<td>SLB</td>
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<td>2012</td>
<td>Spain</td>
<td>Telefonica</td>
<td>Cellnex</td>
<td>500</td>
<td>45,000,000</td>
<td>90,000</td>
<td>SLB</td>
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<tr>
<td>2010</td>
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<td>KPN</td>
<td>Open Tower Company</td>
<td>500</td>
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</tr>
<tr>
<td>2008</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Open Tower Company</td>
<td>101</td>
<td></td>
<td></td>
<td>SLB</td>
</tr>
</tbody>
</table>

**Totals / average**
- 41,178
- 3,286,420,000
- 147,082

*Source: TowerXchange*
European heatmap

Legend

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

Note: For the purposes of our European coverage, ‘Towerco’ describes an independent company which owns and operates passive infrastructure for commercial profit. ‘Infraco’ incorporates MNO joint venture organisations and carve outs which serve more than one entity or market their towers commercially.
Meetup 2018 floorplan
Europe’s largest gathering of tower owners in one room: How can you make the most of the opportunity?

The TowerXchange Meetup Europe enables you to condense months of travelling, client visits and business development calls into just two action packed days. Yet with such a large number of clients in one place, planning your time efficiently and finding a way to stand out from the crowd is a must.

As a sponsor or exhibitor at the event you open up a world of premium opportunities unavailable to delegates. Such opportunities have proven so valuable that over 60% of 2017’s sponsors and exhibitors rebooked their packages during the course of last year’s event!

Can you afford not to join them?

TowerXchange’s top five tips to meet your goals on site

1. Position yourself as a thought leader and let clients approach you
   - Share expertise in the TowerXchange Europe special edition journal
   - Lead the discussion by hosting a roundtable or discussion forum

2. Secure access to invitation-only working groups with MNO and towerco procurement teams
   - Closed door task forces eliciting intimate feedback from buyers responsible for trialing, procuring and using key energy equipment and monitoring and management systems

3. Create a meeting point and bring in reinforcements to cover a large client base
   - Vendors are limited to two Meetup passes to preserve the ratio of buyers to sellers; exhibitors can leverage two additional expo hall passes to cover more meetings with the large customer base
   - Welcome prospects to your exhibition stand or take a closed meeting room for ad hoc conversations when needed
   - Benefit from TowerXchange’s concierge service; facilitating one-to-one introductions

4. Strengthen brand awareness, reputation and likeability
   - Sponsor the networking breaks, drinks reception or networking dinner: this year’s most prominent branding opportunities

5. Arrive prepared: Benefit from a briefing on what your target clients are looking to buy
   - Get ahead of the crowd, don’t just find out which companies are attending but learn more about their portfolio, strategy and who will be representing them in our exclusive pre-event briefing

To discuss the opportunities available contact Annabelle Mayhew, Chief Commercial Officer
e-mail: amayhew@towerxchange.com
phone: +44 (0) 7423 512588
Our sponsors & exhibitors

**SILVER SPONSOR:**

![Acsys Technologies Ltd](acsys.com)

**Acsys Technologies Ltd**

Acsys is a specialized towerco security and field service management software provider. Recognizing the telecom industry's relentless drive to efficiency, we design solutions to accelerate you forward. Our software and mobile applications in combination with military-grade access control hardware form a 4 tiered tool for: Flexibility, Efficiency, Productivity, and Security.

Our solutions are designed to improve your site operations through the near elimination of theft, reduced inefficiencies, vendor and ticket auditing, and real-time remote control of field technicians. In the age of Big Data, Acsys gives you the intel you need to offer your tenants a better experience while reducing your OPEX.

Our expert team of mechatronic security, software development, and telecom professionals represent 14 nationalities and have combined their expertise to deploy the Acsys solutions in nearly 50 countries around the globe. Acsys is ISO 9001 certified and a preferred supplier of many of the biggest names in the telco industry.

Acsys – solutions built to improve your bottom line.

[www.acsys.com](http://www.acsys.com)

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**SILVER SPONSOR:**

![Tarantula](tarantula.net)

**Tarantula**

Tarantula is a proven world leader in telecom site management software and the trusted partner of leading telecom infrastructure operators in 20 countries. The company is owned by Volaris Group, an operating group of Toronto-based software and services provider Constellation Software Inc. Through its specialised site management platform, Tarantula is a fundamental pillar of support behind the management of more than 350,000 mobile towers and assets worth US$25 billion around the world.

Red Cube is the industry standard for end-to-end tower lifecycle management. It is built around 30+ real-world, best practice towerco processes that have been brought to life through persona-based workflows, linking together towerco data such as assets, leases, processes, and financials into one central business model. This functionality is available straight out of the box, allowing companies to quickly deploy an optimised towerco business model.

[www.tarantula.net](http://www.tarantula.net)

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**SILVER SPONSOR:**

![Accruent](accruent.com)

**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, retail, education, healthcare, and corporate markets with over 7,000 customers in 149 countries.

[www.accruent.com](http://www.accruent.com)
Our sponsors and exhibitors

BRONZE SPONSOR: Vinson & Elkins RLLP

Vinson & Elkins is one of the oldest and largest international law firms, with approximately 700 lawyers located in 16 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.

www.velaw.com

BRONZE SPONSOR: Cellnex Telecom

Cellnex is the main services and infrastructure operator for wireless telecoms in Europe. It operates in Spain, Italy, the Netherlands, France, Switzerland and the United Kingdom. Its activities are structured around four main areas: telecoms infrastructure services, audiovisual content distribution networks, security and emergency services networks, and smart infrastructure and urban services management solutions (smart cities and the internet of things).

www.cellnextelecom.com/en/

BRONZE SPONSOR: MediPower

Since 2003, MediPower keeps the leading position as ESCO for the Italian telecom sector, providing energy to off-grid BTS for all the local MNOs (Vodafone, Wind, TIM, H3G). Operating in FULL OPEX model within an extremely challenging logistic and environmental scenario, the company holds a market share greater than 80%.

MediPower experience is replicable globally, relying on the “best-in-class” technology provided by Ausonia: AC & DC gensets, hybrid solutions, remote management and renewable sources integration.

For these reasons, MediPower represents the ideal energy partner to globally approach network implementation projects and/or operational optimization processes, in a cost effective way.


BRONZE SPONSOR: Intelsat

Intelsat S.A. (NYSE: I) operates the world’s first Globalized Network, delivering high-quality, cost-effective video and broadband services anywhere in the world. Intelsat’s Globalized Network combines the world’s largest satellite backbone with terrestrial infrastructure, managed services and an open, interoperable architecture to enable customers to drive revenue and reach through a new generation of network services. Thousands of organizations serving billions of people worldwide rely on Intelsat to provide ubiquitous broadband connectivity, multi-format video broadcasting, secure satellite communications and seamless mobility services. The end result is an entirely new world, one that allows us to envision the impossible, connect without boundaries and transform the ways in which we live. For more information, visit our website.

www.intelsat.com

Exhibitor:

Abloy Oy

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

ABLOY protects people, property, and business operations on land, at sea, and in the air – in all circumstances. Solutions created for users’ individual need extend from locking of homes to sites of operations requiring professionally provided high security. Both the trust users place in us and our pioneering position are based on long-term endeavours – continuously developing new and innovative locking solutions and door-opening technologies that facilitate smooth entry and exit. The position of ABLOY as one of the four global brands of ASSA ABLOY Group supports our internationalization process and empowers us to strengthen our business in existing markets and to expand into new areas.

www.abloy.com

www.towerxchange.com/meetups/meetup-europe | TowerXchange Europe Dossier 2018 | 39
Our exhibitors

Exhibitor:

NorthStar Battery

NorthStar delivers reliable and sustainable power to the world, by designing and manufacturing high performance batteries and energy-saving battery cabinets. NorthStar products are built to provide longer battery life and reduced environmental impact. The company has state-of-the-art facilities in the USA and Sweden, and their products are used in more than 150 countries worldwide. NorthStar can cut your operating costs with their long life products, high operating temperatures and efficient battery cooling.

The new NorthStar ACE™ is the future of energy storage management, an Internet of Things concept that allows you to monitor your batteries remotely using Bluetooth and the cloud.

www.northstarbattery.com

Exhibitor:

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

Exhibitor:

HIMOINSA

HIMOINSA is a global corporation that designs, manufactures and distributes power generation equipment worldwide.

It has extensive experience in the telecommunications market, having supplied equipment with power outputs ranging from 8 to 45KVA in the international market to well-known companies in the sector.

Our telecom range gensets can work remotely, providing efficient and reliable power and incorporate functionalities such as: GPS system, making it possible to locate the machine at any time, fuel level alarm, remote management and remote control for gathering and recording data in real time. HIMOINSA has develops a variable speed hybrid generator sets that reduces fuel consumption by 40% and extend maintenance periods up to 1000 hours.

www.himoinsa.com

Exhibitor:

M2Catalyst

M2Catalyst is a big data/business analytics licensor that crowdsources trillions of cell tower, mobile network, device, and application data points from millions of mobile devices. Our data scientists then utilize proprietary algorithms to generate invaluable actionable intelligence for members of the wireless ecosystem, i.e., infrastructure providers, tower owners, wireless carriers, mobile device manufacturers, and app developers.

http://www.m2mobileinsights.com/blog/a-r-evolution-in-how-towers-are-valued-and-how-co-locations-are-sold/
Hardiman Telecommunications

Hardiman Telecommunications Ltd. was established in 1994. We are a boutique consultancy specialised in strategy development, due diligence assessment and valuation support. Our clients include major TowerCos, private equity funds, corporate finance / advisory and investment functions of leading banks, and telecommunications carriers. We are particularly active in end-to-end support of mergers, acquisitions and divestitures. All of our staff have held profit-accountable positions with global telecommunications carriers, manufacturers and systems integration houses prior to joining us. This allows full support of clients across the continuum from technology through to market effectiveness, spanning engineering, commercial strategy, financial structuring and proven operating methodologies.

www.esbtelecoms.ie

ESB Telecoms Ltd. is a wholesale telecommunications provider, bringing 20 years of telecoms and electrical engineering experience to the industry. We own and operate an extensive telecoms network throughout Ireland with International fibre connectivity to the United Kingdom.

ESB Telecoms Ltd. also owns and manages a portfolio of more than 400 telecommunications towers and sites nationwide. We provide transmission services for mobile and wireless operators, private communications companies and emergency services.

Schréder

Schréder is a worldwide leader in outdoor lighting, present in over 35 countries spanning 5 continents. We work with our partners to create practical, sustainable and beautiful lighting solutions tailored to locations from Rome’s Coliseum to the Channel Tunnel. A family company, Jules Schréder started the business in 1907: we’ve since grown to employ 2,600 people worldwide, who share our passion for lighting up your world. Our tradition of engineering means we’ve been at the forefront of innovation throughout our history, and our latest is to use street lighting to support connectivity in smart cities and beyond. Schréder therefore collaborated with Huawei to launch the SHUFFLE SITE, a multi-functional light column with a small cell to ensure next-generation connectivity is accessible to all and will help cities improve their 4G coverage.

www.schreder.com

European Wireless Industry Association

The European Wireless Infrastructure Association is the European trade association of wholesale wireless infrastructure providers. Our members invest in and operate wireless infrastructure essential to the delivery of mobile voice, wireless broadband and other wireless networks. EWIA advocates policies that encourage the network infrastructure investment and deployment necessary to make advanced wireless broadband available everywhere for consumers, businesses, health care, public safety and the countless other sectors that rely on always-on wireless connections.

http://ewia.org/

New Street Research

New Street Research is an independent research firm specializing in telecommunications equity and debt research. We apply an in-depth, fundamental approach to research that draws on decades of telecom, technology, and policy expertise. We strive to develop differentiated investment insights that impact institutional investors, company executives, and government policy-makers. Our team of 20 dedicated analysts based in New York, London, and Singapore, giving us a truly global and unique perspective on trends across the telecom landscape.

www.newstreetresearch.com

Does your company provide products and services to the European telecom or broadcast tower industry, or to the continent’s MNOs?

If so, please consider exhibiting your solutions to TowerXchange’s select audience of 200+ European tower industry leaders.

The unique roundtable driven format of the TowerXchange Meetup guarantees you facetime with the CXOs of the towercos and MNOs who own and operate Europe’s telecom and broadcast infrastructure.

Contact amayhew@towerxchange.com for a bespoke proposal.
Tower Transactions

In 2017 Cellnex continued to roll up European towers, with the acquisition of Sunrise Communications’ towers in Switzerland and Alticom in the Netherlands. An increasing number of MNOs are bringing their towers to market, indicating that the sale and leaseback model may be gaining more traction in Europe, and opening up opportunities for European towercos to consolidate their position, as well as for new entrants in the market to secure a significant portfolio of towers in key markets. In this section of the dossier we assess some of the biggest deals of 2017, including Cellnex’s acquisitions of Sunrise towers and Alticom, and look ahead to portfolios which we expect to be acquired in 2018. We also explore the IPOs which didn’t happen in 2017 and the potential for more in 2018.

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www.towerxchange.com
Cellnex acquires 2,339 towers and rooftops from Sunrise: exclusive CCO interview

Europe’s leading towerco adds a sixth country to their footprint

In June 2017 Cellnex announced they had reached agreement for the acquisition of 100% of Swiss Towers AG and their 2,339 towers and rooftops from Sunrise, the #2 MNO in Switzerland, for €430mn. When closed, the transaction will take Cellnex’s portfolio beyond 23,000 sites, making the company the tenth largest towerco in the world by site count. TowerXchange spoke to Cellnex CCO Alex Mestre to learn more.

Keywords: 5G, Cellnex, Country Risk, DAS, Europe, Europe Insights, Europe News, Infrastructure Sharing, Insights, MLA, Market Entry, News, Project Finance, Rooftop, Sale & Leaseback, Sunrise, Swiss Towers, Switzerland, Tenancy Ratios, Towercos

TowerXchange: Congratulations on your announced acquisition of 2,339 sites from Swiss Towers AG (Sunrise) – what attracted Cellnex to bid for these particular assets and to enter the Swiss market?

Alex Mestre, Chief Commercial Officer, Cellnex: This is a deal that enables us to further consolidate Cellnex’ European platform. Switzerland is a country marked by stable and secure economic and political environment, while also offering Cellnex clear synergies through its geographical location next to France and Italy, where the Company is also present. Undertaking this acquisition with reputable partners such as Swiss Life Asset Managers and Deutsche Telekom Capital provides not only financial support, but essential knowledge and access to this market as well as to other Central European countries.

Moreover the dynamics of the market driven, as in many other European countries, by significant mobile data traffic data growth is a trigger and a positive stimulus for any telecom infrastructure operator.

TowerXchange: What can you tell us about the portfolio you have acquired and structure of the Swiss tower market? And what is the extent of existing co-location?

Alex Mestre, Chief Commercial Officer, Cellnex: Switzerland currently has a total stock of approximately 11,300 sites providing mobile voice, data service and coverage.
Swiss Towers AG operates 2,339 sites throughout Switzerland with a greater presence in the cantons of the north and west of the country. It means that in just one move Cellnex already achieves critical mass with close 20% of the country’s towers, operating the second network in terms of size, should we include the 200 DAS nodes committed with Sunrise and to be deployed.

32% of these sites are located in urban areas and 64% on rooftops.

The customer ratio is 1.1x.

TowerXchange: Xavier Niel’s NJJ Capital recently acquired number three MNO Salt – Niel’s opcos have a track record of aggressive rollouts with an infrastructure-light network plan – how appealing does that make Salt as a prospective tenant, and to what extent does market leader Swisscom have need for co-location given the relative size of their network and recent network capex?

Alex Mestre, Chief Commercial Officer, Cellnex: The very reason for the existence of an independent tower and telecom infrastructure operator is to drive and improve sharing. This is a process that does not take place overnight. Every MNO is, thus, more than welcome. But beyond increasing customer ratios in the existing asset base, the prospects lie as well in the densification that LTE/5G deployment will require.

As in other European markets, the Swiss mobile telecommunications market is experiencing significant growth in mobile data, for which year-on-year growth is expected to exceed 45% over the next five years. This means further deployment both in urban as non urban areas and it’s reasonable to think that sharing and co-investment schemes will gain momentum. The fact that Cellnex Switzerland will already own a strong position in the Swiss market, with a network covering the whole country, is a compelling argument in order to capitalise on the future deployment of the next generation of infrastructures. The agreement with Sunrise to deploy 200 DAS nodes is an example.

TowerXchange: What impact do you anticipate this acquisition having on Cellnex EBITDA and forecast future revenue growth?

Alex Mestre, Chief Commercial Officer, Cellnex: Once the transaction is completed, and assuming the contribution of newly deployed sites through the build to suit program and 200 DAS nodes, the industry – and Cellnex is playing a leading role – is moving towards a more holistic vision in which independent infrastructure operators take care of other variables based on engineering services, network planning and execution, active equipment management, et cetera

TowerXchange: While Cellnex has acquired a majority 54% stake in Swiss Towers, for the first time you’ve teamed up with a consortium of investors (Swiss Life Asset Managers with 28% and Deutsche Telekom Capital partners with 18%) – was this consortium-approach adopted exclusively because of your partners’ knowledge and access to the Swiss market, or would Cellnex consider a similar consortium-approach for future acquisitions?

Alex Mestre, Chief Commercial Officer, Cellnex: We have been clear in the past stating that one alternative to continue to drive our growth is this kind of consortium-approach. This is a scheme that we already adopted last year when we partnered with F2i in Italy when a potential INWIT sale was considered.

Thus, this is not new to us and it becomes clear that it may well happen again in future deals.

TowerXchange: Xavier Niel’s NJJ Capital recently acquired number three MNO Salt – Niel’s opcos have a track record of aggressive rollouts with an infrastructure-light network plan – how appealing does that make Salt as a prospective tenant, and to what extent does market leader Swisscom have need for co-location given the relative size of their network and recent network capex?
run-rate EBITDA contributed by Swiss Tower AG sites will be in the region of €37mn.

Cellnex group’s backlog (i.e. contracted sales) will approach to €15bn from the current figure of €12bn.

TowerXchange: Cellnex has again used your Master Service Agreement (MSA) contract structure, as opposed to a Master Lease Agreement (MLA) – how does this approach help your MNO counterparts avoid capitalising lease fees post IFRS 16 Lease changes? And do the longevity and cancellation / renewal terms of MSAs differ significantly from MLAs?

Alex Mestre, Chief Commercial Officer, Cellnex: MSA schemes clearly underline the industrial and service approach that qualifies the value creation proposal for our customers. This is an evolving business model. From a pure passive infrastructure management concept, the industry – and Cellnex is playing a leading role – is moving towards a more holistic vision in which independent infrastructure operators take care of other variables based on engineering services, network planning and execution, active equipment management, et cetera.

Clearly, upcoming sharing schemes that will increase its visibility alongside the deployment of 5G will even reinforce MSA structures as a right and suitable alternative for our MNOs clients.

Longevity or cancellation /renewal terms do not differ significantly from the known MLAs schemes.
New country, new model - Cellnex partners up to acquire Swiss towers

Cellnex expands into a sixth country with 2,339 tower deal with Swiss operator Sunrise

With the acquisition of 2,339 towers from Sunrise in Switzerland, Cellnex are not only entering a new market, but also rolling out a new business model; working in partnership with financial investors (in this case Swiss Life Asset Managers with 28% and Deutsche Telekom Capital Partners with 18%) to secure towers as part of a consortium. Sunrise has raised €430mn from this deal.

**Keywords:** 5G, Cellnex, Country Risk, DAS, Europe, Europe Insights, Europe News, Infrastructure Sharing, Insights, MLA, Market Entry, News, Project Finance, Rooftop, Sale & Leaseback, Sunrise, Swiss Towers, Switzerland, Tenancy Ratios, Towercos

Similarly to Cellnex’s recent deal with Bouygues, the acquisition agreement includes the signing of a Master Service Agreement, for an initial period of 20 years, extendable by a further 20 years in 10-yearly increments. A build to suit element is also included in the deal, both potentially for macro towers and for 200 DAS nodes.

Cellnex Telecom Chairman Francisco Reynés underlined the quality of the acquisition “which will enable us to further consolidate Cellnex’ European platform to Switzerland, a country marked by stable and secure economic and political environment, while also offering Cellnex clear synergies through its geographical location next to France and Italy, where the Company is also present. Undertaking this acquisition with reputable partners such as Swiss Life Asset Managers and DTCP will provide not only financial support, but essential knowledge and access to the Swiss market as well as to other Central European countries.”

**The Swiss market**

Cellnex states that there are currently 11,300 mobile sites in Switzerland, meaning their acquisition of 2,339 sites has given them just shy of 20% of market share in one transaction. Most of these sites are in the North and West of the country, and 32% are in urban areas with 64% of the total on rooftops.

TowerXchange believes that many of these rooftop towers are ‘stub’ towers, however, which differ from traditional rooftop sites as there is an existing structure in place, offering the potential to lease up
the sites much more easily than a basic ‘rooftop’ site, which is essentially just an agreement to place a set amount of active equipment in a set location.

Swisscom may become a second tenant, ditto Salt, Switzerland’s third MNO, owned by Xavier Niel, whose asset-light rollout of Free in France has relied heavily on roaming and, increasingly, towercos to achieve scale.

EMF regulations in Switzerland are stringent, which will limit potential tenancy ratios, however, they are in line with Italian regulations: 5 kV/m for electric fields and 100 µT for magnetic fields, and the Italian tower market has been one of the most active in Europe.

### Market potential

As elsewhere, however, Cellnex aren’t just eyeing straightforward tenancy ratios, but increases in data usage, infill, densification and 5G rollout. As Cellnex state: “As in other European markets, the Swiss mobile telecommunications market is experiencing significant growth in mobile data, for which year-on-year growth is expected to exceed 45% over the next five years”. A foot in the door in the Swiss market will allow them to leverage their burgeoning expertise in small cell and DAS deployment, with 200 DAS sites agreed as part of this initial deal.

As Tobias Martinez told us back in January 2017, Cellnex’s model has three stages: firstly, to acquire an asset in the market and learn about market dynamics, secondly to pursue further growth and capture economies of scale and thirdly to consolidate and offer full efficiencies to their customers in that market. At this point, Cellnex is entering stage one, and will doubtless be looking for opportunities to grow in the Swiss market, and with significant market share captured already, that growth may well be achieved through network densification, and doubtless by a degree of decommissioning.

When commenting on this deal, Tobias Martinez stated: "Like all other major European countries, the industry in Switzerland is facing the challenge of meeting the significant growth in mobile data consumption and transmission by incorporating new technologies based on small cells and distributed antenna systems (DAS), which in the medium term will mean densifying networks by rolling out new equipment in parallel with reducing the overlap of some of the already rolled out networks, essentially 2G and 3G. This market development provides a clear opportunity for Cellnex Telecom.”

### The consortium model

Of course, this type of deal is nothing new - Cellnex has been flagging this model as a potential solution to lengthen their leverage limit for several months, and they had been willing to partner with F2i for the INWIT towers when they were briefly brought to market in 2016. In the context of the European market, where American Tower partnered with PGGM in late 2016 to form ATC Europe and acquire French towerco FPS Towers, this represents a model which will pique the interest of heavyweight investors that can accept single digit returns given
the low risk inherent in investing in developed market telecom towers. This ‘third way’ between public investment in a listed towerco, and the straight-out acquisition of private entities allows investors with an appetite for steady and stable infrastructure returns a direct route to significant exposure to the proven towerco business model.

With Europe’s biggest towercos both now employing this model, we may well see further replications from ambitious towercos as well as further expansion by Cellnex or American Tower.

What next?

With no sign of decelerating their acquisition pipeline, Cellnex have played up the ‘neat fit’ of Switzerland’s geographical location heavily in their press release about this deal. Cellnex Telecom Chairman Francisco Reynés didn’t hold back with his comments about “clear synergies through its (Switzerland’s) geographical location next to France and Italy” and the benefit of their financial partners, Swiss Life Asset Managers and DTCP providing “not only financial support, but essential knowledge and access to the Swiss market as well as to other Central European countries”.

So, what potential is there in Central Europe? Telekom Austria had a ‘very tough’ 2016, with EBITDA down 17.7%. Parent company America Movil’s tower spin-off to form towerco Telesites in 2015 shows the company isn’t afraid to think creatively in terms of using infrastructure to its advantage.

In Poland (as in Spain), there is some existing towerco activity in the form of Alinda-owned Emitel (with around 377 telecoms sites), as well as ambition from managed service provider ECS, backed by CEE Equity Partners, to move into tower ownership. Joint venture NetWorkS! operates around 13,000 towers between T-Mobile and Orange and may prove an acquisition target of interest.

In the Czech Republic, CETIN (Česká Telekomunikační Infrastruktura), an infraco carved out of O2, has 4,800 towers and 750 micro sites. CETIN’s business model includes all the physical assets which used to belong to O2, including active equipment and 38,000km of fibre, the MNO having been acquired by PPF and the infrastructure business spun off. Embroiled in some to-ing the fro-ing with the European Commission, CETIN is owned by Czech billionaire Petr Kellner’s PPF Group, and rather than being a prospective acquisition target itself, is more likely a competitor for acquisition opportunities in Central Europe.

Of course the biggest market in Central Europe is also the biggest in Europe: Germany. Bordering countries where Cellnex has operations including the Netherlands, France, Germany, Switzerland and Italy, there’s plenty of geographical synergies to be had, and there’s a towerco with huge potential to be streamlined and commercialised in Deutsche Funkturm. Still 100% owned by Deutsche Telekom, but subject to frequent rumours about a sale, it’s very possible Cellnex’s relationship with Deutsche Telekom could extend beyond their capital investment arm in the near future.

With this consortium deal Cellnex benefits twice over: firstly from new relationships and expertises and secondly, from a financial point of view it allows them to keep their powder dry for a bigger acquisition. With Arqiva coming to market, as well as the potential for 27,000 Deutsche Funkturm sites in Germany, Cellnex must find the right balance between pursuing their three-step growth strategy to support steady returns, as well as keeping an eye on their leverage limit to enable them to grab opportunities to ramp up their European scale in an even more dramatic way.
Complications surrounding Arqiva’s £3bn debt pile were thought to have made a sale look more appealing, and bids and negotiations were ongoing over the summer, but it’s believed that talks with the last remaining bidder, a consortium led by investor Brookfield, ended without an agreement and an IPO bid was announced then swiftly cancelled. Despite some political and economic instability in the UK caused by the Brexit vote, Arqiva remains an attractive asset in an attractive market, and interested parties may come back to the table. TowerXchange digs deeper into Arqiva’s background and takes a look at the potential outcomes of this process.

Arqiva – history and background

With over 60 years’ history in broadcast infrastructure, Arqiva is one of a uniquely European breed of towerco which has grown up from a solid history in television broadcasting and now owns a large chunk of both broadcast and telecommunications infrastructure in their home country.

The company has a long history in the UK starting at the beginning of the 20th century with roots going back to the ITA (Independent Television Authority) in the 1950s. Through a series of mergers and acquisitions, mainly in the early 2000s, Arqiva now consists of those ITA assets, as well as former BBC broadcast towers and National Grid Wireless infrastructure.

Arqiva in its current iteration is responsible for all
UK television broadcasting and was responsible for implementing the digital switchover which occurred in the UK in 2013. They also do most of the radio broadcasting in the UK and buy wholesale satellite capacity to resell all over the world.

The company has recently invested heavily in an M2M division, winning the UK government’s smart meter tender for the north of the UK and Scotland, making them one of the biggest players in the UK, while Arqiva also has exclusive rights of the SIGFOX technology in the UK.

In terms of telecom infrastructure they own roughly 25% market share in UK macro tower sites. Arqiva services all of the four MNOs and has around 8,600 active towers for these mobile operators. Their tenancy ratio is around 2.5x. Although they have 8,600 active towers, the total portfolio consists of over 16,500 towers (the remaining ~8,000 towers are not active due to MNO rollout plans, rural locations where demand is low or deployment complexities as many of them are not dedicated telecoms infrastructure, such as electricity pylons)

In the past, Arqiva’s reputation has dipped in terms of delivery to clients, but the organisation has been working hard to turn around client relationships, and the appointments of CEO Simon Beresford-Wylie in June 2015 and subsequently of CFO Liliana Soloman in 2016, have been integral to this, with impressive growth across the business in Beresford-Wylie’s first year at the helm.

The company has long term and secure contracts with both MBNL (an infrastructure sharing joint venture between EE/BT and 3) and CTIL (a similar joint venture between Vodafone and O2) and grew the M2M and telecoms business unit by 6.4% in FY2015-16.

Over the last few years Arqiva has aggressively pursued a leading position in the UK’s growing small cells market, tendering for (and winning) street infrastructure in several London and Manchester boroughs as well as working with Virgin Media Business on assets in other major UK cities.

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With this in mind the lifespan of DTT is considered possibly the most critical factor in deciding the value of the asset.

And to Arqiva’s credit, growth came from the more traditional parts of the business as well, as Arqiva’s broadcast business grew 4.6% in the last financial year following significant new contract wins and renewals.

All in all, Arqiva represents a significant asset with 79% of the UK’s independent towers, improving relationships with clients, solid broadcast assets and a good foothold in the growing UK future networks.

With a valuation of £6bn, there has been plenty of interest from investors keen to acquire a slice of UK infrastructure.
Why the U-turn?

It’s telling that the time from IPO announcement to cancellation was so short, implying that Arqiva’s valuation was not closely aligned with the market’s. There’s no doubt Arqiva’s new management team has made great improvements but the cost of debt has swallowed up profit and put them further into the red each year. The markets’ excitement about telecom towers and small cells has been offset by uncertainty about the debt pile and the longevity of Arqiva’s broadcast core, which accounted for 47% of revenues in the year to June, compared to just 33% of Cellnex’s revenues for FY 2016. Commentators have been speculating about the longevity of Digital Television Transmission (DTT), which itself replaced analogue transmission in 2014, although Arqiva has refuted these comments, saying ‘hybrid platforms’ such as Now TV will maintain the relevance of digital broadcasting.

Arqiva is far from the first tower company to change their mind about an IPO over the last few years. In September 2016, Telefonica scrapped a planned €1.2bn flotation of their Telxius infrastructure arm (which had also been planned to reduce debt), after failing to attract sufficient demand from the market. In the following month, October 2016, Turkish Global Tower postponed their IPO citing market instability caused by the US elections.

In the following 12 months, a 40% stake in Telxius was sold to KKR for €1.275bn, whereas Global Tower’s need for capital appears less acute.

What next?

Having explored their options in terms of both a strategic sale and a public offering, Arqiva may well choose to wait and allow the dust to settle. Holding off and giving their accomplished management team time to prove their turnaround is sustainable will give Arqiva breathing room to close the gap between their own valuation and what strategic buyers will pay, however without significant restructuring Arqiva’s debt will continue to have an impact on its valuation.

On the other hand, just about every major (and proven) tower investor in the world has been connected with Arqiva over the course of 2017. There’s no shortage of appetite for what remains an attractive asset, just a valuation gap. Arqiva either needs to improve the confidence of their potential investors or to recalibrate their valuation.

That said, the UK and other developed markets are in something of a hiatus at the moment, with most of the 4G rollout on the order books, and very little visibility over what will come next. Once we have visibility of 5G infrastructure requirements and the implications for tower load and small cell rollout, Arqiva may well look even more attractive. With the government committing hundreds of £millions to making the UK a ‘global leader’ and spectrum auctions scheduled for later in 2017, that visibility might come earlier than sceptics think.
Altice announces tower sale

As Altice confirms intent to sell towers in Portugal, TowerXchange investigates further

Altice’s announcement that their tower portfolios in France and Portugal were under review as part of their plans to pay down debt has caught the interest of European tower players. Altice owns around 5,300 GBTs in France through opco SFR and a further ~3,000 in Portugal through MEO, as well as further rooftop assets and sites across both countries. Altice Europe’s CEO Dennis Okhuijsen recently confirmed that the towers Altice owns in Portugal through MEO are part of the list of non-strategic assets for sale. Plans for the French market have not yet been made known, but this latest sale and leaseback opportunity in Europe has caught the attention of Europe’s largest towercos. What is for sale and who might be making a bid for these tower assets?

Keywords: 3i, 5G, Acquisition, Altice, American Tower, Cellnex, Consolidation, Crown Castle, Data Centre, Deal Structure, Digital Bridge, Due Diligence, Europe, Europe News, France, Global Tower, Infrastructure Sharing, MEO, MNOs, Market Overview, Portugal, Private Equity, RANsharing, SBA Communications, SFR, Sale & Leaseback, Tenancy Ratios, TowerXchange Research, Valuation, Wireless Infrastructure Group

Read this article to learn:
- How Altice was built and why it is struggling with debt despite a successful 2017
- Numbers and distribution of the Altice tower assets
- More information on the French and Portuguese markets
- Who will bid for the portfolio(s)
- What the sale of Altice’s towers could mean for European infrastructure

Altice’s story

Founded in 2001 by entrepreneur Patrick Drahi, Altice has spent the last 17 years growing across three continents in telecoms, content, media, entertainment and advertising. Drahi still owns the controlling stake in the business, with 15% of the business listed on Euronext Amsterdam (in January 2014) and 7% of the U.S. business listed on the NYSE in June 2017.

Drahi began building his empire in France, merging several telecoms businesses under the brand ‘Numericable’ in 2007. From 2013 the acquisition spree gathered pace, as Altice acquired Orange Dominicana, before acquiring SFR, France’s second largest operator, and Virgin Mobile France in 2014. In 2015 Altice’s ambitions moved further afield, with the acquisition of U.S. cable company Suddenlink Communications (a deal completed in conjunction with CPPIB and BC Partners) and U.S. cable provider Cablevision. In Europe, Altice further expanded its footprint with the acquisition of Portugal Telecom. Altice were also reported to have bid for both Time Warner Cable in the U.S. and Bouygues Telecom in France in 2015, although neither of these deals came to fruition.

Last year (2017), Altice acquired video ad tech firm Teads and Israeli telecoms operator HOT, and also listed part of their U.S. operations on NYSE in June; one of the biggest listings of 2017. However, by November things were looking less rosy, as disappointing quarterly results saw share prices halve and Altice’s €50bn debt pile began to cause concern. Drahi sacked CEO Michel Combes and
announced the company focus would shift away from acquisitions and towards reducing debt.

**What’s for sale?**

Altice has yet to declare a full concrete plan for tackling their debt pile, although CEO Dennis Okhuijsen recently confirmed that the towers Altice owns in Portugal through MEO are part of the list of non-strategic assets for sale, there are two further solutions which involve the sale of ‘non-core assets’: the divestment of their business in the Dominican Republic, which could raise up to €3bn; and the sale of more of their ~8,500 macro towers plus additional rooftops in France and Portugal, which optimistic estimates suggest could yield up to €4bn. While a straightforward sale and leaseback may be the quickest way to raise the cash, spinning out and floating an MNO-led towerco, as Telecom Italia did with INWIT in 2015, has not been ruled out. Thus far, Altice has only committed to the sale of two small Swiss data centre businesses, Green.ch and Green Datacenter to InfraVia Capital Partners (owners of Irish towerco Cignal and Welsh data centre operator NGD) for around €200mn, a sum which will not make much difference to the debt pile. Some analysts have remarked that even the potential €3bn which could be raised from the sale of Altice’s Dominican Republic business may not be enough to settle the markets, so it remains to be seen which combination of assets Drahi decides to sell, and indeed whether he will choose to act quickly to reassure impatient investors or play a longer game and, as majority shareholder, ride out the storm with minimal concessions in terms of divestments.

**Altice tower assets**

Thus far, Altice has decided to divest its Portuguese towers, of which they own around 3,000 macro towers, the largest towers portfolio in the country. It remains to be seen what will happen with their French infrastructure. Most commentators seem to think that they won’t divest their full portfolio, or at least not all at once. The towers in France, where Cellnex, TDF and American Tower are all active, will no doubt be appealing to the market but equally the Portuguese towers would offer a towerco player the opportunity to become sole player in a European market where there is less concern about parallel infrastructure with their competitors.

Infrastructure sharing in Portugal is uncommon, even on a quid pro quo basis, meaning the tenancy ratio is close to 1x, but in France around 75% of Altice/SFR’s towers have Bouygues telecom as a second tenant already due to the two operators’ previous RANsharing deal, as well as some tenancies from Iliad’s French operator Free. Bearing this in mind, we estimate that the tenancy ratio of Altice’s French towers may already be in the region of 1.6x, however this ratio has been achieved mainly
What is the breakdown of the high sites used by the French telecom industry? And who owns them?

<table>
<thead>
<tr>
<th>Ground based towers</th>
<th>Rooftops structures with telecom equipment</th>
<th>Rooftops without telecom equipment installed, but for which a towerco has a commercialisation agreement:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Orange 8,100</td>
<td>10. Rooftops sites sourced directly by MNOs 13,090</td>
<td>14. TDF 2,985</td>
</tr>
<tr>
<td>2. SFR 5,300</td>
<td>11. Rooftop sites provided by TDF 301</td>
<td>15. FPS Towers 20,000</td>
</tr>
<tr>
<td>3. TDF 7,728</td>
<td>12. Rooftop sites provided by FPS Towers 159</td>
<td></td>
</tr>
<tr>
<td>4. ATC France (formerly FPS Towers) 2,472</td>
<td>13. Rooftop sites sold to Cellnex 1,450</td>
<td></td>
</tr>
<tr>
<td>5. Cellnex (acquired from Bouygues) 4,100</td>
<td></td>
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<tr>
<td>6. Free 350</td>
<td></td>
<td></td>
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<tr>
<td>7. Towercast 500</td>
<td></td>
<td></td>
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<tr>
<td>8. Other structures not belonging to towercos or MNOs 2,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Other ground based structures 7,500</td>
<td></td>
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</tr>
</tbody>
</table>

Sources: TowerXchange research, ANFR, FPS Towers, TDF

through bilateral swaps, which may or may not be readily commercialised. Altice has a total of around 20,000 sites in France, including rooftops, and is already comfortable with the independent towerco model, renting ~500 sites from American Tower (through their acquisition of FPS) and ~2,500 from TDF.

Given the high tenancy ratios in France, there is room for a buyer to increase the tenancy ratio and to monetise existing tenants quickly. However, while it’s believed that Altice are preparing for a sale and updating their asset registers as I write, the value of the French towers can vary dramatically and given the competitive nature of the French market, a ‘one size fits all’ price won’t apply, meaning the negotiations for the towers could be very complex.

The French tower market
What is the breakdown of the high sites used by the French telecom industry? And who owns them?

There are just over 25,000 ground based towers in France, of which 55% remain operator-captive. The remainder are divided among three independent towercos: broadcast-telecom hybrid TDF has 7,728 telecom towers, ATC Europe (formerly FPS Towers) has 2,472, and Cellnex have bought into the French market with 2,300 existing Bouygues towers and a further 1,200 in the pipeline.

In December 2016 American Tower announced the acquisition of FPS Towers for €697mn, a deal which closed in February 2017, gaining them a significant foothold in the market and putting them into
competition with French incumbent tower owner TDF. Cellnex quietly acquired 500 towers from Bouygues Telecom in two transactions in 2016, the first of which was for 230 towers at a valuation of €80mn and the subsequent tranche for 270 towers for €697mn, and in January 2017 they signed a deal with the aforementioned governing the transfer of 1,800 existing sites and 1,200 new build towers for a total of €354mn, giving Cellnex a good presence in France and a solid anchor tenant.

There has also been recent activity in the broadcast vertical of the French market. With TDF acquiring ITAS for a reported €100mn (420 towers) and NRJ seeking a buyer willing to part with ~€300mn for their 500-tower asset Towercast.

The Portuguese tower market

Mobile tower ownership in Portugal

The Portuguese tower market has been fairly dormant since rumors of a prospective sale and leaseback by Portugal Telecom three years ago, which resulted instead in the sale of Portugal Telecom by Brazilian Oi to Altice for €7.4bn in Q2 2015.

TowerXchange understands there to be ~6,800 towers in Portugal, with a further ~4,700 sites in use across different topographies (rooftops, street poles, utilities etc). With no known bilateral sharing agreements in place, colocation is organised on an ad-hoc basis and the tenancy ratio across the country is close to one (the only exception to this being indoor DAS projects, where one operator provides the infrastructure and shares with the other two).

Altice’s MEO have the largest tower portfolio with an estimated 3,000 traditional structures, Vodafone owns approximately 2,500 and NOS about 1,300. In addition, there are around 350 broadcast towers run by state-owned Radiotelevisão Portuguesa, although TowerXchange are not aware of any current colocation agreements with Portugal’s three MNOs.

Who could buy Altice’s towers?

As yet it remains to be seen exactly how many towers will be brought to market, and whether Altice will stick with Portugal or add in towers in France as well. Certainly, the sale of Altice’s Portuguese towers in the short term does not preclude the sale of the French towers in the future, indeed, it may be beneficial for a towerco to develop a relationship with Altice before making a play for their higher value French portfolio. There’s no doubt that this sale and leaseback opportunity will garner interest from European and international towercos, particularly as Portugal is one of the last remaining western European markets with no independent towerco activity.

Cellnex

In a recent interview with TowerXchange, Cellnex expressed an interest in the Altice towers should they come to market. With operations in six European countries already, including neighbouring Spain, Cellnex will have come into contact with Altice/SFR already through the towers they acquired from Bouygues. There has been speculation about Cellnex’s debt capacity, which already surpasses 5x EBITDA. Spanish bank Sabadell calculates that Cellnex has a debt capacity of €2.5 billion, which would fall short of the €4bn Altice had been hoping to raise through the sale of its towers. This leaves Cellnex with three options: increasing
the capitalisation of the company, staggering the purchase (as they did with Bouygues in France) or finding financial partners for the deal, as they did when acquiring the Sunrise towers in Switzerland.

American Tower
Since ATC Europe was formed in 2016 following the partnership of American Tower and Dutch fund PGGM, they have completed one transaction of scale: the acquisition of French FPS Towers for €697m.

According to American Tower, this slow deal rate does not indicate a lack of interest in the European market: far from it, they intend to grow and are looking for opportunities in the form of acquisitions either from operators or of other towercos. Indeed, they have expressed an interest in acquiring the 34% stake in Cellnex currently owned by Abertis, should it become available after the latter’s acquisition is completed. American Tower, however, are a patient investor, and stick closely to their own investment thesis. They’re wary of entering into a price war in such a hot market and their global reach means there’s less pressure to acquire in any one region, but once they have identified an asset they have the time and money to make a serious impact.

Wireless Infrastructure Group / 3i
3i, through UK towerco Wireless Infrastructure Group (WIG), has a strategy to build a European mid-market tower platform driven by entrepreneurial local management teams. After recently scaling up their investment in WIG to a 90% stake worth £186mn, 3i are clearly serious about their commitment to European tower.

In 2016 they made a well publicised play for the FPS towers, highlighting the shared entrepreneurial spirit of the partners, but were ultimately pipped by ATC Europe. WIG’s small cell and DAS expertise could prove attractive to Altice’s Portuguese operations, where a highly competitive market has operators scrambling to offer packaged services in order to win market share.

Digital Bridge
Despite being linked with several European tower sales over the last two years, Digital Bridge have not yet found the right vehicle to launch their European operations. Well versed in future network technology, the Digital Bridge team could bring not only towerco expertise to the table, but also help MEO grow the micro site infrastructure needed for 5G rollout.

SBA Communications
As with Digital Bridge, SBA Communications have operations in North, Central and South America and have shown an interest in the European market over the last few years but have not yet taken the plunge. This opportunity to become the sole operator in an investible Western European country could prove a big draw for the US based towercos.

Global Tower
Perhaps an outlier in this process, Turkcell-owned Global Tower has been exploring opportunities in Western Europe for the last year at least. Their existing portfolio of over 10,000 towers in Turkey, Ukraine, Belarus and North Cyprus is testament to their expertise in tower management.

Crown Castle
Crown Castle haven’t been active in Europe since they sold the former BBC broadcast assets to National Grid in the UK in 2004, but as one of the largest towercos in the US, they have the balance sheet and expertise to act on opportunities when they arise.

Will this be a game changer?
The outcome of the Altice towers coming to market could potentially make huge waves in the European market. The entry of a new and significant player such as Digital Bridge or SBA Communications could shift the level of competition up a gear and with three large multi-national players on the continent it would certainly create a more appealing market for operators looking to divest their assets in future.

However, the Altice towers are far from the only portfolio on the market, and Altice are not the only operator exploring their monetisation options at the moment. It seems more likely that these towers will allow an existing European player to strengthen their position in the market and expand their geographical footprint into Portugal.

Past tower sale and leaseback activity from Telefonica, Wind, Sunrise, Bouygues and KPN has helped the industry to build up benchmarks of a tower’s ‘worth’ in the market, but valuation still remains a dark art and the amount a buyer is willing to pay depends not just on the location, cost base and lease up potential of any given tower, but also the strategic value for the buyer in the larger European ecosystem. We expect to see a complex process before this deal reaches a conclusion.
## European tower deals since 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Seller</th>
<th>Buyer</th>
<th>Tower count</th>
<th>Deal value €</th>
<th>Cost per tower €</th>
<th>Deal structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Spain</td>
<td>MasMovil</td>
<td>Cellnex</td>
<td>551</td>
<td>36,000,000</td>
<td>65,335</td>
<td>SLB*</td>
</tr>
<tr>
<td>2017</td>
<td>Netherlands</td>
<td>Mom and Pop</td>
<td>Cellnex</td>
<td>32</td>
<td>12,000,000</td>
<td>375,000</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2017</td>
<td>Netherlands</td>
<td>Alticom</td>
<td>Cellnex</td>
<td>30</td>
<td>133,000,000</td>
<td>443,333</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2017</td>
<td>Switzerland</td>
<td>Sunrise</td>
<td>Cellnex, Swiss Life and DTCP</td>
<td>2,339</td>
<td>430,000,000</td>
<td>183,839</td>
<td>SLB</td>
</tr>
<tr>
<td>2017</td>
<td>France</td>
<td>Bouygues</td>
<td>Cellnex</td>
<td>3,000</td>
<td>854,000,000</td>
<td>284,666</td>
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</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>ITAS TIM</td>
<td>TDF</td>
<td>420</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2016</td>
<td>Germany</td>
<td>WDR</td>
<td>American Tower</td>
<td>2,482</td>
<td>697,000,000</td>
<td>280,821</td>
<td>Company acquisition</td>
</tr>
<tr>
<td>2016</td>
<td>France</td>
<td>Antin/FPS</td>
<td>American Tower</td>
<td>2,482</td>
<td>697,000,000</td>
<td>280,821</td>
<td>Company acquisition</td>
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<tr>
<td>2016</td>
<td>UK &amp; Netherlands</td>
<td>Shere Group</td>
<td>Cellnex</td>
<td>1,004</td>
<td>393,000,000</td>
<td>391,434</td>
<td>Company acquisition</td>
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<td>2016</td>
<td>France</td>
<td>Bouygues Telecom</td>
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<td>230</td>
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<tr>
<td>2016</td>
<td>France</td>
<td>Bouygues Telecom</td>
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<td>270</td>
<td>67,000,000</td>
<td>248,148</td>
<td>SLB</td>
</tr>
<tr>
<td>2016</td>
<td>Netherlands</td>
<td>Protelindo</td>
<td>Cellnex</td>
<td>261</td>
<td>109,000,000</td>
<td>417,624</td>
<td>Company acquisition</td>
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<tr>
<td>2016</td>
<td>Germany</td>
<td>Telefonica</td>
<td>Telxius</td>
<td>2,350</td>
<td>587,000,000</td>
<td>249,787</td>
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<td>2016</td>
<td>Ukraine</td>
<td>Lifecell</td>
<td>UkrTower</td>
<td>811</td>
<td>47,820,000</td>
<td>58,964</td>
<td>SLB</td>
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<tr>
<td>2016</td>
<td>Spain</td>
<td>Telefonica</td>
<td>Telxius</td>
<td>11,000</td>
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<td>SLB</td>
</tr>
<tr>
<td>2015</td>
<td>Ireland</td>
<td>Coillte</td>
<td>Cignal</td>
<td>113</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Germany</td>
<td>Telefonica</td>
<td>Deutsche Telecom/ Omega Towers</td>
<td>7,700</td>
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<td>Asset Transfer</td>
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<td>2015</td>
<td>Italy</td>
<td>Tecnorad</td>
<td>EI Towers</td>
<td>134</td>
<td>17,000,000</td>
<td>126,866</td>
<td>Portfolio acquisition</td>
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<td>Wind (VimpelCom)</td>
<td>Cellnex</td>
<td>7,377</td>
<td>693,000,000</td>
<td>93,941</td>
<td>SLB with 10% equity</td>
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<td>2015</td>
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<td>TowerCo</td>
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<td>212</td>
<td>94,600,000</td>
<td>446,226</td>
<td>Company acquisition</td>
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<tr>
<td>2014</td>
<td>Spain</td>
<td>Telefonica/Yoigo</td>
<td>Cellnex</td>
<td>4,277</td>
<td>385,000,000</td>
<td>90,016</td>
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<tr>
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<td>Telefonica</td>
<td>FPS Towers</td>
<td>2,166</td>
<td>185,000,000</td>
<td>100,400</td>
<td>SLB with 15% equity</td>
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<td>Bouygues Telecom</td>
<td>American Tower</td>
<td>2,031</td>
<td>393,000,000</td>
<td>193,501</td>
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<td>KPN</td>
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<td>261</td>
<td>75,000,000</td>
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<td>SLB</td>
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<td>Shere Group</td>
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<td>Telefonica</td>
<td>Cellnex</td>
<td>500</td>
<td>45,000,000</td>
<td>90,000</td>
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<td>2010</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Open Tower Company</td>
<td>500</td>
<td></td>
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<tr>
<td>2008</td>
<td>Netherlands</td>
<td>KPN</td>
<td>Open Tower Company</td>
<td>101</td>
<td></td>
<td></td>
<td>SLB</td>
</tr>
</tbody>
</table>

*Totals / average* 41,178 3,286,420,000 147,082

*Deal not yet closed

Source: TowerXchange
Towercast sale could prove influential in French market

The news that France’s only remaining broadcast towerco is on the market has garnered interest

French media group NRJ has announced its intention to sell broadcast towerco Towercast, a competitor to TDF, which offers DTT and FM broadcast services via 500 sites across France. Declaring that Towercast isn’t a ‘fit’ with NRJ’s core business, it’s believed NRJ hopes to raise up to €300mn from the sale. TowerXchange takes a look at what’s on offer, how this sale could affect market dynamics and who the leading bidders are likely to be.

**Keywords:** Acquisition, American Tower, Arcus, Brookfield, Cellnex, Consolidation, EBITDA, Europe, Europe News, France, Infrastructure Funds, Infrastructure Sharing, PSP, RANsharing, Roaming, Sale & Leaseback, TDF, Tenancy Ratios, TowerXchange Research, Towercast, Towercos, Valuation

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Read this article to learn:
- Background on the French tower market
- What is for sale
- This deal in the context of other French tower deals
- Who will bid

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France is one of Europe’s most investible tower markets, and the aggressive market entry of Iliad’s Free Mobile in 2012 has shaken up incumbent MNOs Orange, SFR and Bouygues Telecom, driving down tariffs and ARPU amidst the huge capital expense of spectrum and network densification for 4G.

The French market is host to a diverse array of established independent infrastructure owners in Cellnex, ATC Europe and TDF. Operator Bouygues has embraced the sale and leaseback model and Free Mobile, which is looking for growth without heavy infrastructure investment and is coming to the end of a roaming agreement with Orange, are both very open to third party towers. Added to this is a good amount of M&A, particularly of smaller, entrepreneurial towercos such as FPS or ITAS, meaning whole European ecosystem seems distilled into the French market.

**Key players in the French market**

TowerXchange has closely followed tower deals in France over the last few years. On 19 December 2016 American Tower announced the acquisition of French FPS Towers for €697mn. The sale of Antin’s FPS Towers - around 2,500 towers acquired from Bouygues in 2012 and grown into a towerco with an impressive track record - garnered plenty of interest in the tower industry, and saw American Tower make a significant step in terms of their commitment to the European market.

Cellnex have gained their foothold in the French
market in three tranches: in 2016, they acquired 230 and 270 towers from Bouygues, across two transactions. Their third deal, in 2017, was split into two phases: the first or 1,800 existing and operational sites for €500mn. Cellnex stated that this portfolio was for ‘urban’ sites, which TowerXchange believes consists primarily of rooftop sites. The second part of the deal provides for the construction of 1,200 new towers 2017-2022, in a deal worth €354mn.

TDF, Towercast’s direct competitor in the broadcast market, has undergone some significant restructuring over the last five years, with an increased focus on the French market. In 2016 they acquired broadcast towercos ITAS for an undisclosed amount ‘in excess of’ €100mn.

Communications infrastructure in France
While Bouygues Telecom has divested the majority of their towers, Free Mobile has few of their own towers as a function of a roaming agreement with Orange which had been due to run through 2020, but which will now be phased out from 2017, meaning they will need to leverage independent towers even more.

There is a good culture of infrastructure sharing in France, where many network planners seem inclined to buy rather than build towers. There are a total of 62,794 points of service spread across 47,347 telecom structures, including ground based towers, rooftops and other structures, giving a prevailing tenancy ratio of 1.33. However, the tenancy ratio on ground based towers is around 1.5, and even higher on sites proactively marketed for co-location: France’s oldest towerco, broadcast-telecom hybrid TDF has a tenancy ratio of 1.8 on their 4,865 telecom towers.

The value of assets in the French tower market is particularly sensitive to the governance of RANsharing, given the propensity of French MNOs to enter such partnerships. The 4G RANsharing partnership between Bouygues Telecom and SFR is due to end in late 2018, ending concerns about a possible knock on effect on French tenancy ratios.

Broadcast towers in Europe
Towercast isn’t the only broadcast asset up for sale in Europe at the moment. The UK’s broadcast behemoth Arqiva is currently exploring options, with a bidding process reaching the final stages as of September 2017. While Arqiva’s bread and butter lies in broadcasting, the company has maximised its assets to accelerate growth in its telecoms unit, but which will now be phased out from 2017, meaning they will need to leverage independent towers even more.
What is the breakdown of the high sites used by the French telecom industry? And who owns them?

Sources: TowerXchange research, ANFR, FPS Towers, TDF

<table>
<thead>
<tr>
<th>Ground based towers</th>
<th>Rooftops structures with telecom equipment</th>
<th>Rooftops without telecom equipment installed, but for which a towerco has a commercialisation agreement:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Orange 8,100</td>
<td>10. Rooftops sites sourced directly by MNOs 13,090</td>
<td>14. TDF 2,985</td>
</tr>
<tr>
<td>2. SFR 5,300</td>
<td>11. Rooftop sites provided by TDF 301</td>
<td>15. FPS Towers 20,000</td>
</tr>
<tr>
<td>3. TDF 7,728</td>
<td>12. Rooftop sites provided by FPS Towers 159</td>
<td></td>
</tr>
<tr>
<td>4. ATC France (formerly FPS Towers) 2,472</td>
<td>13. Rooftop sites sold to Cellnex 1,450</td>
<td></td>
</tr>
<tr>
<td>5. Cellnex (acquired from Bouygues) 4,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Free 350</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Towercast 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Other structures not belonging to towercos or MNOs 2,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Other ground based structures 7,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What's for sale?
Towercast owns around 500 towers across France, with a focus on DTT and FM transmission. The broadcast towerco is owned by media group NRJ, a one-time pirate radio operation which now owns five radio networks. NRJ has been close to a sale before, most notably in 2014 when the process was whittled down to two bidders and the sale was believed to be a ‘done deal’, only to fall at the final hurdle, reportedly on price.

This time around, CEO Jean-Paul Baudecroux told Le Figaro ‘Towercast is very profitable and could be worth more than €300mn. Tower cast is not in our core business and its membership of our NRJ Group is even today a handicap to attract new customers which grew 9% in FY16, accounting for 36% of Arqiva’s revenue.

Cellnex, who (as Abertis) began their journey in communications infrastructure as broadcast tower owners, now generate 55% of their annual revenue from their telecoms business unit and just 33% from broadcast. In addition they acquired Dutch broadcast towerco Alticom in 2017 for €133mn.

In Italy, broadcast towerco EI Towers spun out their telecoms arm into the highly successful TowerTel, and Spain’s second broadcast towerco, Axion, was recently acquired by AMP Capital. Broadcast assets are used (and monetised) for telecoms purposes right across Europe, including of course, TDF, who generated 43% of revenues from telecoms in 2016.
An independent buyer could diversify customers in the audiovisual sector and also in telecoms, where Towercast offer some solutions, but does not have a comprehensive offering.

Last year, Towercast generated sales of €55 million and EBITDA of €27 million, but Baudecroux believes revenue could grow by as much as 20-25% by acquiring a more diverse client base across both broadcast and telecoms.

The figure of ‘at least’ €300mn reflects NRJ’s ambitions to raise 11 to 13x Towercast’s EBITDA of €27mn, which would not seem an unrealistic goal, given recent valuations in communications infrastructure. However, Towercast’s revenues were down by 12.8% and operating income down 24% last year, much of which was related to the French government’s decision to sell the 700MHz band range to telecom companies, resulting in the loss of two multiplexes and seeing a sharp drop in profit. Although Towercast received compensation of €18.2mn, it seems that re-grouping and driving the business in a new direction is not something for which NRJ has the appetite, and this need for a new strategy may well knock on to the valuation of the business.

**Potential buyers**

NRJ claims to have received interest from both investment funds and industry buyers, and if the company’s valuation is hampered by a recent drop in profit, it certainly won’t be impeded by investors’ appetite for French towers, with several parties very likely to want to add to their French portfolio.

**Cellnex**

It’s highly likely Cellnex will be interested in this asset. Given their growth strategy is to enter a market, establish themselves and then consolidate, this opportunity to gain a further 500 high towers with ready-made broadcast and telecoms tenants seems a good fit. Cellnex also have a proven track record in both telecoms and broadcasting, giving them the skills and relationships needed to really maximise the opportunity.

**American Tower**

American Tower’s partnership with PGGM and subsequent acquisition of FPS towers at the end of 2016 did not open the floodgates to an increase in European acquisitions, however their acquisition of FPS shows their commitment to the French market, and that they see growth as an important part of their strategy in the country. This opportunity to grow their French portfolio by 20% and diversify may well encourage them to enter the bidding process with increased alacrity.

**TDF/Brookfield/Arcus/PSP**

For TDF this could be a triple win - both extending their coverage, acquiring new clients and removing their last competitor from the broadcast market. The fact that their main investor, Brookfield, is believed to be leading the pack in the bidding process for Arqiva in the UK, shows that they have plenty of appetite for broadcast assets with telecom co-location potential. Some industry experts have been questioning whether the French government would allow TDF to gain a monopoly over broadcasting infrastructure, given the fact that they acquired the other French broadcast towerco, ITAS, in 2016. A deal like this would certainly be subject to scrutiny, whoever the buyer, and the French regulator is certainly keen to discourage consolidation on the operator side. Whether this would extend to infrastructure remains to be seen.

**First State Investments**

Owners of Finnish broadcasting asset Digita since 2012, Australian First State Investments has seen the company grow and flourish in both tower numbers (from under 100 to 556 towers), diversification of clients and diversification of offering. Although they haven’t been linked to any other tower deals in Europe this year, it’s worth considering them as potential bidders for this smaller broadcast towerco which falls firmly within their field of experience.

**AMP Capital**

AMP Capital acquired Spain’s second broadcast towerco Axion in 2016. With 582 towers, Axion is similar to Towercast in both size and market position. AMP also own Towercom, Ireland’s largest towerco, and may well be looking to grow their presence in the sector.

**GIC**

The sovereign wealth fund of Singapore, GIC bid (unsuccessfully) for a stake in Telefónica’s infraco Telxius when it was available earlier in 2017, but lost out to KKR. As investors in Africa’s...
largest towerco IHS Towers, they also have solid credentials in telecoms infrastructure.

**Digital Bridge**
This US based towerco platform was founded by Marc Ganzi and Ben Jenkins, who have invested heavily in telecoms infrastructure since the company's inception in 2013. With tower assets in the US, Mexico, Colombia and Peru and ‘neutral host’ asset Extenet Systems, they've been looking for the right foot in the door of European towers for some time, and will be considering opportunities in France.

**KKR**
Linked to European tower acquisitions including Oi’s potential sale of Portugal Telecom's towers in 2014 (which didn’t materialise as the whole organisation was sold to Altice) and most recently successful bidders for the 40% stake in Telxius. KKR is a global alternative asset manager focusing on private equity, fixed income, and capital markets.

**Competitive process**
Industry speculation is naturally focussing mainly on the three competing towercos already in the French market: TDF, Cellnex and American Tower. Current market conditions, including Free Mobile’s need for more coverage and the end of Bouygues and SFR’s RANsharing deal, are allowing the three large towercos to grow but the finite nature of the current growth means any chance to get ahead in France will be highly valuable to the key players. We expect to see the bidding for this asset to be hotly contested.
A tale of two cities: Service-Telecom acquires Link Development

Moscow-based Service-Telecom gains both footprint and expertise with the acquisition of St Petersburg’s Link Development

Service-Telecom’s announcement of their acquisition of Link Development sees Russia’s number three and four towercos consolidate to offer sites in both of Russia’s major cities. As well as increasing their geographical footprint, the deal has also broadened the scope of Service-Telecom’s infrastructure expertise, with their own agile small cell and light pole experience being supplemented with Link Development’s background in macro towers and great tenancy ratios. TowerXchange caught up with Nikolai Berdin, CEO of Service-Telecom, to find out more about how the deal took place and their plans for the future.

Keywords: 4G, 5G, Acquisition, C-Level Perspective, Co-locations, Deal Structure, Densification, Europe News, Infrastructure Sharing, LTE, Link Developments, Russia, Russia & CIS, Service Telecom, Tenancy Ratios, Towercos, Valuation

Read this article to learn:
- How the deal was conceived and key motivations for the merger
- Scope for further consolidation in the Russian market
- Plans to integrate the two companies
- Routes for growth for Russia’s independent towercos

TowerXchange: Congratulations on the acquisition of Link Development! Can you tell us about the acquisition and your motivations for the deal?

Nikolai Berdin, CEO, Service-Telecom: The tower market in Russia is growing and we’re on top of that market, the third independent big player by most accounts. We now have around 1,000 towers in our portfolio: 500 which we built through Service-telecom alone, approximately 400 which we acquired with Link Development and another 100 which will be finalised by the end of the year.

TowerXchange: Do you think there’s scope for further towerco consolidation in the Russian market?

Nikolai Berdin, CEO, Service-Telecom: At the moment the market is in two parts. As for the towers which the MNOs own, there’s no sign of an immediate deal but we haven’t ruled out the idea of acquiring one of their portfolios.

The second part of the market is the independent sector: Russian Towers, Vertical and Service-Telecom, plus new entrants in the Moscow region and also local companies who operate in each region of the Russian Federation. There are definitely opportunities for growth and for further M&A in this area, to improve and scale up what the independent sector can offer to their MNO tenants.

TowerXchange: Can you tell us about what attracted you to acquire Link Development?
Nikolai Berdin, CEO, Service-Telecom: If you look at the landscape of Russian independent towercos in early 2016, we saw only four reasonably active players and in local markets the main activity was in Moscow and St Petersburg.

We felt consolidation was the next logical step. Link Development was a leader in the St Petersburg market and the best target for us to expand our geographical footprint. No one else has had success in the St Petersburg market, and it has very good potential, so the logic was simple: by buying the leader in the market we consolidated our portfolio and clarified our vision as well as giving ourselves a strong presence in the two major markets in Russia. It hasn’t been an easy journey and we’ve had to work hard to align everyone’s expectations and get the full buy-in of our shareholders, but now the deal is completed, we all view it as viable and long term.

TowerXchange: Can you talk us through your plans to integrate the two organisations:

Nikolai Berdin, CEO, Service-Telecom: We decided that we’d like to create one big joint company with one team, present both in Moscow and St Petersburg. The idea of this is to enjoy the synergies which can be generated by two teams with expertise between them in constructing macro towers, achieving great tenancy ratios and using best practices in terms of monitoring towers. Resolving power issues when three or four tenants mean there’s a huge amount of equipment on a tower isn’t the same as maintaining street poles with only one or two tenants sitting on there. This is why Link can bring us some of the best expertise in the market. Link has been operating in the Russian market longer than any other independent player, and we’re confident that the results they’ve achieved in terms of colocation is much more significant.

At the same time the Moscow team is better positioned to work in a competitive environment, they’re more experienced in growing a portfolio rapidly and has experience in small cells and light poles which is where the market is going today. We envisage that tomorrow’s networks will comprise of several layers, and there will be a place for both macro and small cells in that infrastructure. By joining the companies, we get expertise in both sides as well as expanding our offering across Russia’s two biggest cities.

TowerXchange: Now the Veon deal seems to be off the table, what do you see as the routes for growth for independent towercos in the Russian market?

Nikolai Berdin, CEO, Service-Telecom: We’d like to continue to expand operations into new geographical regions. We are already starting up operations in the Urals and Krasnodar regions, plus we now have professionals in both Moscow and St Petersburg who will continue to grow business in these regions.

We’re also investigating options to acquire local players in regional markets and to continue to use M&A to grow our portfolio in these locations. But putting all this in place we’re aiming to create a platform which will be best positioned to acquire a bigger tower portfolio from an MNO in the coming few years.

There are four MNOs in Russia and each one has its own stance towards divesting towers. Some are rigidly intending to keep hold of their infrastructure and others are more open to working with independent players, so we will keep the lines of communication with them open in the hope that an opportunity will arise, possibly within the next couple of years.
Business Models

Over the course of the last year we’ve had access to some of the most senior execs in Europe’s leading towercos. Over the course of our interviews with them, they’ve shared insights into their business models: what works, why it works and how they plan to capture the growth in the European tower industry. From Tobias Martinez, CEO of Cellnex, to Oscar Cicchetti, CEO of INWIT to Wireless Infrastructure Group’s fibre rollout and an introduction to American Tower’s new CEO EMEA, we’ve got the inside track on tower plans for 2018 and beyond.

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A frank view on European towers from Tobias Martinez, CEO of Cellnex Telecom

Cellnex Telecom CEO shares his views on the future of European towers

As the proposed 2020 5G rollout date draws closer, tower companies must balance capex deployment between organic growth, new acquisitions and investing in infrastructure for a future which may look very different to the architecture of today.

In this interview, Tobias Martinez, CEO of Europe’s biggest towerco Cellnex Telecom and a keynote speaker at Meetup Europe 2018, shares his ambitions for Cellnex in terms of both organic and inorganic growth, and explains how the towerco is preparing for a shift away from macro infrastructure.

Keywords: 3G, 4G, 5G, Acquisition, Altice, Asset Register, C-Level Perspective, Capex, Carve Out, Cellnex, Co-locations, DAS, Data Centre, Decommissioning, Deutsche Telekom, Editorials, Europe, Fibre, France, Infrastructure Funds, Infrastructure Sharing, Investment, Italy, MLA, Multi-Country Partner, Multi-Operator, Operator-Led JV, Project Finance, Sale & Leaseback, Single RAN, Small Cells, Spain, Swiss Life Partners, Switzerland, Towercos, UK

TowerXchange: Can you tell us about Cellnex’s plans for 2018?

Tobias Martinez, CEO, Cellnex: In 2018 we continue to focus on having the right combination of expanding our geographical footprint; integrating new countries where we have recently expanded, like France and Switzerland; and delivering the best possible service for our customers.

In today’s market, we aren’t just judged by the type of services we offer and the reliability of our masts. We have operations in six countries and dealing with different customers we have to think about market positioning, consolidation, and achieving efficiencies for our customers in parallel to expanding and consolidating in new markets. We are in the process of integrating the companies we have acquired over the last year and focussing on customer management; making sure we have the teams in place to drive organic growth while also integrating new assets.

Having said that, we continue to consider acquisitions in new markets. It’s now public knowledge that Altice could be open to a potential transaction in 2018 and Portugal would be an interesting new country to expand our footprint.

TowerXchange: You gained a large amount of new territory in 2017, with operations in some of Europe’s biggest tower markets. Is your main focus now on consolidation in those markets or further growth into new European countries?

Tobias Martinez, CEO, Cellnex: We now have operations in Italy, Spain, France, Switzerland, the
Netherlands and the UK. We have expanded from approximately 7,400 sites in 2014 to over 21,000 at the end of 2017. It would be a step forward for us to improve our footprint in the Netherlands and the UK, but sometimes it's hard to find the right opportunity such as we have been able to capture in markets like Italy, France or Switzerland. It will come.

We always keep an eye out for future asset disposals in the European market. For example, as I have raised, we will see what can be expected from the potential Altice’s tower and telecom sites divesting process. Certainly in 2018 we do expect a very attractive market which will expand our pipeline of opportunities. From dealing with our customers we get a sense that they are increasingly willing to outsource passive infrastructure.

TowerXchange: You’ve acquired towers from Telefonica, VEON, Bouygues and Sunrise now. Do you feel you’ve created a ‘proof of concept’ for a European Sale and Leaseback model, and will we see more operators willing to sell their towers as the market becomes more comfortable with the idea?

Tobias Martinez, CEO, Cellnex: I definitely think the market is moving in this direction. Since our initial acquisitions we’ve been able to acquire more and more assets. Our customers recognize us as a reliable long term partner. For us, it’s about more than just allocating towers or hosting on our assets, we also offer build to suit and decommissioning. We are in constant dialogue with our customers about their future development and strategy. This partnership approach is having an effect and telecom operators are more open to discussing outsourcing opportunities.

The second most important factor is being able to accommodate all customer requirements. Until Cellnex was in the market, Master Lease Agreements were the only framework on which to base realistic services in our industry. The IFRS Standard 16 has changed the dynamics of the market. Both Cellnex and its customers are now revisiting this framework to accommodate a new way to deliver these kind of services.

This is why our Master Service Agreements are one of the levers of value creation which differentiates Cellnex from other competitors. The important aspect is the ability to accommodate all customer requests, accounting issues and concerns around the outsourcing of their infrastructure.

Our Master Service Agreements focus on the services we provide. That means they are about providing coverage rather than providing square meterage in one shelter or access to one tower. It’s managing the relationship in a different way and defining the service in a different way. From an accounting perspective, it’s a different type of service which allows the telecom operator to avoid the full capitalisation of the contracts. This isn’t the case in terms of Master Lease Agreements. The capitalisation of Master Lease Agreements means an impact in terms of debt liability. With Sunrise, Bouygues and Veon we have MSAs rather than MLAs, and for some of our customers an MSA is a must. This illustrates how MSAs will play an increased role for service providers like Cellnex and will let value emerge for our customers.

TowerXchange: We’ve talked a lot about 5G with your team over the last few months. Can you give us your high level thoughts on how quickly we’ll see 5G actually roll out?

Tobias Martinez, CEO, Cellnex: Working out the timing for new technologies is always difficult but from our point of view the timing is not a major issue. We are envisaging the first steps of 5G rolling out for commercial purposes from 2020 but in terms of passive infrastructure we have to start working one to two years before this rollout, so by the end of 2018 and into 2019 it will become a more and more relevant part of our capex plans, our contract reviews and parameters. In 2018 we will be doing more technical tests and trials and by 2019 we will start defining with our customers what will be our common approach to tackling 5G. We don’t expect to see much commercial use before 2021 or 2022.

TowerXchange: Cellnex is leading the way in terms of future infrastructure and diversifying your portfolio. Do you still see macro infrastructure as the core of your business? Do you envisage this changing over time?

Tobias Martinez, CEO, Cellnex: Macro infrastructure will continue to play a key role in the future network architecture. 5G is a dramatic change in the nature of the services we offer; it’s a big change and not just an evolution from 4G as 4G was from 3G. 5G will be an entirely different type of network, and will bring different types of services. We have to talk about robotics and autonomous cars for example. In these industries we need a latency below one millisecond, and this threshold means an almost immediate response, which means a different network...
structure. We’re going to need a lot of fibre optic backhaul connected to the towers and computing capacity near to the end users in order provide less than one millisecond latency. This will be a major undertaking for the entire industry.

To make this happen densification will be critical. Network infrastructure will be based on macrocells but not just macrocells: we need to deal with urban areas which will mean more urban telecoms infrastructure such as small cells and DAS ecosystems providing more capacity indoor and outdoor coverage.

For wireless infrastructure operators this means an expansion of our role. We have to expand from mainly passive infrastructure solutions to a more holistic approaches. Multioperator small cells, fibre to the tower, edge computing, maybe even big data analysis - why not? At the end of the day, we’re envisaging new business models which means more partnerships with other specialist companies, more specific knowledge on industries such as insurance, banking, manufacturing etcetera, as we are envisaging telecom operators will offer more vertical solutions indoor and outdoor coverage.

Recently we have managed to install a brand new network at the Atletico Madrid stadium to offload the mobile broadband services for all our customers using one single infrastructure. We’ve also deployed a similar solution at Olimpico de Roma. Moving forward we have to understand the business model and business case better, whether that’s about datacentres or other new types of services. We are keeping an eye on acquisitions that Cellnex’s peers have made in the US expanding into fibre optic and data centres. We are exploring, but being prudent, as we have to make this journey with our customers, so we are testing the water.

**TowerXchange: Your acquisition of the Sunrise towers saw you team up with equity partners from Swiss Life Asset Managers and Deutsche Telekom Capital Partners (DTCP) for the first time. How did that partnership get started? Is this a model you’ll be looking to replicate in future deals?**

**Tobias Martinez, CEO, Cellnex:** The acquisition in Switzerland was the first time we worked with investment partners, and it doesn’t mean we will always try to replicate it. In Switzerland we wanted to get a local partner like Swiss Life and it was a suitable opportunity as well to get involved with DTCP -the Deutsche Telekom capital investment arm- as the Swiss market is close to them and opened a way for cooperation and learning from each other. So far it’s going well, maybe it’s still early as we just acquired Swiss Towers AG last summer, but our relationship with both Swiss Life and DTCP is progressing very well. We don’t have any additional commitment for other countries (I mean with DTCP) but we are both open to consider further opportunities to enlarge our footprint. Everything takes time to deliver, so we need to work with them. It’s more a strategic partnership than a pure financial relationship.

**TowerXchange: As one of the headline speakers at Meetup Europe, a lot of people will be coming to listen to you. What will you be listening out for during your discussions at the event?**

**Tobias Martinez, CEO, Cellnex:** The tower sector is relatively small, although global in its scope. There aren’t thousands or event hundreds of independent companies in the market. Meetup Europe provides an opportunity to listen to other viewpoints not just from our fellow towercos but also to listen to and be listened to by analysts, investors, and telecoms operators, in order to get a full picture of the momentum of our sector.

Furthermore, TowerXchange Meetup Europe is also a great opportunity to understand what’s happening in terms of themes such as planning customer requirements, hearing their concerns and technology challenges. All in all TowerXchange Meetup Europe is becoming more relevant and more complete in terms of having a full picture of the different angles and views on the sector. It’s becoming a reference for the industry and we appreciate the opportunity to attend. You can meet more people in one or two days than you can in one month in the office or travelling abroad.
INWIT’s vision for the future of towers

INWIT are leveraging their close MNO relationships to accelerate small cell rollout in Italy. But between their current deployment plans and the infrastructure needed by 2030 is a significant gap. TowerXchange spoke with INWIT CEO, Oscar Cicchetti about his vision for the future of towercos, INWIT’s plans and how quickly he anticipates infrastructure players will need to change to meet market demands.

Keywords: 4G, 5G, Co-locations, DAS, Data Centre, Decommissioning, Europe, Europe Insights, Europe Research, Fibre, INWIT, Infrastructure Sharing, IoT, Italy, LTE, Multi-Operator, Operator-Led JV, RANsharing, Small Cells, Smart Cities, Towercos

Read this article to learn:
- How INWIT thinks 5G will roll out in Europe
- Where 5G will drive the biggest shifts in telecoms infrastructure
- How INWIT is currently preparing for 5G rollout
- Predictions on how the industry will change in five and ten years
- Threats to towercos posed by 5G and how they can be mitigated

TowerXchange: How does INWIT think 5G will roll out in Europe?

Oscar Cicchetti, CEO, INWIT: 5G is coming. MNOs and vendors are working on the standard and on the key technologies needed for the new network features. Several trials are up and running in order to better understand and shape the potential business models, the risks and opportunities.

I’ll start by focusing on the two main features promised by the new standard: speed and latency.

In terms of speed, the expectation is to go from 100MB for 4G to 10GB delivered by 5G. In terms of latency, the new technology should allow to move from 30-60 milliseconds to just one millisecond. Even if we just consider these two key features, it’s immediately clear that 5G will not be just smartphones. Smartphones, even with an intensive use of video, don’t need these extreme features. That is to say that we have incredible capabilities ahead of us, but it’s not yet known what the customers and players will do with it. The whole industry is looking to 5G rollout to see what kind of use cases will be made possible by the new promised features.

Moving to actual 5G deployment, it’s clear that between now and 2020, 5G is expected to be deployed in the Far East and the US. The first use case in the US seems to be using 5G to provide ultra-fast broadband in areas where fibre is not available, while in Korea MNOs will probably start...
with the next wave of services, as there are many areas where 5G seems to be very promising, in particular robotics and smart production, augmented reality for professional and consumer applications, low latency connections for connected cars and platforms for connected objects.

Again, the main issue our industry has to address is a better understanding of use cases.

TowerXchange: 5G could be a game changer for players across the mobile value chain, where do you think the biggest changes or relationship shifts will take place?

Oscar Cicchetti, CEO, INWIT: If you look at what’s going on now, I think that the separation between infrastructure based business models and service based business models starts to become very clear. What happened in the US, where over 80% of wireless infrastructures are now managed by towercos, is taking place everywhere in the world. If we try to understand the European route to consolidation, it’s clear that there is a delay, because the tower industry is only taking off now. But, on the other hand, the towers have already been built up. The difference between Europe and the US is that there’s no big room for new BTS projects. Consolidation in Europe is and will be more focused on decommissioning than BTS. I expect Europe’s consolidation will come in the form of MNOs undertaking sale and leasebacks transactions or consolidation among existing towercos.

TowerXchange: How will infrastructure change over time?

Oscar Cicchetti, CEO, INWIT: The current situation is very clear: the infrastructure business models of towercos are real estate business models. Operators and investors look at towercos as real estate providers but they are something more than that.

In the path from 4G towards 4.5G and 5G, MNOs will be called to heavily invest in spectrum and new network technologies, but it is not yet clear where and how they can get an adequate return. As a result they’re increasingly willing to share, in order to reduce the total cost of ownership of their networks. If the operators decide to not only share towers, but also additional infrastructures, the towercos can fruitfully expand on those new services.

Let’s consider one of the most likely new sharing area: small cells. In the new network architectures, for several reasons, many more antennas than now will be needed. In a 5G fully deployed scenario, a single operator will need at least 10 small cells for each macro cell, so we’re talking about hundreds of thousands of small cells in single European country. It’s likely that MNOs will be willing to share among them a relevant part of this new assets and to use a third party as a provider. This translates into an opportunity for neutral host players able to offer “small cells as a service” and towercos are very well positioned to play this role. What’s happening in the US confirms this trend.

TowerXchange: What is INWIT currently doing to prepare for 5G rollout?

Oscar Cicchetti, CEO, INWIT: First of all, it’s worth mentioning that we are the leader in Italy for traditional towers. With our 11,000 high quality towers and special relationship with TIM, as well as the with other MNOs, mainly Vodafone, we are often chosen to provide the new macro towers which MNOs might need in densification projects.

Secondly, we believe that small cells will have a significant role, not only in 5G deployment but also in the path from 4G to 5G. We want to position INWIT as the main neutral host in this transition. We’re at a very early stage of the process, and are currently trying to pinpoint areas where shared micro-coverage is or will be needed in the near future.

In addition to that, we have noticed that operators at this stage are looking also for single operator small cells. They believe that in some cases having single operator micro-coverage can be a competitive advantage. We don’t want to lose this opportunity, so we include this offering in our portfolio. We now offer two services: coverage as a multi-operator neutral host and single operator solutions.

We have included 4,000 small cells in our plans
to the end of 2018. This number for this stage of deployment is relevant but is in line with the market’s needs. Just a couple of years ago MNOs were planning hundreds, not thousands, of small cells but now the demand is taking off and we see in this a potential exponential growth.

Our goal is to become the neutral host of choice by quickly reaching an appropriate scale through agreement with the owners of the most relevant locations and in tune with the plans of our customers.

TowerXchange: Can you talk us through how you see your role in 5 years? Do you think it will change significantly?

Oscar Cicchetti, CEO, INWIT: We believe that we could move from a real estate business profile to something else. If towercos want to fully value the relationship with MNOs, they have to deal with a next generation infrastructure business model. I do believe that in this second wave of shared infrastructures there will be many opportunities for towercos.

I’ve already cited the first that is on the radar screen: small cells. Small cells are an infrastructure business, being characterized by long term contracts with landlords and MNOs. In term of numbers, we have two dots to be connected, the first is the few thousand small cells of today, the second is the hundreds of thousands in the longer term. The line between those two dots could take any shape and will be driven by the market. In five years it’s impossible to tell if we’ll be at 20,000 or 40,000 or even 80,000 small cells.

There are several different players who could get a slice of the small cells pie, such as facility management providers in buildings, but we believe towercos have a competitive edge as they know the MNOs and there are many commonalities between tower workflow and small cells workflow, such as dealing with landlords, providing energy and civil infrastructures, managing the relationship with MNOs.

TowerXchange: Are there other infrastructure elements to be considered in five years time?

Oscar Cicchetti, CEO, INWIT: I’d like to mention two opportunities that could materialize in the next five years or more: tower data centres and 2G refarming.

Let me start with tower data centres. As mentioned previously, one of the two relevant figures for 5G is the low latency, with robotics and self-driving cars as services that will need it. But the real latency that the user is interested in is the application latency. We experience how much time we need to get a video or a webpage, not the latency of the radio subsystem. If we consider this, to obtain an “end-to-end low latency” the content should be closer to the users, as it could take one millisecond to reach the antenna, but then nine or ten milliseconds to reach the app in the cloud.

One solution is mobile edge computing, which takes the content closer to the customer. And it’s reasonable to expect that this higher proximity to the customer should be at the tower base. In the future, towers should include a new structure called a tower data centre where MNOs can put a cache or protocol acceleration server to deliver “end to end low latency”.

Also for tower data centres we have a relevant advantage as towercos as we have the towers and space around, so if someone wants to build a distributed data centre there’s no better place.

As far as the refarming is concerned, we have seen the rollout of 2G, 3G and 4G and we are now implementing 5G; some of these technologies could be switched off sooner or later. There are differing points of view. 3G seems to be the most likely to be switched off because it was deployed to provide data services, but 4G and 5G can do that better than 3G. On the other hand 2G could have a longer life, as it will continue to be used by the visitors coming from less developed countries and by the first generation of IoT implemented on GPRS which will make it very hard to be switched off. But, on the other hand, 2G is on frequencies that could be better used in the more remunerative 4G/5G services. It seems reasonable to guess that in the future operators
could agree to have just one 2G network using a limited shared spectrum such as 5MHz to free up more spectrum for 4G or 5G. Should this happen a third reliable party like a towerco can manage the shared network.

**TowerXchange: We are at the beginning of a huge evolution for the mobile industry. We’ve talked about opportunities, but what does INWIT see as the biggest threats for towercos over the coming years?**

**Oscar Cicchetti, CEO, INWIT:** In terms of threats I think first of all it’s about the health of our customers. The mobile industry needs to grow and if the operators stopped investing in and growing their businesses, we would fail with them. We need the mobile industry to continue to be relevant, but there’s no indication this could be a real threat.

Another threat we need to consider in our business model is RAN sharing. An operator could decide not to have its own nodes on the towers, but to use nodes of other operators. This issue can be easily addressed through appropriate contractual provisions. RAN sharing should be either forbidden or towercos can charge more for it. Currently, there are very few cases where RAN sharing is taking place in Europe.

**TowerXchange: What are your thoughts on network virtualisation? Do you see this as an opportunity to extend your offering?**

**Oscar Cicchetti, CEO, INWIT:** Network virtualisation is something that is happening now. In general, we could say that the network intelligence will move towards two opposite trends: virtualization will move network features from the borders (Radio Access Nodes) to the core while the mobile edge computing will move contents from the core to the borders (tower data centers).

In concrete terms, we are already seeing the operators implementing cloud RAN architectures where, among other features, a single baseband module will be serving several radio modules. So there would be one master node with baseband and some other satellites without it. This can translate into an opportunity for the existing tower contracts because no changes are expected in the towers without baseband modules as they will maintain radio unit and antennas, while in the master towers MNOs could require more space and consequent price uplift could be asked.

**TowerXchange: What will telecoms infrastructure look like in 2030 and what role do you expect INWIT to play?**

**Oscar Cicchetti, CEO, INWIT:** I’d like to quote a GSMA white paper on 5G that says it will be likely that in the future the operators will agree to operate just one network and transform themselves into service providers. This was written by the operators themselves. Whatever date in the future we choose for this, the trend is that the operators will be pushed to share more. This could be the final twist in the story and it’s likely that towercos are well positioned to partner with operators.
The edge of tomorrow: WIG’s vision for future infrastructure
Embracing the opportunity to create infrastructure on the edge of the network

As traditional telecom architecture continues its evolution towards IT architecture, and network priorities shift towards the increased speeds and reduced latency required to meet 5G demands, towercos must also evolve and be ready to capture the infrastructure opportunities which will come with enabling this shift.

TowerXchange spoke to Scott Coates, CEO of Wireless Infrastructure Group, about his vision for independent wireless infrastructure at the network edge and how WIG is preparing for new opportunities both through building skill sets and new, collaborative relationships.

**Keywords:** 4G, 5G, C-Level Perspective, C-RAN, Centralised RAN, Co-locations, DAS, Data Centre, Enterprise, Europe, Europe Research, Fibre, Multi-Operator, Network Rollout, RAN sharing, Rooftop, Sale & Leaseback, Small Cells, Towercos, United Kingdom, Urban vs Rural, Wireless Infrastructure Group

**Read this article to learn:**
- An overview of the current infrastructure market
- Why towercos are well placed to roll out small cells
- Whether small cells could be seen as a threat to towercos
- Five and 10 year visions for communications infrastructure, and where the opportunity lies

*TowerXchange: How would you characterise the current telecom infrastructure market?*

*Scott Coates, CEO, Wireless Infrastructure Group: What's interesting is that when mobile networks first rolled out, towers were the primary infrastructure asset, but the independent wireless infrastructure or towerco sector didn't exist, it came along later. Most of the towercos built their portfolios through sale and leaseback processes. There was some build to suit, but most of our sector's growth has been through purchasing towers, upgrading them and opening them up for other networks.

What’s exciting about small cell rollout is that it’s a whole new layer of infrastructure which needs to be built and independent infrastructure operators will be there from the beginning. If we can deliver solutions and lower TCO for our customers then our sector should be set to play a significant role in the deployment of small cells. The potential requirement of 10 small cells for every one existing macro could create a market opportunity as large as towers over the next 10-15 years. If you listen to some of the commentary out of Crown Castle it certainly chimes with this view.

I’d characterise the current market for small cells here in the Europe as established and growing rapidly for indoor and early stage or emerging for outdoor. We launched our indoor business five years ago and it has fantastic momentum across a range of verticals. Our customers have really responded to the business model and our...
commercial approach. We don’t expect to see the outdoor market gather real momentum for another two to three years and certainly by the time we see 5G. However, work is happening now to prepare for this - we are doing smaller scale deployments and using these opportunities to get the relevant building blocks in place (such as the people, skills, assets and relationships) in preparation for wider rollout.

**TowerXchange: Tell us about the value you’re adding for your customers and why you’re best placed to roll out small cells.**

**Scott Coates, CEO, Wireless Infrastructure Group:** Deploying outdoor small cells efficiently involves managing a lot of moving parts. When we were appointed wireless infrastructure partner to the city of Aberdeen for example, we formed a steering group involving several key city departments such as planning, traffic and streetlight management. We worked though as many “what-if” scenarios as possible and shaped new processes for the deployment and operation of our infrastructure that could survive the challenges we might encounter such as pole swap-outs, installations on traffic lights and routine or reactive maintenance. We took time to create a rule book that we could use in Aberdeen and carry into other cities and this approach paid off, with the construction of the network completing in under two months. Experience of handling assets in this type of busy environment with multiple stakeholders is a key value we can now bring to our customers but we also need to do this in a way that lowers TCO.

We don’t consider small cells a real estate play - agreeing to pay a city or the asset owner a fixed amount to use their lampposts and then recharging this at a margin to MNOs is not a model we think has much of a future. Instead we believe that our role is to create the underlying infrastructure solutions and for us that means owning fibre and aggregating MNO demand onto our fibre assets. I think there is real opportunity to lower TCO by deploying the same commercial philosophy that we have for DAS and build to suit towers.

**TowerXchange: Can you go into a little more detail about the network you have recently activated in Aberdeen?**

**Scott Coates, CEO, Wireless Infrastructure Group:** WIG has constructed a fibre connected network of multi operator small cell nodes. It’s a contiguous network across the city centre and also passes high footfall areas around the central railway station, university and football stadium. WIG designed and constructed the network and deployed multiple
fibres to each node which all connect back to a central hub. Telefonica are the first MNO to launch on our network and are utilising C-RAN architecture which is a first in the UK market. We are delighted with the performance of the network and we plan to expand it.

More generally, we see some small cells being deployed using wireless backhaul but we are focused on creating long-term infrastructure that can support C-RAN and other fibre-hungry architectures. Supporting more processing at the edge of the network is key to lowering latency and using network resources more efficiently. It is interesting to see towercos announcing plans for mini data centres on tower sites, further addressing this need for local processing capability.

Networks of old were based on telecoms architecture but new networks will have a stronger IT feel to them. The opportunity we see is to create the independent wireless infrastructure at the edge of networks.

TowerXchange: Tell us more about your fibre rollout plans

Scott Coates, CEO, Wireless Infrastructure Group: We believe there is a demand and an opportunity to deliver bespoke fibre networks that support existing mobile backhaul in a particular city but crucially, also deliver the platform to add smalls cells as they are required.

This will need us to deploy our own fibre and we are expanding our team to do that. There’s lots of duct already out there, meaning we can avoid major digs if we can get access. From a regulatory point of view, there needs to be access to BT Openreach’s duct in the UK and this is already available to the national telcos in other European markets.

There is also a need to expand our relationships from the tower space as we did with our indoor smalls cells business five years ago. This means a broader set of relationships with cities and local authorities. There are a few challenges in this area as some local authorities are placing their street assets out for tender and taking a very short-term view, focusing on maximising revenue rather than unlocking significant long-term investment in their city. We think this is a missed opportunity, particularly outside of London.

TowerXchange: Do you think the new network architecture could be seen as a threat to towercos?

Scott Coates, CEO, Wireless Infrastructure Group: We expect to see two main trends in network activity over the next few years – more capacity in urban and indoor locations and a journey towards ubiquitous coverage in rural areas. More towers will be needed in rural areas and elsewhere outside of urban centres but in cities we expect to see the capacity expansion addressed through small cells.

TowerXchange: What’s your prediction for towers five years from now?

Scott Coates, CEO, Wireless Infrastructure Group: In five years we will be in full scale deployment of small cells. There will be continued demand for indoor systems, in both bigger and smaller buildings, and also strong demand for outdoor smalls cells. The question is who will be investing to deliver the infrastructure? I think it’s worth looking to the US for a good forward view as they’re well ahead of Europe in the deployment of fibre connected small cells. Crown Castle and Extenet are involved, as well as fibre-only players like Zayo and carriers ATT and Verizon are also doing it for themselves. It’s a big enough space to support and require all of these players to be investing and Europe will need similar engagement from across the sector. We certainly see small cells as an attractive and additive space to be investing.

TowerXchange: What about 10 years from now? Will we still have ‘towercos’?

Scott Coates, CEO, Wireless Infrastructure Group: We’ll have independent wireless infrastructure companies which is what we call ourselves already. Some of those will address customer needs with a mix of tower, fibre and other wireless infrastructure assets and some players will probably remain pure towercos, there’s still room for both models. If you look at DAS, five years ago people thought it was an odd thing to be doing in Europe, with just WIG and Commscon rolling out neutral host solutions in any meaningful way, but now it’s much more mainstream. Small cells will get that way as well, now it looks a bit R&D but it will move to the top of the strategic debate as the scale of demand emerges.
The next steps for Irish towercos

Colin Cunningham and Donal O’Shaughnessy, founders of Irish towerco Cignal, talk about growth in the Irish market

In the two years since we last spoke to Irish towerco Cignal, they’ve been busy growing through both organic and inorganic means in the fragmented Irish market. Cignal now owns land at 476 locations supporting telecoms infrastructure, of which Cignal own the tower infrastructure at 201 of these locations and the remaining locations (275) are leased to 3rd parties who own the tower infrastructure. TowerXchange caught up with founders Colin Cunningham and Donal O’Shaughnessy to find out how they’ve grown over the last two years, how they’re laying the foundations for 5G rollout in the market and timelines for consolidation in the fragmented Irish market.

Keywords: 5G, Acquisition, C-Level Perspective, Capex, Cignal, DAS, Densification, Europe, Europe Insights, Fibre, Ireland, Market Overview, Small Cells, Towercos

Read this article to learn:
- How Cignal’s background allows them to move quickly on opportunities in the Irish market
- The reaction of Irish infrastructure owners to 5G rollout
- Thoughts and forecasts for consolidation in the Irish market
- How Cignal has been making the business case for rural tower rollout

TowerXchange: It’s been two years since we last interviewed Cignal, what has your focus been on since that time?

Colin Cunningham, CEO, Cignal: Because Cignal was very much a start up when we bought the Coillte portfolio and founded the company, we’ve been trying to focus on where we position ourselves in the market. In the last 12 months we have seen some momentum in what we’re trying to do. We have started delivering sites in ‘black spot’ areas which have been traditionally difficult areas to cover. We’ve had relatively high success in terms of planning applications over last 12-18 months. It’s a very different environment in terms of what was there 10-15 years ago and the government is focussing on trying to enhance rural coverage and constantly trying to support initiatives to facilitate mobile and broadband rollout. We are completing acquisitions of small portfolios and single site acquisitions and have been building some momentum into that strategy over the last 12-18 months.

We’re also keeping an eye on what’s coming in terms of the 5G rollout. Following the downturn in the economy in 2008 we are now seeing more property developments of scale in Ireland which are going to need large scale DAS-type and rooftop solutions. Cignal is currently exploring a number of these opportunities.

TowerXchange: Tell us more about how you make the rural tower business model work?
Colin Cunningham, CEO, Cignal: First of all we have built an efficient strategy in terms of our overall project delivery. We examined all the overheads in the business case and came up with different commercial solutions, not necessarily the traditional ones. The fact that we started with a blank piece of paper gave us the ability to do something a bit different. Our commercial model is different; the process we use; the environment is different in terms of government and community support. In fact people are ringing our office to know when the tower will be built as they want the service. A number of factors such as this feed into our strategy and mean we’re able to deliver on a commercial basis.

TowerXchange: You have been making gains in terms of acquisitions in Ireland, what’s your strategy for future growth?

Donal O’Shaughnessy, Chairman, Cignal: It’s a mixture of organic and inorganic growth, continuing to drive new sites where coverage is needed and also trying to acquire what’s available out there. We have a steady flow of acquisitions all the time, and have put a strong property acquisition team into the business. On the portfolio acquisition side, it gets more difficult as portfolios aren’t always available but it’s timing, you can be lucky and just get it at the right time. We have the structure in place and all of the support services, if an acquisition was available in the morning we could start to react right away. We are capitalised and ready to go if the opportunities present themselves. We have pillars of internal development, rollout and construction which aren’t dependent on acquiring but at the same time we’re ready, willing and able to do that. It’s down to what opportunities the market puts our way and also what opportunities we create ourselves.

TowerXchange: Were the opportunity to arise, do you have the capitalisation and appetite to go for an acquisition of scale?

Donal O’Shaughnessy, Chairman, Cignal: Absolutely. At the end of the day Cignal is backed by InfraVia, a multi-billion Euro fund manager. There’s appetite to deploy more funds into Cignal and no real limit on that other than the fundamentals of what we acquire has to stack up.

TowerXchange: The Irish market has several active towercos and JVs, how likely do you think it is that Irish towers will become acquisition targets for international towercos in the near future?

Colin Cunningham, CEO, Cignal: There is still ongoing consolidation in the Irish market. Cignal for sure is very active in that process. The necessary consolidations will certainly happen over the next 24 months. The other side of it is that some of the smaller towercos are going to need capital to invest in their existing infrastructure to support the rollout of 5G equipment requirements, so that could be a catalyst for them to exit at that point in time. This may therefore create a natural exit timeframe for some of the smaller players in the market. For sure it can be expected that International Towercos will seek to enter the Irish market at some point and there are many opportunities for future infrastructure investment through the rollout of the national broadband plan, 5G Network deployments & Network densification requirements.

TowerXchange: Can you talk us through the Irish market at the moment? What are the key factors which define it?

Donal O’Shaughnessy, Chairman, Cignal: We’ve got a couple of key changes, Eir mobile will have a new shareholder in the next couple of months and the 3/O2 network consolidation is still ongoing. Most of the operators have been densifying their 4G coverage, so that’s been the key thing over the last 24 months. The focus generally has been on optimising what they have, rolling out 4G and covering areas which have been poorly served for a number of years. Irish operators have started the 5G conversation, but no definite plans have been shared as yet, it’s still a bit early for any definitive understanding. DAS and densification of networks is under discussion and we’re looking at how we can play in that space as well, seeking opportunities to provide passive infrastructure on the street to accommodate these requirements.

TowerXchange: Talk to us about 5G rollout in Ireland and your plans for future infrastructure.

Colin Cunningham, CEO, Cignal: We’re certainly pushing and trying to design solutions such as fibre to the antenna and C-RAN: we’re having those discussions with our customers. We’re not seeing
anything of scale yet but it’s on the horizon. Fibre to the tower and C-RAN type deployments are two areas we will be very focussed on. At the moment we are looking at the type of solution and the type of site and we’ll progress some pilot projects over the next 12 months to try out different rollout strategies with a focus on efficiency of rollout and cost. There will be opportunities for Cignal to participate in pilots of different types of rollout. We’re engaged in the conversation and trying to put forward unique solutions where we can. We started with a blank piece of paper two years ago and had a keen eye on the future, that was all part of our discussion when we started the business so we’re well placed to pursue these opportunities and have aligned ourselves to key partners who add to our pool of expertise.

Donal O'Shaughnessy, Chairman, Cignal: Our street furniture programme will really kick off with the municipalities. When you talk about putting data centre capabilities at the base stations or putting fibre connections into sites it enhances 5G capability more than a data centre would. We’d see that more as a leapfrog in terms of infrastructure connectivity as it’s costly in terms of equipment, power and space. Moving towards cloud-based networks rather than posting everything on the site. We’re working on infrastructure which has a massive impact in dense urban areas and the next step is to take that to a C-RAN type deployment, have fibre going from a local exchange straight to the antennae. We’ve been working hard on this for the last 12 months and are engaged with a number of municipalities. The government is trying to encourage this, so we are working in a very interesting environment where we’re getting a lot of support from customers, local government and national level support too. We are very lucky to have a shareholder willing to invest and we have the necessary technical expertise in place; we’re in a very strong position as we go forward. We’re delivering on what we’ve been given from our customers and our focus is to keep doing that.

TowerXchange: Cignal has been involved in TowerXchange Meetups since we launched in Europe in 2016. Tell us about what you’re hoping to get out of the European event this year.

Donal O’Shaughnessy, Chairman, Cignal: We want to talk about the evolution in data centres and bringing data to the site, it will be interesting to understand the scale it’s happening in. We also want to discuss the whole area around C-RAN: are operators actively rolling out? It’s quite an investment to put C-RAN architecture in a network, are they actively investing in this?

Colin Cunningham, CEO, Cignal: How are other markets planning out new opportunities for street furniture and DAS, and what does the 5G infrastructure world look like in five to ten years time? We need to be putting groundwork in place for infrastructure to support that in the timeframe in which it will be rolled out. We’re also keen to talk about the cross over to IoT networks, which are becoming more and more prominent. We’d like to see how it can actually be fixed together as opposed to looking at DAS, 5G and IoT in isolation.
Women in Towers: Leah Stearns, CEO EMEA, American Tower

Leah Stearns on her career to date and aims as the new EMEA chief for American Tower

As part of our Women in Towers series, TowerXchange caught up with Leah Stearns, who moved into the rotational role of CEO EMEA in July 2017. She talked us through her background and how American Tower (and telecoms infrastructure) has changed over the past 16 years. She also shared insights into her new role, and her ambitions for the coming years.

Keywords: 5G, Acquisition, Africa, American Tower, Brazil, C-Level Perspective, Colombia, Consolidation, Due Diligence, Europe, France, Germany, Ghana, India, Mexico, Nigeria, Sale & Leaseback, South Africa, Towercos, Transfer Assets, Uganda, USA, Women in Towers

Read this article to learn:
- How Leah’s background prepared her for her current role
- The importance of gaining a 360 view of the company
- Leah’s core aims in her current role
- Her greatest professional achievement

TowerXchange: Tell us about how you got into telecoms infrastructure

Leah Stearns, CEO EMEA, American Tower: I joined American Tower’s Corporate Finance team over 16 years ago. Shortly after I joined there was a realignment of priorities to focus solely on our core tower leasing business. At the time, the U.S. telecom industry was in a state of significant change and I found it fascinating to work for a business which was going through such a material transformation.

TowerXchange: Can you walk us through your career in towers to date?

Leah Stearns, CEO EMEA, American Tower: I spent my first years working in tax, financial planning and analysis, primarily supporting American Tower’s operational teams as well as in investor relations, working with our institutional investor base. In 2005, American Tower completed the acquisition of SpectraSite in the US, and I provided finance support to our operations through that process.

Beginning in 2006, international expansion became a top priority at American Tower, as we sought to replicate the success we had found in Mexico and Brazil. Ahead of this, I worked through our initial global market assessment and then spent time supporting the international business development team from a corporate finance perspective. This included working on transaction evaluations and financial diligence, starting with a 200 tower build to suit project in India.
In the late 2000s my role shifted to lead our Investor Relations efforts. As we pursued our REIT conversion, our investor relations team invested a significant amount of time in investor education about the company and industry. Transparency always has been very important to our investor relations outreach. From my perspective, American Tower is very fortunate to have very thoughtful and long-term investors and I’m happy to be able to continue to work closely with our investors in my current role.

In 2013 my role was expanded to include capital markets and treasury. I was responsible for leading our global financing strategy to support deals such as the Verizon transaction, our expansion in Brazil and launch of operations in Nigeria. This included raising debt and equity capital while working with the rating agencies to help them understand our commitment to our investment grade rating.

I’m now six months into my new role, and I’m privileged to lead a wonderful team with a tremendous depth of talent. I’m responsible for advancing our position as the leading telecom infrastructure provider in EMEA; and Europe and Africa present unique opportunities for American Tower.

**TowerXchange: What does your current role entail?**

*Leah Stearns, CEO EMEA, American Tower:* EMEA represents about 10% of American Tower’s revenue: there are around 15,000 sites in the region across six markets - Nigeria is the largest, then South Africa, Ghana and Uganda in Africa. In Europe we operate in Germany and more recently in France, the latter being the result of our recent acquisition of FPS towers.

We’ve been a patient and disciplined investor, focussed on long-term growth. For example, in Europe the fact we’ve grown slowly doesn’t mean we’re not interested in investing more on the continent.

The primary focus of my current role is to drive our regional strategy. This spans across multiple facets including managing customer relationships, maximising our return on invested capital through selectively investing in attractive assets, driving organic growth and overall efficiency.

In addition, we continue to play a meaningful and important role from a corporate social responsibility perspective and we’re committed to giving back to the communities in which we operate. In Africa, we’ve recently launched our first digital village sites in Nigeria which provide educational resources and training at our tower sites.

Finally, American Tower is focused on driving innovation to support the emerging needs of telecom infrastructure. In Europe, urban densification is something we are looking to invest in. In Africa, we’re focused on reducing our carbon footprint through investing in renewable and more efficient power solutions at our tower sites.

**TowerXchange: What is your greatest professional achievement?**

*Leah Stearns, CEO EMEA, American Tower:* I’m so proud of being part of the team which has grown American Tower to what it is today. There’s no one piece of the puzzle; our work has culminated in creating an organisation which is well respected, with a great business model and has achieved impressive returns for shareholders. I’m also excited about next 5-10 years with a focus on innovation as well as continuing to grow our asset portfolio.
The TowerXchange European tower power report

Tracking power and backup usage across the continent

Over the last three months, TowerXchange has conducted an extensive survey, having in-depth conversations with independent towercos, JV infracos, MNO-owned towercos and MNOs themselves across Europe to build a picture of how tower power is managed across the continent. We’ve uncovered unique insights not just into current power requirements, but also how shifting economic, environmental and political environments will affect how power is consumed and provided.

Keywords: 5G, Cellnex, EI Towers, Energy, Europe, Europe Insights, France, Fuel Cell, Germany, Hybrid Power, Italy, Market Overview, Masts & Towers, Off-Grid, On-Grid, Procurement, ROI, Regulation, Renewables, Russia, Russia & CIS, Scandanvia, Small Cells, Solar, Tax, TowerTel, TowerXchange Research, United Kingdom, Uptime, Urban vs Rural, Wind, Wireless Infrastructure Group

Read this article to learn:
- Statistics and critical information about how European power is consumed
- Backup strategies and distribution
- The role of Critical National Infrastructure in mobile networks
- How towercos prefer to deal with power provision
- Purchasing plans and strategies for power and backup across Europe

The involvement of towercos in power in Europe

The European tower market is unique in many ways: from the high incidence of shared infrastructure between broadcast and telecoms to the need for extensive decommissioning across many markets; these idiosyncrasies all contribute to a unique power footprint across the continent. With grid power available across most of the region, and excellent coverage across population masses, power needs differ dramatically to markets in Africa or Asia (see the sidebar). In some African markets, power provision can account for as much as 60% of OPEX, by comparison European towercos are reporting at most 12% of their OPEX spend going on power provision as the majority is passed through.

The operational demands of managing telecoms infrastructure in Europe are much more straightforward than in emerging markets. To date, much of the role of the towerco has been financial - allowing MNOs to shift towers off their balance sheet and release capital. Indeed, many towercos have felt thus far that there is little competitive advantage to be had in operational aptitude and thus they outsource much of this on a large scale. By offering a purely ‘grass and steel’ solution, towercos have traditionally expected their tenants to manage their own backup power solutions, although negotiating with utility companies and passing through power has become the norm.

Grid access

In terms of grid connectivity, Europe enjoys high
coverage, with the majority of our respondents stating that their network enjoyed almost 100% grid access. These numbers were attenuated slightly by responses from Scandinavia and Central and Eastern Europe, where some countries have lower grid access due to geography or for environmental reasons. Marius Pilinka, CEO of Teletower, which owns 485 towers across Latvia and Lithuania, explained that “10% of our sites are off grid mainly because it is not physically possible to provide a connection to on-grid power; more than a third of Lithuania’s territory is covered by forests.”

**Negotiating power prices**

Respondents to TowerXchange’s survey reported negotiating rates for electricity in Europe to be very straightforward, with most buyers comparing their purchasing process to that of any other product with 6-12 monthly price reviews according to the duration of their contracts. In countries like Russia, for example, where the market is dominated by one player and prices are considerably lower than elsewhere on the continent, there is little to no price comparison and assessment needed.

The issue for tower owners in Europe is that they are comparatively small-scale customers for electricity suppliers, and the fact that their needs are disparate and spread over a large geographical area means their attractiveness as customers is limited. Some respondents in Scandinavian countries reported that their membership in buying coalitions gave them a stronger hand in negotiations with electricity suppliers, while others find that hedging allows them to mitigate price fluctuations in purchasing electricity. Vodafone, who are often leading the pack in terms of innovation, are taking part in trials of the SmartNet Project, which allows towers to use their battery backup to support the grid during peak times - a reciprocal agreement which could reduce costs and help to stabilise fluctuations.

EI Towers also pointed out to us that it’s not just about how you buy power, but when, with a tender at the right time saving 10-15% over other times of year. Buyers need to look carefully at the fluctuation of power prices across the year depending on oil costs, supply forecasts and consumption. An example of this includes when French power prices increased sharply at the end of 2016 due to overrunning works on one of the country’s key nuclear plants.

Some tower owners are thinking more creatively in order to reduce energy costs. Juha-Pekka Weckström, CEO of Digita in Finland, explained that “Digita is part of a coalition of big electricity buyers called “Voiman Ostajat” which negotiates electricity prices as a block” he added that “Along with this we use hedging, which gives a protection against the variation of electricity prices.”

**Power provision**

European power is almost 100% pass through on third party towers, with every towerco respondent we spoke to offering pass through power on the majority of their structures, although around 25% of those asked did either have a mixture of pass through power and MNO-controlled power on their sites, and/or offered a fuller power solution to their tenants. Where a mix of models is used, the
situation often stems from legacy infrastructure and relationships, meaning that we would expect the number of towers operating on a pass through basis to increase as towercos standardise across their portfolio.

Metering and billing is a low-opex model for towercos, and not geared to generate much profit, but efficiency and transparency are nevertheless critical for infrastructure owners to maintain a good tenant relationship, and tenders are conducted on a regular basis. Metering and billing can prove costly for towercos, however, given their often light operational staffing levels and the vast amount of data which needs to be collected and interpreted.

For broadcast and other clients where third party providers also operate active equipment, power is a part of the package and there’s no direct transfer of power costs but a fixed fee for power provision, allowing a small profit to be made. This fee will include grid power (calculated based on current rates agreed with utility providers), backup power, equipment and monitoring.

Cellnex are keen to leverage greater transparency to improve efficiency across sites, with Mirko Masi, Director Technology - Global Operation, saying: “Where we provide passive infrastructure services to telecom operators we are providing power supply based either on a simple pass-through model or a power as a service model. The trend now is to migrate to a pay-per-use power supply model, where all the associated costs are passed-through to customers in a simple and transparent way. This model is also better to promote joint initiatives to improve power efficiency.”

Backup power requirements

Backup power on sites is still split between MNO and towerco ownership, varying not just by tower ownership but even from site to site dependent on legacy provision. Unsurprisingly, towercos carved out of MNOs and joint ventures such as INWIT or CTIL tend to take ownership of backup supply for their towers. In addition, broadcast providers like Arqiva or TDF tend to back up their infrastructure due to its role as critical national infrastructure. Increasingly, as independent towercos look to consolidate their position in the market, many of them are moving from a ‘steel and grass’ model towards a service offering in order to differentiate themselves and increase tenancy ratios, and this includes consolidating backup power as well as offering grid power through a pass through or pay-per-use model.

TowerXchange Survey Result: How is power provided on your sites?

- **100% pass through**: 69%
- **Mixed pass through and MNO provision**: 11%
- **Power as a service**: 20%

Source: TowerXchange

TowerXchange Survey Result: Do you currently use smart meters?

- **Yes**: 84%
- **No**: 16%

Source: TowerXchange
We know that the large telecommunications companies are looking to use renewable energy to reduce fuel consumption and help contribute to a more sustainable world. However, generator sets remain and will continue to be a fundamental part of any BTS, as they are the only way of guaranteeing reliable backup power and providing an immediate response in the absence of any other energy source. Levels of solar radiation are not stable, winds are variable and battery running times only guarantee supply for as long as they are designed to last, meaning they won’t be able to deal with any problems lasting longer than this period. Therefore, any energy model would include an electrical generator in the backup system for the BTS, especially at the most critical stations.” Guillermo Elum, EMEA Regional Sales Head, Himoinsa

Backup power provision

Batteries are the most common form of backup, with an average of around two hours of backup power available, where backup is deemed necessary. Lithium ion batteries are seen as the most desirable batteries for European telecoms, but most tower owners still have questions around ROI in the field.

Gensets are reserved for the most important sites; those with more tenants, which serve a larger than average population or which form part of critical national infrastructure such as broadcast services or emergency communications.

Additionally, we noted the importance of temporary generator hire in the European market, a solution which is not generally observed in emerging markets. Rather than own, maintain and secure fuel for their own generators, MNOs and towercos will use contractors to bring in generators on the backs of lorries for the duration of an outage. Two key factors mean this model works well in the European market; firstly, power outages are infrequent, short lived and usually confined to a small geographical area and secondly, the size of most European countries means that generators can be stored and deployed to most regions with relative ease. Most respondents have a list of local portable generator suppliers which they can call on in an emergency, with towercos often taking responsibility for this.

Increasingly the towercos we spoke to said that they were assessing the possibility of coordinating backup power on site themselves. In part to create a fuller service offering to their tenants, and also in order to optimise the space used at the bottom of each tower and maximise the amount of equipment which can be placed on them.

According to Nigel Moss, COO at Wireless Infrastructure Group ‘We’re deploying our own containerised, tamper-proof diesel generators to around 10% of our facilities where resilience is particularly key, for example at remote locations or at hub sites. Typically we’re deploying permanent 25 KVA generators that can provide resilience to several customers.

We see this as a value added service proposition: it’s about enabling shared economics for our customers, saving space and avoiding duplicative generators.’
Renewable and hybrid solutions are not widely used in Europe, although grid power from ‘green’ sources is preferred in some markets, such as Germany, where incentives are in place. As a rule, renewable and hybrid backup solutions are used by the larger and more innovative players in the market, both in terms of towerco and MNOs, meaning that as their use in the field is proven, there’s a good chance that renewable solutions will become more prevalent on the continent.

The role of government and CSR

There is currently very little government incentive for using renewable power, with respondents claiming that tax breaks for sustainable electricity either don’t apply to telecoms infrastructure or are so small as to make no material impact on their balance sheet. Some respondents stated that, although power prices haven’t gone up significantly, the percentage of the power bill allocated to supporting renewable power has gone up, making tower owners supporters of renewable power by default. Power as a commodity may have gone from 80% to 30% of the bill, but the cost of the full package in absolute terms didn’t change much.

Moves towards more sustainable sources of power are driven in some cases by corporate social responsibility policies, either their own initiatives or as part of the value chain of customers who are adopting best practices in the sector.

Drivers for change in Europe

Although it’s unlikely that European tower power will ever shift off-grid, there are a number of economic, political and commercial factors which are driving the market towards a hardening of power networks and backup power is becoming increasingly important across the continent.

Critical National Infrastructure

In the UK, emergency services communications have shifted from the TETRA system to EE’s network, meaning the towers from which they operate have become a part of critical national infrastructure, and outages are not an option. For those towers which form part of a broadcast network, such as those belonging to Arqiva in the UK, TDF in France and Cellnex in Spain, their position as critical national infrastructure is well established and their networks are well backed up. With threats from cyber attacks and terrorism upping the ante, both battery and genset backup is moving up the agenda.

Powering small cells and future networks

“We see clearly the connection to the urban grid as the main source of supply, even if distributed generation and local distribution points will help in the challenge. Where backup batteries will...
TowerXchange Europe Dossier 2018 | www.towerxchange.com/meetups/meetup-europe

TowerXchange Survey Result: Is part or all of your network considered Critical National Infrastructure?

| Yes 49% | No 51% |

Source: TowerXchange

TowerXchange Survey Result: What % of opex does power account for for you right now?

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<thead>
<tr>
<th>0%</th>
<th>1-10%</th>
<th>11-20%</th>
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<td>18%</td>
<td>42%</td>
<td>40%</td>
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Source: TowerXchange

TowerXchange Survey Result: What % of capex spend is planned for power purposes over the next year?

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<td>17%</td>
<td>83%</td>
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Source: TowerXchange

be required for small cells, in our view Lithium batteries will help due to reduced volume and weight of the equipment.” Mirko Masi, Director Technology - Global Operation, Cellnex

Towercos and MNOs seem to be split on the small cells issue. There are those who are aggressively pursuing opportunities in order to secure market share, and those who are waiting to see how the drivers for this section of the market develop. Those who are working on small cells see that they will have a new set of energy requirements in the near future for this type of asset. With solutions such as picosolar already in place for some street furniture, this may be an opportunity for renewable or hybrid energy models to break into the European telecoms infrastructure market in a more widespread way.

On the other hand, proximity to the grid for urban infrastructure means that batteries may become an important part of the power cycle as street lamps are switched on and off according to time and season.

Most of the tower owners who are developing small cell solutions are in the process of exploring their power needs and trialling solutions at the moment. One complication towercos and MNOs are wrestling with is the low consumption of each small cell - well below the minimum power requirements which utilities need for connection, meaning small cell owners pay for more power than they use as there are no low consumption deals in the market.

The challenge will be to have national regulators and authorities provide very low power points of presence. Currently other similar low-consumption
street furniture, such as parking meters, are powered through local municipal power networks, but it’s not clear to date if they can provide power for third parties.

Solar and battery solutions, which have been used widely for other street furniture, are an option for small cell owners, but keeping the small cell network ‘invisible’ becomes trickier as power sources are attached. Low impact solutions which can power small cells will be sought after as they proliferate across Europe.

**What next for European tower power?**

European tower owners have benefitted from near-universal grid access and very low outages since their infrastructure was put in place. This has allowed them to focus their energy elsewhere as they can simply ‘plug and play’ in most locations. However, a number of factors, including the shifting of critical national infrastructure onto telecoms infrastructure, the roll out of small cells and alternative infrastructure and the shift of towercos from seeing themselves as ‘real estate’ owners to focus on service offerings means many towercos are seeking to harden at least part of their network.

According to Heavy Reading’s ‘Mobile network outages and service degradations’ report of February 2016, they estimate that mobile operators are spending 18% more on network outages and service degradations than they did in 2013 - a total of around $20 billion globally on an annual basis.

In addition, we foresee some major external factors which may well affect tower owners’ abilities to rely on the grid. Power generation capacity is struggling to meet demand in many part of Europe, and while renewables are growing; over- and under-supply due to fluctuations in weather are becoming more common. National power grids’ ability to deal with this varies across the continent but many countries are issuing warnings about a ‘power crunch’ in the next few years, particularly as electric vehicles begin to become more popular and represent both a huge new drain on the network and a shift in the peak times when power will be needed.

Already, power management firm Eaton’s most recent Annual Blackout Tracker saw the number of grid outages in the UK more than double between 2010 and 2015. Tower owners may need to think more creatively about how and when they consume power from the grid, and even leverage their position to become a part of the solution, as explained by Eric Estrade of Vodafone in his recent interview with TowerXchange.

In the short term, TowerXchange hopes to open up the dialogue between MNOs, towercos, suppliers and regulators in order to allow European tower owners to access ‘best practice’ solutions from around the globe, not just in terms of power generation and backup, but also to enhance efficiency and think creatively about their opportunities and responsibilities over the next 10-20 years.
Global infrastructure: power comparison

**Africa:** Power is the biggest single operational challenge for tower owners in Africa. An estimated 60% of opex is spent on powering cell sites in the region as grid provision is scarce and inconsistent. Theft of diesel and batteries is also a huge problem, contributing to complex logistical and security requirements as well as climate and geographical issues. Hybrid and renewable solutions are becoming more prevalent as they eliminate or reduce the need for a diesel supply chain, but there is no one solution which is currently proving infallible in the current circumstances.

**Asia:** Power provision in Asia varies dramatically from country to country. With over 30 countries in the region, from Singapore to Myanmar, there is no ‘one size fits all’ in terms of geography or infrastructure. In countries like Myanmar or Laos, as in many parts of Africa only the major cities benefit from grid connection, and the remainder of the country remains off grid. Renewables and hybrid solutions are becoming more popular in Asia, with India recently launching a huge initiative to push green power which is driving change across the country. Responsibility for power varies as much as everything else on the continent - generally towerco will pass through when on grid, and in off-grid cases they will provide a power solution to their tenants, but the measuring and billing of power is not consistent from one country to the next.

**Latin America:** In LatAm power provision is still managed by the MNOs, even when they are using a third party tower, and even pass through power is almost unheard of. The grid works across the board, with only a few spots with very low population density (such as the Amazon) off-grid. Those sites which are off-grid tend to be powered by diesel generators, with renewables still hardly used in the region. However, auctions for new spectrum are coming hand in hand with targets for increased rural coverage, meaning off-grid provision will need to improve in the CALA region.
Broadcast towers: profiting from adjacency
Where the opportunities lie in European broadcast assets

In 2016 and 2017 we have seen an acceleration in the number of broadcast assets coming to market in Europe. Once seen as more complicated and less dynamic than telecoms towers, increasingly towercos and investors are reviewing their strategy on broadcast towers and becoming more open to adding this adjacent asset class to their portfolios. TowerXchange takes a look at how these portfolios have grown, the current opportunities in the market and who is investing in European broadcast towers.

"Keywords: SG, Active Infrasharing, American Tower, Arqiva, Brookfield, Cellnex, Co-locations, Consolidation, DAS, Data Centre, Digita, Digital Bridge, Editorials, Europe, Exit Strategy, Finland, France, Germany, IPO, Infrastructure Sharing, IoT, O&M, Private Equity, Small Cells, Spain, TDF, TowerXchange Research, Towercos, UK"

Read this article to learn:
- Where broadcast towercos operate in Europe
- Which deals have taken place recently and what’s on the market
- Valuations of European broadcast towers
- Who is investing in broadcast towers
- Further opportunities which can be leveraged from broadcast towercos competencies

Broadcast towers in Europe

Broadcast towers have a much longer and more varied history than telecoms towers. Radio broadcasting began around 100 years ago, and by the 1950s most governments in Europe had established (and owned) a radio network.

In the 1960s and 70s some of the world’s largest towers were built across Europe, to allow radio and television transmission to millions of homes across the continent. Towers such as the 646m Warsaw radio mast in Poland, the Ostankino Tower in Moscow, Russia and the Emley Moor mast in the UK are testament to governmental commitment to getting broadcast signal to every home across the country.

By the 1990s, broadcast networks covered almost 100% of European populations, and many of the publicly owned towers were privatised in huge deals.

Synergies between broadcast and telecoms towers

By fortunate coincidence, as European operators began to build their networks, many of the national broadcast towers were being privatised and looking for alternative revenue streams. Although the higher frequencies used in telecoms communications meant base station networks needed to be denser, there was a clear synergy with the high broadcast towers, which were already optimally positioned and had power and access routes in place.
In a recent interview with TowerXchange (see TowerXchange interview ‘View from the top’ Journal issue 12) Nicolas Ott, Arqiva’s Telecoms Managing Director, explained why there’s such an extensive crossover between broadcast and telecom towers, explaining that it’s a three layer answer, incorporating infrastructure, sourcing and skills.

“In terms of infrastructure, if you look at a broadcast tower it’s always a relevant structure for MNOs. These broadcast towers are so big and strong, adding a few antennas for MNOs is easy. The majority of our broadcast towers have antennae for MNOs as well. There’s no need to duplicate assets and investment with these towers.

In terms of sourcing, for both telcos and TV we outsource a lot to third party suppliers for maintenance and other ‘easy’ work, although we do keep the sophisticated stuff in house. We use the same suppliers for all parts of the business, so when we issue a tender we can propose a bigger scope, which means the bidder can offer us a more competitive price and service. The same applies for electricity as we buy electricity on our sites for both our MNO and broadcast customers, and by combining we get a better service and price, so our customers all benefit.

When it comes to skills, we keep the most value-add functions in house. When someone wants to put an antenna on a mast you need to do fairly technical drawings, we do a lot of that in house as we have to be sure it’s done well and you need huge project management capabilities.”

For European infrastructure owners, these

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synergies allow them to maximise their assets. With both telecom and broadcast tenants signing long term contracts with quality covenants at a time when demand for infrastructure investment is high, there is increasing interest in these adjacent asset classes.

**Broadcast assets for sale in Europe**

Over the last 18 months a handful of broadcast assets have come to market and have had very different fortunes in terms of outcome. Certainly, it seems that the larger independent towercos are becoming more comfortable with the idea of owning broadcast assets, despite a reluctance to consider them initially, which means we now see companies such as American Tower buying up small broadcast portfolios which they would not have considered before.

**American Tower/Westdeutscher Rundfunk (WDR)**

Announced in late 2016 in the German press, American Tower acquired 186 transmission towers from German radio broadcaster Westdeutscher Rundfunk (WDR). Although the purchase price is undisclosed, American Tower quarterly reports reveal that their Q1 2016 purchases totalled $79.8mn for 433 towers in Germany, Nigeria, the US and Brazil, so we estimate that the German towers may have cost in the region of €35-40mn.

**TDF/ITAS/Towercom**

Until 2016 there were three broadcast towercos in France - TDF, ITAS and Towercom. In 2016, TDF acquired ITAS for a reported €100mn, rolling their 420 towers into the TDF portfolio. In September 2017 French media group NRJ announced its intention to sell broadcast towerco Towercast, declaring that Towercast isn’t a ‘fit’ with NRJ’s core business. It’s believed NRJ hopes to raise up to €300mn from the sale.

Towercast owns around 500 towers across France, with a focus on DTT and FM transmission. NRJ has been close to a sale before, most notably in 2014 when the process was whittled down to two bidders and the sale was believed to be a ‘done deal’, only to fall at the final hurdle, reportedly on price.

Last year, Towercast generated sales of €55 million and EBITDA of €27 million, but NRJ CEO Jean-Paul Baudecroux believes revenue could grow by as much as 20-25% by acquiring a more diverse client base across both broadcast and telecoms.

The figure of ‘at least’ €300mn reflects NRJ’s ambitions to raise 11-13x Towercast’s EBITDA of €27mn, which would not seem an unrealistic goal, given recent valuations in communications infrastructure. However, Towercast’s revenues were down by 12.8% and operating income down 24% last year, much of which was related to the French government’s decision to sell the 700MHz spectrum band to telecom companies, resulting in the loss of two multiplexes and creating a sharp drop in profit. Although Towercast received compensation of €18.2mn, it seems that re-grouping and driving the business in a new direction is not something for which NRJ has the appetite, and this need for a new strategy may well knock on to the valuation of the business.

**Axion**

In 2016 Spanish broadcaster Axion was sold by Antin Infrastructure to AMP Capital. Axion operates 584 broadcast towers in Southern Spain, with some telecom colocation.

**Alticom/Cellnex**

In 2017, Cellnex acquired Alticom and its 30 high towers in the Netherlands for €133mn. For Cellnex this was not simply a broadcast play, but an acquisition designed to bring in house the skills and expertise needed to create new network architectures which will provide the low latency critical for 5G rollout.

**Arqiva**

After failing to reach an agreement with strategic buyers despite getting close to a deal with a consortium led by Brookfield, Arqiva announced an IPO in October 2017, which was then cancelled two weeks later. The short turnaround time suggests that Arqiva quickly identified a mismatch between their own expectations and those of the markets, and the towerco’s next move is as yet unknown.

The markets’ excitement about telecom towers and small cells has been offset by uncertainty about the debt pile and the longevity of Arqiva’s broadcast core, which accounted for 47% of revenues in the
year to June, compared to just 33% of Cellnex’s revenues for FY 2016. Commentators have been speculating about the longevity of Digital Television Transmission (DTT), which itself replaced analogue transmission in 2014, although Arqiva has refuted these comments, saying ‘hybrid platforms’ such as Now TV will maintain the relevance of digital broadcasting.

In terms of telecom infrastructure, Arqiva own roughly 25% of the UK’s macro tower sites. Arqiva services all of the four MNOs and has around 8,600 active towers for these mobile operators. Their tenancy ratio is around 2.5x. Although they have 8,600 active towers, the total portfolio consists of over 16,500 towers (the remaining ~8,000 towers are not active due to MNO rollout plans, rural locations where demand is low or deployment complexities as many of them are not dedicated telecoms infrastructure, such as electricity pylons)

The company has long term and secure contracts with both MBNL (an infrastructure sharing joint venture between EE/BT and 3) and CTIL (a similar joint venture between Vodafone and O2) and grew the M2M and telecoms business unit by 6.4% in FY2015-16.

It’s worth noting that just about every major (and proven) tower investor in the world has been connected with Arqiva over the course of 2017. There’s no shortage of appetite for what remains an attractive asset, just a valuation gap. Arqiva either needs to improve the confidence of their potential

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**Figure 2: European broadcast transaction map**

- Broadcast assets have changed hands in the last three years
- Broadcast assets for sale/IPO
- Dedicated independent broadcast towerco offering services to telecoms tenants in the market
investors or to recalibrate their valuation. For more information read https://www.towerxchange.com/ruling-britannia-who-will-acquire-the-uks-biggest-independent-towerco/

**Digita**

Finnish broadcaster Digita’s network of 556 towers covers 99.9% of the Finnish population and has offered colocation opportunities to Finnish MNOs for several years. Their more recent diversification into IoT and data centres appears to be a savvy move, given the valuation Alticom achieved through a similar move into adjacent verticals. Several heavyweight investors have already been linked with the asset, with a formal sales process believed to be about to begin in Q4 2017.

**Broadcast valuations**

There appears to be much less transparency around the valuations of broadcast towercos than there is around telecom assets, and it’s clear that there’s often a gap between broadcast towerco expectations and what the market is prepared to pay. There’s also often more to a broadcast towerco deal than meets the eye; as towercos move into 5G infrastructure, they need to think about offering tenants a full service, and often the value in these broadcast companies is in skillsets and expertise as much as physical assets.

“Valuations for broadcast assets have not necessarily reached the levels seen in the mobile tower segment. As such, whilst not all assets will necessarily be attractive in the long run, it may be possible to identify and create value around specific broadcast assets.” Says Brian Burns, Telecoms Strategy Director at PWC.

“At a European level, the sub-700MHz spectrum has been allocated to broadcasting up to 2030. There is less certainty after that point, and some spectrum may be allocated to mobile but, particularly in countries where other alternatives are more limited, digital terrestrial television (DTT), broadcasting may continue well beyond that point.

At the same time, broadcasting network operators may be well placed to act as platforms to enter or grow in adjacent markets such as mobile hosting, small cells, IoT, data centres and even fibre deployments. All of these areas have the potential to generate significant growth, although some are higher risk.

In the long run, there will always be winners and losers in this sector as with any other, largely driven by the market dynamics in individual countries as well as broadcasting players’ chosen strategies. These assets may be most appealing to more sophisticated investors who are well placed to assess the long-term risk of DTT switch-off, as well as the suitability of the specific target to capitalise on potential growth opportunities.”

**Who’s investing in European broadcast assets?**

Several different entities have a proven interest in broadcast tower assets:

**Alinda Capital Partners**

Infrastructure investors who acquired Polish broadcast towerco Emitel from Montagu Private Equity in 2013.

**AMP Capital**

Bought Axion, the Spanish broadcast towerco from Antin in 2016. Among other communications infrastructure investments, Australian AMP Capital also owns Irish towerco Towercom and has been linked to Finnish towerco Digita.

**Antin Infrastructure Partner**

Antin Infrastructure Partners has a solid track record in telecom and broadcast towers, having sold FPS Towers to ATC Europe in 2016, and also sold Spanish Axion to AMP Capital in the same year.

**APG Asset Management**

APG is a Dutch investor with a strong track record in European infrastructure. They are rumoured to be interested in Finnish towerco Digita.

**Arcus Infrastructure Partners**

Arcus form a part of the consortium which owns TDF and also sold UK-based Shere Group to Cellnex for €393mn in 2016.

**Brookfield Asset Management**

Current investors in TDF and led the consortium which came close to acquiring Arqiva in summer 2017. Brookfield are actively pursuing tower investments around the world.
Cellnex
As well as owning their own legacy broadcast assets, Cellnex acquired Dutch broadcast towerco Alticom in 2017 for €133mn. Cellnex has ambitions for strong growth in Europe and a clear vision of the expertise they need to bring in to lead the 5G infrastructure rollout.

Canada Pension Plan Investment Board (CPPIB)
The Canada Pension Plan Investment Board is a part of the consortium, led by Macquarie, which owns Arqiva. They also own Broadcast Australia, an Australian broadcast towerco, and have a small stake in TDF in France.

Digital Bridge
Digital Bridge has been linked to several tower sale processes in Europe, including the Arqiva sale process. Their current companies include Mexico Tower Partners, the largest independent towerco in Mexico and companies offering ‘neutral host’ and data centre services.

EQT
EQT is a Swedish investor with a large global portfolio and a strong background in TMT investment. They’ve been linked with the Digita sale process in Finland.

First State Investments
Australian First State currently own Finnish broadcast towerco Digita, which they acquired from TDF in 2013. They are looking for buyers for the asset.

IFM Investors
Infrastructure investors on a global scale. Currently form a part of the consortium which owns Arqiva.

InfraVia Capital Partners
Infrastructure investor InfraVia Capital owns Cignal, the ambitious Irish towerco which acquired Cellcom in 2017. They have also been linked to the sale of Finnish towerco Digita.

Macquarie Group
Macquarie is a prolific investor in towers, with current investments in Arqiva, Russian Towers, Towercom in Slovakia, Ceske Radiokommunikace in the Czech Republic, Viom Networks in India, InSite in the USA, D’LIVE in South Korea and Axicom Group in Australia.

PSP Investments
Canadian PSP Investments is currently a part of the consortium which owns French TDF.

DTT and the future of broadcast
Broadcasting is currently seen as a critical part of European infrastructure, and indeed it is generally considered to be critical national infrastructure by most governments. However, the increasing consumption of content via the internet and the rise of IPTV services such as Netflix and Amazon Prime have led to speculation that digital broadcasting could be ‘switched off’ as soon as 2030, and the spectrum repurposed to provide further bandwidth for mobile communications.

Clearly, for towercos whose profits rely on the services they provide to the broadcast industry, this is a significant threat to the longevity of the business. Simon Beresford Wylie, Arqiva CEO, refuted the claims that IPTV would replace broadcasting. “It is arrant nonsense. People are over simplifying,” he told the Financial Times, saying that in the UK, ‘hybrid’ platforms such as Now TV were helping to maintain the relevance of free-to-air live television.

However, like many broadcast towercos, Arqiva is investing heavily in diversification, working on a comprehensive small cell offering and adding the SIGFOX IoT network to their portfolio. In Finland and Estonia, Digita and Levira have both developed impressive data centre capabilities and of course broadcast now makes up just 33% of Cellnex’s annual revenues, with their growth strategies focussing on telecoms towers and future networks.

One advantage which broadcasting towercos have over telecoms towercos is their experience in delivering a full service to tenants. Whereas telecom towercos have often acted more as straightforward ‘real estate’ investors, broadcast towercos will generally provide power, backup and O&M services, as well as delivering active services, with many providing the transmission itself.

As 5G drives network evolution over the next five to 10 years, and the rise of small cells and network virtualisation drives the need for outsourcing more and more of the network to neutral hosts, these capabilities will become increasingly valuable in the towerco’s toolkit.
Women in Towers: Europe
Introducing the leading women in European towers

TowerXchange is committed to encouraging and enabling diversity across communications infrastructure. As part of our ongoing work in the tower community, we have spent several months working with some of the most senior women in European towers and profiling them for this new feature. Women in Towers is a live project and we will be updating it regularly, as well as adding in content for the other regions we serve. We have been delighted with the industry response to this project and hope to reflect the seniority and diversity of the experts we work with throughout our Meetups in 2018 as well. If you’d like to be considered for this feature, or to nominate a colleague, please email me frose@towerxchange.com

Keywords: 5G, C-Level Perspective, CTIL, Carve Out, Co-locations, Deutsche Funkturm, Editorial, Europe, Europe Insights, Germany, INWIT, Infrastructure Funds, Italy, MBNL, Operational Excellence, Operator-Led JV, Private Equity, Russia, Russia & CIS, Standard Bank, Tenant’s Perspective, Tilman Global Holdings, Towercos, UK, Vertical, Wireless Infrastructure Group, Women in Towers

Read this article to learn:
- Who are the most senior women in European towers
- How they have pursued successful careers in the tower industry
- What their greatest achievements have been
- Where their future ambitions lie

Cellnex: Yvette Meijer, Country Manager, Netherlands
I got introduced to the telecoms world a long time ago at Ericsson in the UK back in 1992. However, I really began my ‘infrastructure’ career in 1997 working in procurement at EnerTel, the first challenger to KPN for voice in the Netherlands after the liberalisation. At the time, EnerTel had taken the decision not to also go for a mobile license and so I was involved in a project transferring greenfield and rooftop contracts that EnerTel had already acquired in anticipation of the mobile license, to Ben (now T-Mobile Netherlands). I was quite intrigued by how Ben had awarded Nokia a turnkey contract to roll out their whole mobile network from start to finish, and so decided to leave EnerTel
and join Nokia to be part of this exciting roll out of a new mobile network in the Netherlands.

At Nokia I started as Site Acquisition Negotiator and not long after I became Regional Site Acquisition Manager. In 2000 I left to join my partner who had moved to London to set up the InterXion DataCentre. In London I joined Colt (City of London Telecoms/Technology Services), a Europe-wide provider of different fibre metro networks, initially as a project manager DSL unbundling Local Loop in the UK, later, over a period of over 10 years, followed by various programme management roles in engineering, network operations across Europe and India.

An opportunity arose in 2012 when Arcus Infrastructure Partners acquired 461 towers from KPN through a share purchase agreement. Our paths (fortunately) crossed and I was given this amazing opportunity and assignment to launch Shere Netherlands and manage the assets. At that time Shere Ltd had already been in existence as a successful tower and land management company in the UK since 2004.

I started with the recruitment of the team, finding an office, doing a handover with the former KPN staff and went from there. At the same time the LTE rollout was just beginning in The Netherlands.

From that moment on I found myself looking up (spotting the Shere towers) instead of looking down (spotting Colt the manholes) anywhere I went.

In July 2016 Cellnex Telecom acquired Shere’s competitor in Netherlands, Protelindo with 260 towers. A few months later Cellnex also acquired Shere Masten. This meant the very quick integration of Protelindo (renamed Towerlink Netherlands B.V.) into the Shere Masten team and a joint integration of ‘Cellnex Netherlands’ as such into the new parent organisation; Cellnex Telecom. A lot of my time over the last year has therefore also been dedicated to organisational matters.

Cellnex in Europe is much more than ‘just’ a tower company. In addition to this, Cellnex recently acquired Alticom in the Netherlands, thus also starting operations in broadcast and data centres. All this means that we are now actively looking for other opportunities that will bring us more in line with the businesses Cellnex is involved with such as DAS and small cells, 5G, Smart Cities and Edge Computing.

My role has changed from startup, operational to consolidation, followed by integration and now more focusing on business development. And this variation is exactly what makes my job challenging and fulfilling.

Just two months after my start date in March 2012, the Shere team was fully up and running and had taken over the responsibility for the KPN towers four months ahead of target. More than anything building an efficient stable team of dedicated professionals and building a trusting relationship with our customers, (not limited to) the four MNO’s in The Netherlands, has been my greatest professional achievement. We offer speed and a professional yet personal service to our customers with clear processes and quick response times. All this resulted in an increased value of the company and the acquisition by Cellnex Telecom. Despite of the fact we are now part of a large European and listed company, we remain a hands on and lean team focused on our customers and operational excellence.

CTIL: Belinda Fawcett, General Counsel and Director of Property & Estates

I joined 3UK in 2005 to head up their legal property team, managing the retail property portfolio and the roll out of the 3UK Network. After four years, I moved to MBNL - a Joint Venture between 3 and T-Mobile (now EE). I was one of the founding
directors and played a key role in developing and delivering the strategy for the consolidation of their 3G networks. We delivered the projected cost savings and other synergies for both shareholders. The MBNL Network was the first consolidated mobile network in the UK.

In 2015 I joined CTIL (a JV between Vodafone and Telefonica) as General Counsel and Director of Property. I established the in-house legal team and restructured the Property and Estates Team to support the shareholders’ ambitious plans for a joint network across the UK. In order to meet the challenging timelines of the shareholders, we reviewed and re-defined the strategy and accelerated the consolidation, recovering missed timelines and implementing new business processes which would enable us to achieve further improvements to the key performance indicators of time, cost and quality.

The CTIL Property team is playing a key role in the introduction of the Electronic Communications Code, developing standard documentation and processes for the telecoms industry once the new Code is introduced. We are working closely with the Property industry to drive a culture of change in the relationship between the Landlords and Tenants in the telecoms infrastructure domain with a view to supporting and ultimately delivering the Government’s ambition to improve connectivity in the UK. We are pulling down the traditional barriers and addressing key issues raised by the Code in a collaborative and cooperative manner.

This is a strong focus area as I firmly believe this to be the way forward if the UK is to compete in the Global marketplace and provide the support to the UK Government’s commitment to build world Class infrastructure and improve connectivity.

Deutsche Funkturm: Dr. Saskia Wagner, Regional Manager Munich

I have been working in the telco environment for the past 14 years. After finishing my law studies in Bonn and Lausanne, Switzerland with a doctorate, I started working in the legal department at Deutsche Telekom in 2003. The focus of my thesis had been on competition law, therefore I was looking for an employment in a bigger company with their own marketing department that I could advise as a lawyer concerning their advertisements.

After different roles in the legal department and later on in the human resources department at Deutsche Telekom I took the opportunity to lead the human resources department at Deutsche Funkturm in 2012. After two years developing employees’ skills and launching an individually designed training to promote aspiring young female employees, I wanted to change into the “operational” part of the business and I became head of site acquisition in Bavaria, a task that perfectly fitted with my studies in law. These last two years I have been working as branch officer in our regional office in Munich. I could extend my knowledge about technology while being responsible for the realisation of infrastructure for mobile networks in southern Germany.

Me and my 40 colleagues are responsible for the rollout of radio network infrastructure in the area between Ingolstadt and the border to Austria. Building infrastructure for mobile network providers means that we support network providers in selecting the suitable site, renting the needed area and providing them with planning sheets and site documentation. Furthermore we organise the construction and maintenance of the infrastructure, get permissions if necessary and stay in contact with the municipalities.

Working in a technical environment, almost exclusively male dominated, is very challenging, all the more for me as a non-technician. And of course our operating goals are very ambitious. But I am very happy and thankful to be working together with many competent and supportive colleagues.
INWIT: Gabriella Raffaele, Head of Human Resources

After a short but significant experience in Finance Department of Ethicon – part of the Johnson & Johnson Group - I began working for TIM in 1996. For the first four years I worked as a professional in the Total Quality Department with the objective of improving service levels and customer satisfaction by reengineering some core processes, such as billing, network delivery, complaints and credit management. After this I spent more than 10 years within the HR Department of TI – the Italian incumbent - where I was responsible for organisational development leading a turnaround toward a more agile and lean organisation. During this period I was involved in transformation projects related to the infrastructure of both our mobile and fixed networks. In 2014 I served the company as HRBP Manager - Human Resources Business Partner - with the ambitious goal of reskilling and empowering the sales forces, then in 2015 I joined INWIT as HR Director.

Within INWIT I was responsible for building team management, core processes, organisation and capabilities from scratch, playing a critical role in building the company, which is now considered one of the best tower operators in Europe. Since 2015 the scope of HR Department has been to transform the tower department of TIM into an independent company with autonomous processes, systems and resources. Moreover, the strategic achievement has been to build a new culture and a new vision in people through strong internal communications. Once we were past the start-up period, HR’s role has focused on performance improvement. The HR department is responsible for hiring and firing, training and talent development, performance evaluation, compensation, payroll, administration, organisation and so on. But ultimately the HR department is asked to have a practical understanding of business needs and to reflect that in HR processes. The innovative attitude of the company - which has created new business lines – has necessitated the hiring of new strategic skills and the transformation of existing ones from a pure real estate approach to a technological vision. At the same time the HR Department had a key role in boosting operations by improving processes and gaining ISO certification in order to expand business opportunities.

I have no doubt that my greatest achievement is the experience I have accrued in INWIT, professional as well as human. It’s amazing to contribute to the success of INWIT, to improve the company performance day by day the and to immediately see results the results. Vision, strategy and business objectives are clear throughout the organisation and it is so powerful to see how individual performance acts directly on company performance. In terms of professional results I’m proud to say that we have increased the number of personnel by 60%, hiring people with strong competencies which will be useful for the delivery of our small cells plan; we have launched a new variable incentive system focused on business targets and we have deployed a program of continuous learning.

My main goal has been to transform the attitude of people in order to make INWIT the best in class company in the tower market in terms of business growth, by a new vision and a strong brand.

MBNL: Juliette Wallace, Business Planning and Property Director

I got into towers right at the beginning of my career: during my undergraduate course in Civil Engineering at the University of Lancaster, I had the opportunity to work for Telefónica in their Planning and Design department, which was my first exposure to the world of towers and telecommunication sites. After that I worked for the BaaBaa software team on the project to support the planning of MBNL’s sites. I then moved to the role of Business Planning and Property Director with the ambition to contribute to the success of MBNL by raising the awareness of the business and the company’s people, and by fostering a culture of collaboration and innovation. I have been with MBNL for almost 18 years, starting as a junior consultant and growing within the team. The company has been growing exponentially in recent years, and I am proud to have played a role in driving the business and growing its footprint across the UK.

MBNL operates in a highly competitive market with demanding customer requirements, and we are constantly looking for new ways to improve our service and deliver value to our customers. One of my key achievements has been to transform the attitude of people in order to make MBNL the best in class company in the tower market in terms of business growth, by a new vision and a strong brand.
Engineering I had the opportunity to take a year out in industry. I ended up in the Site Design Services department of the company which was to become One2One (later T-Mobile and now EE). I spent just over a year undertaking a small amount of site design work and working closely with the CAD department, however, a large percentage of my time was spent in a structural engineering capacity undertaking tower analyses. A large part of which involved working on our large switch towers to ensure we could continue with putting further loading on them in the form of microwave dishes.

By the time I graduated the construction market was at a low point, and after about a year I returned to One2One as a Project Co-ordinator, again working predominantly on the towers and focussing on provision of secondary steelwork for microwave dishes to support the new site rollout. I then moved into a role focussing on the management of site share applications, and after a further year or so, I was promoted to the role of Project Manager for new site rollout.

This role gave me responsibility for managing the acquisition, design and construction outsourcing for about 1,000 sites. A promotion to Senior Project Manager provided me with line management experience, and it wasn’t long before I was managing a full complement of staff in the ADC space as the Build Manager for the South Region.

I took a short period away from hard-core site rollout for a while, covering central services which supported the build regions, before once again being promoted to Head of RAN Strategy & Commercial. It was whilst in this role that I became involved in the ground-breaking negotiations between T-Mobile and Three to launch the world’s first network sharing arrangement and thus MBNL was born.

I joined MBNL in 2008 as Property Director, taking on responsibility for ensuring the legal agreements which govern our use of the land were amended as necessary to enable the RANshare to proceed. It was an amazing journey and by 2010 the project to consolidate the two networks was substantially completed. Since then, we have seen T-Mobile merge with Orange to form EE, the rollout of 4G and many other projects which have kept my role as Property Director at MBNL exciting and current.

As Property Director at MBNL, I am responsible for all matters associated with the estate management of the physical infrastructure. The role includes the cost management associated with the rent, rates and also the power costs of the estate. We have in the region of 20,000 cell sites each of which has its own nuances and needs. Our landlords are immensely important to us as they are our gateway to our sites.

My greatest professional achievement has been the network sharing agreement between T-Mobile and Three – it has stood the test of time and proven its worth time and again. The fact that O2 and Vodafone have tried to copy us is flattering!

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Russian Towers: Ekaterina Novikova, Director of Organisational Development

I always liked to learn new things, get engaged in various projects, to evolve. My first education was technical; however, it did not prevent me from working successfully in PR. Later I became interested in organisational development. I studied and received additional qualifications in Human Resources and Project Management. Prior to joining “Russian Towers” I worked in NIS (“NIS-GLONASS”), the federal operator in navigation and information systems, where I had real life opportunities to apply and refine all my skills; technical as well as organisational. When I was invited to join the Russian Towers team, I had no doubt that this would be my next challenge and a very interesting experience.

Since my joining Russian Towers I’ve held the position of Director of organisational development. My areas of responsibility are the company’s organisational development, human resources management, PR and administrative matters.
My greatest professional achievement is being a part of a highly professional and motivated team who focus on continuous improvement. I am very proud to say that five members of our team entered the rankings of the top 1000 managers in Russia this year!

Standard Bank: Nina Triantis, Managing Director, Global Head of Telecoms and Media
I have been involved in the TMT sector for about 25 years and have worked both in the developed world and in EM, with Standard Bank for nearly 13 years. I run the Bank’s Telecoms, Media and Technology sector team globally, and have been involved with a wide cross section of clients across a number of Bank products/offerings. Tower infrastructure sharing was well known to myself and the team at SB from prior experience, when we saw companies positioning to do this in Africa, we focused on the sector very early on, since its very beginnings. This of course paid off as the bank ended up arranging finance for the lion share of towerco deals, and we have also been very active on the advisory side and more recently in capital markets transactions.

It has been a great journey and it has been very gratifying to have participated in it with the rigour, and breadth and depth of achievement. We look forward to the next evolution of the sector including to the future of the existing major players on the continent.

TDF: Tatiana Bergamo, COO
I joined TDF in December 1999. Before that, I worked in the semiconductor industry in an international company as a product marketing engineer. I seized the opportunity of the new telecom business stream opened by TDF to host MNOs for the roll-out of 2G/3G. It was a very exciting challenge to be part of the mobile telephony adventure and to bring my experience in a competitive environment to the incumbent broadcaster which was used to monopoly. The French towerco leader allowed me to take on a broad range of responsibilities and to enhance my skillset. After joining TDF as pre-sales manager, I quickly took on account management accountabilities in the telecom business, then I dealt with business development to diversify our customers base (dealing with local authorities, equipment vendors, WiMAX carrier, et cetera) before finally becoming Sales Director for the whole Telecom business unit, dealing mainly with MNOs on hosting, roll-out and maintenance activities.

After a decade of business development, I pivoted toward operations to enable that side of the business to become more agile for both broadcasting and telecom activities. First I created a cross functional team in charge of resources and performance management which oversaw supply chain, operational capex & opex as well as pre-sales and contract costs and KPI management. After four years, I moved one step further up the organisational chart and took the lead of whole operations in TDF.

In my role managing operations, my teams and I are responsible for delivering what is needed to our customers in terms of telecom roll-out, broadcasting activities and all network operations including building new assets and new activities such as fibre. We are the TDF factory!

The challenge is to continuously anticipate market requirements and technological evolutions, adapt our processes and skills, manage the change through the whole team and nurture talent. We make the TDF strategy happen in an operational prism and fulfill the customer requirements: Connect faster, further, everywhere! My greatest achievement has been the role I’ve played in the growth of TDF and in the transformation of the ‘factory’ (our operational competencies). I’m excited to continue the
adventure by investing in mutualised and open infrastructures to increase densification and diversify the services we offer in mobile telecom, broadcasting and fibre.

I get enormous satisfaction from customer satisfaction feedback – that's the best testimony for our assets and service developments. I am also very proud of the way our teams have responded to the changing shape of the business, over the last few years we've switched from analogue to digital and are now moving into fibre to keep up with customer requirements; throughout these evolutions we've been able to move flexibly and proactively to anticipate the needs of the market.

Tillman Infrastructure: Suruchi Ahuja, CFO

I studied at the School of Engineering and Applied Sciences at Columbia University and completed my MBA at INSEAD before beginning my career as an analyst in Citigroup's Hedge Fund Services Business. Prior to joining Tillman Global Holdings (TGH), I worked as an investment analyst at MAST Capital Management, a credit-focussed hedge fund, covering the telecom, telecom infrastructure and satellite and communications industries. I am currently CFO of Tillman Infrastructure, a tower company currently deploying one of the largest build programs in the US. In addition I am a partner at parent company, Tillman Global Holdings, where I co-lead global business development and mergers & acquisition activities across North America, South America, Europe and Asia. I'm deeply involved in every step of the process, identifying greenfield investment opportunities and managing transactions. I'm also pioneering TGH's digital cities initiative, which targets redefining the way citizens interact with their broader communities through holistically upgrading urban infrastructure.

I'm on the board of JCDecaux Link, a joint venture which builds and operates small cell infrastructure globally, and I'm also on the New England board for UNICEF.

Vertical: Valerie Buriachko, Client Relations Executor

This was my first role in telecoms. Before, I worked in the metal industry for 10 years, for a company that produced metal sheets for canned food. After that, I worked for a Swiss company that provided the equipment for can making, but that was for a short period of time. Then in 2013 I was invited to the Vertical project to help with operations, because that's what my background was, and my primary task was to help the company build processes.

This is my fourth year with Vertical, and I've seen the company grow from just four employees to more than 60. The first two years were exhilarating but I got very little sleep!

In the early days we did a lot of PR work - when the first poles appeared in the city we had calls 24/7 asking what the poles were and whether they were harmful to the local population, with only 10 people in the company by that time it was all down to me to respond to this. So we went to talk to people, organised a lot of meetings, met with lots with different government departments - construction, civil services, public relations.

It's more routine now, and our focus is on expanding the business. The type of work has changed. We have built strong relations but industry rivalry has grown very much, which means you have to be tough and quick as our competitors also want to be first and you can't allow them to be a step ahead.

Our expansion plans mean we need to make sure our company is well organised to roll out to the regions. It's hard work as there will be a different approach in each area. We have different legal requirements regarding property and land leases, which varies greatly from region to region. Sometimes our legal staff even need to give
recommendations to local government on which part of their laws they should change to facilitate infrastructure builds. We need to explain how it will help their economy and bring money to local coffers. Then comes a lot of legal work where you have to work on the mistakes in legislation and contracts until you can go away and dig the soil to put in the light pole or tower.

Maintaining good relationships with our customers is a critical part of what I do. I need to know each MNO, their KPIs, how they grow, what new technologies they’re using. We work very closely together, with daily calls and emails, and weekly visits. We also work together with the operators to help extend their radio frequency. Some regions are not covered by their mobile network and they don’t have the capacity to meet the requirements of their subscribers. In big cities where tech grows faster and people have 4G they need to provide fast internet. We have to build the infrastructure for them to improve their networks. We must follow every step they make, and even be one step ahead to know their plans and be ready to deploy in areas they are going to grow in.

At the same time, I’m also responsible for our work with local government, authorities and municipal services as well as some legal preparation, lots of negotiations and meetings. Everything starts with a base: how we will build this infrastructure and I’m responsible for all this.

My greatest achievement is the fact I’ve grown personally as well as professionally. Being in a position to build a business from the ground up, and step back from what I’m doing to see a situation from all sides has been very enriching. I sell our services, so I’m a salesperson and I push my team to hit targets, but I also have to understand the bigger picture in the context of the company or the economy as a whole.

Next year we will expand and will have to perform in other big cities across Russia. It’s a very important part of our strategy. Once this is completed I’d like to move towards our technology development and work with MNOs on ideas to hide their equipment and be invisible in the urban environment. Our government pays a lot of attention to the appearance of the city and is nervous about the look of the equipment put on the poles. They don’t want to ruin the architectural views of the city. They have tasked us with working out how to hide the equipment and I have a technical education so this is a good fit for me.

For the operators, doing small projects isn’t easy but for us it’s easier to build into the design process. We’re creating urban poles which will provide the capacity of a full size base station hidden inside poles or tanks. We are also looking forward to the appearance of 5G, which will require even more attention to the placement of the equipment. My staff who work day to day with the MNOs have got good enough not to need my input all the time, so working on the technical progress and ideas is what I’m looking for.

Baring Vostok Capital Partners Fund V has joined us this year. We believe that their unique experience and knowledge of the market will take us to a whole new level and help us reach new heights.

Wireless Infrastructure Group: Angela McLean, Senior Commercial Manager

I have been working within the telecommunications sector for nearly 20 years. Soon after graduating with a property degree, I joined a network roll-out supplier initially focusing on the identification and site acquisition for a number of the UK Mobile networks.

The experience gained, then led me to move Network Operator side, managing the infrastructure portfolio of the UK’s Tetra Network, supporting the UK blue light sector. When the opportunity arose to join the commercial function of an infrastructure company such as Wireless Infrastructure Group (WIG), I jumped at the chance to use my experience and move to the other side of the fence to work in this fast paced, innovative and expanding company.

My role is wide ranging supporting both the commercial, delivery and business development functions of the business. Primarily, I manage the day to day relationships with our non-mobile customers which include Airwave, BT, Arqiva and hundreds of small operators using our infrastructure to support their networks.
Wireless Infrastructure Group is an independent infrastructure company working behind the scenes to enable better connectivity across the UK. We build and operate communication towers in rural and suburban areas together with fibre-based networks to improve mobile coverage in buildings and on city streets. We invest in higher capacity infrastructure that can support multiple networks and new technologies.

There are a large number of projects I am proud to have been either involved with or led in the facilitation of the network deployment for WIG’s non-MNO customer base. Very recently I have led WIG’s support to the roll-out of a regional transportation network in the West of Scotland and the UK element of a European Aviation Network across both WIG and WIG’s partners’ infrastructure. My leadership ensured WIG’s involvement in both projects was delivered on budget and on-time. I was also directly involved in facilitating the utilisation of WIG’s infrastructure to support the roll out of the SWAN led by Capita and their partners.

Outside of the commercial networks, I look for opportunities to engage in more localised projects, for example, working with smaller organisations to help facilitate the provision of rural broadband for the benefit of small communities working with local individuals to help identify and utilise our existing infrastructure.

Every day is unique in the UK towers sector. I relish the challenge professionally, to keep abreast of the ever changing demands of our customer requirements, technological advances and the ever changing landscape of the telecommunications sector.
How to value the Altice towers

Unique crowdsourced business intelligence from M2 evaluates tenancy lease-up potential

It’s no secret that Altice is selling thousands of towers across France, Portugal and potentially the Dominican Republic. Prospective bidders have a limited time window in which to conduct their due diligence, evaluate the assets, and make a compelling offer in what is sure to be a competitive process, given that it includes that last substantial tower portfolio to be sold in France, and the market-leading MNO’s towers in Portugal. M2Catalyst has developed the Crowd SiteIntel tool specifically to accelerate towercos’ time to insight.

Keywords: 4G, Acquisition Market, Altice, Americas, Business Case, Co-locations, DAS, Data Room, Dominican Republic, Due Diligence, Europe, France, IBS, Infill, KPIs, LTE, M2Catalyst, Market Forecasts, Overview Valuation, Portugal, RF Design, Ratios, Sale & Leaseback, Site Level Profitability, Small Cells, Tenancy.

Read this article to learn:
- How M2Catalyst can evaluate the tenancy lease-up potential of every Altice tower
- The impact of small cell infill
- How M2Catalyst measures network performance indoors, and distinguishes cellular from Wi-Fi data usage
- How to evaluate the lease up potential of the 15,000 new towers targeted by the French government in no coverage zones
- Enabling towercos to sell co-location and new build proactively as business partners of MNOs, rather than passively selling vertical real estate

TowerXchange: Whenever a new portfolio of towers comes to market, as is the case with the Altice towers in France, Portugal and the Dominican Republic, potential bidders urgently need to map the towers for sale relative to the other towers in the market and, more importantly, they need to understand the lease up potential of the towers for sale. How can M2Catalyst help them with this?

Mike Brough, CEO, M2Catalyst: The Crowd SiteIntel platform from M2 has been designed with a data science approach to disrupt the tower valuation space.

The Crowd SiteIntel Tenancy Lease-Up Potential (CSI-TLUP) reports for France are built upon billions of network performance measurements that have been crowdsourced by M2Catalyst. M2’s proprietary algorithms measure and quantify the current and potential tenant performance for each site in the target M&A portfolio. The CSI-TLUP analysis incorporates a tremendous amount of complex information, such as the range of towers, technologies on each tower, and relative signal strength, quality and performance of current versus non-tenant MNOs within the range of each tower. This enables M2 to provide data-derived actionable information for the potential bidders.

TowerXchange: M2Catalyst has some experience of studying French cell sites. To what extent is the French network heterogeneous?

Mike Brough, CEO, M2Catalyst: The macro tower market in France is significantly impacted by the small cell (micro, pico, DAS) infill.
To study the macro and rooftop site value for potential non-tenants, you cannot just look for the next nearest macro or rooftop property. There needs to be a very thorough analysis of all the small cell antennae utilised in the range of each target site. The CSI-TLUP France Report covers well over one million antenna sectors, providing a complete picture of the non-tenant MNO small cell coverage in proximity to macro and rooftop sites.

**TowerXchange: Can you share a small sample analysis of the SFR towers?**

**Mike Brough, CEO, M2Catalyst:** In Figure One you can see that we have analysed two example towers from the Nanterre area of Northwest Paris. Looking at the detail in Figure Two focuses on outdoor street-level network performance. The SFR tower in Téréva Houilles unsurprisingly provides a great customer experience for the anchor tenant’s subscribers, but network performance for Free and Bouygues subscribers in the vicinity is poor, suggesting strong lease-up potential. Orange’s coverage is patchy, showing evidence of small cell in-fill, but not the broad coverage that could be provided by the SFR tower.

M2 can produce a granular study identifying the specific lease-up potential of every tower in the SFR network up for sale, and we can analyse the adjacent competitive sites too, giving the prospective buyer significant comfort in assessing the lease-up potential of the portfolio, and thus the valuation of the assets.

**TowerXchange: Given that France has a relatively mature macro tower network, much of**
the competition among towercos in the country is likely to focus on small cells and in building solutions – how can M2Catalyst help target investment in such innovations?

Mike Brough, CEO, M2Catalyst: The general rule of thumb with MNOs in Europe and the Americas is that 80% of mobile data usage is consumed indoors. M2 has performed some very long and painstaking studies with Tier One operators to validate that the Crowd SiteIntel has the unique capability to determine whether a signal reading in our database is coming from inside or outside a building. This enables the CSI-TLUP platform to provide an extra layer of service for In-Building Solutions (IBS), i.e., determining the MNO in-building network performance in proximity to target sites. M2 can also measure the amount of LTE versus Wi-Fi data used per building, to help target buildings where higher network capacity is required.

At the Marché du Centre site (Figure Three), in-building coverage is analysed. It’s Free and Orange who have the greatest lease-up potential for frequency bands that can provide indoor coverage, Bouygues RSRP (LTE Signal Strength) is higher than Free Mobile and Orange, but still has several weak spots.

TowerXchange: While M2 Catalyst can provide invaluable insights during due diligence, how can your business intelligence platform also help towercos sell co-locations and target new site builds after the transaction?

Mike Brough, CEO, M2Catalyst: The CSI-TLUP reports can be imported to popular data visualisation tools such as Tableau to provide clear and concise reports to direct and support a towerco’s sales team’s approach to MNO customers. As an example, say you have 3,000 towers in your portfolio in Portugal. Instead of simply having your sales personnel approach MNOs with the entire portfolio, CSI-TLUP for Portugal allows business development teams to take a targeted approach.
Perhaps 2,500 of the Portugal towers in the 3,000 site portfolio do not have Vodafone as a tenant. Of these 2,500 towers, the CSI-TLUP Portugal report might indicate that 250 towers have a high level of “No Coverage” dead zones for Vodafone, and another 450 have very poor signal strength and signal quality. These are clearly the 700 towers with the highest likelihood of consummating a sale.

TowerXchange: The French government has announced a project to fund up to 15,000 new towers in no coverage zones. Again, how can M2 help map both the ‘no coverage spots’ in France, and how does your intelligence inform which of those potential sites might have a near term path to securing a second tenant?

Mike Brough, CEO, M2Catalyst: M2 maps no coverage zones for each MNO independently and also measures the distribution of no coverage readings as a proxy for potential traffic in the area. In France, as in virtually every country around the world, there are national parks and remote areas with no mobile coverage, but which are not necessarily the best targets for a towerco. The most valuable green field sites would have the highest traffic of no-coverage readings across all MNOs. CSI-TUPL can identify these high value no-coverage areas, which are often found along train lines, motorways or suburban villages.

TowerXchange: Finally, please sum up how M2Catalyst’s Crowd SiteIntel can improve the accuracy and accelerate the forecasting of lease-up potential of towers in France, Portugal, the Dominican Republic – or anywhere else for that matter!

Mike Brough, CEO, M2Catalyst: The Crowd SiteIntel data is continuously gathered, enabling M2Catalyst to provide towercos, MNOs and other prospective investors in the French or other tower markets with business intelligence reports with amazing speed. General reports are often already available for specific markets, as they are across the Altice assets that are coming to market in France, Portugal, and the Dominican Republic. M2Catalyst can also provide custom reports within a matter of days or weeks, depending on the amount of customisation required.

For a demonstration of M2’s Tenancy Lease-Up Potential reports for France, Portugal, the Dominican Republic, or to request a free sample study of another tower market, please email kosmotherly@towerxchange.com, or visit M2's booth at the TowerXchange Meetup Europe, taking place on April 17-18 in London. www.towerxchange.com/meetup/meetup-europe/
Meet the European tower industry supply chain

TowerXchange is not only about the views of towerco and MNO strategists. One of our top priorities is to provide a platform for proven passive infrastructure equipment and service to introduce themselves and their activity. From static asset manufacturers to access control systems, site management systems, RMS and backup power solutions, these companies play a critical role in ensuring the efficiency and safety of towercos, MNOs and their employees.

In this section we gather interviews with a selection of the top service, solution and equipment manufacturers joining the TowerXchange Meetup Europe this April.

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Ensuring European site security: how ABLOY’s solutions are fit for a changing landscape

Abloy’s mechatronic master key systems deliver much more than simple lock and key

Telecom towers are increasingly considered a part of critical national infrastructure, and with acts of sabotage reported in Sweden in 2016, securing telecoms sites has never been more important. Tower owners need to deal with this challenge in addition to combating issues such as internal theft, vandalism and the changing shape of their infrastructure in the face of 5G rollout. Aaron Yule, Managing Director of ABLOY UK, shared his experiences in the European market with us, and explained how these challenges can be overcome.

TowerXchange: Please introduce Abloy, your footprint and your offering to the European market

Aaron Yule, Managing Director, ABLOY UK: ABLOY are the leading experts on high quality door/asset locking and functionality.

Our product range includes electric locking, key cylinders, padlocks, small locks, and associated products to ‘secure’ the door or asset. Together, our solutions offer secure, compliant and lasting solutions trusted by organisations throughout Europe and the rest of the world, across a variety of industries – wherever compromise is not an option. We have the capability to offer a complete security solution; from initial surveys and fact finding, to assessments, problem solving and planning through to specification.

ABLOY has major MNO customers using its CLIQ technology in over a dozen European countries, and an installed base of more than 90,000 locking points utilising the CLIQ technology mechatronic locks and keys.

The high security range from ABLOY is capable of securing applications ranging from large corporate headquarters, network buildings, data and media centres, retail outlets, down to the smaller base stations, gates and equipment cabinets as well as anti-climb hatches, road site cabinets, monopoles, masts, hubs, feeders and chamber pits. All of which have their own unique security requirements and a demand for long serviceable life.

The telecoms sector is a dynamic, highly competitive and fast moving corporate market. Any break or

Keywords: 5G, ABLOY, Editorial, Europe, Passive Equipment, Health & Safety, Outdoor Equipment, Site Visits, Small Cells
interruption to the services caused by physical attack including vandalism, theft or civil disobedience can cause serious downtime which will inevitably prove costly in reputation and future business. At ABLOY we pride ourselves in being able to offer solutions that not only resolve security issues but can also provide significant benefit to the customer.

Solutions such as the ABLOY Protec2 CLIQ electronic key systems are designed to meet the needs of organisations with many off site workers requiring access to many remote sites – sometimes ‘shared’ remote sites. To maintain the necessary security, major organisations are benefitting from the following CLIQ® features:

- Authorised access to restricted areas for staff and contractors
- Ability to enable/revoke key authorisation remotely
- Future proofing capability
- Supports PIN validation
- Contribution towards asset management and asset data reporting
- Improved operational efficiency and reduced running costs
- Time saved and operational efficiencies in key collection, and reduced aborted visits
- Full audit trail reports
- Deletion of lost/stolen keys
- Integration capability (eg. permit to work)
- 100% control of all keys, 100% of the time
- SaaS and mechanical systems combine to create state-of-the-art Custom solutions

Aaron Yule, Managing Director, ABLOY UK: Carriers play a central role in fighting emerging security threats. In the future, securing the entire internet value chain will be an even bigger priority. Carriers can meet these expectations with a wide array of technical and operational innovations.

The pressing need for secure networks and high service levels is a central challenge that determines the suitability of locking solutions for the telecom sector. The locking solutions need to fulfil strict security standards and protocols, while maintaining efficient access control to ensure effective maintenance of the physical network.

In this case, the overriding challenge involves theft, be it materials or information, which can be perpetrated by external and internal parties. While external theft is usually a costly break-in or a serious act of vandalism, internal theft is a real and widespread problem as contractors and other external partners tend to pay relatively small key deposits. Lost keys are rarely reported and the percentage of returned keys is often smaller than unreturned.

Internal theft often involves either leaving doors open or keys ending up in the wrong hands. In the long term, these seemingly minor lapses in security can render mechanical locking systems obsolete. The simultaneous expiration of patents for different locking systems also increases the risk of keys being copied without the system owner’s knowledge. This incurs sizable costs as keys and cylinders need to be replaced in addition to the loss of equipment and wiring. Carriers should also take into account the cost of possible system outages and damage to reputation.

Mechatronic master key systems overcome these challenges by not only providing a high level of physical security in the key mechanism but also full flexibility in the electronic element. System owners can maintain full control of keys, thereby preventing any unauthorised access. The full audit trail, from either key or locking point, enables the owner to narrow down who has gained access and when to counter the threat of internal theft.

TowerXchange: Is tower security in Europe driven by economic factors, or are there regulatory and governmental pressures to meet certain standards?

Aaron Yule, Managing Director, ABLOY UK: Successfully maintaining telecom networks poses a major challenge to locking solutions. Current requirements may be more economically driven however, in the future carriers may have an imposed set of parameters to ensure they are able to continue providing high quality, reliable and affordable data and voice services.

Communication networks worldwide depend on their ability to deliver services 24/7. Any break or interruption to this service caused by vandalism, physical attack or random disruption in the network will prove costly in reputation and finance. Networks also require continuous upkeep and maintenance, which should be done fast and cost-effectively.

Recent years have seen the importance of the
Recent years have seen the importance of the telecoms sector rise to the levels of critical national infrastructure and we soon expect to see various governing bodies start to enforce a certain level of security standard to ensure satisfactory protection of the operator’s assets.

The locking solutions of today bring with them a host of benefits not just in terms of improved system security but also in financial benefits brought about through the investment from greater efficiency and productivity of personnel, reduced aborted visits, and improved management of contractors on site.

Mechatronic locking systems are equipped with an audit trail functionality that allows supervision of when maintenance staff visit the location and for how long. Particularly useful since contractors usually charge telecommunication companies based on the number and duration of service visits. With mechatronic locking, the time and money that was used before on key distribution can be efficiently used for maintenance. For unplanned visits, access can be granted remotely and in real time, utilising the most local/efficient resource available at the time.

Using mechatronic locks in combination with mechanical ones offers high security levels cost-efficiently. Utilising mechatronic locks to secure tower premises allows for the full security & transparency of mechatronic locking. Costs can then be optimised by using regular mechanical locks within the premises. Sophisticated mechatronic locking systems, allow the same mechatronic key to be used in both the mechatronic locks, as well as the mechanical ones.

TowerXchange: Tell us about how Abloy can help drive efficiencies within telecoms infrastructure.

Aaron Yule, Managing Director, ABLOY UK: The telecom industry is changing rapidly. The market is becoming more and more fragmented; big remote telecom towers are turning into smaller local cell sites; and, customers want a better return on investment. Today’s data and voice services have to deliver exceptional quality and reliability at an affordable price, and there are a host of challenges from markets, consumers, and evolving technologies. Whether big or small, companies need to reduce costs, improve quality, and build for flexibility and scalability, all of which affects your choice of locking solution. The industry wants suppliers that add value and help them increase efficiency and reduce costs.

For instance CLIQ is not just a key; it’s a technology that not only controls access and can help improve operational processes, but integrates with operators existing H & S, BMS and Telemetry systems.

Remote granting of access rights by using a mechatronic locking system minimises operational costs as technicians can access towers and repeaters more quickly. Indeed, the region based engineer can become a ‘thing of the past’ as due to remote programming of keys the entire team could potentially be granted access to any of the locks required. This reduces downtime and provides transparency of movement throughout the network. The latest app based mobile solution allows for instant access requests being decentralised to enable fast authorisation managed locally. With ABLOY CLIQ REMOTE audit trail functionality it can be seen when maintenance staff visited the location and for how long. For unplanned visits, access can be granted remotely and in real time.

All locking systems require occasional maintenance although it’s rarely carried out. Mechatronic systems allow more effective maintenance management through continual monitoring of lock usage and
can provide an audit trail of implemented lock maintenance. This in turn can improve asset knowledge and management.

**TowerXchange: What is the role of your solutions in asset data and reporting?**

**Aaron Yule, Managing Director, ABLOY UK**: We can see that all players in infrastructure sectors have a desire and a need to improve asset management and the operational data that can then contribute towards improved operational efficiencies and asset utilisation. The ABLOY solution can provide a detailed asset database by linking locking solutions per site to a separate asset log.

ABLOY CLIQ provides a range of data that when integrated with other business systems, including HR, H&S, conformance and compliance training, can automate operational decisions using rule based software.

**TowerXchange: How do you see the densification of networks as 5G rolls out affecting the security of telecoms infrastructure?**

**Aaron Yule, Managing Director, ABLOY UK**: With 5G the whole infrastructure would see a new set of needs being addressed - smaller cell sizes, smaller sites, increase in cabinet usage, new potential locations, etc (eg street light poles). The number of locking points will increase dramatically, and nature of locking will move from a site gate or door to securing more enclosures and small cabinets. Access needs will remain similar however our thoughts are that from an access control management perspective there would be a need for more accurate ‘cluster size’ applications to ensure access into the correct enclosure/cabinet. ABLOY has a very long history with enclosure locking and huge co-operation with cabinet manufacturers so potential solutions are already in place – utilising the latest technology electromechanical key system. Having a piece of software that can enable management of these new locking points will be essential.

Similarly, there should be some security requirements put in place by the industry on these new enclosures / cabinets to ensure they reflect the privacy and security of data needs relevant to the comms.

**TowerXchange: Can you give us some insight into Abloy’s vision for the future?**

**Aaron Yule, Managing Director, ABLOY UK**: The ABLOY vision is to continue to be the World-leading locking solutions provider.

To maintain this position we will continue to listen to the end users in our core markets and understand how our solutions can be developed in conjunction with the customer’s ambitions for security and efficiency.

We recognise that this will mean continuing the development path from mechanical keys to electromechanical keys to online keys to the next generation products; and to ensure this journey is successful, will be the integration partner to key telecoms operators and service providers.
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.

Keywords: Accruent, Americas, Asset Lifecycle Platform, Asset Register, Capacity Enhancements, Central America, Europe, Infrastructure Lifecycle Management, Infrastructure Sharing, Job Ticketing, KPIs, Monitoring & Management, Multi-country Partner, NOC, O&M, Operational Excellence, RMS, Site Level Profitability, Site Management System, Siterra, South America, Transfer Assets, Who’s Who

Read this article to learn:
- Accruent’s position in the telecom ecosystem and global footprint
- How Siterra helps manage the full tower site life cycle
- How Siterra enables working with subcontractors
- The benefits of a SaaS site management platform

TowerXchange: Please introduce your company – where do you fit in the telecoms infrastructure ecosystem?

Bill Glass, General Manager 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?

Bill Glass, General Manager 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 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?

Bill Glass, General Manager of Telecom, Accruent:
The solution can help tower companies handle leads and administration models. In addition, the asset register and customer portal integration that sits at the heart of Siterra’s colocation solution can be used to provide up-to-date information on colocation. For example, a 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?

Bill Glass, General Manager of Telecom, Accruent:
We are constantly developing and upgrading our platform to suit the needs of tower companies. As things currently stand, Siterra provides for more than 90% of tower companies’ needs straight out of the box. The 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?

Bill Glass, General Manager 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?

Bill Glass, General Manager of Telecom, Accruent:
Our annual product investment is larger than most of our competitors’ revenues – that in itself differentiates us from our competitors.

On top of this, Siterra is a SaaS platform, so we have benefited from the shift towards cloud applications.

Unlike many other solutions on the market, our SaaS application was not built from scratch based on an on-premises application – all of our incremental investments have been to enhance its functionality. Total costs for the customer can escalate quickly if a solution needs to be re-built over time or requires extensive support. That’s why it makes much more sense to purchase a proven SaaS solution like Siterra.

With some solutions on the market, users tend to become beholden to professional service teams after deployment. That’s not the case with Siterra. Once a customer has bought the solution and implemented it, they’re up and running. They don’t need to constantly check in with our professional services department.

There’s also a huge amount of functionality built into Siterra that allows customer system administrators to modify workflows, create new reports and manipulate site data on a large scale within the administration console. Users don’t need to receive any code or help from Accruent to make these changes.

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

TowerXchange: Please can you describe some of the limitations of mechanical locks and keys?

Olivier Meganck, VP Sales, Africa, 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?

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
Olivier Meganck, VP Sales, Africa, 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?

Olivier Meganck, VP Sales, Africa, 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 some of the basic practical advantages of mechatronic locks?

Olivier Meganck, VP Sales, Africa, 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?

Olivier Meganck, VP Sales, Africa, 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?

Olivier Meganck, VP Sales, Africa, 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?

Olivier Meganck, VP Sales, Africa, 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?

Olivier Meganck, VP Sales, Africa, 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.
Ensuring RMS systems work in the field

How Asentria bring extensive expertise in trials to ensure a solution is fit for purpose

Asentria, with over 100,000 sites in operation have become an integral part of their customer’s cell site optimisation efforts. Bringing extensive experience from working on fully operating networks, Asentria’s application engineers understand what is essential to get a network up and running successfully and cost effectively, with proper trials fundamental to this process. Asentria’s Jon Baars examines why RMS projects can often fail and explains where Asentria’s successful track record in such projects stems from.

**Keywords:** Asentria, Monitoring & Management, O&M, Operational Excellence, RMS, Site Level Profitability, Site Surveys, Skilled Workforces, Who’s Who

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**Read this article to learn:**
- How Asentria has evolved into more than just a hardware supplier
- The number of sites using Asentria systems in operation worldwide
- The mistakes many companies make in selecting an RMS system
- How trials and selection processes should be designed to minimise the risk of failure
- What differentiates Asentria from its competitors

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TowerXchange: Please can you introduce Asentria and their portfolio of solutions for the telecom sector - what is the company's origins?

Jon Baars, Director of Sales and Marketing, Asentria: Asentria is a thirty year old hardware manufacturer based in Seattle, WA USA. We began by designing and manufacturing hardware devices to integrate to PBX (voice) switches, and deliver alarm and telemetry data. Telecom operators began to use our devices for different purposes than just for PBX. The US military was also an early user. We began to transition to working more specifically with US-based mobile network operators to monitor their remote locations; power, security, and environmental issues at cell sites primarily. We have installations with two US based MNOs with approximately ~10,000 sites apiece currently in operation, and other worldwide networks with hundreds or thousands of sites deployed. Our current customers refer to us as part of “cell site optimisation” efforts. It is far beyond just alarming now.

TowerXchange: What is Asentria’s go to market strategy?

Jon Baars, Director of Sales and Marketing, Asentria: We are used in many different telecom networks; rail or highway projects, oil and gas, utilities, and others. Our focus, however, is on MNOs and tower companies. There is a large amount of upfront integration and support necessary in order to get the most sophisticated projects up and running. The primary product we sell is hardware, but there is
also a large component of services and integration that go with that hardware to get a project up and running within the operational environment of a large network operator. With larger network operators, the projects really never end, it is more of a partnership. We seek large networks as the large scale enables us to devote significant upfront time to integration, proof-of-concept, and rollout plans. We help people who are motivated to solve a variety of operational issues at those sites optimise their sites. We're broadening the geographic scope of our market seeking these large networks and the people responsible who want to make their networks better.

TowerXchange: The first question our readers usually ask of any vendor in the RMS category is “how proven is your solution in the field”?

Jon Baars, Director of Sales and Marketing, Asentria: We have over 100,000 sites in operation at this moment. The largest deployment we have had was approximately 18,000 sites at its peak for a US based MNO; it was a pretty sophisticated solution. Our hardware device was in a smaller cabinet, and we allowed wireless (EDGE) access to the cabinets, and enabled them to reboot individual -48VDC powered devices within the cabinet. The initial goal was to reduce truck rolls and mean time to repair, but the solution evolved to where we were managing many other things at the site; antenna tilt, managing power usage, and general network troubleshooting. Our current largest ongoing project is for a US based MNO, and it is more focused on issues tower owners would be concerned with; power, security, and environmental monitoring and integration to all the various sub-systems at the site. We “flatten” all this data into a usable form so that operational decisions can be taken. We are doing a project for hundreds of sites in the Middle East primarily for security purposes. We have a current project in the EU for what will eventually be thousands of sites that is based primarily on wireless modem access to sites.

TowerXchange: Why do you think it is that RMS projects often fail?

Jon Baars, Director of Sales and Marketing, Asentria: At this point, we have a lot of experience in what is actually being done successfully and cost-effectively. We expect to do a trial for any large network; go to a site and deploy our solution so we test our assumptions and prove that we work. Sometimes decisions are made regarding an RMS system solely based on paper RFQ document. It is difficult for us to know what exact solution we would propose until we actually go to a few sites. We expect to go to one site, then move on to deploying to a few sites, testing our deployment documents, and then support the process as it moves on to a broader deployment. As previously mentioned, we look at this as an ongoing process.

Trials are a must; it is very difficult for us to come up with realistic pricing until we can agree with the customer what the solution is. Very rarely do
we decide in advance what the solution is, and the scope of the solution doesn’t change during the trial phase. If we had our preference, there would be an initial request for information phase, where some broad data could be given by the RMS vendors. A short list of vendors could be created and some small budget could be dedicated to getting the shortlisted vendors to come do a trial at a small number of sites. Using this method, I think failures would be much more rare. Everyone could agree in advance of a large rollout what was to be delivered and the RMS vendor could deliver a much more accurate price based on a promised solution.

TowerXchange: Finally, what differentiates Asentria from other RMS providers?

Jon Baars, Director of Sales and Marketing, Asentria: We have a lot of experience doing these systems. We expect every large project to run through a trial phase and we have application engineers whose job is to successfully create these trials. People in this application engineering role have generally worked on many other fully operating networks, and have a very good idea of what the standards are that are necessary to get a network up and running. We are aware of what other network operators are doing successfully and cost-effectively, and we will push to make our trials model the ideas that others are currently making work. We bring a lot of value at the trial phase, just for the opportunity to show what our solutions can do. We have a broad, flexible, and high quality product, and have thirty years of experience successfully implementing these projects.
Jet powered microturbine gensets offer a more efficient alternative to traditional DGs

Innovative solution is more cost effective, cleaner, greener, quieter, burns just about any liquid or gas fuel and breaks even even compared with DGs after approximately 15 months

It's not often TowerXchange comes across a genuinely innovative alternative to a traditional diesel genset that provides primary or backup power to many emerging market cell towers, but when we heard about Bladon Jet's micro turbine gensets (MTGs), we had to find out more! While the MTG is cleaner and quieter than a traditional DG, with almost no maintenance requirements, what makes the MTG particularly interesting to towercos is the fact that they are more efficient and are cleaner and quieter than a similar powered DG. Delivering cleaner and more efficient energy are key business requirements we continuously see from mobile operators and towercos.

**Keywords:** Africa, Asia, Bladon Jets, Capex, DG Runtime, Energy, Fuel Cell, Hybrid Power, Off-Grid, Opex Reduction, RMS, ROI, Rooftop, Shelters, Site Visits, Skilled Workforces, Solar, Spare Parts, Unreliable Grid, Uptime, Who's Who

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**Read this article to learn:**
- How Bladon Jets harnessed the power of choice at 40,000ft for static power solutions
- The size and weight advantages of MTGs over traditional DGs
- A low maintenance solution: no oil, no water, only one big moving part
- The importance of an energy efficient solution that compliments your existing supply chain – MTGs can run on almost any liquid or gas fuel
- Months to breakeven/crossover in different scenarios, compared with traditional DGs

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**TowerXchange: Where do Bladon Jets fit in the telecoms infrastructure ecosystem?**

Stuart Kelly, VP Market Development, Bladon Jets:

We have invested considerably in R&D over the last 5 years and perfected the design and manufacture of low cost jet powered microturbine gensets (MTGs). Our MTGs are positioned to replace diesel generators as the primary or backup power solution at cell sites, thanks to our superior performance and reliability. Bladon's MTGs are ultra quiet, clean and green, small and light, which is critical at shared cell sites.

Jet engines aren't new. This is a 70 year old technology, and is the power of choice at 40,000ft. Our secret sauce is not so much a new technology as a manufacturing methodology that enables us to produce microturbines economically in volume. One of our most important manufacturing techniques is a process to cut turbine blades from a single piece of material. Our units are about 30% smaller than a diesel generator, yet they generate the same power. We've been able to manufacture to a price point such that our MTGs are commercially viable compared to reciprocating diesel gensets.

**TowerXchange: How did your micro jet engines evolve as a solution for cell sites?**

Stuart Kelly, VP Market Development, Bladon Jets:

TATA became excited about our micro turbines and invested via Jaguar Land Rover in 2010. The first incarnation was actually in the Jaguar CX75 concept supercar, but the ancillary application of
the technology was for static power solutions for telecoms.

We are finalising our market entry strategy to sell 12kW MTGs into telecoms. For us the towercos, managed service providers and MNOs themselves are all prospective clients.

**TowerXchange: Which telecom markets are you targeting and why?**

**Stuart Kelly, VP Market Development, Bladon Jets:** Given the Tata connection, an early market will be India. The continent of Africa is also a key market for Bladon’s products. We have conducted field trials in Africa over the last few months and learned valuable feedback from our partners there. Some of our field trial units have been running nonstop for 1000+ hours without ANY filter changes or servicing. That’s a really compelling proposition to towercos that are crippled with genset maintenance costs.

We have attended TowerXchange Meetups around the world to share Bladon’s vision with MNOs and towercos. With so many assets changing ownership in Africa, there is a new focus and financial drive to leverage tower assets harder. When towers are bought, or being prepared for sale, audits often reveal the assets aren’t operating as efficiently as the owner might have thought. But the new owners don’t want to create too much turbulence in the supply chain, so it’s important that our solution complements the existing energy supply chain in developing markets.

**TowerXchange: Tell us about your solution’s maintenance requirements.**

**Stuart Kelly, VP Market Development, Bladon Jets:** Microturbine engines are a low or no maintenance solution. Unlike a diesel reciprocating engine, there is no oil and no liquid coolant in our solution. We have just one moving part, the turbine itself, which runs on air bearings with no liquid lubrication. Maintenance is a key issue at remote sites that might be many hours drive on a lousy road – the cost to get there can kill the TCO – so a technology with the potential to dramatically reduce site visits can be very compelling. There is a very low skill requirement to maintain our MTGs – in the highly unlikely event of a turbine failure, our strategy is remove and replace, not rebuild onsite. For lesser maintenance issues, such as filter changes, the O&M subcontractor can readily maintain a stock of fuel and air filters.

As well as reducing fuel and maintenance costs, thieves are less inclined to steal our MTGs as there are few if any parts they can recycle.
Aspiring ESCOs that are currently in the business of maintaining traditional diesel gensets have an opportunity to profit handsomely by deploying a more reliable solution like ours – their goal of selling at a price per kWh rate becomes more compelling. Our MTG unit has robust telemetry built in, so you need fewer field engineers as many settings can be changed remotely. From the NOC you can see if units are operating outside of their tolerances, enabling preventive maintenance rather than waiting for it to break. Also, and not insignificant for the tower operator, is the use of telemetry to know where the unit is as well as having the inbuilt electronics to stop the unit operating if moved without permission – the same technology as a tracker system on a car.

TowerXchange: Okay, so what are the advantages of micro jet engines over other alternate energy solutions such as fuel cells or solar?

Stuart Kelly, VP Market Development, Bladon Jets: There is no reliable or sustainable supply chain to support hydrogen or methane fuel in Africa yet. As a technology that is hostile to the current supply chain, the practical challenges of keeping fuel cells running are prohibitive to embracing that particular alternative energy solution in more than perhaps 20% of the estate. Let’s be honest, green power is not widely used on cell sites. In India for example, eco-friendly cell sites account for less than 1% of the estate, but tower owners still want to migrate away from the reciprocating diesel genset because of the substantial energy and maintenance opex it incurs. We don’t see our solution as an alternative to a 200sqm PV array; our solution is so much more compact that the use cases differ significantly. Solar isn’t the optimum alternate energy solution for all cell sites; even in Africa, sites don’t get good quality sunshine all the time, especially in high rise areas with shadows. You can install solar panels on an urban rooftop, and find that six months later the neighboring building has had five floors added! Our solution doesn’t succumb to such vagaries. Solar has to be a part of the future, but in the context of telecom towers it’s not a killer app, it’s a point solution. Our MTGs can be used to smooth power from solar as well as replacing a chugging tractor engine based generator. When renewables work the MTG can become a part core part backup, there are no startup issues even if it’s left idle for some considerable time between use. The fuel will contaminate before the genset has a problem!

But the important thing is that this is an evolution not a revolution – the MTG can be adapted to any local fuel supply resource. Bladon gensets, in keeping with all turbine based solutions, run on a wide range of fuels, including green alternatives such as natural gas and biofuels as well as diesel and kerosene. Bladon MTGs will also tolerate a blend of fuels like diesel mixed with kerosene thus making the mix useless for thieves planning on using it for other diesel engines.

TowerXchange: How does the capital outlay for your MTGs compare to traditional DGs, and when does the Total Cost of Ownership (TCO) crossover?

Stuart Kelly, VP Market Development, Bladon Jets: The capital outlay for an MTG is currently slightly higher than a quality diesel genset solution, but the price difference is a double not triple digit percentage. Running for 12 hours a day in SSA in 30° heat then within 15-19 months the TCO will crossover having recovered the difference in capital outlay through fuel and maintenance cost savings.
TowerXchange: How near are your MTGs for telecom to being a market-ready solution?

Stuart Kelly, VP Market Development, Bladon Jets:
We go into production later this year. The first run of MTGs have already been ordered, and we’ve signed distribution agreements already with partners in Africa and India. We’ll be manufacturing in the UK, and in Asia soon too, and from the US in due course.

TowerXchange: What is the sweet spot in terms of the load your solutions can support?

Stuart Kelly, VP Market Development, Bladon Jets:
Our Bladon MTG12 MTG delivers up to 12kW, with output options 230V AC or 120V AC. We also have a 48V DC output variant that telecom clients tend to like. Most telecom sites need somewhere between 3kW and 6kW for constant power, maybe 9kW if there is a hybrid arrangement requiring battery bank charging. Since the MTG runs at variable speed to match the load our efficiencies are much better at partial loads compared to traditional DGs.

TowerXchange: How do you ensure modularity as power requirements increase with the addition of multiple tenants?

Stuart Kelly, VP Market Development, Bladon Jets:
Given that operators are trying to drive power consumption down, a new BTS might need 1kW when the last model needed 2kW. At the moment the applications we see don’t consume more the 3kW in total, so it should be possible to add a second tenant without upgrading the MTG. Because our unit doesn’t de-rate over time, its ability to deliver continuous power is stronger. The MTG is a more reliable means of delivery of consistent power than a conventional DG for a multi-tenant site. If additional tenants are added beyond what one MTG can provide, the answer is to add a second unit in a daisy chain. And if the power requirement reduces again, our units are relatively easy to relocate to another tower. Another critical consideration is that the MTG can be 25% more efficient as a reciprocating engine when running at part load.

TowerXchange: How do you bring Bladon Jets to market – do you sell direct or through channel partners?

Stuart Kelly, VP Market Development, Bladon Jets:
Our model is to sell through partners. Towercos and MNOs need the credibility of boots on the ground to provide after sales service, even with a low maintenance solution such as ours. We are targeting key managed service providers on the front lines of tower builds, upgrades and maintenance, with the objective of creating a pipeline for thousands of unit sales.

TowerXchange: Finally, please sum up how you would differentiate Bladon Jets from other cell site energy solution providers.

Stuart Kelly, VP Market Development, Bladon Jets:
We’ve taken a well known form of power generation in the reciprocating engine, turned it on its head and married it with another established technology in jet engines, then developed a manufacturing process to bring to market an innovative solution with a lower TCO business case for telecom tower operators. Micro jet engines are ultra reliable, super durable, low maintenance, and generally have a TCO runway in Africa and India from 9 to 19 months. The MTG is designed to support the current supply chain, which means our solutions can be easily introduced with an expectation of a short term payback. The fact that it’s an exciting jet engine is only so interesting – what matters is reducing fuel bills, and the ability to deploy it into the field easier and cheaper than a regular diesel genset.
Space odyssey - how satellite backhaul is improving terrestrial infrastructure

Intelsat offer satellites for high performance data connectivity across the globe

Commercial satellite communications provider Intelsat is the largest company of its kind in the world. In this interview, Joost Hageman, Senior Principal Marketing Manager, shares his insights into how satellite communications can be used to complement telecoms infrastructure, the best and most efficient solutions for deployment and how satellite services can support small cell and densification efforts both in urban and rural areas.

Keywords: 5G, Backhaul & FTTH, Core Network, Europe, Infill, Intelsat, Small Cells, Urban vs Rural

Read this article to learn:
- Intelsat's history and offering to the telecoms infrastructure industry
- How Intelsat's solutions are working in the field
- How the European market is responding to satellite solutions
- What the rollout of 5G will mean for satellite communications in telecoms infrastructure

TowerXchange: Please introduce Intelsat, your history and the company’s footprint in Europe

Joost Hageman, Senior Principal Marketing Manager, Intelsat: Intelsat was founded over 50 years ago as the world’s first provider for commercial satellite communications services and our reach is global rather than only covering Europe.

The company still is the largest operator in terms of revenue, capacity and geographic reach, with over 60% of its revenues generated by serving Mobile Networks and VSAT Operators.

Intelsat’s global network delivers efficient data-connectivity arrangements allowing for a rapid extension of high-speed mobile broadband to hundreds or thousands of sites. Cell Backhaul via Satellite scales extremely well where the business case for terrestrial connectivity solutions is currently absent or not attractive. With its roots in the telecom-sector Intelsat engineers closely liaise with operators and their infrastructure-partners, keen to develop and drive new revenue streams with them while ensuring effective, flexible, secure and reliable communications.

We believe that Intelsat EpicNG next generation satellite technology – seven High Throughput Satellites (HTS) by 2018 – is a game changer for the sector. The Epic satellites were specifically designed to provide high performance data connectivity for mobile networks and broadband ‘communications on the move’ for the maritime, the automotive, and aviation sectors.
TowerXchange: Intelsat has a great offering to tower owners - can you give us some examples of how Intelsat is working in the field? Do you have any case studies?

Joost Hageman, Senior Principal Marketing Manager, Intelsat: Intelsat provides over 80 mobile operators and operator groups with satellite-based backhaul services. This includes the top 10 mobile groups in Africa, representing 70% of the region’s 1 billion active SIM cards.

The projects cover all the scenarios including quick deploy rural solutions, upgrades from 2G to 3G/4G LTE, and better, shared backhaul, usage based billing, disaster recovery and addressing new market segments with deployments in developing and developed regions. Deployments range from basic voice in the Democratic Republic of Congo to providing 4G/LTE in Japan, the USA, and throughout the EMEA region.

Connectivity delivered via satellite is per definition flexible and can be applied to meet the USO requirements of the mobile spectrum license holders. Satellite also scales well enabling management of traffic growth, for example for video delivery via mobile networks, and to manage large shifts in network traffic; this can be effectively managed as needed without over-investing in your network.

TowerXchange: Tell us about how you view the European market; with towers owned by MNOs, MNO-captive towercos, JV infracos and independent towercos all operating in the market, how do you find these different market segments respond to your solutions?

Joost Hageman, Senior Principal Marketing Manager, Intelsat: The European market is diverse, highly sophisticated and competitive.

There is also demand for quick deployment solutions outside of metropolitan areas that enable MNOs and infrastructure partners to cater for a rapid rise in mobile data demand. In price-sensitive markets we have deployed carrier grade solutions to help operators meet their USO demands and we also work on infill solutions. About 30 percent of Europe’s estimated 600,000 cell sites are currently managed by tower companies, and this is expected to grow further. Within this context we are convinced we can provide towercos and their customers with an extra highly efficient way to expand mobile data coverage. HTS allows for cost-effective enhancement of the data connectivity with a carrier grade quality of service.

TowerXchange: How do you see the need for densification and the increased focus on small cells affecting how the European market develops?

Joost Hageman, Senior Principal Marketing Manager, Intelsat: Densification will radically change the operating model with the massive proliferation of small cells.

We have been looking into this and it will be interesting to see how this develops, especially when data intensive applications like video on social media are used on a significant scale. Our experience is that in metro-areas connectivity is usually provided via terrestrial means, but we can imagine supporting large scale events like Glastonbury Festival in the UK or something like Lowlands in The Netherlands, because supporting this type of events are typically close to our competence.

TowerXchange: Given your global reach, can you share with us your views on how the European market differs from the rest of the world?

Joost Hageman, Senior Principal Marketing Manager, Intelsat: Europe is a highly diverse market, an environment in which our larger customers already have a lot of experience. Europe is arguably a more competitive environment for MNO brands than the USA.

This requires them to differentiate, and one of the ways to achieve that is by capturing and retaining
customers that require connectivity anywhere. The biggest difference with Africa is the degree in which consumers from developed markets have been able to embrace mobile data connectivity. With a median penetration for basic mobile voice at 82% most of Africa’s growth in the years to come will be in a shift from basic mobile voice to mobile data, while Europe will see more expansion with upgrades to 4G and better connectivity.

TowerXchange: Please share with us Intelsat’s vision for the future of the European market and how you fit into it.

Joost Hageman, Senior Principal Marketing Manager, Intelsat: We view satellite connectivity as complementary to terrestrial network connectivity. Satellite allows you to get into the periphery and swiftly cater for any seasonal or daily shifts in network traffic. This applies to the current generations of mobile networks and for any future network requirements such as 5G sites in ultra-high capacity network designs with traffic rates at 10x LTE-A. We are geared to help mobile networks cope with such a rapid rise in demand for data connectivity. With far more user generated content than ever, including video, we must also account for bi-directional networking requirements which is something we are able to support with our High Throughput Satellites. We realise full well that our solutions must be cost-effective for operators and tower companies alike and are convinced that we have a highly interesting proposition for network engineers and integrators to play with.

Visit the TowerXchange.com website

- Access to the “Internet of People” in the global tower industry – a trust web of over 35,000 decision makers in telecom and broadcast infrastructure
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How MediPower makes going off-grid in Europe easy
An innovative offering for remote and rural towers in Italy is growing across Europe

Massimo Ombra, President, MediPower: In the European telecom industry scenario, MediPower is a pathfinder company which has been able, for almost 14 years, to offer a different concept in the supply of power to local MNOs. The new business model introduced by MediPower was based on the idea to replace, and effectively act as, the national provider of a commercial grid, servicing those sites which were still too remote to be touched by the national electrification plan of the country, and those locations where customers required temporary power for their equipment.

So, with our wealth of experience in the generating sets business, and being a genset manufacturer with more than 80 years’ pedigree, Ausonia’s management team decided to create its own Energy Service Company (ESCO), named MediPower, with the aim of taking responsibility for all the power-related aspects for its customers, guaranteeing MNOs a stable and continuous energy supply to their sites, based on a monthly payable service fee. To do that, Ausonia and MediPower joined their strengths to design and produce a range of diesel generators which had to have specific features in order to reach the lowest TCO and to generate an attractive offer based on OPEX. Since then, thousands of sites have been powered by our gensets, which have been installed, maintained (both in the preventive and corrective sense), overhauled, refueled, remotely monitored and managed by MediPower NOC throughout the Italian territory.

Keywords: Albania, Ausonia, ESCOs, Editorials, Energy, Europe, Greece, Hybrid Power, Italy, MediPower, Off-Grid, Opex Reduction, Renewables, SLA, Solar, Unreliable Grid, Uptime, Wind

While ESCOs are gaining traction in Africa, in Europe most towers are in easy reach of reliable national grids. However, for those towers which are off grid, either because of their remote location or temporary nature, handing over responsibility for power to a third party is a very attractive proposition for European tower owners, Massimo Ombra, President of MediPower, talks us through the details.

Read this article to learn:
- MediPower’s offering in the European market
- How the ESCO model can be rolled out across Europe
- The different energy needs of towercos and MNOs
- How market consolidation and M&A will change energy needs
Today we serve all four Italian MNOs (Vodafone, TIM, Wind and H3G), with a market share above 80% and being sole supplier to three out of the four previously mentioned MNOs. At the same time we are exploring different opportunities in other European countries where our OPEX business model seems to be attractive to MNOs and towercos.

**TowerXchange: What is MediPower’s strategy to expand its power lease-based business across Europe?**

**Massimo Ombra, President, MediPower:** After several years of continuous successes, a few years ago we reached the maximum market share we could ever think to achieve in Italy, basically due to two main reasons: the first one is that some MNOs have got specific internal policies forcing them to keep at least two suppliers for energy services; the second one is that the number of off-grid sites in Italy could change only in terms of a few sites per year, as the grid network is well distributed and it covers almost the entire Italian territory.

Since we are ambitious and we strongly believe in the benefits and advantages our services can provide to our customers, we started looking over the Italian border, mainly at Greece, Spain, Albania and other countries where the commercial power network is not as well distributed and reliable as it is in Italy. As part of this process, we started discussions with different European MNOs and towercos, in order to explore business opportunities in the region and verify if our OPEX-based approach could match their energy requirements and cost savings targets. We have deepened such discussions with some of them and, once the opportunity is close to materialising, we will soon launch the relevant new country-based opcos. The implementation of our business model in a new country is quite easy and quick to achieve, as the technological framework which is behind it is ready to be replicated and immediately deployed, so that we can start offering our energy services to any new customer in Europe within a short period. The sooner we launch our new opco, the sooner our customers start enjoying the benefits, in a win-win business cooperation.

**TowerXchange: Can you talk us through the energy needs of Italian towers? What are the main drivers for your clients’ energy demands? How does this differ from other parts of the world?**

**Massimo Ombra, President, MediPower:** When it comes to power, we see that Europe is different from other parts of the world, and, within Europe itself, every country has its own power requirements and territorial distribution of the energy needs.

In Italy, the energy we sell to our customers is mainly required on sites which are quite difficult to reach, such as the Alps or remote areas, and on temporary sites which are still not reached by the National Grid. In other countries, the main energy need is concentrated on islands, forests, wild areas or simply to give energy to small communities. All this represents a very challenging scenario in which to perform our business, as from a logistical point of view accessibility to the site is difficult and the genset rotation on temporary sites, at least in Italy, is
close to two months. On sites which are unlikely to be reached by a national electrification plan, the rotation ratio is much higher, so we try, as much as we can, to adopt green energy solutions, with the aim to strongly reduce OPEX and bring down the logistical costs relevant to site visits for maintenance and refueling.

Within this scenario, MediPower is able to provide high efficiency and green energy solutions, based on the deployment of Ausonia products such as high efficiency DC gensets and hybrid power systems, integrated with renewable energy sources such as solar and/or wind. By doing this we can definitively state that the significant advantage of having MediPower as an energy partner is the fact that our customers are no longer dependent on CAPEX for their power needs, as they can enjoy of a “pay per use” energy service, totally complementary to the electrification process of their network.

**TowerXchange: In a market where there is a large amount of towerco activity, what differences do you see between how towercos and MNOs respond to energy needs?**

**Massimo Ombra, President, MediPower:** Generally speaking, both MNOs and towercos are moving from a CAPEX based selection towards a TCO analysis of the energy solutions, as their attention to OPEX is very important and the control over these variable costs is a key tool in monitoring their own operational performance.

Additionally, the energy demand is generally variable, as it mostly depends on the strategies they adopt in their different markets. In fact, if we consider sites with one MNO only (single tenant), the site power consumption is today generally reduced compared to a few years ago, thanks to the new technologies of the telecom equipment installed on site, and it’s typically stable over the period.

But if we look at the towercos, which have an interest in entering into multi-tenancy agreements and sharing their costs over more customers, the site power consumption is typically subject to variations over the period, as it depends on the total number of tenants in collocation. This forces them to look for efficient, scalable and reliable energy solutions which can guarantee them the lowest TCO, in order to always optimise the energy production costs in terms of $/kWh.

We have also to highlight that there is a clear tendency for both MNOs and towercos to subcontract the power supply and all relevant issues, in order to stay focused on their natural business and following development. This is something already happening in Africa and other regions, but the process is clearly slowed down by the hesitations which arise during the evaluation of the potential energy partner(s) to be selected, which must be financially and operationally reliable, as the powering of the network will be based on their service performance. Of course, the introduction of Service Level Agreements (SLAs) and strict ratios for power availability can help them to identify which company can really perform the services successfully, especially in the short term, during the ramp-up period. Honestly, we think this process will still take several years to be widely used among the telecom industry players, but it’s something that is definitely going to happen, creating a new category of energy service and solutions vendors.

**TowerXchange: The Italian market is due to change again with the entry of Iliad’s Free Mobile, what’s your take on how this will affect the status quo?**

**Massimo Ombra, President, MediPower:** It will definitely be interesting to see what will happen upon the entry of Iliad’s Free Mobile into the Italian market, once the green light is given by the European Union to the joint venture between Wind and H3G. The low-cost tariffs which are going to be offered by the French company will force all the rest of the mobile operators to react fast, creating a more competitive market and more attractive offers to the subscribers.

With reference to our energy service business covering the entire national territory, we see this new entry as an opportunity to extend our offering to Free Mobile, and it’s worth bearing in mind that that some of their future sites are already currently powered by our fleet of gensets, because of the energy supply agreements we signed with both Wind and H3G for their off-grid and temporary sites. Additionally, among their priorities, it seems that Free Mobile will have to build a big portion of its network infrastructure for mobile base stations, which will be additional to those inherited from Wind and H3G, and we are ready to offer the extension of our energy services even to any additional site where they would decide to enjoy of the advantages and benefits MediPower can offer to them with for many years.
NorthStar: more than just a battery company

Market leaders in premium lead acid batteries committed to understanding and resolving their customers’ energy storage problems

NorthStar is more than just a battery company. They’ve made a commitment to really supporting their customers. A commitment to help customers select the right batteries. A commitment to identify and resolve power system problems, even if they aren’t caused by batteries. A commitment to manufacture, and dispose of, lead-acid batteries in an environmentally aware manner. Of course, NorthStar also manufactures premium lead acid batteries which they say represent the best compromise between capex and opex, which is why they are one of the market leaders in energy storage for emerging market cell sites.

Keywords: Who’s Who, How to Guide, Meetup Preview, Energy, Installation, Opex Reduction, Batteries, Fuel Security, Air Conditioning, Off-Grid, Unreliable Grid, ROI, Hybrid Power, DG Runtime, Dimensioning, Procurement, Warehousing, Shelters, Rectifiers, Africa, Asia, Pakistan, NorthStar Battery

TowerXchange: Please introduce NorthStar to our readers - what role do you play in the telecoms infrastructure ecosystem?

Thierry Tardivent, Head of MEA and APAC, NorthStar Battery: Since 2000 NorthStar’s telecom batteries and site solutions have been delivered in more than 150 countries. NorthStar helps its customers globally to extend battery life and save energy by providing High Performance AGM Batteries specially designed for different grids and telecom applications – I believe today NorthStar Batteries makes the best AGM batteries in the industry.

But NorthStar Battery is more than just a battery company. We also have a unique expertise in power systems for emerging markets which is key to optimise battery life and energy saving.

TowerXchange: We usually ask how many cell sites in Africa, LatAm and Asia the interviewee’s solutions are installed - I guess that may be difficult to specify given the scale of NorthStar’s business! However, can you give us a sense of the size of your telecoms business in those three regions.

Thierry Tardivent, Head of MEA and APAC, NorthStar Battery: Tens of thousands sites in MEA are equipped with NorthStar products. In Pakistan alone, Northstar has equipped over 5,000 sites with a pure fuel saving application delivering outstanding results. Many thousands of hybrid...
sites in Africa have been equipped with NorthStar technology since 2000.

**TowerXchange: Why are lead acid batteries standing up to the challenge of alternate energy storage chemistries in a telecom context?**

**Thierry Tardivent, Head of MEA and APAC, NorthStar Battery:** Frank Fleming, our renowned CTO, has a strong belief that lead acid can remain the technology of choice for telecom energy storage for the next 50 years, as long as we push the limits of the design.

We also want to push back against the bad environmental image of lead acid batteries, which is why we invested massively in environmental controls when we built our new factory. Many of our key customers select NorthStar as their preferred/strategic supplier partly because of our strong environmental control. Corporate Social Responsibility policies make environmental control a key target for companies like Ericsson, with whom we’ve been a key strategic partner since 2002. We’re also strategic suppliers to NSN, Huawei and ZTE.

**TowerXchange: How much tailoring to the specific requirements of individual sites can really be achieved through the selection of batteries?**

**Thierry Tardivent, Head of MEA and APAC, NorthStar Battery:** One battery cannot fit all applications. You need different chemistry depending on the grid profile and energy situation. There’s a huge difference between the battery you should deploy on a stable grid in USA, compared with the unpredictability of the grid in Pakistan, and pure off grid applications in Myanmar for example.

NorthStar differentiates ourselves by offering different chemistry depending on the application and grid profile. Whereas with other vendors the battery is a standard, commoditized component, forcing site designers to solve their problems through the modification of other power systems, NorthStar have been able to customise the design of our batteries for different grid availability and telecom applications.

For example, one of the most unstable grids we have experienced was in Bangladesh. No matter what power system we used, there were so many repeated power outages that it seemed we were never able to fully recharge our batteries. That presents a problem for traditional lead acid energy storage technology, but we were able to modify our electro chemistry to be fully partial state of charge (PSOC) compatible.

**TowerXchange: Why is the replacement cycle so much shorter for batteries on developing market cell sites, and what can be done to deliver reliable, sustainable power?**

**Thierry Tardivent, Head of MEA and APAC, NorthStar Battery:** We think there is too little understanding of why batteries are failing. While the right choice of battery is crucial, it’s as much about the electrochemistry as it is the choice of supplier – so simply switching to a different supplier won’t fix the problem. Energy storage solutions need to be redesigned to provide reliable, sustainable power to cell sites in emerging markets, providing faster recharge, high cyclic, high temperature, high efficiency operation.

You need to deploy the right power system, on the right settings and ensure it’s installed properly. This is why we are launching the NorthStar Academy – to help to extend battery life by two to three times and save energy.

While some battery vendors may prefer their batteries die sooner to accelerate replacement cycles and sales volumes, NorthStar want to make sure our batteries last a long time and deliver the opex savings targeted. Our success comes from our people in the field, people with a background from the power industry, who can address power system problems holistically and who can help our customers fix those problems. If it’s not a battery problem, we don’t just say “talk to the power system vendor”, we help the customer to change controller settings, cabling et cetera – training their people to avoid repeating mistakes.

**TowerXchange: I understand NorthStar initially, and to a certain extent still do, sell a significant proportion of batteries via OEMs – how does the entry of the independent towercos affect the**
criteria against which energy storage solutions are acquired?

Thierry Tardivent, Head of MEA and APAC, NorthStar Battery: We have always had a strong strategic relationship with OEMs and we will always will. But we also realised we need to accelerate the battery technology and solutions awareness at the end customer level such as with towercos as they are more and more driving the battery selection process.

Our technology has been approved already by two major emerging market towercos this year. We still see a few examples where energy storage solution selection is driven by short term capex savings, resulting in a temporary improvement in the P&L. However, making the wrong decisions in the selection of energy storage is does not yield performance improvements that are sustainable in the medium and long term, particularly at unstable and off grid sites.

There are only three or four factories worldwide that can manufacture premium AGM batteries. But the good thing about premium AGM is that they have a two year shelf life thus we can then easily maintain inventories in hubs all around the world and provide a short lead time to our customers; we adapt to the logistical challenges to ensure our products are available as close as possible to market.

TowerXchange: What is the performance, and cost, difference when using premium lead acid batteries versus lower cost alternatives at cell sites in harsh conditions?

Thierry Tardivent, Head of MEA and APAC, NorthStar Battery: A premium AGM (thin plate technology) would normally cost 30% more than a Standard AGM battery with three to four times greater storage life and up to five times longer operating life in real harsh conditions (typically 2.5 X the life).

A lot of our customers are migrating from dual DG to DG plus battery hybrids to cut DG runtime by 50% or more. If you want to optimise energy efficiency programmes, you have to think about total efficiency; about DG efficiency, the efficiency of rectifiers, and the efficiency of batteries. A standard battery can suffer two to three times more loss than a premium battery, which can make a huge difference for some applications. A premium, fast charge battery can take a lot of energy to recharge the battery in short time, which enables the customer to run the DG faster and more efficiently, for a shorter time.

For example, when we rolled out NorthStar Blue Technology in Pakistan, we found that most of the operators were buying low cost batteries because of their focus on capex. When they saw that at off
grid sites we were cutting DG runtime by up to 85%, we helped them realise that it doesn't even matter if you replace in your batteries every two to three years if you payback the investment in three to four months.

NorthStar Blue Technology is ideal for unstable and off grid sites; it’s a fast charge, high efficiency battery with Partial State of Charge (PSOC) compatibility. If used in a hybrid genset combination, it offers the best capex and opex compromise. Other technology such as sodium and lithium batteries are two to three times the price and are not so easy to implement in large scale projects.

TowerXchange: Why are telecom batteries failing so early? And what are the key steps towercos and MNOs can take to extend battery life?

Thierry Tardivent, Head of MEA and APAC, NorthStar Battery: We need to increase customer awareness of the root cause of batteries problems. What NorthStar have done, and what all the battery manufacturers should have done, is make an assessment on over 60 countries where our batteries had been installed, to find out what were the key challenges were with using batteries, and to and try to find a solution for each:

1 Make sure to select the right battery based on grid and application including sizing/dimensioning; in too many cases there is not enough power to recharge the batteries. Our recommendation is that customers need to use different chemistries for different locations.

2 Solve installation and setting issues: everything from cabling the battery properly to controller settings (charging voltage, boost timing et cetera); low voltage disconnect; temperature sensor configuration and cooling systems. Too many site installers don’t even know how many rectifiers they need to recharge the batteries – spending an extra US$200 on a rectifier can save a US$5,000 battery bank.

3 Temperature: a 10°C change in temperature can reduce battery performance by as much as 30-50%. But air conditioning just to cool energy storage elements costs a lot of money. A few years ago we partnered with one of the most famous fridge manufacturers to leverage proven consumer product technology into the telecom fields. We took the high efficiency, high reliability DC compressor cooling technology, added a unique cabinet structure and made the world’s most efficient telecom battery cooler called SiteStar. We can now cool batteries with just 40W even at 30-40°C ambient. Over 30,000 sites have been equipped with our SiteStar technology to date with very positive feedback from the field.

4 Protect batteries from theft and vandalism: One approach we’re trying is to protect batteries in a

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Why are telecom batteries failing so early?

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<th>Reason</th>
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<td>Wrong setting or installation</td>
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<td>Incorrect battery selection</td>
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<tr>
<td>Temperature</td>
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<td>Theft and vandalism</td>
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Source: NorthStar Battery
safe-like structure. We’ve co-operated with a safe manufacturer to come up with a cabinet which used to be a safe box; made of robust, very thick metal. Another area we’re starting to explore is advanced locking systems.

In some countries theft is related to the parallel market; at one point batteries were even being resold to the operators from which they were stolen! This was resolved with a relatively easy to fix – an engraving that cannot be removed. In other cases the parallel market is home usage, but I feel that’s minimal.

No single approach to combating theft can be successful everywhere as there are different causes of theft, from theft by large organisation’s to pilferage within the fuel supply chain. Ultimately combating theft requires working with the operators and towercos to develop an understanding of the nature of their theft problem and what budget they can afford to resolve it. Theft is a problem, and we want to address it.

NorthStar can help MNOs and towercos overcome all four of these challenges. I’m particularly concerned when people talk about minimising the competence required of people in the field. While the solution needs to be as simple as possible to be installed and operated, the competence of the average field engineer is not necessarily the same in Southern Asia and Africa as it might be in Europe. We see a lot of mistakes in installation, and we’re happy to the deliver first training at the NorthStar Academy on the basic principles – we can put all the installers in one room, identify common problems and misconceptions, and make corrective actions.

**TowerXchange: How do NorthStar ensure you remain sensitive to environmental considerations from manufacture to disposal?**

**Thierry Tardivent, Head of MEA and APAC, NorthStar Battery:** NorthStar has invested heavily in building the most environmentally advanced battery plant in the world. But our environmental policies actually start from the design of the product; making sure the battery is designed to last longer and also not to deteriorate beyond the end of its life. We are also developing an advanced solution to operate batteries with the minimum energy consumption – our SiteStar battery cooler designed in Sweden is still the most energy efficient Battery cooler in the industry.

**TowerXchange: Finally, please sum up how you would differentiate NorthStar’s batteries from other energy storage solutions for remote cell sites.**

**Thierry Tardivent, Head of MEA and APAC, NorthStar Battery:** Most battery companies are focusing only on selling their own components. But NorthStar are more than just a battery company. We take a different approach – we really want to help our customers (as well as help ourselves). How we support our customers is a tangible, core value for NorthStar Batteries. In the past few years we’ve assessed the typical problems faced by our customers, and come up with solutions for what can we do to extend battery life and save energy.

We seek to understand our customers’ problems. We’ll audit your site for you and we won’t leave without giving you an analysis of the problem and corrective actions. You won’t get an “it’s not a battery problem – talk to power system vendor” attitude with NorthStar – we have a strong competence on the whole power solution, not just the batteries.

We’ve changed the focus of our business to help our customers understand how to select the right batteries. One best electro-chemistry and battery technology isn’t right for all grid profiles and applications. For example, low technology batteries could be good enough for some developed market applications. But battery performance is more problematic in developing markets, so we’ve developed energy storage solutions for unreliable and off grid applications which we think represent the best compromise between capex and opex.

Lastly we are developing solutions which have a very quick payback. Payback after five to ten years won’t work in telecom industry – everything needs to pay for itself in less than two years. NorthStar are focused on developing the best opex solutions, with affordable capex and quick payback – making our energy storage solutions a ‘no brainer’!
Tarantula platform designed to facilitate colocation in Europe

Enabling tenants and tower companies to collaborate and realise significant time savings

Tower companies and their tenants have historically struggled to get visibility into the end to end colocation process. They have not been able to identify hold-ups and have often found it difficult to manage documents waiting for approval. Tarantula has a proven, trusted and highly configurable software platform (Red Cube) which leverages the latest technology to significantly improve the efficiency of colocation operations. In this interview, Maurice Barnes, Tarantula's COO, explains how Tarantula is shaking up the world of site management.

Keywords: Co-location, Divestments, Joint venture, MNO, OPEX, Tarantula

Maurice Barnes, COO, Tarantula

TowerXchange: Please introduce yourself and Tarantula for readers less familiar with your company.

Maurice Barnes, COO, Tarantula: I have over 10 years of experience in telecommunications infrastructure management. I was previously involved in International Business Development with Telstra Corporation and worked as Director, Business Technology Services with Crown Castle Australia. More recently, I spent five years working in the APAC region in enterprise software sales before joining Tarantula in early 2015 as Director, Customer Solutions prior to assuming my current role as COO in late 2016.

The company formally launched in early 2001 as an industry-wide site sharing co-location platform in the UK. Our software has helped manage more than 18,000 co-locations on this platform in the UK and hundreds of thousands of colocation transactions across Europe, Asia and Africa. This equates to millions of dollars of site rent being collected each month, all enabled by our platform. Our co-location module provides centralised management of colocation on the web, which in turn enables the customer and tower owner to collaborate and yield time savings for all parties. Tarantula provides transparency for end to end co-location – users can identify hold-ups, manage documents awaiting approval, improve performance against SLAs, and reduce disputes.

So what makes us stand out as a company? Our team has in-depth knowledge of working with and experience in operating tower companies. This
alignment means we understand their software needs inside out. Based on this, we have taken 30 real-world, best practice towerco processes and brought these to life through persona-based workflows, linking together towerco data such as assets and leases into one central business model. This is available straight out of the box, allowing companies to quickly integrate and deploy a towerco business model and end to end site management in a single software platform. The software is being used in 20 different countries around the world which gives us a breadth of industry experience.

It is these inherent values and benefits that have powered our product philosophy and links the Red Cube platform to the creation of business value.

**TowerXchange: What has been Tarantula’s experience of working with European towercos, infracos and MNOs?**

**Maurice Barnes, COO, Tarantula:** We have been working with UK opcos since early 2001. Over the last 15 years we have also worked with a variety of tier one MNOs and tower operators across Western and Eastern Europe.

We’ve learnt that West and Eastern European MNOs and service providers operate slightly differently. For example, in Russia, planning processes are slightly different than the UK – things tend to get done much faster in Russia.

**TowerXchange: How do you see the evolution of the European Tower industry in the past year?**

**Maurice Barnes, COO, Tarantula:** It appears that the time is ripe for European tower divestment. A lot has been spent on licenses. There are a number of planned divestments across Spain, Russia and Italy. On top of this, we’ve also noticed an increasing number of interested buyers - strategic as well as financial – getting engaged in European tower transactions.

All of these players have one overriding concern – how to absorb or transfer these assets quickly and to monetise assets in a sustainable manner. That’s why out of the box software is so critical. The industry will need to adapt faster as time to market considerations become increasingly important factors for start-up tower companies and newly acquired portfolios. Out of the box software will play a critical part in developing best practice processes for these businesses so they don’t need to re-invent the wheel.

**TowerXchange: How does the unique structure of the European tower industry - consisting of many operator-captive and MNO JV infracos as well as independent towercos - affect their respective appetite and need for portfolio management information?**

“
The industry will need to adapt faster as time to market considerations become increasingly important factors for start-up tower companies and newly acquired portfolios.”
Maurice Barnes, COO, Tarantula: I’d like to answer this question in two parts. The first thing that needs to be borne in mind is that there are two very different drivers affecting the market. Fortunately, we have experience in both segments.

The Indian market is a good example. In India, you have Indus, which is an operator-led joint venture tower company. You also have traditional tower companies like American Tower. Both of these companies have quite different goals and objectives. One goal is to serve their MNO parents and ultimately deliver efficient service provision. In this regard, automated portfolio management toolsets are critical for managing and provisioning the process for installing and upgrading equipment. MNOs are less interested in how the lease agreement links back to the original customer order and whether it was installed at the correct height. Joint venture infrastructure companies are often more interested in being efficient service partners than in monetising the rental of the tower. So portfolio management is more asset and SLA centric.

For independent tower companies, the business is all about real estate. Managing the space on towers is central for these companies’ profitability. As a consequence, a portfolio management platform needs to provide a level of data granularity that can efficiently link leases with assets and ensure revenue is not lost.

A lot of people seem to think the tower industry is homogeneous, when it clearly is not. Over the last 15 years we’ve learnt a lot about the nuances in our industry. We understand the differences between different geographies and business models. So we know lots about the different ways in which companies view their portfolios. This is why we have built a software platform that is flexible and configurable and takes into account the different business drivers for each type of tower company.

TowerXchange: We hear increasing appetite for the European tower industry to engage with active as well as passive infrastructure, and broadcast as well as tower assets - how can management information support this extension of the business model?

Maurice Barnes, COO, Tarantula: Extension of the business model for tower companies will link back to processes being extended and adapted. This will ultimately drive the management information. Capturing data and providing a flexible and configurable process layer that is scalable will allow the tower industry to quickly seize new opportunities.

TowerXchange: New tower businesses are being created, carved out or acquired on an increasingly regular basis in Europe - where should such entities start when it comes to improving asset register accuracy and commercialising tower management which might have previously been managed purely on a cost chargeback basis?

Maurice Barnes, COO, Tarantula: First of all, tower companies need to understand what is on their sites in terms of assets. Secondly, they have to understand how these assets link back to commercial site licenses.

This allows tower companies to enjoy cost optimisation when they service their sites, and this represents a substantial proportion of opex.

Understanding these two questions is not an overnight process. The faster a new tower company can invest in a proven software platform such as Tarantula, the quicker they can enhance their asset valuation and accelerate the whole process of integrating assets.

We have seen several examples of this such as the recent American Tower-Viom transaction; Helios Towers Africa buying assets from Bharti Airtel; and edotco buying Digicel MTC in Myanmar. A solid platform provides confidence to the investors when conducting any due diligence and this makes integration of the towers easier once purchased. Tarantula has developed an integrated tower purchase module to ensure customers benefit from a ‘step by step’ process to ensure any new assets can be monetised fast.

Lastly, it should be mentioned that adopting the 30 Tarantula tower best practice processes can enable a new tower company to rollout the platform faster across its ecosystem of operations to create a single version of the truth. Managing the business through multiple Excel sheets does not inspire the same level of confidence with investors and potential
TowerXchange: How would you characterise the current state of portfolio management information in European telecoms - are built-for-purpose platforms like Tarantula’s widely used, or is your main competition still Excel spreadsheets?

Maurice Barnes, COO, Tarantula: Portfolio management only covers one part of the challenge – assets are typically understood in a narrow sense. For example, many telcos see it as the ground and tenant lease. We look at portfolio management in a much broader holistic sense. For example - the end to end process from the initial co-location request through the installation all need to be covered and managed. A tower asset is constantly changing and the key is ultimately to derive a full history of all changes on the tower and track how they are linked back to the commercial lease arrangements.

Some companies think they can ‘build it themselves’, using Excel or other building blocks. Building your own tool really makes little sense when standard products like Tarantula are available with millions of dollars of ongoing product investment that reflect improved business practices across the industry. Also, it dilutes the core “lease management” focus of towercos by needing to build IT teams and manage “non-core” IT projects.

Tower companies are waking up to the importance of data quality, but face numerous challenges with data integrity. Our experience is that the challenge of creating and managing a new tower company via a single software platform is often underestimated. Managing expectations when all users have ‘one platform’ and they have their own Excel or Access database is not a small issue.

TowerXchange: Finally, please sum up how you would differentiate Tarantula’s solution from competitive site management platforms.

Maurice Barnes, COO, Tarantula: Tarantula brings 15 years of experience in this sector globally with its software platform. We recognise that markets are different, the US is not Europe or Asia, while other solutions are still learning the market differences. Having global experience with roots in co-location from early 2000, gives us a depth of knowledge no other competitor has when it comes to implementation.

With an installed base in nearly 20 countries, we are always well aware of the industries needs and this fuels our ongoing roadmap enhancements, providing our customers with the latest knowledge incorporated within the product.

Our 30 real-world tested, best practice towercos processes integrate data including assets, leases, and financials, into one central business model. This allows companies to quickly integrate and deploy a towercos business model as a single source of truth delivered as a software service.
The power of choice: power solutions for future networks
As power needs grow and change, Vertiv talks us through the opportunities to excel through innovation

With over 30 years of experience, Vertiv isn’t just looking at its past achievements, but is focussing on driving the innovative solutions which will power extensive 5G rollout and densification in European communications infrastructure. In this interview, we ask Eric LeCalvez, Vice President, Strategic Accounts, Telecoms, EMEA, Vertiv, more about the company’s experiences in powering urban sites, and find out how he sees power needs and expectations changing in the future.


Read this article to learn:
- Who Vertiv are and what solutions they offer
- How European power needs are unique
- Potential drivers for renewable power solutions in Europe
- The critical infrastructure needed to support a de-centralised network

TowerXchange: Please introduce Vertiv, your background and how the company was formed

Eric LeCalvez, Vice President, Strategic Accounts, Telecoms, EMEA, Vertiv: Vertiv leads the design, build and servicing of critical infrastructure. Our technology enables vital applications for data centres, communication networks and commercial and industrial facilities. We support today’s growing mobile and cloud computing markets with a portfolio of power, thermal and infrastructure management solutions.

As a business, we have a long heritage within the industry. Formerly Emerson Network Power, we have operated for decades, building our knowledge base and expanding our global footprint to become one of the leading providers of critical infrastructure solutions. Vertiv is a nimble and agile organisation that can take on business challenges with the spirit of a start-up, but with the experience of a legacy brand.

Within Vertiv, we have four separate flagship brands. These are Chloride, Liebert, NetSure and Trellis. Vertiv also recently acquired Energy Labs, a global manufacturer of air handling solutions, and Geist, a global manufacturer of Rack Power Distribution Units. These acquisitions will add complementary capabilities to accelerate growth in Vertiv’s key markets - cloud, colocation and edge.

TowerXchange: Can you tell us about your global scope and particularly about your footprint in Europe?
Eric LeCalvez, Vice President, Strategic Accounts, Telecoms, EMEA, Vertiv: Given the breadth of our portfolio, coupled with our long heritage, we have built an extensive global presence and can serve virtually all major telecom operators and leading tower companies in Europe and around the world. We provide critical infrastructure and services within telecom access, edge and core, as well as data centre facilities globally.

In addition, we provide a complete range of services to help customers improve the operating performance of their critical infrastructure, deliver capacity expansion and optimise energy costs.

It's safe to say, wherever you're based in the world, or whatever your critical infrastructure need may be, we can help you out!

TowerXchange: What unique challenges and opportunities do you feel European towercos face?

Eric LeCalvez, Vice President, Strategic Accounts, Telecoms, EMEA, Vertiv: Optimisation of colocation sites will be the single greatest challenge for tower companies. Specifically, new site locations in urban areas are faced with the twin issues of delivering higher utilisation from available sites while upgrading them in preparation for 5G. But with any challenge comes an opportunity - managing the critical infrastructure to perform at its most efficient while being largely unable to standardise site consumption is possible with innovation. 5G will drive higher power consumption, mainly due to new antenna technologies, and the harmonisation of sites holistically across the network through management platforms will present a considerable opportunity to make operational efficiencies and performance harmonisation. We need look no further than data from TowerXchange’s Europe Dossier 2017 to see the proliferation of European tower companies: over €1.5bn of tower acquisitions (at the time of publication); 44 tower companies active in the Europe region; and 92,732 towers and sites potentially for sale; numbers which suggest there is a great deal of confidence in European tower companies.

TowerXchange: In the recent TowerXchange Tower Power Report, 83% of respondents said they planned to allocate capex to power in the next 12 months. Can you tell us a bit more about why European power needs are growing, and what your recommendations for European tower owners are?

Eric LeCalvez, Vice President, Strategic Accounts, Telecoms, EMEA, Vertiv: Power needs are not only growing, they are changing. ICT convergence and network de-centralisation are widening the options on energy topology at site level. Since energy topology is a topic that is far from being standardised, flexibility in energy topology is recommended to accommodate the broadest range of technology loads.

Looking to the immediate future, the challenge for the next 12 months will be to keep up with increased bandwidth requirements, which will require an update of existing networks from a capacity perspective. Overall power needs are increasing and the recommendation is to survey the sites to frame these needs and identify those sites requiring a power distribution upgrade. Ensuring energy efficiencies are factored into such solutions is vital. To this regard, Vertiv can support telcos by providing Energy Savings as a Service, (ESaaS).
TowerXchange: Renewable and hybrid power solutions are far less common in Europe than in markets like Africa or Asia. Do you see this situation changing in the future? If so, what will the catalyst be for change?

Eric LeCalvez, Vice President, Strategic Accounts, Telecoms, EMEA, Vertiv: Unlike Europe and other developed markets, there are more pockets in Asia and Africa that lack access to conventional utility sources, which has led to them being greater adopters of renewable and hybrid power solutions. But the situation in Europe will certainly change, with environmental considerations providing the catalyst, and renewable and hybrid power becoming more cost-efficient. Monetary considerations like the fluctuation cost of oil will also be a factor.

TowerXchange: Do you think the shift to 5G will have a significant impact on the way infrastructure owners use power and provide backup power for their assets?

Eric LeCalvez, Vice President, Strategic Accounts, Telecoms, EMEA, Vertiv: 5G and its surrounding network elements are allowing architects to frame new models that directly impact power and energy storage. Certainly, there will be a need for a number of different solutions and remote power will be a contender for use in metropolitan areas. In addition, we will see sites with or without battery backup fed by either AC or DC power.

TowerXchange: We’re increasingly hearing about how network architecture will be revolutionised as 5G rollout gathers pace - what’s your view on edge computing?

Eric LeCalvez, Vice President, Strategic Accounts, Telecoms, EMEA, Vertiv: The new use cases for 5G, with requirements for higher bandwidth and low latency, will force telecom and solution providers to bring computing power away from a central point to dispersed locations at the ‘edge’ and closer to the user. This will require new high-density solutions covering both traditional telecom and data communications requirements.

Essentially, edge sites are the result of a great deal of work readying the network for decentralisation. Pushing application hardware towards the consumer will mean that, depending on the criticality of the site, edge sites will need to be designed to protect and back-up hardware that is rapidly increasing in thermal density. Besides power requirements, there are also rigorous climate requirements with increased heat load and narrow temperature range limitations to consider. If they are to perform as intended, edge sites will require some serious innovation, not least in the design of their critical infrastructure requirements.

Help is at hand though, with tower companies emerging as essential colocation facilities – not only for radio equipment but for the processes and consumer content generated through the coming phases of digital transformation. Doing such computing locally provides additional benefits of reducing logjams at central data centres/repositories, increasing the speed at which data is processed and reducing latency. Requiring as little as 100 square feet of space – and increasingly affordable thanks to an increase in out-of-the-box solutions and modular capabilities – there is much to recommend tower companies for edge computing deployment.

From here on to 2020, we expect to see many more telecom operators testing and trialling 5G. However, it is no longer realistic for wide-scale deployment by 2020 as there is still more to be done on next generation telecoms standards. It is quite probable though, that 5G hardware can be deployed running LTE software on it so that, once agreed, 5G could be rolled out relatively quickly. For 5G to work at the speed it’s intended to, significantly more optical fibre has to be placed in the ground between sites to move all of the data around.
The Digital Economy Bill – supporting the UK through turbulent times

How the new Digital Economy Bill will secure digital infrastructure and support growth through 5G rollout and Brexit turbulence

As the 5G dawn breaks on the horizon, key stakeholders must act quickly and decisively to ensure they are in a position to emerge successful from the rollout. MNOs, towercos, fibre owners, local authorities and service providers must work together to ensure the foundations are laid for universal and super-fast, yet safe and controlled access to broadband for all.

The Government is keen to demonstrate that the UK will remain at the forefront of this technological revolution. The Digital Economy Bill (the Bill) was introduced in the Queen’s Speech in May 2016 and published a fortnight after Brexit on 6 July 2016. The Bill, which is intended to lead to the passing of a new Digital Economy Act is being championed by the Department for Culture, Media & Sport who say that it will “put in place the foundations for the digital future”, helping to make the UK “a world leader in digital provision”.

Why do we need more legislation?

Telecommunications is one of the most rapidly changing industries in the world. Network operators are constantly seeking to challenge their competitors by developing ever-expanding platforms for customer engagement. To do this, they find themselves having to meet a growing customer demand for data and to provide those same customers with seamless services, all against the backdrop of a rapidly evolving digital world.

How does the Bill apply to telecoms infrastructure?

The Bill aspires to improve digital access for everyone. It seeks to impose wide-ranging measures which are designed to pave the way for universal and super-fast, yet safe and controlled access to broadband for all.

Network operators and digital infrastructure owners, in particular, will be closely tracking the progress
of the Bill through Parliament. In the measures on infrastructure and equipment roll-out contained in the Bill, cheaper and simpler infrastructure development is seen as key to universal broadband access and a truly digital society.

What are the key infrastructure-related changes?

The Bill contains a new draft Electronic Communications Code (the Code), designed to make the rollout of digital infrastructure less expensive and less complicated. Replacement of the current Electronic Communications Code, which has consistently been cited as overly complex and in need of an update, is being seen as a welcome change by many.

One of the key changes to the proposed Code relates to lowering the cost of installing and maintaining telecommunications equipment on private land.

Significantly, the Code’s definition of “land” specifically excludes electronic communications apparatus. The Bill is therefore not seeking to control the lease rates in master lease agreements (MLAs) or managed services agreements (MSAs) between tower companies and their tenants. This would have had substantial consequences. Instead, the changes are focussed on the relationship with the owner of the greenfield or rooftop land on which the digital infrastructure and equipment is located.

This is not, however, to say that the changes are irrelevant to the MLA or MSA arrangements between tower companies and their tenants. The right under a ground lease to locate a tower and communications equipment on a piece of land is as valuable as the tower and the equipment itself because, without having the right to locate and access such tower and equipment, the tower company cannot look after the equipment and the operator cannot ensure uninterrupted services to its customers in the relevant location. In any MLA or MSA the provisions relating to ground lease extension or renewal are therefore typically a topic of great importance.

Controls in the MLA or MSA over extension of ground leases and increases in ground rent are paramount. Tower companies will want to ensure the flexibility to negotiate competitive ground lease terms and to relocate tenants if negotiations are unsuccessful. Network operators will want relocation and the associated interruption to their services to be an exceptional outcome only. Network operators and tower companies therefore share an interest in seeking to protect themselves from increases to ground rents during the term of the MLA or MSA. Traditionally, the parties to the MLA or MSA, regardless of which of them directly absorbs the ground rent cost, have found that they cannot insulate themselves entirely from the risk of the landlord increasing the ground rent. There are several examples of where this could happen.

A good example is a situation in which a network operator wishes to perform an equipment upgrade. Other examples include where a tower portfolio is acquired, for example by a sale and leaseback transaction, or if a network operator is the subject of a takeover or decides to share its equipment with another network operator. Each of these examples opens up the possibility for the landlord to renegotiate, and in the process increase, the ground rent.

While ground rental income should always fairly compensate the landlord, the Code seeks to regulate the increase to the ground rent. Specifically, when determining ground rent, landlords will no longer be able to reference the value of the land or the economic value created by the demand for digital services by consumers to leverage a rent increase. In other words, the profitability of the site to the network operator or the tower company will not be relevant to the rent that can be charged. Put simply, landlords will not be able to impose unreasonable rental sums for the installation of equipment on their land any more.

The real thrust of these particular measures in the Bill is that charging rent for digital infrastructure should become more like charging rent for equipment of other utilities such as water and electricity. This will have the effect of controlling...
ground rents which should become cheaper in time. Operators will be able to take advantage of lower rents and, among those lobbying for the introduction of the Bill into law, it is hoped that equipment rollout will increase and customer access will correspondingly improve.

The political sensitivities around accessing harder-to-reach areas should ultimately quieten as there is likely to be an uptake in overall national digital coverage.

The Code additionally proposes to remove the consent right of landlords for equipment upgrades or network sharing. Traditionally, landlords have been able to demand a higher ground rent as a quid pro quo for allowing network operators to upgrade or share equipment, even if the amount of space used to do so is relatively unchanged. Anything which could dissuade the network operator from its rollout of better equipment to improve coverage is now viewed as being at odds with public policy and the need to keep pace with rapid digital progress.

In the Code, the Law Commission recommends that where equipment upgrades or sharing of equipment between operators causes minimal visual change, landlord consent ought not to be required at all.

In the event of a dispute between landowners and the operator or tower company regarding ground rent, the court will now be able to set the rent to avoid a prolonged hold up and associated lack of access to a site.

The Bill’s proposals also extend to simplifying the planning process in connection with placing digital infrastructure on land. Historically, local planning authority consent would be required prior to constructing or installing broadband infrastructure at national parks, areas of outstanding natural beauty and conservation areas. The Communications Act 2003 removed the requirement for planning authority consent but only as a temporary measure which had been due to expire in April 2018. The Bill proposes removal of the April 2018 expiry date so that the easing of planning rules in relation to digital infrastructure will become permanent.

What's the verdict?

The infrastructure measures in the Bill, which passed its second reading on 13th September 2016, have been favorably received by network operators and tower companies. Landlords have expressed disappointment with the proposed infrastructure provisions on the basis of a perceived lack of balance. Network operators have lobbied for the changes the Code is proposing, which are hoped to enable more economical roll-out of equipment and improved access for fixing faults. Any change in law is, however, potentially disruptive. Network operators will not want landlords’ concerns about their income stream to interfere with the maintenance of their infrastructure and equipment or the rollout of important upgrades.

There is also still some uncertainty about precisely what shape the legislation will take once it is passed. In recent weeks, a group of almost 90 cross-party MPs issued a report calling for the Government to reconsider the introduction of a “national roaming network” in order to eliminate coverage “not spots”. The report argued that mobile users in rural areas with poor coverage should, like overseas visitors to the UK, be able to switch between operators depending on which has the strongest signal. Network operators have responded that such a move would be a “significant disincentive” to competitive network investment. Progression of the Bill through the House of Lords, itself heavily populated by landowners, could add another interesting dynamic to the discussion. Understandably, many remain curious as to the Bill’s eventual impact.

Finally, with Brexit on the horizon, and the UK’s potential exit from the EU’s Digital Single Market, whether the Bill goes far enough in ensuring that the UK is at the forefront of global digital transformation is uncertain. With Brexit on the horizon, and the UK’s potential exit from the EU’s Digital Single Market, whether the Bill goes far enough in ensuring that the UK is at the forefront of global digital transformation is uncertain.