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About TowerXchange

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

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.

TowerXchange was acquired by Euromoney Institutional Investor PLC on December 1, 2017.
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TowerXchange Meetup calendar

- TowerXchange MENA 2019, January 29-30
- TowerXchange Meetup Europe 2019, 9-10 April
- TowerXchange Meetup Americas 2019, July 9-10
- TowerXchange Meetup China 2019, August
- TowerXchange Meetup Africa 2019, October 8-9
- TowerXchange Meetup Asia 2019, December 3-4
TowerXchange’s analysis of the tower market in the Middle East & North Africa

The Middle East and North Africa is the region the least penetrated by the towerco business model globally. With the exception of Pakistan (which TowerXchange has grouped into our regional coverage), there have been no tower transactions of scale, and whilst a handful of build-to suit towercos have emerged, fewer than 1% of the region’s 275,104 towers sit in independent towerco hands.

In North Africa, some operators have embraced infrastructure sharing more readily than their counterparts in the Middle East, with an active sharing agreements in place in Tunisia and approximately one third of towers in Egypt being shared, but on the whole infrastructure sharing between MENA MNOs has been limited.

Yet the winds of change are upon us.

In Kuwait, IHS Towers have reached a deal to acquire Zain’s 1,700 sites (with the deal expected to close imminently) and on 28 November it was announced that Zain had reached an agreement for the sale and leaseback of their 8,100 Saudi Arabian towers to the towerco. In Oman, Omantel are expected to announce a tower sale imminently, with approximately 2,900 macro towers and 5,000 rooftop towers up for grabs.

Further MNOs in the region are also understood to be studying tower sales closely, attracting the interest of towercos and investors in this virgin territory. Rumours have circulated that Tunisie Telecom may consider a sale of their tower portfolio, Djezzy (in which VEON are major shareholders) is known to have previously explored a tower divestment and is rumoured to retain that appetite to sell, and should Zain Group’s transactions go ahead successfully in Kuwait and Saudi Arabia, one can expect their tower divestment strategy to spread to other markets.

Some operators have explored different paths. In Iran, number one and number three MNO MCI and Rightel have opted to form a towerco venture – Iranian Towers – in partnership with domestic towerco, Fanasia. In Saudi Arabia, Saudi Telecom Company which had previously looked at both a joint venture and a tower sale has now set its sights on carving out an internal towerco to better manage its portfolio of 16,400 towers, establishing Communications Towers Co Ltd in early 2018. The entity is yet to start commercial operations, with regulatory approvals still pending but observers expect this to be resolved by early 2019. The operator invited bids for a management contract in its new tower venture, although their reluctance...
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to hand over any equity has deterred most of the major tower cos from participating.

The ESCO model is also gaining traction in MENA as an alternative outsourcing strategy. In Lebanon, Alfa has signed an ESCO contract with IPT PowerTech, whilst in Egypt, Orange (which in 2016 under the MobiNil brand had reached an agreement to sell 2,000 towers to Eaton Towers; a deal which didn’t obtain regulatory approvals) has issued an ESCO RFP. TowerXchange has also been made aware of further MNOs on the cusp of announcing ESCO RFPs.

In markets where new build is required, operators who may not necessarily be considering a tower divestment, are opening up to the idea of working with independent tower cos in a bid to rollout new sites in a less capital intensive manner. Several major tower cos have been linked to the Egyptian market, where new build requirements are particularly high, both for established operators and new market entrant, Telecom Egypt. New build to suit players are also starting to emerge across the region, some of which have an appetite for tower acquisitions, should towers come to market.

As the region begins to open up to the independent tower cos model and infrastructure sharing, there is a pressing requirement for governments and regulators to create supportive legislation. In this regard, progress in many markets has been slow and continued support and education on the merits of shared infrastructure and tower cos remains key. Whilst a small market, with just 1,500 towers, Bahrain’s regulator has been one of the most proactive. In early 2018, the country’s Telecommunications Regulatory introduced the Public Radio Communications Stations Regulation, designed to regulate the deployment of new towers and encourage infrastructure sharing in the country.

The advent of 5G and the move towards smart cities is necessitating major investment in densifying telecom networks in many of the most developed countries in the MENA region. How to achieve such densification, whilst often contending with declining ARPU and increased taxation, is causing operators to consider new business models and potential infrastructure sharing strategies.
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Whilst the MENA region has a number of common threads including a number of operators active in multiple markets, a central role of government in business, a strong Arabic influence and similar climates and geographies, it is also important to note the stark differences across different markets; From the highly developed GCC countries pushing towards 5G and decommissioning of parallel infrastructure, through to the war torn countries of Iraq, Afghanistan and Syria where network rollout, restoration and power remain top concerns in operationally challenging markets.

TowerXchange examine the dynamics at play in 16 countries across the MENA region, exploring key MNOs and their tower portfolios, the level of infrastructure sharing and presence of towercos, network expansion required and operational challenges present.

On 29-30 January 2019, in response to the momentum in the market, TowerXchange will bring one of their world renowned Meetups to Dubai for the first time; assembling the who’s who in the MENA tower market. If you would like to get involved, please contact Laura Graves, Managing Director, EMEA at lgraves@towerxchange.com

### Country analyses

**Afghanistan**
- **Subscribers:** 33.5mn
- **Tower count:** 6,645
- **MNOs:** Five
- **Towerco activity:** Asia Consultancy Group

Afghanistan has five MNOs, Afghan Wireless (AWCC) which is the country's fastest growing MNO, Roshan which is funded by the Aga Khan Development Fund and is the country's largest MNO, multi-national players MTN (which has hinted at exiting the market) and Etisalat, and newcomer Afghan Telecom which is part of the Ministry of Communications and Information Technology. Telecommunications remains an important sector for the Afghan government, with Afghan Wireless understood to be the largest tax payer in the country.

<table>
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<th>Figure two: Footprints of MENA's major MNOs</th>
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<td><strong>Country</strong></td>
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n.b. Lighter colours indicate the company owning a stake in an MNO in the country

Source: TowerXchange
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Each of the operators own pretty much of all of their sites, with the MNOs understood to have between 1000-1500 towers each. The Telecom Regulatory Authority of Afghanistan (ATRA) states that there are 6,645 base stations in the country, and with limited infrastructure sharing one can assume that a rough proxy for the number of towers. As the country’s newest player with just 5% market share, Afghan Telecom’s network is smaller than that of its competitors and the operator has recently inked a network sharing deal with Etisalat. Afghan Telecom currently uses around 60-70 of Etisalat’s towers, with plans to extend this tower sharing arrangement. Networks are better established in Northern and Central regions, although Afghan Wireless is still investing in Southern regions of the country.

Since the MNOs entered the market in the early 2000s, the security situation has deteriorated significantly. The Taliban demanded the shutdown of a significant number of sites to avoid surveillance by national and international security forces; where these demands were not met many sites were blown up. MNOs have been reluctant to invest and so there has been little activity in terms of new tower build or co-location. Frontier Tower Solutions had operated in the market in the earlier days, building, operating and maintaining sites for Afghan Wireless but the towerco has since wound up operations in the country. Afghan managed service provider, Asia Consultancy Group, owns ~100 towers which it makes available for co-location and RANsharing services.
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Solar solutions had been examined but the payback period means that MNOs have been reluctant to invest. There are few to no major international contractors operating in the market outside of the military (with foreign troops also having massively reduced their presence, a factor which caused a drop in subscriber numbers) although TowerXchange has heard rumour about one multinational MSP offering ESCO-like services in the market.

In spite of the challenging conditions, coverage in the market has been described as “fairly okay”. There are 33.5mn subscribers with mobile penetration sitting at 89% (source: ATRA) and 4G coverage is available in major urban areas, where data usage continues to grow faster than expected.

In early 2018, the ATRA agreed to provide US$32.1mn of funding to deploy 250 base stations in rural and remote areas. Roshan will deploy 137 sites, Afghan Wireless 84 sites and Afghan Telecom a total of 29.

Algeria

Subscribers: 47.0mn
Tower count: 19,000
MNOs: Three
Towerco activity: Some colocations on towers belonging to national broadcaster Télédiffusion d’Algerie (TDA); Infrashare registered as a towerco in the country

Algeria has three MNOs, Mobilis (Algerie Telecom) with 41% market share, Djezzy (Optimum Telecom Algerie) with 31% and Ooredoo (Wataniya Telecom Algerie) with 27%. There are 47mn mobile connections in the country, growing at a rate of 8% YoY and mobile penetration sits at 113% (Source: ARPCE – L’Autorite de Regulation de la Poste et des Communications Electroniques). Each of the MNOs obtained a 4G license in 2016 and rollout is well underway with around one quarter of the population covered as of Q1 2018.

There are an estimated 19,000 towers in the country of which 20% are ground based and the rest are rooftop or alternative site typologies. Mobilis has the largest portfolio with around 7500 sites, followed by Djezzy with 6,500 and Ooredoo with 5,000. State owned broadcaster, Télédiffusion d’Algerie (TDA) has approximately 350 towers. The country needs an additional 2,000-3,000 new sites to be added in the next 18-24 months, and what’s more, a significant proportion of existing sites need to be dismantled and replaced. Mobilis has long had plans to deploy 1,200 to 1,400 sites but repeated changes in management have stalled rollout plans in recent years.

Less than 2% of sites are currently shared, with many lacking the structural capacity for additional tenants and MNOs failing to agree what constitutes a fair swap. In late 2016, the regulator introduced plans for active sharing and in a short period of time, Ooredoo and Djezzy started sharing around 1,000 sites. In mid 2017 however, the regulator did a u-turn, prohibiting active sharing although provisions for active sharing are however laid out in the 4G license conditions.

No tower transactions have been carried out in the Algerian market, although Djezzy, in which VEON are major shared holders, carried out an exploratory study into a potential tower sale (VEON, formerly VimpelCom, has experience in...
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tower divestments having previously sold their Italian towers to Cellnex and looked at the sale of their assets in Russia, Pakistan, Bangladesh and the CIS). Limits on foreign direct investment in Algeria (limiting international players to a 49% stake) however meant that there was a lack of appetite from most international towercos to enter the market. Newly established Algerian towercos, Infrashare (headed up by the former CTO of Ooredoo Algerie) keeps a keen interest in tower portfolios in the market and has financing options that enable it to abide by the FDI rules.

In terms of site operations, 99% of sites are on grid with generators used for backup on core sites. With comparably cheap fuel prices the case for hybrid solutions is reduced.

**Bahrain**

**Subscribers:** 2.2mn  
**Tower count:** 1,500  
**MNOs:** Three  
**Towercos activity:** None

The Kingdom of Bahrain has three mobile network operators; Batelco, Saudi Telecom Company owned Viva and Zain serving a subscriber base of 2.2mn (source: TRA Q2 2018).

In spite of its small landmass, Bahrain has a total of 1,500 sites of which around 12% are currently shared, leading to significant parallel infrastructure. In 2016, the Telecommunications Regulatory Authority of Bahrain (TRA) commissioned a study to examine the rationalisation of the Kingdom’s total tower count down to a core network of 400 sites. In early 2018, the TRA introduced the new Public Radio Communications Stations Regulation (PRS Regulation) to regulate the deployment of new towers and “rectify existing ones in accordance with best practice”. The new detailed legislation lays out key specifications for new and existing towers, specifying everything from the type of concrete used in the foundations to key health and safety requirements. The rectification plan is to take place over the next 15 years, with more than 90% of the towers requiring modification and the TRA setting out a goal of increasing the percentage of sites being shared from 12% to 40% in the country.

When questioned by TowerXchange on different business models to reach the targets set in place, the TRA stated “Currently there are three operators who are licenced to deploy masts and towers in Bahrain. As a result there are three different mast and towers networks, i.e. one for each operator. The Authority considers there is room for improvement by merging these different networks into one or at least two. This could be done either by introducing a towercos company, a joint venture between existing operators or other feasible business models.”

**Egypt**

**Subscribers:** 103.2mn  
**Tower count:** 22,704  
**MNOs:** Four  
**Towercos activity:** HOI-MEA (plus interest expressed from a number of other towercos)

Egypt now has four MNOs (each with 4G licenses) with Telecom Egypt joining Vodafone, Etisalat and Orange after having obtained a license in 2017. With 103.2mn subscribers (source: GSMA intelligence, Q4 2017) and just over 22,000 towers,
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Egypt has over 4,500 subscribers per tower, the highest in the MENA region.

Tower ownership is fairly evenly split amongst the three established MNOs with new market entrant, Telecom Egypt lagging behind with just 2000 towers. Four infraco licenses also having been awarded to Alkan, Mobiserve, EEC and HOI-MEA to enable them to own towers, although only HOI-MEA has built and retained a portfolio of towers with their current site count sitting at 38. Rumours had circulated that HOI-MEA were looking for a buyer for their towers.

There have been no tower transactions of scale in the market. MobiNil (now Orange) reached a deal back in 2016 to sell 2,000 of their sites to Eaton Towers for $131mn although the deal was cancelled and does not look like it will return to the table any time soon. Infrastructure sharing between the MNOs is relatively widespread, with Orange reporting that over a third of the towers they use are shared with other operators. In early 2018, Telecom Egypt reached a wholesale agreement with Vodafone to utilise its transmission and infrastructure services for a three year period whilst it establishes its network.

Each of the four MNOs were awarded an 4G license in 2016, and whilst 4G coverage is relatively extensive in Cairo, major rollout is still required elsewhere. Collectively, Orange, Vodafone and Etisalat are understood to be adding 300-500 new towers per year, whilst Telecom Egypt has initiated the next phase of their network rollout, requiring the addition of 1,000 new sites (GBTs, rooftops and IBS). Such high requirements for new build and co-locations has attracted the interest of international towercos, with American Tower, TASC Towers, Digital Bridge and Eaton Tower all being linked to potential opportunities in the market.

Grid connection for tower sites is slow and expensive and so generators are widely used, often two per site due to the high loads. Fuel remains cheap by international standards and so the case for hybrid solutions is reduced; although fuel subsidies are gradually being phased out. Orange has issued an RFP for an ESCO to take over power for a portion of their towers in the market, with a goal of improving energy efficiency at sites. At least one of the other MNOs is expected to follow in Orange’s footsteps.

Iran
Subscribers: 118mn
Tower count: 37,106
MNOs: Three national plus FCP and WiMAX players
Towerco activity: Iranian Towers and Fanasia

Iran is the Middle East’s largest mobile market with 118mn subscribers. There are three national operators in the country of which MCI (Mobile Communication Company of Iran) is the largest with 61.3mn subscribers and 43% of the market share. MTN-Irancell, a joint venture in which MTN holds a 49% stake, is Iran’s second largest operator with 45.5mn subscribers and 40% of the market share; and RighTel is the third largest operator with 9.5mn subscribers and around 8-9% market share. In addition to this there are a number of FCP players and WiMAX operators who make up the balance of the market share.

There are currently around 37,000 towers in the Iranian market and with very little infrastructure sharing between the operators there is a significant
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degree of parallel infrastructure. In 2014, Fanasia, an Iranian company with a background as a turnkey service provider to the country’s MNOs, started their own towerco business. Their first project on Kish Island, conducted with the support of the Kish Free Zone Organisation, was to rationalise the number of towers on the island. With 110 sites on the Island, each with a single tenant and unsuitable for the addition of further tenants, Fanasia built 27 new sites which the operators were mandated to use, whilst existing sites were decommissioned. The municipality benefited from a revenue sharing model on top of the land rental fee and further benefited from the freeing up of land under the old towers. Following the success of the Kish Island project, Fanasia reached a similar agreement with the municipality of Mashhad, Iran’s second most populous city to develop a core network of 350 sites in March 2016. Fanasia currently owns 106 towers.

In early 2017, in response to the growing trend towards infrastructure sharing in Iran, a new tower company, Iranian Towers, was formed. The three shareholders in the company are MCI and Rightel, Iran’s number one and three MNOs, and Fanasia, Iran’s first towerco. The first phase of Iranian Towers’ operations will be the construction of approximately 1,000 new sites which are capable of accommodating multiple tenants. These sites will be constructed primarily in the major cities in order to accommodate 4G and 4.5G rollout. The new rollout will include both ground based and rooftop sites and will be conducted with the coordination of municipalities who will benefit from revenue sharing on the sites. Iranian Towers now own around 1,000 sites.

**Iraq**

**Subscribers:** 36.7mn  
**Tower count:** 14,769  
**MNOs:** Three national plus several LTE only players in Kurdistan  
**Towerco activity:** None (although rumours circulating)

Iraq has three nationwide MNOs which own 2G and 3G licenses; Zain, Asiacell (owned by Ooredoo) and Korek Telecom (in which Orange has a stake). Zain has the largest mobile market share, with Asiacell close behind, whilst Korek Telecom is the country’s fastest growing operator which is dominant in the Kurdistan region. In addition to the three nationwide operators, there are a host of 4G LTE players in the Kurdistan region, Fastlink being the largest with Tishknet, Goran-Net and Mobitel amongst the other players. The government had proposed the introduction of a fourth national operator (in which the ruling government would have a stake) although further details are yet to emerge with political issues thought to be holding the process up.

There are 14,769 towers in the market split between the national and Kurdistan operators (figure seven). Approximately 10-15% of the country’s total stock was understood to have been destroyed or damaged during the conflict over the past three years, with power systems particularly damaged, and so major reparatory works have been underway.

There has been significant under investment in networks in recent years with 3G coverage understood to be particularly poor and so significant network expansion is required; Korek Telecom forecast that they need to build a further 2,500 sites. Major investment has been pledged.
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by international investors and donors in a bid to rebuild Iraq’s economy, with significant funds expected to be channeled into telecoms.

Iraq’s MNOs are struggling with high OPEX, attributable in large part to security and logistics issues across the country. Power remains a major challenge and whilst figures for power availability vary by region and by time of year (ranging from zero grid to 16-18 hours in Kurdistan in summer), the vast majority of sites are reliant on two diesel generators. Hybrid solutions are yet to have any large scale trials in the country, and whilst fuel is not expensive by a global comparison, the costly and difficult logistics associated with fuel delivery and generator maintenance means that a switch to hybrid solutions is attractive.

**Jordan**

**Subscribers:** 11.7mn  
**Tower count:** 6,836  
**MNOs:** Three  
**Towerco activity:** TASC Towers

There are three MNOs in Jordan; Orange, Zain and Umniyah (owned by Batelco) which have a roughly similar mobile market share and as such, the market is highly competitive. There are just over 7,000 towers in the country, roughly split between the three MNOs, and towerco, TASC Towers, owns a modest portfolio of sites.

Jordan’s Telecommunications Regulatory Commission (TRC) is in the process of creating a centralised database of fibre optic networks in a bid to limit duplication of infrastructure and encourage network sharing. Whilst no such scheme currently exists for towers, infrastructure sharing does exist between the MNOs with Orange reporting that just under 15% of the sites that it uses are shared with other operators.

The telecommunications sector is subject to heavy taxes in Jordan with operators having been exposed to increased electricity prices which has had an impact on operator profits. Orange have invested in a 33.7MW solar PV plant to produce the electricity it requires.
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Kuwait
Subscribers: 7.2mn
Tower count: 4,100
MNOs: Three
Towerco activity: IHS Towers (pending closure of the Zain tower deal)

There are three MNOs in the Kuwaiti market where intense price competition has driven data costs down drastically, putting pressure on the country's operators. Decreasing ARPU has made justifying investment in rolling out new sites tough, with each MNO focussing on implementing cost optimisation initiatives.

Market leaders Zain have reached an agreement to sell 1,700 towers to IHS Towers for US$165mn. The deal is expected to close imminently, with just a couple of minor regulatory issues to be finalised. When completed, the deal will mark the first major tower transaction in the Middle East (excluding Pakistan). The entrance of a towerco will provide a more cost effective means to expand networks in a market where infrastructure sharing has been limited to date. There are approximately 4,100 towers in the Kuwaiti market with significant parallel infrastructure existing. Decommissioning is expected to play a significant role in IHS’ business model in the country.

Lebanon
Subscribers: 4.6mn
Tower count: 2,600
MNOs: Two
Towerco activity: None

There are two state owned MNOs in Lebanon, touch and Alfa, for which Zain Group and Orascom have management contracts. The two operators have a roughly equal market share in a country which has some of the highest mobile tariffs in the world. There are approximately 2,600 towers evenly split between the two operators, with no independent towercos operating in the country. Whilst subject to budget approval from the government, plans have been announced to add between 700-800 new towers before the end of 2019.

Of the 2,600 towers, approximately 15% are on good grid with 24 hours of availability, 73-75% are on poor grid (with availability ranging from 6-18 hours) and 10-12% of sites are completely off-grid. Alfa has signed an ESCO contracts with IPT PowerTech, with IPT PowerTech taking over management of the operators full portfolio of sites.

Morocco
Subscribers: 43.9mn
Tower count: 19,054
MNOs: Three
Towerco activity: None although two new towercos eyeing the market

Maroc Telecom is the leading MNO in the Moroccan market with 42% market share, ahead of both Inwi (in which Zain has a 15.5% stake) and Orange in a country with 43.9mn subscribers. Data usage continues to grow as 4G rollout progresses, with Maroc Telecom reporting 4G population coverage at 93% (versus 73% in 2016).

Maroc Telecom has the largest tower portfolio with approximately 10,000 sites, whilst Orange and Inwi are understood to have 4,000-5,000 each.
Infrastructure sharing between the MNOs exists, with approximately 15% of sites thought to be shared.

**Oman**

**Subscribers:** 6.6mn  
**Tower count:** 15,400  
**MNOs:** Two (plus resellers); entrance of third MNO imminent  
**Towerco activity:** Oman Towers Company

Oman has two MNOs, Omantel and Ooredoo as well as two mobile resellers, Renna Mobile and Friendi Mobile. In 2017, the government introduced a tender process for a third MNO which attracted interest from parties including Zain, Saudi Telecom Company, Etisalat and Sudatel. The tender process was cancelled with the government instead deciding to award the license to a consortium involving local funds (potentially led by a flagship sovereign wealth fund) and a global strategic partner. The stated objective for the change in strategy was to enable the local funds to deploy their assets in Oman as part of an overarching economic diversification vision away from oil. Details are yet to emerge of what kind of commercial model is being proposed for the consortium, similarly no official dates have been announced for when the license will be awarded.

In addition to the threat of a third MNO and existing competition from OTT players, Omantel and Ooredoo have felt further pressures from an increase in MNO royalty fees from 7% to 12% and a tax increase from 12% to 15%.

There are approximately 4,900 ground based towers and 10,000 rooftop sites in the country, roughly evenly split between the two major MNOs. Omantel are understood to be increasing their tower count by about 4-5% per annum, suggesting an average of around 100-120 new towers are built by the operator each year. For Ooredoo, similar numbers are forecast. Infrastructure sharing has been limited to date but has started to increase as the MNOs aim to execute the rollout of 4G more cost effectively, with current estimates suggesting approximately 10% of towers are shared.

In February 2018, Oman 70 Holding Company, ActivCo and the Omani Government set up a new organisation called Oman Towers Company. The company plans to build approximately 600 towers in the first five years, and has an interest in acquiring or managing the existing portfolios of Oman’s MNOs.

Rumours have surfaced that Omantel are considering the sale of their towers with a formal process expected to be announced by early 2019.

**Pakistan**

**Subscribers:** 147.8mn  
**Tower count:** 34,300  
**MNOs:** Four  
**Towerco activity:** edotco and AWAL Telecom (plus several other licenses held)
Pakistan has four MNOs; Jazz (formed through the acquisition of Warid by VEON’s Mobilink) leads the market, followed by Telenor, China Mobile’s Zong and Ufone (in which Etisalat has a stake). With a relatively low mobile penetration rate of ~73% and a data penetration rate of ~24%, there is significant opportunity for long-term growth in the market.

Towercos have been licensed in Pakistan since 2006 but MNO attitudes towards infrastructure sharing only started to thaw in 2011, initially seeing their networks as a source of competitive advantage.

Towershare-owned Tanzanite built a portfolio of 700 sites in the market, built largely from acquisitions, with the majority of towers coming from previous WiTribe assets. The Tanzanite portfolio, 40% of which were ground based towers, secured tenancies from all major operators, reaching a tenancy ratio of 1.6x before being acquired by pan-Asian towerco, edotco Group for US$88.9mn in 2017.

edotco subsequently joined forces with Dawood Hercules, a listed Pakistani holding company conglomerate to acquire the 13,000 Jazz towers which had been carved out into a subsidiary, Deodar. The sale has however since fallen through although rumours suggest that local investors and their partners are working to rekindle the deal, albeit perhaps at a smaller scale.

Whilst several local companies are also licensed as towercos (with 14 license holders currently listed by the Pakistan Telecommunications Authority), only AWAL Telecom appears to be trading as such.

MNOs Telenor, Zong and Ufone each retain their tower portfolios. Ufone has been exploring the potential sale and leaseback of their towers in Pakistan for some time. The process was stalled by the de facto merger of PTCL and Ufone, and associated management changes, but Ufone could yet contribute over 6,000 further assets to the pool of commercially shared towers.

China Mobile’s Pakistan opco, which trades under the brand name Zong, has around 9,100 sites, of which around 2,000 are colocations.

Telenor is a keen advocate of all forms of network sharing; towers (sharing primarily with Jazz), fibre (sharing with Zong), and has taken a lead role in exploring active infrastructure sharing. Telenor and Zong undertook Pakistan’s first RANsharing trials across around 30 sites, while the Norwegian-owned MNO has also shared IBS, both under the MORAN model where spectrum is not shared.

Figure thirteen: Tower ownership by Tunisia’s MNOs

There has been extensive infrastructure sharing between operators but significant parallel infrastructure exists, especially in urban areas, implying that decommissioning is likely to be a key part of towerco strategy in the future. TowerXchange estimate the prevailing tenancy

Source: TowerXchange
ratio (the average number of tenants across all towers in the country) to be around 1.25 in Pakistan, with a clear pathway to 1.5. Of around 10,000 co-locations in the country, most originate from barter arrangements, with some application of commercial lease rates, but more often offset against one another so no cash changes hands. These agreements will continue to be converted to commercial leases as towercos continue to become more prevalent.

Pakistan’s MNOs cite power as the number one operational challenge in the market, followed by security and landlord issues. While Pakistan’s electricity grid remains unstable, and outages can last eight or more hours, the situation has improved notably in recent years. Backup diesel genset runtime is being reduced at sites on the country’s better grid connections, with DGs increasingly being removed from such sites. edotco will offer a full tower+power service in Pakistan, meaning they will lease tower and ground space as well as providing DC energy.

Qatar

| Subscribers: 4.4mn |
| Tower count: 5,000 |
| MNOs: Two |
| Towerco activity: None |

Qatari headquartered Ooredoo are market leaders in their home market, with 3.4mn subscribers versus Vodafone’s 1mn. Vodafone has sold its 51% stake in its opco to former joint venture partner, Qatar Foundation, with the local opco continuing to operate under the Vodafone brand via a Partner Market agreement.

There is little to no infrastructure sharing in the market, but with both operators now effectively owned by the state the government may start to view infrastructure sharing more positively.

At the end of 2017, Ooredoo launched one of the first “5G speed experiences” at select locations in Doha. Qatar is positioning itself as a front runner in the rollout of 5G, with a world class infrastructure backbone one of the key pillars of the Qatar National Vision 2030.

Saudi Arabia

| Subscribers: 43.9mn |
| Tower count: 35,500 |
| MNOs: Three |
| Pending towerco activity: Communication Towers Co. Ltd (STC’s carve out - not yet active) plus IHS Towers(pending closure of the Zain deal) |

There are three MNOs in Saudi Arabia; market leaders Saudi Telecom Company, Mobily (in which Etisalat has a 27% stake) and Zain. Additionally there are two MVNOs; Virgin Mobile and Lebara. Between them, Saudi’s MNOs own over 35,500 towers with STC having the largest portfolio. Infrastructure sharing in the Kingdom has to date been very limited, with less than 2% of sites believed to have more than one tenant. In the major cities, Riyadh and Jeddah, there has been some infrastructure sharing as part of MNO densification plans to meet growing data usage, whilst in some of the country’s holy sites where access to land is limited, infrastructure sharing has arisen out of necessity. These infrastructure sharing arrangements are typically under bilateral commercial agreements and thus far have only covered passive equipment.

With little infrastructure sharing a high degree of parallel infrastructure has developed; 95% of Zain and Mobily’s sites are reported to overlap and as such, the government is keen to promote infrastructure sharing.

Various passive infrastructure strategies have been explored by each of the Kingdom’s MNOs in recent years. As early as 2011, Saudi Telecom Company and Mobily announced their interest in forming a towerco joint venture only for talks to stall; the MNOs revisited joint venture plans in late 2016 but once again decided not to proceed.

The first talks about tower sales emerged in late 2014, when Zain appointed Citi to oversee a potential sale of their towers. Mobily followed suit announcing a tower sale process before STC also weighed in on the action hinting they too may look to sell their larger portfolio. Ultimately all tower sale processes were pulled, leaving bidders with their fingers burnt after so many stop-start discussions.

In late 2017, Zain announced that it had entered
into exclusive negotiations with TASC Towers and Saudi based Acwa Group to sell their portfolio. Talks expired and Zain subsequently entered into exclusive negotiations with IHS Towers and Towershare, with the operator having previously agreed the sale of their Kuwaiti towers to the pair. On 28 November 2018, Zain announced that it had accepted an offer valued at SR2.43bn (US$647.7mn) from IHS Towers for the sale and leaseback of its portfolio of 8,100 Saudi towers, with a new build order for 1500 towers included in the deal.

In Q1 2018, Saudi Telecom Company established Communication Towers Co. Ltd., a fully owned limited liability company, with a share capital of SR 200 million which “will be responsible for owning, constructing, operating, leasing and commercialising telecom towers.” The vast majority of Saudi Telecom Company’s 16,400 towers will be transferred into the entity which is yet to start commercial operations, awaiting the necessary licenses from the relevant authorities. STC issued an RFP for a towerco management partner, but with the operator reluctant to give up an entity in the towerco venture, interest from the international tower community was limited.

Market intel suggests that there has been movement in recent weeks in CITC’s discussions regarding towerco licenses, with such developments expected to spur progress with the Zain tower sale and Communication Towers commencement of operations.

Tunisia

**Subscribers:** 14.2mn  
**Tower count:** 8,383  
**MNOs:** Three plus Lycamobile  
**Towerco activity:** NATIC and Infrashare (newly formed towercos)

There are 15mn active subscribers (source: INTT Q3 2018) and three MNOs in the Tunisian market; market leader Ooredoo, Orange and Tunisie Telecom. Emirates International Telecommunications (which has a stake in UAE operator du) recently reached an agreement to sell its stake in Tunisie Telecom to private equity firm, Abraaj Group. Rumours had circulated that the transaction may precipitate a sale of Tunisie Telecom’s towers and whilst the takeover has since been called off, leaving the fate of Tunisie Telecom’s towers in the balance, observers expect a tower deal to occur in the future.

There are an estimated 8,383 towers in the Tunisian market, split between the region’s MNOs. In addition, there are two new towercos eyeing up the market, NATIC and Infrashare. Whilst NATIC has an appetite for build to suit (which is understood to be somewhat limited in the country), Infrashare’s interest relates more to sale and leaseback activity should it arise. When it comes to major infrastructure projects, the government has instigated limitations on foreign direct investment, limiting international participation to 49% Such legislation is expected to be extended to towers in the country, although forthcoming elections may shake things up once again.

Infrastructure sharing exists with Orange reporting that approximately a third of its sites are shared with other MNOs. In addition to passive infrastructure sharing, Tunisie Telecom and Ooredoo have a RANsharing deal in the country into which there had initially been discussions to include Orange.

UAE

**Subscribers:** 19.0mn  
**Tower count:** 13,000  
**MNOs:** Two  
**Towerco activity:** None

Etisalat lead the UAE’s market where it competes with du (and new MVNO, Virgin Mobile). Emirates International Telecommunications (which has just sold its stake in Tunisie Telecom) is a shareholder in both du and Virgin Mobile in the country.

Whilst two competing entities, both Etisalat and du have a common shareholder in Emirates Investment Authority which has 60% share in the former and a 39.5% share in the latter which creates an unusual situation in the market. The two operators have a fixed network sharing deal.

There are an estimated 13,000 towers in the UAE of which Etisalat owns 8,000.

The country is very much positioning itself to be a front runner when it comes to 5G.
Meetup MENA 2019

The 20th retreat for the telecoms infrastructure elite, coming to MENA for the first time in 2019

29-30 January 2019, Dubai, UAE

Keynote speakers include

- Hatem Bamatraf
  CTO
  Etisalat International
- Kamil Hilali
  CSO
  Zain Group
- Dimitris Lioulias
  VP
  Saudi Telecom Company
- Rehan Hassan
  Board Member
  Enfrashare
- Ted Manvitz
  EVP & CSO
  IHS Towers
- Kash Pandya
  CEO
  Helios Towers
- Keith Boyd
  SVP & CCO, Africa
  American Tower
- Suresh Sidhu
  CEO
  edotco Group
- Charles Green
  CEO
  IDIA

To discuss your participation, contact Annabelle on +44 7423 512588 or email amayhew@towerxchange.com
Speakers, roundtable hosts and panellists

Keynotes
- **Hatem Bamatraf**, Chief Technology Officer, Etisalat International
- **Keith Boyd**, SVP & CCO, Africa, American Tower
- **Charles (Chuck) Green**, CEO, International Digital Infrastructure Alliance
- **Rehan Hassan**, Board Member, Enfrashare
- **Kamil Hilali**, Chief Strategy Officer, Zain Group
- **Dimitris Lioulias**, Vice President, Corporate Strategy, Saudi Telecom Company
- **Ted Manvitz**, EVP & Chief Strategy Officer, IHS Towers
- **Kash Pandya**, CEO, Helios Towers
- **Suresh Sidhu**, CEO, edotco Group
- **Kevin Smithen**, Managing Director, Digital Colony
- **Hussein Abdulkhader**, COO, Asia Consulting Group
- **Wiktor Barcicki**, Technology Economics, Etisalat International
- **Malek Bouteraa**, CEO, Infrashare
- **Syed Buland Iqbal**, Deployment Expert, Jazz Pakistan
- **Abu Chowdhury**, CFO, ASMA Capital
- **Eric Crabtree**, Chief Investment Officer, IFC
- **Spencer Crawford White**, CTO, Delmec
- **Bachir Estephan**, NOC Director & Head of Innovation Centre, IHS Towers
- **Sam Evans**, Partner, Delta Partners
- **Akshay Grover**, Chief Investment Officer, ISON Towers
- **Enda Hardiman**, Founder & Managing Partner, Hardiman Telecommunications
- **Steve Howden**, SVP, Group Head M&A, IHS Towers
- **Stuart Kelly**, VP, Market Development, Bladon Micro Turbine
- **Zardasht Khalid**, Site Management Director, Korek Telecom
- **Ali Khan**, Senior Expert, M&A, Omantel
- **Gayan Koralage**, Director of Strategy & Commercial, edotco Group
- **Alex Leigh**, Chief Commercial Officer, Helios Towers
- **James Maclaurin**, Non-Executive Director, Dialog Axiata & Founder, edotco
- **Ioannis Mavridis**, Senior Vice President, TAP Advisors
- **Rob Middlehurst**, Vice President, Regulatory Affairs, Etisalat International
- **Nihat Narin**, CEO, Global Tower
- **Marc Perusat**, Managing Partner, TASC Towers
- **Gordon Porter**, VP, Operations, IHS Towers
- **Gulfruz Qayyum**, Managing Director, TMT, Citi
- **Chawki Sahine**, Director General, Télédiffusion D’Algérie (TDA)
- **Rabin Sen**, Consultant in Tower Transition and Optimisation (Former Director at edotco and American Tower)
- **Kamal Shehadi**, Chief Legal & Chief Regulatory Officer, Etisalat International
- **Moustafa Sobh**, Regional Expert, Egypt
- **Rustem Umerov**, Managing Director, ASTEM
- **Senior Representative**, Vinson & Elkins

Interested in joining the speaking faculty? Contact Laura Graves, Managing Director, EMEA: lgraves@towerxchange.com
# TowerXchange Meetup MENA – provisional agenda

## 29-30 January 2019

### Day One | 29th January 2019

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<th>Time</th>
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<td>08:00</td>
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| 09:00 | The MENA tower landscape and emergence of an infraco industry                            | **Kieron Osmotherly**, Founder & CEO, TowerXchange  
**Frances Rose**, Head of EMEA, TowerXchange                                                                                                                                 |
| 09:45 | **Keynote** | Rethinking the shape, ownership and management of communications infrastructure in a digital economy | **Moderator:** **Rehan Hassan**, Board Member, Enfrashare  
**Hatem Bamatraf**, Chief Technology Officer, Etisalat International  
**Kamil Hilali**, Chief Strategy Officer, Zain Group  
**Dimitris Lioulias**, Vice President, Corporate Strategy, Saudi Telecom Company                                                                                                                                 |
| 10:30 | Networking refreshment break                                                              |                                                                                                                                        |
| 11:00 | **Keynote** | Creating a supportive environment to foster infrastructure sharing and develop a robust tower industry | **Charles (Chuck) Green**, CEO, International Digital Infrastructure Alliance                                                                                                                                 |
| 11:20 | **Keynote** | The role for independent towercos in driving network efficiencies | **Moderator:** **Gulfraz Qayyum**, Managing Director, TMT, Citi  
**Ted Manvitz**, EVP & Chief Strategy Officer, IHS Towers  
**Suresh Sidhu**, CEO, edotco Group  
**Kash Pandya**, CEO, Helios Towers                                                                                                                                 |
| 12:20 | Networking lunch                                                                           |                                                                                                                                        |
| 13:50 | Roundtable session I and buyer briefings                                                  |                                                                                                                                        |
| 14:50 | Networking refreshment break                                                              |                                                                                                                                        |
| 15:20 | **Panel** | MNO owned towers, MNO captive towercos, independent towercos and other models – the pros and cons for the telecommunications sector | **Nihat Narin**, CEO, Global Tower  
**James Maclaurin**, Non-Executive Director, Dialog Axiata & Founder, edotco  
**Marc Perusat**, Managing Partner, TASC Towers                                                                                                                                 |
| 16:00 | **Panel** | The investibility and investment case for towercos and infracos in MENA | **Moderator:** **Ioannis Mavridis**, Senior Vice President, TAP Advisors  
**Abu Chowdhury**, CFO, ASMA Capital  
**Eric Crabtree**, Chief Investment Officer, IFC  
**Rustem Umerov**, Managing Director, ASTEM                                                                                                                                 |
| 16:45 | Chair’s closing remarks                                                                   |                                                                                                                                        |
| 17:00 | Networking drinks in the exhibition hall                                                  |                                                                                                                                        |
| 19:30 | Networking dinner (separately bookable)                                                   |                                                                                                                                        |
TowerXchange Meetup MENA – provisional agenda
29-30 January 2019

Day One | 30th January 2019

08:30 Welcome coffee

09:00 Panel | Infrastructure for smart cities and 5G: Business models, partnerships and technologies to deliver efficiencies
- **Moderator:** Sam Evans, Partner, Delta Partners
- **Kevin Smithen**, Managing Director, Digital Colony
- **Gayan Koralage**, Director of Strategy & Commercial, edotco Group
- **Wiktor Barcicki**, Technology Economics, Etisalat International

09:45 Panel | Connecting the unconnected: Network restoration, rural coverage expansion and temporary coverage
- **Zardasht Khalid**, Site Management Director, Korek Telecom
- **Hussein Abdulkhader**, COO, Asia Consulting Group
- **Senior Representative**, ieng Group

10:30 Networking refreshment break

11:00 Roundtable session IV

12:00 Networking lunch

13:30 Roundtable session III

14:30 Networking refreshment break

15:00 Improving the efficiency of cell site operations
- **Moderator:** Spencer Crawford White, CTO, Delmec
- **Gordon Porter**, VP, Operations, IHS Towers
- **Wiktor Barcicki**, Technology Economics, Etisalat International
- **Alex Leigh**, Chief Commercial Officer, Helios Towers
Provisional roundtable topics

Hour long interactive sessions hosted by an expert moderator. Each table will involve approximately 20 participants and will be held under Chatham House rule to facilitate open exchange. Provisional topics include:

**Geographical focus**
- Saudi Arabia
- Egypt
- Iraq
- Pakistan
- Turkey
- North Africa
- GCC (excluding Saudi Arabia)
- Current and former conflict markets: where and when will the growth be?

**Towerco and infraco business models and considerations**
- Global regulatory frameworks and the tower industry: the good, the bad and the ugly
- Evolution and comparison of towerco business models globally
- The highs and lows of the global tower industry: what has been learned?
- Active sharing: its forecast role and how to provision for it
- Avoiding and handling MNO and towerco frictions and cultivating a productive partnership
- Towers as an investment opportunity: value drivers, threats and the longterm outlook
- The evolution to a converged infraco model
- MNO owned, joint venture and independent towercos: the relative merits
- How to scale a towerco

**5G, smart cities and tomorrow’s networks**
- The 5G outlook in MENA: timelines and applications
- Beyond towers: sharing a broader range of infrastructure in the 5G era
- Infracos and infrastructure sharing models for smart cities
- Indoor coverage in a 5G era
- Rethinking the design of towers for infrastructure sharing and 5G applications
- Who should be the infrastructure owners for tomorrow’s networks?
- Adapting MLAs and MSAs for heterogeneous networks

**Improving efficiencies in network rollout and operations**
- Accelerating network rollout: Practical learnings and supportive environments
- Reducing site opex: what are the easy wins?
- The role for ESCOs in MENA
- How to make site visits more efficient
- Achieving value through decommissioning
- Specifying and establishing a robust RMS and ERP system
- Tighter asset management to deliver better margins
- Delivering rural coverage and expanding the network edge cost effectively
- Intelligent site designs and upgrades: avoiding false economies
- Optimising energy efficiency at high temperatures
- Maximising the value of your energy assets
- Accelerating co-location: processes and practices
GRIDSERVE®

GRIDSERVE Sustainable Energy Limited (“GRIDSERVE”) is a rapidly expanding energy services company which develops, builds, owns and operates sustainable energy solutions for critical power infrastructure. We are seasoned sustainable energy professionals with roots that started with some of the world’s first commercial deployments of solar energy and energy storage solutions over 40-years ago. This rich history of product design, manufacturing, and solution provision has uniquely positioned GRIDSERVE at the forefront of today’s hybrid energy marketplace. More recently GRIDSERVE’s strong pedigree in solar and energy storage, has been responsible for the development, construction, and operation of more than a gigawatt of solar energy and energy storage solutions, including connecting over 100 utility-scale sustainable energy projects to the UK grid in the last five years alone.

GRIDSERVE has combined best-in-class modular technologies and services to focus on delivering turn-key dependable, low cost, clean energy for critical power infrastructure applications. GRIDSERVE’s 12kW DC Solar Energy Centre (SEC12) integrates the world’s highest performance and most optimised components to provide maximum efficiency DC hybrid power systems that have been designed specifically for direct current telecom BTS applications. GRIDSERVE’s SEC12 is configured as a ‘plug and play’ hybrid power solution that integrates the very latest advances in bifacial solar power, intelligent energy storage, and ultra-high efficiency DC generators, into single systems complete with climate controls, and fully controllable, secure, advanced remote monitoring features. GRIDSERVE is accredited to the international quality and environmental standards ISO9001 and ISO14001.

www.gridserve.com

Bladon

Bladon is a pioneer in the design, development and manufacture of Micro Turbine Gensets (MTGs) - using high-speed, ultra-reliable, low noise and clean-burning microturbines together with patented air-bearing and heat exchanger technologies that will transform distributed power generation.

Bladon is the world’s first manufacturer of microturbine gensets for the telecom market. Providing 12kW of power the Bladon MTG has upto 8,000 hour service intervals, fuel flexibility to use diesel, kerosene or mixture, secure packaging and reduced environmental impact. The Bladon MTG is the world’s only EURO V emission standard compliant 12kW diesel genset and uses no engine oils or liquid coolants thanks to its one moving part and air bearings technologies.

www.bladonmt.com
Delmec

Delmec has been a primary component in the telecommunication industry, not only within the infrastructure area but also providing state of the art telecom solutions for Ireland, UK, Africa, Europe, America and the Middle East for over 30 years. With the company’s headquarters based in Ireland, Delmec provide structural and network solutions, infrastructure builds, steelwork, renewable energy and fibre network builds. Our expertise has led us to become a renowned provider of engineering services to the telecom and utility sectors, specialising in full turnkey solutions from design concept to live on air.

Delmec’s reputation can be witnessed in over 40 countries where key services have been provided to a wide range of clients whom many have continually sought the expert knowledge of Delmec for their telecom’s needs. Delmec strive to provide services ensuring the client is given the best customer service, maintaining a high efficiency and always to a quality that is highly regarded in the telecom industry with many of our clients stating that Delmec are; The best in the world at what we do.

www.delmec.ie

IPT PowerTech

IPT PowerTech Group delivers specialized solutions to the power, industrial and telecom sectors in Africa, Middle East and South-East Asia. Combining power expertise with telecom infrastructure specialization, we are market leaders in providing energy solutions, telecom services, and managed maintenance services. The group is recognized as the global Leader of the Guaranteed Savings and T-ESCO models. Our self-manufactured enclosures allow us to create customized energy efficient/hybrid and renewable energy solutions, and to implement new concepts in site renovation.

With offices in 11 countries, our solutions are delivered to more than 60 operators, tower companies and vendors in more than 50 countries.

www.iptpowertech.com

Vinson & Elkins RLLP

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

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

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

www.velaw.com

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
2019 exhibitors

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

Exhibitor:

Byrne Equipment Rental

Byrne Equipment Rental is the largest plant and equipment rental company in the Middle East and after listening to the market on the challenges of CAPEX demands in acquiring generators, batteries & rectifiers has developed a managed power solution for the market, which is underpinned with fuel delivery all in a flat monthly fee, with a single point of communication and billing.

The Hybrid product on the initial launch will provide the telco market with the first true deliverable managed power solution and will support 10Kw, 24Kw & 48kw load demand which is purposely designed to support the Tele-communication tower market.

https://byrnerental.com

Exhibitor:

EnerSys

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

www.enersys.com/GlobalLanding.aspx

Exhibitor:

Flexenclosure

Flexenclosure provides sustainable Internet infrastructure – designing and manufacturing intelligent power management systems and prefabricated data centres for the ICT industry.

eSite x10 is the world’s first power system purpose-built for outdoor telecom sites and to outdoor telecom standards. It is a patented, sealed, tamper-proof unit with passive convection cooling, no filters, no moving parts and it requires no maintenance. eSite x10 is the future of telecom site power.

Flexenclosure is based in Sweden and has additional offices offices and staff in Canada, India, Ireland, Malaysia, Mexico, Myanmar, Nigeria, South Africa, Sweden, the UAE and the UK.

www.flexenclosure.com

Exhibitor:

Infozech

Infozech is IOT based cost optimization and revenue management solution provider for telecom
2019 exhibitors

Infozech’s iTower Product Suite helps tower companies with Asset, Billing (Infrastructure & Energy), Site uptime and Energy Management with Analytics powered approach. Infozech’s Analytics Product Suite enable consumers with meaningful insights for smarter decisions. We believe that “Data is itself a cost till it is associated to analytics to get actionable insights”.

Infozech manages over 100,000 tower sites, tracking over 42 Million litres of fuel per year, reconciling bills worth USD 23 Million, reconciling 700,000 Assets for customers across multiple geographies.

www.infozech.com

Exhibitor:

nexsysone

NEXSYS-ONE is a true telecom industrial software platform with over 18 year’s experience deploying and maintaining mobile network infrastructure. We serve Tier-one operators, Tower companies and System integrators with innovative software solutions to improve efficiencies and performance whilst eliminating unwanted costs due to operational process failures or visibility. We take pride in our software that its built around our experience of building & operating over 350 networks since 2001. We capture network requirements around quality assurance, project management, tower sharing, IFRS compliant lease management, work force management, procurement & supply chain processing, warehouse & asset management, health & safety, access & RMS supply, Fiber/TRS/RF tracking and risk management.

www.nexsysone.com

Exhibitor:

NorthStar Battery

NorthStar is a global leader in designing, manufacturing and deploying a wide range of batteries and energy storage solutions. Our mission is to deliver reliable and sustainable power to the world.

Using advanced technology, our products have been built to ensure longer battery life, lower operating costs and reduced environmental impact. We maintain a global presence with major operations in Sweden, USA, China and the Middle East and distribution and service centers in Latin America, Europe, Africa and APAC.

Visit our booth for more information about our new innovative products including NorthStar ACE® - Wireless Battery Management!

www.northstarbattery.com

Exhibitor:

Shandong Zhaowei Steel Tower Company Ltd.

Shandong Zhaowei Steel Tower Company is a leading steel tower manufacturer from China, integrating design, R&D, fabrication, exportation, installation and after-sales service providing.

Since 2006, we have exported towers to many countries and won good reputation from the clients worldwide, and accumulated rich experience in the past more than 10 years overseas business development. now, we are audited steel tower supplier for China steel tower company, Huawei, ZTE and Ericsson. and we have established after-sales office in Manila, Yangon, Dhaka. and we are building our fabrication plant in Ethiopia, and in the middle of 2018, it will be ready for fabrication. hope to be your partner in the steel tower supplier.

www.chinatowers.com

Exhibitor:

NorthStar Battery

NorthStar is a global leader in designing, manufacturing and deploying a wide range of batteries and energy storage solutions. Our mission is to deliver reliable and sustainable power to the world.

Using advanced technology, our products have been built to ensure longer battery life, lower operating costs and reduced environmental impact. We maintain a global presence with major operations in Sweden, USA, China and the Middle East and distribution and service centers in Latin America, Europe, Africa and APAC.

Visit our booth for more information about our new innovative products including NorthStar ACE® - Wireless Battery Management!

www.northstarbattery.com

Exhibitor:
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.telecoms.net

ieng Group

i engineering Group provides end-to-end engineering infrastructure solutions to the telecommunications and power industries across Africa, the Middle East and Southeast Asia. Employing a dynamic team and personal approach, we’ve grown rapidly since our inception in 2007 and are now operational in eighteen countries: Afghanistan, Algeria, Cameroon, Chad, Congo, DR Congo, Ethiopia, Ghana, Guinea, Kenya, KSA, Lebanon, Liberia, Myanmar, Nigeria, Pakistan, Uganda and Zambia. We do managed services (active & passive) on one hand; procurement, site build and commissioning on the other; as well as fiber optic. We manage today over 11,500 sites for Africa’s largest MNOs and all 4 towercos.

www.ieng-group.com

Meetup MENA 2019
29-30 January, Dubai

Meetup Europe 2019
9-10 April, London

Meetup Americas 2019
9-10 July, Boca Raton

Meetup China 2019
August, Beijing

Meetup Africa 2019
8-9 October, Johannesburg

Meetup Asia 2018
3-4 December, Singapore

www.towerxchange.com

Meetup MENA 2019
29-30 January 2019, Dubai, UAE

The 20th retreat for the telecoms infrastructure elite, coming to MENA for the first time in 2019

www.towerxchange.com/meetups/meetup-mena
How can I join?

Early booking is strongly recommended

All previous Meetups have **SOLD OUT**

Register today to guarantee your involvement

- amayhew@towerxchange.com
- +44 (0) 7423 512588

**Discounted passes and group bookings available for towercos**
Discounted passes and group bookings are available for representatives from tower companies. Register online or contact Annabelle Mayhew on amayhew@towerxchange.com for further details.

**Complimentary and VIP passes for MNOs, regulators and government officials**
Whether responsible for M&A, strategy, network operations, procurement and supply chain, energy, security, etc., a limited number of passes for the 2019 Meetup MENA exist for government officials, regulatory representatives or MNO executives. Register online or contact Annabelle Mayhew on amayhew@towerxchange.com

**Vendor participation limited**
In order to maintain the ratio of buyers to sellers, vendors (excluding MSPs) are limited to two full access and two expo only access passes and attending representatives must be director level or higher.

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**TowerXchange Meetup Dinner**
**Tuesday 29 January 2019**
**Fee £100**

Join us on the evening of Tuesday 29 January 2019 for an exclusive networking dinner and make the most of your Meetup experience!

TowerXchange networking dinners are the perfect occasion to discuss business opportunities and share industry insights in an informal yet elegant setting. A fee is required to cover food and beverages for the evening, please select the dinner option when registering online. Prior registration is essential: please note the dinner will sell out and we are unable to take registrations on the day.
MENA’s largest gathering of tower owners in one room: How can you make the most of the opportunity?

The TowerXchange Meetup MENA 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 and prospects 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. Over 150 companies have taken advantage of the opportunities on offer in the past five years!

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 MENA 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
email: amayhew@towerxchange.com
phone: +44 (0) 7423 512588
# TowerXchange Meetup MENA 2019

Le Meridien Hotel & Conference Centre, Dubai

## Benefits

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Delegate pass</th>
<th>Exhibitor</th>
<th>Bronze Sponsor</th>
<th>Silver Sponsor</th>
<th>Gold Sponsor</th>
<th>Platinum Sponsor</th>
<th>Diamond Sponsor</th>
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<tr>
<td>Access to TowerXchange Meetup</td>
<td>1 pass</td>
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## Bronze, Silver, Gold and Platinum Sponsorship Benefit Options - Bespoke packages can be created on request

**Bronze Sponsorship**
- Stationary sponsor (provided by client)
- Gift drop (provided by client)
- Drinks coaster sponsor (provided by client)
- Business card wallet (provided by client)

**Silver Sponsorship**
- Totes Bags (provided by client)
- Sponsorship of coffee break day two pm
- Sponsorship of coffee break day two am
- Sponsorship of coffee break day one am
- Sponsorship of coffee break day one pm

**Gold Sponsorship**
- Sponsorship of breakfast (Open) day one

**Platinum Sponsor**
- Sponsorship of breakfast (Open) day two
- USB sponsor (provided by client) - **SOLD**
- Lanyards (provided by client)
- Sponsorship of Lunch Day one
- Sponsorship of Lunch Day two
- Sponsorship of icebreaker drinks
- Champagne Roundtable session sponsor
- Targeted gift drop to selected delegates

**Diamond Sponsor**
- Sponsorship of Drinks Reception
- Sponsorship of Networking Dinner

## Industry breakdown of a comparable tower industry Meetup

- **MNO**
  - 19%
- **Towerco**
  - 18%
- **Investor**
  - 14%
- **Managed services and tower builder**
  - 14%
- **Energy equipment and services**
  - 14%
- **Advisory firm: investment, strategy, legal**
  - 7%
- **Small cells & DAS**
  - 7%
- **Other**
  - 6%

*Discounted rate available to Towercos, Government and Regulator representatives, 100% discount for qualifying Director - C-level execs from Operators*

There is limited availability for roundtable hosts, panel moderators and inclusion on the Technology evaluation working groups please contact amayhew@towerxchange.com to learn more.
TowerXchange’s who’s who in MENA towers

TowerXchange presents an A to Z of MNOs, towercos, investors and advisors who are key stakeholders in the MENA tower industry

Whilst 99% of towers in the MENA region sit in the hands of the MNOs, efforts around infrastructure sharing are continuing to build, towercos and tower joint ventures are being formed and tower sales have begun. At such a pivotal time, TowerXchange examines the key stakeholders currently active in, or with a potential appetite to join, the MENA tower industry.


**Abraaj Investment Fund:** UAE investment fund in the process of acquiring a stake in Tunisie Telecom from Emirates International Telecommunications. The stake sale may precipitate the divestment of towers from Tunisie Telecom.

**Abu Dhabi Investment Authority:** Investment fund which had formed a consortium with KKR, Canada Pension Plan Investment Board and GIC Singapore to buy a stake in a merged Bharti Infratel and Indus Towers deal, valued at ~US$11bn (the deal since having fallen through). Could have an interest in putting capital at work in Middle Eastern towers. Currently has a preference for tower investments outside of the MENA region but that could change.

**Acwa Group:** Saudi conglomerate with an interest in towers. Joined forces with TASC Towers in their bid to acquire Zain’s Saudi Arabian sites.

**Africinvest:** Tunisian headquartered private equity firm focussed on the African continent and rumoured to have an appetite for towers in the North African region.

**Al Rahji Group:** Saudi based investor which was linked with 2016 Mobily tower sale process (which was subsequently cancelled).

**Al Zamil Group:** Middle Eastern investor who was linked with previous tower sale processes in Saudi Arabia.

**Aktivco:** ECSO owned by Camusat who owns 34% of Oman Towers Company – the first towerco in Oman.

**Read this article to learn:**
- Details of MENA's major MNOs and their regional footprints
- Independent towercos with a footprint in the region
- Towercos and investors with a potential appetite for MENA tower portfolios
- TMT advisory firms with experience of tower transactions
**Alkan:** MEA tower manufacturer and system integrator which holds one of the four infraco licenses in Egypt to build and own towers in the country. The company is yet to retain any of the towers that it has built.

**American Tower:** The world's largest independent commercial towerco with a global tower count approaching 150,000. Whilst American Tower do not currently have a presence in the MENA region, the towerco is highly acquisitive with a truly international footprint spanning the Americas, Europe, Africa and Asia. As a US listed company, their ability to enter some Middle Eastern markets may be challenging but where there is an interesting tower transaction of scale, American Tower is never very far away.

**Asia Consultancy Group:** Afghan managed service provider. Also owns ~100 Afghan towers available for co-location and RANsharing services.

**Asiacell:** Ooredoo’s opco in Iraq.

**ASMA Capital:** Bahrain headquartered Infrastructure fund managers with a known interest in the tower asset class

**AWAL Telecom:** Pakistani towerco with an undisclosed tower count.

**Batelco:** Bahrain headquartered telecommunications company with mobile network operations in Bahrain and Jordan (where it operates under the Umniah brand) and a minority investments Yemeni operator, Sabafon. Batelco had previously explored the sale of its tower portfolios in Bahrain and Jordan to fund acquisitions. When the acquisitions fell through, so did Batelco’s appetite to sell towers.

**Berkshire Partners:** Berkshire backed Crown Castle during their successful foray into European towers in the late nineties, and currently has active investments in Protelindo (the largest towerco in Indonesia which had a small footprint in the Netherlands until their Dutch towers were sold to Cellnex in 2016), Torres Unidas (active in the Andean region of CALA) and Tower Development Corporation (active in the US and Puerto Rico). The investor may look at emerging opportunities in MENA.

**Blackstone:** Another serial towerco investor currently working with Phoenix Tower International in CALA. Should a sizeable towerco emerge in MENA, Blackstone may well assess the opportunity.

**Brookfield Asset Management:** Investor with an active interest in towers which owns a stake in French towerco TDF. Brookfield entered into discussions to acquire UK based Arqiva and also recently evaluated the Indian towerco, Reliance Communications. Brookfield has an appetite for further tower investments and has increasingly been looking at MENA.

**BuyIn:** 50/50 procurement joint venture between Deutsche Telekom and Orange, a key client for companies looking to sell into Orange’s MENA opcos.
Canada Pension Plan Investment Board: CPPIB is the professional investment management organisation that invests the funds of the Canada Pension Plan on behalf of its 20mn contributors and beneficiaries. CPP’s tower investments include a 10.3% stake in Bharti Infratel with KKR, bought at US$951.6mn. It was also part of a consortium led by KKR which was in talks to buy a significant stake in a combined Bharti Infratel and Indus Towers deal.

Capital Group: Investor keen on the towerco asset class with capital at work in Eaton Towers (who had expressed an interest in Egypt).

Citi: One of the world’s leading tower transaction advisory groups who have been involved in tower process in Saudi Arabia and Kuwait.

Communication Towers Company: Towerco subsidiary established by Saudi Telecom Company in Q1 2018 to take over responsibility for owning, constructing, operating, leasing and commercialising telecom towers for the operator. As of 1 December 2018, the entity is yet to commence commercial operations but activity is expected by early 2019.

Dawood Hercules Corporation (DH Corp): Listed Pakistani investment conglomerate with a US$600mn market cap. Took a 45% stake in edotco Pakistan prior to the (now cancelled) deal to acquire 13,000 towers from Jazz.

Digital Colony/ Digital Bridge: An investment vehicle through which stakes are invested in towercos around the world. Has active investments in Mexico Tower Partners, Andean Tower Partners and Vertical Bridge and also sold Global Tower Partners (GTP) to American Tower in 2013 for $4.8bn. More recently, Digital Colony acquired Finnish towerco, Digita and invested in UK indoor mobile connectivity providers, Stratto and Opencell. Digital Bridge had expressed an interest in the deal activity in Saudi Arabia.

Djezzy (Optimum Telecom Algerie/ OTA): Algerian MNO in which Russian owned VEON (formerly VimpelCom) has a 49% stake (with the remainder held by the Algerian government). VEON has sold their WIND towers in Italy to Cellnex and initiated (and since cancelled) tower sale processes in Russia, Pakistan and the CIS. The company had conducted an initial investigation of a potential tower sale in Algeria, but with limits on foreign investment in the country, there was insufficient interest from towercos. Should a willing buyer appear, Djezzy may well move forward with plans.

dU: The UAE’s number two MNO in which the government also has a stake.

Eaton Towers: Africa’s fourth largest towerco, with a portfolio of 5,300 sites across Burkina Faso, Ghana, Kenya, Niger and Uganda. In 2016, the towerco reached a deal with MobiNil (now Orange) to acquire 2,000 Egyptian towers (about one third of the operator’s total stock in the country) before the deal was cancelled. Eaton remain committed to the Egyptian market with CEO Terry Rhodes telling TowerXchange “Eaton Towers still regards Egypt as a market ready for independent tower companies. The imminent rollout of 4G, together with economic and political changes which have made US dollars very scarce mean the operators will be under financial and operational pressure to expand their

Figure two: Eaton Towers’ global footprint

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uganda</td>
<td>1,300</td>
</tr>
<tr>
<td>Ghana</td>
<td>1,200</td>
</tr>
<tr>
<td>Kenya</td>
<td>1,200</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>700</td>
</tr>
<tr>
<td>Niger</td>
<td>600</td>
</tr>
<tr>
<td>Undisclosed country</td>
<td>300</td>
</tr>
</tbody>
</table>
networks. It would be enormously beneficial for this expansion into infrastructure”. The towerco has less of an appetite for the more developed Middle Eastern market, having shied away from participation in Zain’s tower sales in Kuwait and Saudi Arabia with the different dynamics not a good fit for their current portfolio and capabilities.

**edotco Group**: Pan-Asian towerco with a footprint of 28,490 towers across Malaysia, Sri Lanka, Bangladesh, Cambodia, Pakistan and Myanmar. In 2017, edotco acquired Towershare's Pakistani business for US$90mn before linking up with Dawood Hercules Corporation in a now-cancelled deal to acquire 13,000 towers from MNO Jazz. Spun out of Malaysia’s Axiata, the MNO’s shareholding in edotco has been diluted to 62.4% following private placements by INCJ, Khazanah and KWAP. edotco has previously been linked with tower transactions in the Middle East and is understood to have an appetite for geographical expansion outside of its current markets.

**EEC Group**: Egyptian towerco manufacturer holding one of the country’s four infraco licenses that enable it to function as a towerco. EEC is yet to retain any of the towers it has built on its balance sheet.

**Emirates International Telecommunications**: Dubai Holding’s primary investment vehicle in telecoms; has a stake in UAE’s du, and Tunisia’s Tunisie Telecom. EIT is attempted to sell its stake in Tunisie Telecom to Abraaj Investment Fund in 2018, but this deal fell through.
Etisalat: UAE’s leading MNO with a presence in Saudi Arabia (Mobily), Egypt (Etisalat Misr), Pakistan (Ufone) and Afghanistan in addition to a 53% stake in Maroc Telecom (which itself has a presence in 15 African markets) and a presence in further Asian markets. The operator has experience of monetising tower portfolios, selling their Nigerian portfolio to IHS back in 2014 and 2015, although the lease payment challenges which compounded their financial woes prior to their exit in 2017 are understood to have deterred the MNO from any future tower divestments. In Saudi Arabia, Mobily had explored a potential tower sale as well as a potential joint venture with number one MNO, Saudi Telecom Company although both plans appear to have been put on hold for the time being. Meanwhile in Pakistan, Etisalat’s subsidiary, Ufone has also been exploring a tower sale for a while. edotco’s entry into Pakistan (through the acquisition of the Towershare towers), coupled with IHS’ potential entry into Saudi Arabia (should their acquisition of Zain’s towers go through) will once again expose Etisalat to working with independent towercos, something which may inform its strategy going forward. In North Africa, the MNO is investigating the ESCO model as an alternative outsourcing strategy, and given the operational complexities and high opex of operating in Afghanistan, remains keen on finding an ESCO partner there too.

Fanasia: Iranian Tower builder with experience of building over 400 sites. Became the first independent tower company in Iran and currently owns 106 sites having also been heavily involved in decommissioning.

Figure five: Global Tower’s tower portfolio

<table>
<thead>
<tr>
<th>Country</th>
<th>Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey</td>
<td>8,067</td>
</tr>
<tr>
<td>Ukraine</td>
<td>1,201</td>
</tr>
<tr>
<td>Belarus</td>
<td>828</td>
</tr>
<tr>
<td>Cyprus</td>
<td>115</td>
</tr>
</tbody>
</table>

Source: Global Tower

Figure six: Helios Towers’ global footprint

<table>
<thead>
<tr>
<th>Country</th>
<th>Sites</th>
</tr>
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<tbody>
<tr>
<td>Tanzania</td>
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<td>DRC</td>
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<td>Ghana</td>
<td>888</td>
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<tr>
<td>Congo B</td>
<td>378</td>
</tr>
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</table>

Source: Helios Q3 2018 financial results
programmes working closely with municipalities. The towerco more recently formed a new towerco venture with number one and number three MNOs in the country, MCI and Rightel (see Iranian Towers).

**GIC**: Investment firm which manages Singapore’s foreign reserves through investments in over 50 countries including a stake in IHS Towers. GIC’s interest in towers was further confirmed by their bid to acquire a stake in Teléfonica’s Telxius and the firm had also been linked to tower transactions in the Middle East.

**Global Tower**: MNO Turkcell’s wholly owned infraco managing the company’s tower portfolios (totalling 10,211 sites) in Turkey, the Ukraine (via UkrTower), Belarus (BelTower) and Northern Cyprus. In 2016, Global Tower postponed their planned IPO at the eleventh hour. The company is known to have an appetite for tower portfolios outside Turkcell’s home markets, targeting Eastern Europe, the CIS and the Middle East.

**Helios Towers**: Africa’s third largest towerco with a portfolio of 6,560 towers split across Tanzania, the DRC, Ghana and Congo Brazzaville. The towerco has recently dropped the world “Africa” from its company name and has expressed an interest in markets outside of the African continent, suggesting that they may well have an interest in tower portfolios coming to market in MENA. The towerco has a strong grounding in operationally complex developing telecoms markets.

**HOI-MEA**: Egyptian managed service provider and tower manufacturer, possessing an infraco license in the country and owning a portfolio of 38 towers built for Vodafone and Etisalat. There had been speculation that HOI-MEA had been looking for a buyer of its tower portfolio.

**IHS Towers**: MEA’s largest independent towerco with a portfolio of 22,860 towers across Nigeria, Cameroon, Côte d’Ivoire, Rwanda and Zambia. The towerco has recently agreed the first tower transactions of scale in the Middle East, reaching an agreement to acquire Zain’s 1,700 Kuwaiti and 8,100 Saudi Arabian towers. The towerco is very much positioning itself to be a leader in the Middle Eastern market and one can expect IHS will have a strong interest in any future tower portfolios which come to market. Privately owned, IHS’ investors include MTN (with a 29% stake), Wendel and the IFC.

**Infrashare**: Newly established towerco focused also on the North African market. Infrashare’s management team hails from LCC Algeria with their CEO formerly serving as CTO of one of the country’s leading MNOs.

**International Finance Corporation (IFC)**: The IFC is a member of the World Bank Group, the world’s leading DFI. The IFC has invested around half a billion dollars in debt and equity in eight towercos across emerging markets and whilst some of the Middle East’s more developed markets might beyond the investor’s remit, expect the investor to have an active interest in more emerging countries.
**IQ Networks**: Iraqi carrier with the largest independent infrastructure portfolio in the country.

**Iranian Towers**: Towerco venture created between Iran’s number one and number three operators, MCI and Rightel, and towerco Fanasia. The towerco will manage all new site build for the two operators with plans to consolidate much of MCI and Rightel’s existing tower portfolios into the venture.

**ISON Towers**: Emerging market focussed towerco which recently obtained a towerco license in Bangladesh and has significant appetite for towers in MENA.

**Jazz**: Created from the merger of Warid and Mobilink (VEON) in early 2017, it is the largest MNO in Pakistan by subscribers. In late August, Jazz agreed the sale and leaseback of its 13,000+ towerco subsidiary, Deodar, to edotco, who partnered with local firm Dawood Hercules for the deal, valued at US$940mn. In October 2018, Jazz announced that the deal had been cancelled. Jazz’s portfolio was established over 20+ years of operations, featuring a balanced urban-rural mix, and mainly tracks with the population concentration of Pakistan along the Indus valley with greater concentration of sites in the Central region, followed by the South and Baluchistan and KPK and North regions. About 80% are ground-based as opposed to rooftop structures.

**KKR**: Global investment firm that manages investments across multiple asset classes including private equity, real estate, credit strategies and hedge funds. KKR acquired a 40% stake in Telefónica’s infraco, Telxius, and in June 2018 acquired a 49% stake in Altice’s French SFR TowerCo as well as being linked with other tower processes including a merged Bharti Infratel and Indus Towers deal.

**Korek Telecom**: Iraq’s fastest growing MNO with a portfolio of over 3,500 sites. The MNO has significant network deployment plans following a turbulent time in the war torn country, with an almost doubling of its total tower stock required.

**Macquarie Group**: Serial towerco investors with capital at work in Arqiva, Russian Towers, Axicom and Mexico Tower Partners demonstrating their truly global interest in the asset class. The investor does not currently have a focus on the MENA region.

**Maroc Telecom**: Morocco’s incumbent operator in which Etisalat has a 53% stake. The operator also has a strong West African presence through subsidiaries in nine African markets. The company remains conservative with regards to infrastructure sharing and has expressed little interest in divesting their towers to date (although rumours have surfaced of some early stage tower sale discussions by some of their West African opcos).

**MCI**: Iran’s largest MNO (and 15th largest operator globally) with a portfolio of 21,000 sites. Has formed a new towerco, Iranian Towers, with Iran’s number three MNO, Rightel and Iranian towerco, Fanasia.

**Mobily**: Number two MNO in Saudi Arabia, in which Etisalat have a 27% stake. Had previously commenced a process to sell their portfolio of 9,600 towers before abandoning plans to focus on the formation of a tower joint venture with number one MNO, Saudi Telecom Company. Plans for a joint venture have since been scrapped with STC forming establishing their own towerco subsidiary. Mobily is yet to confirm any plans for its own towers.

**Mobiserve**: Egyptian system integrator which holds an infraco license in Egypt. Yet to retain any towers on balance sheet.

**MTN**: Africa’s largest MNO which has monetised towers in seven of their 20 markets, forming joint venture towercos with American Tower in Ghana and Uganda, completing sale and leasebacks with IHS Towers in Cameroon, Rwanda, Zambia and forming a joint venture with the former in Nigeria (prior to restructuring its shareholding in the JV for additional shareholding in IHS group level). In the MENA region, MTN has a presence in Iran (via MTN Irancell) and Syria. MTN Irancell’s competitors MCI and Rightel have formed a new towerco, Iranian Towers, which MTN has opted to stay out of.

**Mubadala**: Abu Dhabi’s leading investment company which is active in 13 sectors and more than 30 countries around the world. Known interest in MENA towers.

**NATIC (North Africa Telecom Infrastructure Company)**: North African towerco part of the Asel Telecom group.
New Silk Route: New Silk Route is a US$1.4bn private equity firm that invests in private companies in India, Asia and the Middle East. Its investments in the telecommunications infrastructure industry include Ascend Telecom in India.

Newroz Telecom: A fast-growing MNO, ISP and fibre provider based in the Kurdistan region of Iraq.

Oman 70 Holding: Shareholder in newly formed Oman Towers Company.

Oman Towers Company: Newly formed towerco, first in Oman in which Oman 70 Holding company owns a 56%, Aktivco owns a 34% stake and the Omani government owns a 10% stake through Oman Broadband Company. Oman Towers Company plans to invest RO15mn (~US$39mn) in its first phase of activity, with plans to build 600 towers in the first five years. The towerco also has an appetite for the existing tower portfolios of the country’s two MNOs.

Omantel: Oman’s incumbent MNO, 51% owned by the government. Recently acquired a 21.9% stake in Zain in a bid to diversify its revenue sources and overcome the risks of being present in a single market. The operator owns approximately 2,900 ground based towers and 5,000 rooftop towers.

Ooredoo: Qatar headquartered operator with a presence in Algeria, Iraq, Kuwait, Oman, Palestine and Tunisia (as well as further afield in Myanmar.
and Indonesia where it has extensive experience of working with towercos). Infrastructure sharing by the MNO in MENA has been limited to date but is something that Ooredoo is keen to place additional focus on both in terms of passive and active sharing; active sharing agreements are understood to have been struck with Tunisie Telecom and Djezzy in Tunisia and Algeria respectively. Iraq represents the MNO’s most operationally challenging market where power concerns are particularly acute. Such dynamics make outsourcing to either ESCOs or a towerco particularly attractive.

Orange: Multinational MNO with a footprint in 29 countries across Europe and Africa; in MENA they have a footprint in Egypt, Jordan and Morocco (and non controlling interests in Tunisia and Iraq). The operator has monetised towers in three African markets and engaged in active sharing arrangements in Europe. In MENA, the operator had reached an agreement to divest a third of their Egyptian towers to Eaton Towers before the deal was cancelled. The operator has since issued an ESCO RFP in the country and appears to have limited interest in divesting any further tower portfolios.

Providence Equity: Communications infrastructure investment specialists with money at work in Indus Towers (India), Grupo Torresur (Brazil) and KIN (Indonesia). Providence had been linked with previous tower sale processes in Saudi Arabia although their appetite to invest in MENA appears to have cooled.

Squippo International: The former ownership team behind Viom Networks which was acquired by ATC India. Believed to have an appetite for opportunities in multiple markets.

Rightel: Iran’s third largest operator. Has joined forces with MNO MCI and towerco Fanasia to form a new towerco, Iranian Towers.

Sanabil: Saudi Arabian investor, which although wholly owned by the government’s Public Investment Fund, operates as an independent investment institution. Understood to have an interest in towers.

Saudi Telecom Company: Saudi’s leading MNO which also has a presence in Bahrain and Kuwait where it trades under the name VIVA. Saudi Telecom Company had explored the sale of its 16,400 Saudi towers before abandoning the sale to explore the formation of a joint venture with Mobily, a plan which was then put on hold. STC had commenced proceedings to form its own in house towerco, creating Communication Towers Company in Q1 2018 (although the entity is yet to commence commercial operations).

SBA Communications: Publicly listed towerco with a portfolio of over 25,000 towers across North America, South America, and Asia.
and South America. The towerco has preferred to operate a “grass and steel” model, shying away from markets where power presents a challenge to towercos. The towerco had expressed an interest in MTN's South African portfolio and may well have an appetite for major tower portfolios in the MENA region should they come to market.

**Tanzanite:** Towershare’s Pakistani business which had built a portfolio of 700 towers, mostly through acquisitions and with the majority coming from previous WiTribe assets. In June 2017, edotco agreed to purchase 100% of Tanzanite for US$90mn.

**TAP Advisors:** Boutique advisory firm with a long history of advising on tower deals.

**TASC Towers:** Towerco which had entered into exclusive negotiations to acquire Zain’s Saudi Arabian towers before the MNO abandoned talks in favour of negotiations with IHS and Towershare. TASC has developed a modest tower portfolio in Jordan.

**Telecommunications Regulatory Authority of Bahrain (TRA):** Bahrain regulator which introduced new legislation surrounding infrastructure sharing and tower rollout in the Kingdom at the start of 2018.

**Telenor:** Norway's incumbent MNO with a presence in 29 countries including Pakistan. Telenor is a keen advocate of all forms of network sharing.

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**Figure eleven: Zain’s geographical footprint and sites used**

<table>
<thead>
<tr>
<th>Country</th>
<th>Sites</th>
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<tbody>
<tr>
<td>Bahrain</td>
<td>577</td>
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<td>Lebanon*</td>
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<td>Kuwait</td>
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<td>Iraq</td>
<td>4,551</td>
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<tr>
<td>Saudi Arabia</td>
<td>9,233</td>
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</tbody>
</table>

- **Zain owned sites**
- **Tower sale agreed with IHS Towers**

Site counts obtained from Zain Q3 2018 financial results.
sharing towers (primarily with Jazz), fibre (with Zong), and has taken a lead role in exploring active infrastructure sharing. Telenor and Zong undertook Pakistan’s first RANsharing trials across around 30 sites, while the Norwegian-owned MNO has also shared IBS, both under the MORAN model where spectrum is not shared.

**Tillman Global Holdings:** Investor with a broad appetite for towerco investments anywhere from early stage opportunities to sale and leasebacks in mature markets of thousands of sites. Led by Chairman and Co-Founder of Eaton Towers and ex-CEO of Orange, Sanjiv Ahuja.

**Towershare:** Dubai headquartered towerco which built a portfolio of 700 towers in Pakistan (mostly through acquisitions, with the majority of towers coming from previous WiTribe assets). In June 2017, edotco agreed the purchase of 100% of Towershare’s Pakistani business, Tanzanite, for US$90mn. In Kuwait, Towershare joined forces with IHS Towers reaching an agreement to acquire 1600 Zain towers, with Towershare since absorbed into IHS’ operations.

**TPG Capital:** Private equity firm with a known interest in towers. Has been linked to opportunities in the MENA region.

**Ufone:** Ufone is the mobile arm of the incumbent telecoms provider in Pakistan, PTCL, and is the fourth largest operator in the country by subscribers. Ufone has been exploring the potential sale and leaseback of its towers in Pakistan for some time. The process was stalled by the de facto merger of PTCL and Ufone, and associated management changes, but Ufone could yet contribute over 6,000 further assets to the pool of commercially shared towers in the country.

**Vinson & Elkins:** Law firm with significant expertise in the tower sector. Manages the Middle East from their Dubai office.

**Vodafone:** Multi-national MNO, Vodafone is an advocate of infrastructure sharing and has entered into passive infrastructure sharing JVs in the UK (CTIL) and Ireland (NetShare), as well as active infrastructure sharing deals in Greece, Romania, Spain and again in the UK. In September 2018, Vodafone’s new CEO, Nick Read, announced his intention to assess the sale of 55,000 of Vodafone’s European towers. Apart from Vodafone India’s participation in Indus Towers in India, a sale and leaseback deal in Tanzania through subsidiary Vodacom, and a manage with license to lease deal in Ghana, Vodafone has not yet entered into deep partnerships with towercos. In MENA, Vodafone has a presence in Egypt where the company has also agreement with new mobile market entrant, Telecom Egypt, to provide transmission and infrastructure services.

**Wendel:** Family fund which is a leading investor in IHS Towers.

**Zain:** Operator which has agreed the sale of their 1,700 Kuwaiti sites and 8,100 Saudi Arabian sites to IHS Towers. The company also has operations in Iraq, Sudan, Bahrain and Jordan and could be a likely candidate to commence further tower sale proceedings, should the Kuwait and Saudi transactions prove positive.

**Zong:** Formerly knowns as CMPak, Zong is China Mobile’s Pakistan opco. It ranks third by subscribers and has around 9,100 sites, of which around 2,000 are co-locations.

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**Advance apologies:** we’re bound to have missed one or two key stakeholders in Middle Eastern and North African towers – if so we’d like to know! If you feel your company should be profiled in the TowerXchange who’s who in MENA towers, please email Laura Graves, Managing Director, EMEA, TowerXchange, at lgraves@towerxchange.com

**TowerXchange will be bringing together the who's who in MENA towers at the TowerXchange Meetup MENA, being held on 29-30 January 2019 at Le Meridien Hotel & Conference Centre, Dubai.**
MENA represents a diverse region, from developed markets in Gulf Cooperation Council (GCC) states where mobile penetration is high and data usage is growing exponentially, through to war torn regions such as Afghanistan and Iraq where significant rollout is required and operational challenges are high. Ahead of the TowerXchange Meetup MENA being held in early 2019, TowerXchange takes a deep dive into the MENA region, exploring the current appetite for passive infrastructure equipment and services in 16 countries.

**Keywords:** Access Control, Afghanistan, Algeria, Bahrain, Batteries, DAS, Egypt, Energy, Hybrid Power, IBS, Iran, Iraq, Jordan, Kuwait, Lebanon, Morocco, MENA, Middle East, North Africa, Oman, Pakistan, RMS, Site Management System, Small Cells, Qatar, Saudi Arabia, Tunisia, UAE

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**Read this article to learn:**

- Where the volume of new build will be highest across MENA
- Countries, MNOs and towercos requiring significant investment in cell site energy
- Country by country requirements for site upgrade and turnkey infrastructure services
- Where the biggest opportunities exist for small cells and DAS deployment
- Expected investment in RMS, access control and site management systems
- Who the leading MNOs and towercos are in each country
# Demand forecasts: telecom infrastructure in MENA

<table>
<thead>
<tr>
<th>Vendor opportunity matrix</th>
<th>Energy</th>
<th>RMS, ILM and access control</th>
<th>Tower manufacture</th>
<th>Turnkey infrastructure</th>
<th>Small cells, microcells, DAS and IBS*</th>
<th>Advisors</th>
<th>Towercos</th>
<th>MNOs</th>
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**Afghanistan**

With major security issues across the country, a large percentage of opex and capex is spent on security, a figure the country's operators are looking to reduce with remote monitoring and access control systems presenting viable solutions. Energy presents a major challenge across the entire country, with 99% of sites reliant on diesel generators. Solar solutions have been explored but currently the payback time on offer has not proven attractive. Delivery of fuel to sites is however problematic so hybrid solutions are being explored. Under investment means that there is a severe shortage of towers in the country and whilst Afghan Wireless (AWCC) is being the most proactive in expanding their networks, other operators remain conservative with rollout until the political situation improves.

**Algeria**

Collectively the country's MNOs plan to add 2,500 towers to the 19,000 tower market with Mobilis planning the biggest new build. The level of infrastructure sharing is low and many sites are unsuitable for additional tenants thus necessitating strengthening and upgrade projects. The MNOs in the market had trialled outsourcing managed services to smaller subcontractors in a bid to save costs but their lack of project management capabilities mean that the MNOs are reconsidering working with larger players. VEON backed Djezzy had looked into a tower sale but limits on foreign direct investment meant that appetite for the towers was limited; FDI rules are meant to be changing and should a company express an interest, one could expect the deal to return to the table. 99% of sites are on grid and with cheap fuel costs, generators are the mainstay technology for backup power.
<table>
<thead>
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<td>With 1500 sites in a country that requires just 400, new legislation has been introduced to regulate the deployment of new towers and promote infrastructure sharing. Whilst there will be little to no new build, requirements to rectify sites to better blend into the environment means there is an appetite for camouflaged towers. Major decommissioning is required in Bahrain creating opportunities for turnkey services companies. Power is not a major concern with a robust grid in place. Tower sales have previously been looked at in the country and whilst there are no active processes, Zain is in the process of selling its Kuwait and Saudi sites and so its attention may turn to its portfolio in Bahrain once the previous deals are complete.</td>
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<td><strong>Egypt</strong></td>
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<td>With over 22,000 towers, Egypt is one of the MENA's largest tower markets but with 103.2mn subscribers significant new build is still required. Since having been awarded the 4th license in the country, Telecom Egypt has been using national roaming agreements but has recently started to build their own sites with a plan to own their own infrastructure. Between 15-30% of each MNO's sites are understood to be off-grid and whilst the price of diesel is currently cheap, it is expected to rise steadily strengthening the business case for hybrid and energy efficiency solutions. Grid connections are slow and expensive and the high load on cell sites means that as many as three generators can be required. Orange are close to awarding an ESCO contract in the market, with one other MNO considering issuing an RFP. Orange had considered a tower sale but the deal was blocked by the regulator, no further tower sales are currently expected.</td>
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<td><strong>Iran</strong></td>
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<td>Operators, MCI and Rightel have joined forces with Fanasia to create a new towerco - Iranian Towers which had added 1000 new sites for the two MNOs with further site build planned. Iranian Towers plans to consolidate overlapping infrastructure between MCI and Rightel creating opportunities for turnkey service providers, whilst the requirement to replace sites with those with capacity for multiple tenants creates opportunities for tower manufacturers. Iranian Towers were known to be assessing site management systems to better manage their portfolio of sites. The towerco is also exploring energy and space saving solutions including new racks and solutions for outdoorisation</td>
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<td>Opex costs are high in Iraq with security and logistics being the biggest contributing factors meaning that tools such as remote monitoring and access control to reduce site visits are in demand. Energy costs due to lack of grid power are the next biggest contributor to opex, most sites are understood to have two diesel generators and the assessment of hybrid solutions in the country has just begun. Restoration work is still ongoing repairing energy equipment and grid connections damaged during the conflict. TowerXchange has been made aware of at least one MNO looking to issue an RFP for an ESCO solution. Considerable new build is expected with major investment now being channelled into rebuilding the country’s infrastructure and economy, one MNO has said they plan to add 3000 towers to their network and significant new build is expected by the others. Infrastructure sharing has begun but most existing structures are unsuitable for additional tenants, thus considerable strengthening work is required. In Kurdistan, in building solutions are being deployed and parallel infrastructure exists thus necessitating decommissioning. Early discussions have begun regarding outsourcing of towers with one company considering entering the market as a towerco.</td>
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<td>The telecoms sector has been hit by electricity price hikes in Jordan, negatively impacting opex. Orange has invested in a solar plant to produce the electricity it requires and other MNOs continue to look at ways to control their power costs. A tower sale had been looked at in Jordan back in 2012 and whilst there are no current processes underway, should Zain’s tower sales in Kuwait and Saudi Arabia go well, the MNO may consider offloading their Jordanian assets.</td>
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<td>Zain’s sale of its tower portfolio to IHS Towers is expected to close imminently and decommissioning is expected to play a key part of the towerco’s strategy in the market where significant parallel infrastructure exists. New build will be limited but expect tower strengthening and upgrade work as sites are prepared for additional tenants whilst IHS may look to put in place new site management systems across its portfolio as it integrates the sites into its business. 5G trials are underway in the country with small cells and DAS solutions required in order to carry out commercial rollout. Whilst the electricity grid is extensive in Kuwait, approximately 10% of sites are understood to lack grid connections and are thus reliant on diesel generators 24/7.</td>
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<td>Whilst a small market with just 2,600 towers, plans have been laid out for each operator to add 300-400 new towers starting 2019, an almost 30% increase in the country’s total tower stock. Around 10% of sites are off-grid with a further 75% of sites on poor grid (poor grid availability ranging from 6-18 hours). IPT PowerTech recently won an ESCO contract to take over management of power on Alfa’s sites. The country is small and security is not a major concern but a need to manage power creates remote monitoring requirements. There are major fibre rollout plans currently underway in the country, creating work for subcontractors.</td>
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Morocco’s 19,000 towers are all owned by the country’s three MNOs, with market leaders, Maroc Telecom having the largest portfolio of around 10,000 sites. Etisalat are becoming increasingly involved in Maroc Telecom’s operations and whilst the country has a reliable grid, energy efficiency measures will be likely priorities to improve operating margins. 4G rollout continues thus necessitating site strengthening as further equipment is added to towers.

The entrance of a third MNO in the Omani market is imminent, with the operator expected to be backed by local funds. Infrastructure sharing has been limited to date but the entrance of a new MNO coupled with 4G rollout means that tower strengthening will be on the agenda as more equipment is added to sites. MNOs are understood to be growing their tower count by around 4-5% a year, suggesting that around 100-150 sites are built per annum. Rumours are circulating that a tower sale is on the cards in Oman creating a high demand for advisors in the market.

Power remains the number one operational challenge in the market with the grid being unstable and outages reported to last eight or more hours. edotco offer power as a service across their ~800 towers in Pakistan and are focussed on reducing diesel consumption across their portfolio. Their deal to acquire the 13,000 Jazz towers fell through in September 2018 and there have been rumours that other interested parties may acquire Jazz’s portfolio of towers, meaning the need for advisors in the country remains high. After power, security presents the next largest challenge to tower owners and so remote monitoring and access control systems are of key importance. There is extensive parallel infrastructure, especially in urban areas and so expect decommissioning to feature more heavily since edotco’s entry into the country. In building coverage is in an early phase in the country, with around 100 buildings covered, growth is however forecast in the future.

Qatar has ambitions to be one of the front runners in 5G with commerical deployment forecast for 2020. Such goals will necessitate investments in small cell and DAS with the country likely to be one of the earliest mainstream adopters of the technology. As a small country with good coverage, new build in the market is expected to be extremely limited although with little to no infrastructure sharing to date, decommissioning is likely to feature more heavily. There is a major focus on street level solutions and an interest in camouflage solutions, presenting opportunities for innovative tower manufacturers and designers. Qatar remains locked in dispute with several Arab nations and diplomatic ties have been cut and transport links severed meaning that supply chains have been shaken up.
<table>
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<tr>
<th>Vendor opportunity matrix</th>
<th>Energy</th>
<th>RMS, ILM and access control</th>
<th>Tower manufacture</th>
<th>Turnkey infrastructure</th>
<th>Small cells, microcells, DAS and IBS*</th>
<th>Advisors</th>
<th>Towercos</th>
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Data usage continues to grow exponentially and a further 1000-2000 new sites are required in urban areas to meet demand. All new high rise buildings need to be built with DAS and FTTH and STC have 5G trials currently underway meaning that alternative site typologies are growing in importance. Zain has reached a deal to sell its 8,100 towers to IHS, with a contract for 1500 new sites to built included in the deal. Saudi Telecom Company has created a new towerco subsidiary, Communication Towers and is enlisting the service of advisors to finalise their strategy, a move which may include the assignment of a towerco management partner. Infrastructure sharing is becoming increasingly common meaning that strengthening will be required. In terms of power, urban towers all benefit from good grid, but rural and remote areas (approximately 25% of sites) are reliant on generators plus batteries. Batteries are reported to be performing well at high temperatures with shading and free cooling being preferred to other cooling solutions. Solar has gained little traction in the region due to the dusty conditions.

Rumours had circulated that following Abraaj’s acquisition of Emirates International Telecommunications’ stake in Tunisie Telecom, a tower sale would follow. Abraaj’s takeover has since fallen through and as such, talks of a tower sale appear to have cooled. A small country, the amount of new build required is limited but newly emerged towerco, NATIC, is in discussions regarding build to suit contracts with the country's MNOs. Should towers come to market, one can expect NATIC to have a keen interest. Infrastructure sharing is comparably prevalent in Tunisia with around one third of sites shared and a RANsharing agreement in place between Tunisie Telecom and Ooredoo.

With a large proportion of high rise buildings in dense urban areas and plans to launch commercial 5G in 2019, small cells and DAS rollout are a priority in the UAE with the country set to be one of the earliest adopters of the technology. The two player market, with Etisalat and du having a common shareholder in the form of the Emirates Investment Authority means that the country is less attractive to towerco and so no tower deals are expected any time soon. New build requirements are limited and power isn’t a major challenge and so there are fewer opportunities for tower manufacturers and energy equipment manufacturers in the UAE than other regions. With Dubai acting as the regional hub to MENA however, companies looking to form partnerships with other suppliers would be well placed to invest time in local stakeholders based in the Emirates.

* Pending closure of the Zain deal
The turbulent history of MENA tower transactions

Which deals have come and gone and which will cross the finish line?

With the closure of MENA’s first major tower transaction looking imminent with Zain Group’s sale of 1,700 Kuwaiti towers to IHS Towers on track to be finalised by early 2019, TowerXchange look back on the tower deals that have come and gone in MENA, exploring factors that have contributed to the decisions and examining what the future holds for tower transactions in the region.

Keywords: AWAL Telecom, Abraaj, Africa & ME, Algeria, Bahrain, Build-to-Suit, Carve Out, Citi, Communication Towers, Country Risk, DH Corp, Deal Finance, Deal Structure, Deodar, Djezzy, Eaton, Eaton Towers, edotco, Egypt, Etisalat, Fansasia, HOI MEA, IHS, IHS Towers, Infrastructure Sharing, Investors, Iran, Iran, Iranian Towers, Jazz, Jordan, Kuwait, MCI, MENA, MNOs, Middle East, MobiNil, Mobily, Ooredoo, Operator-Led JV, Orange, Pakistan, Rightel, Sale & Leaseback, Saudi Arabia, Saudi Telecom Company, TASC, TASC Towers, Tanzanite, Towershare, Tunisia, Tunisie Telecom, VEON, Valuation, VimpelCom, Vodafone, Zain

Read this article to learn:
- The factors that have held back tower transactions in MENA
- Tower sale processes that have been announced and cancelled and the reasons behind the decisions
- Attitudes of the region’s major operators towards working with towercos and how this may impact future strategy
- Deals that are expected to close and the knock on effect this will have in the market

Tower ownership and mobile market dynamics in MENA

The Middle East and North Africa is the region currently the least penetrated by the towercos business model, with fewer than 1% of towers currently sitting in towercos hands (versus the global average of 66% - see figure one). As such, with a handful of exceptions, MENA’s 275,104 towers sit in the hands of mobile network operators.

The vast majority of countries have three operational MNOs, many of which have some degree of state ownership, and there are a handful of operators with operations in multiple markets, namely Etisalat, Zain, Saudi Telecom Company, Ooredoo, Orange, Batelco and VEON. The scale of total tower counts owned by the operators in MENA varies dramatically, from over 35,000 towers in Saudi Arabia and Iran, to just 1,500 towers in Bahrain (figure two).

In spite of many commonalities between countries (a strong Arabic influence, a central role of government in the business sector, similar climates and environmental conditions and a prevalence of key telecom players across multiple markets) MENA is not a uniform market. At the one end of the spectrum you have GCC countries with European levels of affluence, at the other end of the spectrum you have developing countries with unstable geopolitical situations, a factor it is important to take into account when making statements about dynamics in the region. Whilst some countries have close to 100% population coverage, high
mobile broadband penetration and are positioning themselves to be front runners in 5G, others are focussed on expanding or restoring network coverage and rolling out 3G in operationally complex markets.

The size, health and wealth of different mobile markets has a significant impact on MNO motivations to divest towers and work with independent towercos, whilst similarly having an impact on the appetite of towercos to enter such countries. More detail on key dynamics at play can be read in TowerXchange’s country by country study of the MENA tower industry.

**Why haven’t we seen tower deals in MENA? What factors are at play?**

There are a number of different factors which have held back the proliferation of sale and leaseback and towercos activity across the MENA region. Here we examine ten different considerations:

1. **No overriding financial pressure to monetise tower portfolios**

When studying tower transactions globally, one of the principle drivers behind operator decisions to monetise their tower portfolios has been the pressure to reduce leverage, raise capital and
improve their balance sheets. Many (although not all) of MENA’s operators are well financed entities with healthy balance sheets and as such, have not felt pressured to monetise their passive infrastructure.

2. The “buyer not seller” culture within mobile network operators

Historically, many of MENA’s MNOs have been buyers rather than sellers, with their healthy balance sheets meaning that they have focussed much more on acquisitions than divestments. With no longstanding history of selling assets, the sale of a tower portfolio requires different thinking and a different strategy to that which an operator may be used to.

3. A focus on improving top line revenues versus reducing costs

With some of the world’s highest data usage, voice still generating strong revenues and ARPU being relatively well preserved relative to other regions, many of MENA’s MNOs have focussed more heavily on improving and growing top line revenues than reducing costs. As such, the efficiencies generated by infrastructure sharing and outsourcing to towercos have not taken centre stage on board room tables.

4. CTO-led strategies and the view that networks are a source of competitive advantage

It has been observed that MNOs in the region tend to be very much led by the CTO and only in recent years have the CFO and commercial teams become more involved in influencing the strategic direction of an operator, balancing the technical influence. Whilst in some markets, coverage might be the differentiator, in others it will be quality of service. With there often being little difference in market share between MNOs in some countries, maintaining that competitive edge through quality of service, OTT offerings or innovative packages are key focal points for companies, something they fear may be eroded by sharing or outsourcing their infrastructure.

5. Simple operating conditions

In a number of sub-Saharan and Asian countries,
towers are often located in remote areas with poor road access and no grid connection. Ensuring that such towers remain operational is highly complex with generator maintenance and refuelling as well as theft on sites representing particularly acute challenges. As such, operators in those regions have been motivated to sell towers in a bid to rid themselves of operational complexities and focus more on their core business. In more developed markets in MENA where the vast majority of towers are in urban areas and the electricity grid is reliable, such motivations do not exist. The same cannot be said however for MENA's developing markets.

6. State involvement in MNOs and the cash-cow nature of the telecoms sector

Many of MENA's MNOs in which the state has a significant stake have been generating healthy profits, thus making significant contributions to state coffers. Governments have been reluctant to cede control of such cash-cow businesses and as such, assets have not changed hands. Decision making in the public sector is often slower and more conservative than in the private sector and as such, radical changes in strategy are less likely.

7. Lack of clear regulatory frameworks for towercos and infrastructure sharing

Whilst infrastructure sharing and the towerco business model has become widespread on other continents, there has been until recently limited regional examples and benchmarks in MENA. Familiarising governments with the merits of infrastructure sharing and the towerco business model is a lengthy process and critical to the success of a tower transaction.

8. Government concerns over security

As a region with a number of political tensions and security concerns, governments in the region have voiced concerns about handing over control of towers to foreign entities, anxious about who could gain access to towers and the potential impact of that on national security.

9. Unfavourable political and economic conditions

Political turmoil, limits on foreign direct investment and currency devaluation in some countries has served to deter a number of towercos from entering such markets. Whilst MNOs in such countries may have been keen to sell, a lack of willing buyers has acted as the roadblock in tower processes getting off the ground.

10. A preference for doing business with known regional players

This one presents a bit of a catch 22. In all walks of life in the Middle East, business is generally conducted with the people you know. Whilst towercos have been operating globally since the mid 1990s, in the absence of local MENA towercos, the market has had to start slow while new entrants build relationships with MNOs and governments in the region.

Attempts at tower transactions in MENA

In spite of the aforementioned factors, several attempts have been made to do tower deals and stimulate towerco activity in MENA, with varying degrees of success:

2006: PTA establishes towerco licensing regime in Pakistan

Select towercos active

In 2006, the Pakistan Telecommunications Authority (PTA) established a licensing regime in Pakistan, setting unofficial goals to promote infrastructure sharing in the country. Several companies have been awarded towerco licenses since then although only Tanzanite Tower, edotco and AWAL Telecom ever commenced commercial towerco operations.

2010: NTRA awards towerco licenses in Egypt

HOI-MEA active

In late 2010 and early 2011, Egypt’s National Telecom Regulatory Authority issued telecommunications infrastructure licenses to four Egyptian companies, namely HOI MEA, Alkan, EEC and Mobiserve’s Mobitower. The licenses enable the companies to build, own, retain and lease space on towers in the country, effectively functioning as independent towercos.

Whilst four companies were awarded licenses, only HOI-MEA has built and retained towers, developing
a modest portfolio of 38 sites built for Etisalat and Vodafone since the license was awarded. HOI-MEA have reportedly been looking for a buyer for their tower portfolio.

**2011: Batelco explore the sale of tower portfolios in Bahrain and Jordan**  
**Process cancelled**

In December 2011, Bahrain Telecommunications Company (Batelco) announced plans to sell its tower assets in Bahrain and Jordan. With zero debt, the decision to explore a tower transaction related to the funding of future acquisitions outside of its domestic market in a bid to offset falling revenue in Bahrain’s already small mobile market. Batelco appointed Citigroup to run the process and reportedly received two binding bids for the tower portfolios, rumoured to be between US$200-300mn.

In May 2012, the operator announced that it had decided not to move forward with the sale and leaseback transactions, with Batelco’s then CEO, Sheikh Mohamed Al-Khalifa noting that the company had “the ability to raise funds at much lower rates than tower companies and thus could not justify the lease back arrangements.” Rumours suggested that the acquisitions that Batelco had earmarked fell through and as such, raising capital became less of an urgent priority.

Abandoning the tower sale process, Batelco announced that it had instead decided to pursue tower sharing opportunities with other operators in the market.

**2015: MobiNil (now Orange) agree the sale of 2,000 towers to Eaton Towers in Egypt**  
**Process cancelled**

In April of 2015, Orange (then trading as MobiNil) announced the sale of their stake in the company’s tower subsidiary, Egyptian Company for Mobile Tower Services (ECMTS) to Eaton Towers for EGP1bn (US$131.2mn). The agreement encompassed the purchase of approximately 2,000 towers (around one third of Orange’s total tower count in the country) with a 15-year leaseback contract for the operation and maintenance and also for the additional build-out of new sites. The towers purchased by Eaton were in three geographic areas: Delta, Upper Egypt and Red Sea and excluded Orange’s rooftop sites in Cairo.

Eaton subsequently entered negotiations to acquire a second tranche of Orange towers, although no deal was announced.

Following the agreement, Eaton Towers and Orange worked on the technical handover of the towers, with Eaton beginning to shadow operations from January 2016. 13 staff were recruited from Orange into Eaton’s Egyptian team whilst Karim El Azzawy (formerly of Egyptian managed service provider, Mobiserve) was appointed as the country manager.

In March 2016, the Central Bank of Egypt devalued the Egyptian Pound by almost 13% as they shifted their exchange rate policy in a bid to boost foreign reserves and increase competitiveness. As per the signed agreement between Orange and Eaton, the devaluation meant a revision to the commercial terms of the deal, with further devaluation and revisions expected.

On the 21 July, the longstop date laid out for completion of the transaction, Orange Egypt was still awaiting certain regulatory approvals relating to the change of control of ECMTS, the separate company into which they had transferred the 2,000 towers for Eaton to acquire.

With the prerequisites and conditions necessary for completion of the deal not met, the Orange Egypt board made the decision to not extend the deadline and as such terminated the agreement.

**Read more on potential towerco activity in the Egyptian market in “Major new build forecast in the Egyptian tower market”**.

**2011 & 2016: Saudi Telecom Company and Mobily discuss the formation of a towerco JV in Saudi Arabia**  
**Talks abandoned**

In 2011, Saudi Telecom Company and Mobily first entered into discussions surrounding the potential formation of a joint venture into which they would pool their existing tower portfolios in a bid to reduce passive infrastructure related capital and operating spend. The pair were understood to be considering selling off a 49% stake in the projected US$2.5bn venture but talks stalled and plans surrounding a joint venture were shelved.
The two parties once again re-opened joint venture discussions in 2016, signing an initial three month agreement to study the joint venture in the August of that year, an agreement which was subsequently extended before the pair appointed Standard Chartered as an advisor to oversee the process in 2017. Talks once again dissolved, with the two parties reportedly unable to agree on how ownership should be shared.

2016: Mobily shortlists three bidders for tower sale in Saudi Arabia

Process cancelled

In between joint venture discussions with Saudi Telecom Company, Etisalat’s Saudi Arabian opco, Mobily, formally launched a tower sale process in 2016 after having appointed TAP Advisors to run the deal. Mobily’s strategy was motivated by a need to reduce their debt burden after substantial accountancy errors in 2014 led to their annual profits being revised down from a profit of SAR219mn to a loss of SAR913mn.

The tower process attracted a high degree of interest, with names linked to the transaction including IHS Towers, Digital Bridge, TASC Towers, edotco, Providence Equity Partners and Towershare plus local investors and conglomerates including Saudi Aramco, Al Rahji Group and Al Zamil Group. The deal reached an advanced stage with technical and commercial due diligence completed and with Mobily receiving three binding bids, reportedly at terms they were happy with.

However, with Mobily having managed to refinance much of their original debt at more attractive terms, the urgency to sell towers was reduced, and as such, when Saudi Telecom Company once again approached them to open joint venture discussions, Mobily abandoned the tower sale process.

2016: Djezzy study the potential for a tower sale in Algeria

Formal process never initiated

In 2016, VimpelCom (now VEON), who own a 49% stake in Algeria’s Djezzy, commenced a strategy to monetise their tower portfolio globally, kicking off processes in Russia, Bangladesh and Pakistan (and later, the CIS). At the same time, a team was appointed at Djezzy to assess the business case for a sale of the company’s 6,500 Algerian towers.

With limits on foreign direct investment in Algeria (limiting international ownership to 49%) and talks around active infrastructure sharing between Djezzy and Ooredoo materialising at the time, the preliminary study revealed limited appetite amongst towercos to participate in a tower transaction in the country. With processes underway in Russia, Bangladesh and Pakistan, the M&A team at VimpelCom turned their attention to such more imminent transactions and no formal tower process was announced in Algeria.

2016: Zain enter into exclusive negotiations with TASC Towers and ACWA Group in Saudi Arabia

Deal cancelled

In early 2015, Zain appointed Citigroup to study the potential for a tower sale across its operations in multiple markets. Later in 2015, Zain’s then CEO, Scott Gegenheimer confirmed the company was opening a process for a sale of both their Saudi and Kuwaiti towers and in March 2016 it was announced that they were narrowing down potential bidders.

Stop-start discussions around Mobily and STC’s joint venture and Mobily’s tower sale in Saudi Arabia delayed the sale process, however in December 2016 Zain announced that it had entered into exclusive negotiations with a consortium involving TASC Towers and local conglomerate, ACWA Group for the sale and leaseback of their Saudi Arabian tower portfolio, with a reported deal value of around US$500mn.

With the acquirers unable to raise the necessary equity however in the desired time frame, the deal was subsequently cancelled.

2017: MCI, Rightel and Fanasia form Iranian Towers

Joint venture operational

In early 2017, Iran’s leading mobile network operator MCI and number three operator, Rightel joined forces with Iran’s first towerco, Fanasia to create a new towerco going by the name Iranian Towers.

Fanasia, an Iranian company with a background as a turnkey service provider to the country’s MNOs, first commenced towerco operations in the country.
in 2014. Their first project on Kish Island, conducted with the support of the Kish Free Zone Organisation, was to rationalise the number of towers on the island. With 110 sites on the Island, each with a single tenant and unsuitable for the addition of further tenants, Fanasia built 27 new sites which the operators were mandated to use, whilst existing sites were decommissioned. The municipality benefited from a revenue sharing model on top of the land rental fee and further benefited from the freeing up of land under the old towers. Following the success of the Kish Island project, Fanasia reached a similar agreement with the municipality of Mashhad, Iran’s second most populous city to develop a core network of 350 sites in March 2016.

Speaking at the time of Iranian Towers’ formation in an interview with TowerXchange, MCI’s CTO Morteza Taheribakhsh said “Iranian Towers was established to act as an exclusive towerco for both MCI and RighTel. It is expected that most new sites required by both operators will be built and operated by Iranian Towers. Furthermore, we will gradually proceed to purchase and leaseback the existing sites of MNOs. Therefore both build to suit and buy-leaseback scenarios have been considered by Iranian Towers.”

Taheribakhsh added “In Iran, as with the rest of the world, operator voice revenues and ARPU are continuing to decline whilst demand for data continues to increase. Significant capital is required to deploy 4G and 4.5G technologies which are required to support the increased data requirements. This places significant strain on mobile network operators and as such cost saving measures become increasingly important. Considering this fact, the primary motivation behind the creation of Iranian Towers is cost management. Sharing the cost of new site deployment as well as site operations will bring considerable savings to the business. Having Iranian Towers in place will enable MNOS to invest in their technological requirements without worrying about site infrastructure costs.”

The first phase of Iranian Towers’ operations was the construction of approximately 1,000 new towers, capable of hosting multiple tenants, across major cities in the country to accommodate 4G and 4.5G rollout. The second phase of Iranian Towers operations is to involve the sale and leaseback of the operators’ two tower portfolios. With MCI owning 21,000 towers and Rightel just 4,000, the exact number of towers that will be transferred to the towerco is yet to be decided.

2017: edotco Group acquire Tanzanite Tower in Pakistan  
Deal completed

In June 2017, edotco announced that it had entered into an agreement to acquire Tanzanite Tower, Towershare’s towerco business in Pakistan. The deal, encompassing 700 towers and valuing Tanzanite at an enterprise value of US$90mn enabled edotco to add a further footprint to its portfolio and add instant scale to its operations in Pakistan, and marked the first in market towerco consolidation in the extended MENASA region.

2017: Jazz agree tower sale to edotco and DH Corp in Pakistan  
Deal cancelled

In August 2017, VEON’s Pakistani subsidiary, Jazz announced that it had reached a deal for the sale of its wholly owned tower company, Deodar, to Tanzanite Tower, a towerco wholly owned by edotco and Dawood Hercules.

The transaction, for a total consideration of PKR98,700mn (US$940mn) covering Deodar’s total portfolio of approximately 13,000 towers was for an initial 12-year period with the option to renew for three consecutive periods of five years each.

Commenting on the transaction at the time, Jean-Yves Charlier, Chief Executive Officer of VEON, said: “This transaction is highly value accretive for VEON and GTH and a further execution of VEON’s asset light strategy. It also reflects the start of a long-term partnership with a strong counterparty with significant experience in tower management.” Proceeds from the deal were to be used for general corporate purposes, the funding of recently awarded spectrum and repayment of a proportion of Jazz’s outstanding debt.

In September 2018 however, Jazz announced that the tower sale had been cancelled due to a failure to get the necessary regulatory approvals to proceed. For further information on the cancelled sale process read “TowerXchange’s updated Pakistan tower market study 2018”.


2017: Zain agree the sale and leaseback of towers to IHS in Kuwait

Deal closure imminent

On 10 October 2017, Zain Kuwait announced that it had reached a deal with IHS Towers for the sale and leaseback of its tower portfolio in the country. As previously mentioned, Zain began studying the potential to sell its tower portfolios back in 2015 when they appointed Citigroup to lead the process.

Whilst Zain’s larger tower portfolio (and Mobily’s concurrent tower sale) in Saudi Arabia stole much of the limelight, Zain reportedly received 15 bids for their Kuwaiti portfolio. The operator undertook a rigorous processes to narrow this down to five shortlisted bidders before finally settling the deal with IHS Towers and Towershare for an agreed deal value of US$165mn (Towershare having since been absorbed into IHS).

The deal is expected to close imminently with the two parties in the process of agreeing final closing conditions.

For further detail on the transaction read “Kuwait: Poised for a landmark moment in the MENA tower industry”.

2018: Saudi Telecom Company establish Communication Towers in Saudi Arabia

Process ongoing

After a number of stop-start discussions with Mobily regarding the formation of a joint venture, in Q1 2018, Saudi Telecom Company revealed that it had established a dedicated towerco subsidiary called Communication Towers Co. Ltd. which would be responsible for owning, constructing, operating, leasing and commercialising telecom towers for the operator.

It is understood that STC plans to transfer the vast majority of it’s 16,400 tower portfolio into the entity which is yet to commence commercial operations, pending approvals from the relevant authorities. STC’s initial plan for the towerco was to put in place a towerco management contract for the first 2-3 years, but with the operator reluctant to cede any equity, limited interest was received from the international tower community. Some within the organisation remain hopeful of securing a towerco partner, whilst others see Communication Towers moving forward without such a management contract in place. With progress having been made regarding towerco licensing in Saudi Arabia, rumours suggest that Communication Towers could commence commercial operations as early as January 2019.

2018: Zain agree the sale and leaseback of towers to IHS in Saudi Arabia

Process ongoing

The latest news to come out of the emerging MENA region was Zain’s 28 November announcement that it had reached a deal with IHS Towers for the sale and leaseback of its 8,100 Saudi Arabian towers for US$647.7mn. The deal, for an initial term of 15 years also includes a build to suit component, provisioning for the addition of 1,500 new towers over the next six years.

The two parties entered into exclusive negotiations back in 2017, with the agreement between Zain Group and TASC Towers for the portfolio having collapsed. The deal is still subject to approvals from lenders and the relevant authorities but marks a significant step in the establishment of a Middle Eastern tower industry, given Saudi Arabia’s importance and scale in the region.

For further detail on the deal read “Saudi Arabia makes major strides in the tower industry”.

What towerco and transaction activity could we see moving forward?

The completion of a first tower transaction in the MENA region is expected to act as a catalyst for further activity, putting in place a benchmark and template for other operators and regulators to potentially follow. Whilst the specific nuances and dynamics of different markets play heavily on an operator’s tower strategy in a given country, figure four examines what we know about the tower strategies of multi-country operators with a footprint in the region, speculating as to what this means we could expect going forward.

In addition to the multi-country players, several single country operators have been rumoured to have an appetite to explore tower transactions. In Oman, Omantel (which now owns a 21.9% stake in Zain) is expected to announce a tower sale process
in early 2019 and in Tunisia, the (now cancelled) sale of the business to Abraaj Group was expected to precipitate a tower sale.

As in other regions, most towercos looking at a prospective buy and leaseback opportunity will be looking for a credit-worthy seller in an attractive market. The dollar linked economies of many countries in the region present an attractive opportunity and with the MENA region seen as virgin territory for towercos, interest is stirring from towercos in all four corners of the globe.

The importance of local partners cannot be underscored enough in MENA and so it is likely that we may see partnerships between international towercos and local companies as they aim to bring both towercos and regional expertise to a bid. In the GCC in particular, the huge wave of infrastructure development that is underway means that telecoms must compete with other infrastructure asset classes for local investment, but as companies and countries look to diversify away from their dependency on oil, telecoms infrastructure could present an attractive investment opportunity.

Whilst progress is being made on a regulatory front, particularly in Kuwait and Saudi Arabia, history shows us that decision making in the region has traditionally been slow and cautious by regulators and operators alike. There is a continuing need for education of relevant stakeholders on the merits of infrastructure sharing and the importance of independent towercos and infracos in rolling out and managing the region’s communications infrastructure more cost effectively.

In a bid to support the development of the nascent tower industry in MENA and foster improved infrastructure sharing, TowerXchange will be hosting a VIP networking event in Dubai on 29-30 January, welcoming operators, towercos, regulators, investors and other important industry stakeholders to discuss key issues and opportunities.

Participation is already confirmed from a large proportion of companies referenced in this article including Etisalat, Saudi Telecom Company, Zain, Omantel, IHS Towers, American Tower, edotco and TASC Towers. For further information, please visit www.towerxchange.com/meetup/meetup-mena/
Figure four: Tower strategies of MENA’s major operators

<table>
<thead>
<tr>
<th>Operator</th>
<th>Regional footprint</th>
<th>History of tower deals and working with towercos</th>
<th>Expected activity going forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zain</td>
<td>Kuwait, Saudi Arabia, Iraq, Jordan, Sudan &amp; Bahrain (plus management contract in Lebanon)</td>
<td>Deals agreed with IHS Towers in Saudi Arabia and Kuwait</td>
<td>High likelihood the operator will explore further deals should the Kuwait and Saudi deals prove successful</td>
</tr>
<tr>
<td>Saudi Telecom Company</td>
<td>Saudi Arabia, Kuwait &amp; Bahrain</td>
<td>In the process of establishing their own towerco subsidiary, Communication Towers, in Saudi Arabia</td>
<td>Communication Towers expected to commence commercial operations in 2019. If successful, the same towerco strategy may be rolled out to other markets</td>
</tr>
<tr>
<td>Etisalat</td>
<td>UAE, Saudi Arabia, Egypt, Pakistan &amp; Afghanistan (plus 53% stake in Maroc Telecom)</td>
<td>Tower transaction completed in Nigeria (prior to exit of the market due to opco’s insolvency); experience working with towercos in select markets</td>
<td>Keen appetite to increase infrastructure sharing with other operators in a bid to increase utilisation of their assets. Tower deals not ruled out but given experience in Nigeria will remain cautious</td>
</tr>
<tr>
<td>Orange</td>
<td>Egypt, Jordan &amp; Morocco (plus non controlling interests in Tunisia &amp; Iraq)</td>
<td>Monetised towers in three sub-Saharan African markets; agreed and then subsequently cancelled a tower deal in Egypt; extensive experience of working with towercos across Africa and Europe</td>
<td>Although has experience of doing tower deals in sub-saharan Africa, currently more focussed on other forms of infrastructure sharing including working with ESCOs and sharing with other operators. Tower deal considered unlikely</td>
</tr>
<tr>
<td>Batelco</td>
<td>Bahrain &amp; Jordan (plus minority interest in Yemen)</td>
<td>Announced and then cancelled tower sale process in Bahrain and Jordan</td>
<td>Recent restructuring of the business may make doing a tower deal hard but could potentially explore the option once again</td>
</tr>
<tr>
<td>Ooredoo</td>
<td>Algeria, Iraq, Kuwait, Oman, Palestine &amp; Tunisia</td>
<td>Tower sale completed in Indonesia plus experience of working with towercos in Myanmar</td>
<td>No serious rumours of tower deals emerged yet maintains keen focus on furthering infrastructure sharing; potential candidate for tower transaction activity</td>
</tr>
<tr>
<td>VEON</td>
<td>Algeria and Pakistan</td>
<td>Commenced a major tower monetisation strategy globally but only one deal closed to date. Reached and the cancelled a deal to sell Pakistani towers; expressed an appetite to divest Algerian towers; experience of working with towercos in Russia; successfully sold Wind towers in Italy to Cellnex in 2015</td>
<td>Pakistan deal rumoured to be back on the table; likely to have an appetite to divest their Algerian towers should a willing buyer present themselves</td>
</tr>
<tr>
<td>Vodafone</td>
<td>Egypt</td>
<td>Keen advocate of infrastructure sharing, forming tower JVs in the UK and Ireland and participating in Indus Towers in India; sold towers in Tanzania and signed MLL arrangement in Ghana; extensive experience in working with towercos across multiple markets</td>
<td>In 2018, Vodafone’s new CEO announced they were assessing the sale of their 53,000 European towers; no tower deal currently expected in Egypt but likely to have a strong appetite to share infrastructure and work with towercos in the market</td>
</tr>
</tbody>
</table>

Source: TowerXchange
Towerco activity
Towerco activity plus major tower sale rumoured
MNOs rumoured to be considering a major tower transaction
Confirmed tower sale process underway
No towerco activity or deal rumours

Figure five: MENA tower heatmap

Source: TowerXchange
Etisalat: searching for efficiency across a diverse portfolio

Etisalat International’s CTO shares insights into key MENA markets

Etisalat operate across 16 different countries, with an extensive presence in the MENA region including UAE, Saudi Arabia, Pakistan, Afghanistan and Egypt. TowerXchange spoke to Etisalat International’s Group CTO, Hatem Bamatraf, to find out more about plans for their MENA opcos, Etisalat’s current take on selling towers and network sharing and what partnerships and products they’re looking to deploy in order to boost efficiency across the region.

Keywords: 3G, 4G, 5G, Afghanistan, C-Level Perspective, Carve Out, ESCOs, Egypt, Etisalat, Etisalat Misr, Hybrid Power, Investment, MNOs, Market Overview, Middle East, Mobily, Network Rollout, Operator-Led JV, Pakistan, Renewables, Sale & Leaseback, Saudi Arabia, Smart Cities, Solar, UAE, Ufone

TowerXchange: Please introduce Etisalat's global footprint and tell us about your opcos worldwide. Can you give us a picture of how far each opco is in terms of technology rollout?

Hatem Bamatraf, CTO, Etisalat International: We operate in 16 countries across the region with approximately 145 million subscribers. Our portfolio of companies differs in terms of scale and technology. In our key markets, our networks are advanced with 4G with large population coverage as well as a very high penetration of FTTH. When it comes to new technology launches, Etisalat Group is always at the forefront, believing that technology opens up new opportunities for the business and operations.

TowerXchange: We'd love to know your thoughts on some of the key MENA markets in which you operate. Can you talk us through the growth potential in the MENA markets in which you operate?

Hatem Bamatraf, CTO, Etisalat International: In Egypt, our focus is on growing the 4G coverage while managing the needs for 3G capacity. We are happy with the progress and we will probably be adding more sites per year in the short term to penetrate new areas.

I think KSA needs more cooperation between operators in terms of technology rollout. I hope that the degree of sharing will increase, especially as 5G rollouts are approaching. What is interesting about KSA is also the future of fixed infrastructure given the

Read this article to learn:
- How the Etisalat portfolio is developing in terms of technology rollout
- An update on Etisalat’s key MENA opcos
- The main operational challenges Etisalat faces across their portfolio
- Etisalat’s current thoughts on selling towers and working with towercos
- How Etisalat is looking to work with ESCOs and why

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ambitious plans of the government to drive fibre adoption.

The situation in Afghanistan is complex mainly due to two reasons: security and fragmentation of the market. We continue to invest in our network to enable traffic growth and extend coverage into remote areas. I think that the market in Afghanistan needs transformation if it is to continue growing and securing investments.

Pakistan is a very competitive and I would say challenging market. We continue to share passive infrastructure with other operators wherever it is feasible and economic. We are also evaluating other forms of network cooperation. I don’t necessarily think of towercos as a requirement for passive sharing adoption – I see it more as a financial decision on which assets the operators wants to own and which not.

TowerXchange: You operate in a very diverse set of markets – what do you see as the main operational challenges across your portfolio, and what plans do you have to tackle any inefficiencies which may be creeping in?

Hatem Bamatraf, CTO, Etisalat International: That’s true. The markets we operate in vary a lot in terms of disposable incomes, infrastructure and local resources. In terms of operational challenges, we are trying to constantly reduce the costs of providing both data and voice services. In some markets, such as Afghanistan or parts of Pakistan security is a serious issue that adds challenges to our operations.

TowerXchange: You’ve completed one tower deal in the past, in Nigeria. What’s Etisalat’s current stance on tower transactions, how important is it for you to retain control of your assets?

Hatem Bamatraf, CTO, Etisalat International: Our stance has not changed. We look at the situation of the specific opco and the specific market it operates in. We are always in favour of increasing the utilisation of our assets to reduce the cost base. We look at this topic very carefully and evaluate all our options. We also monitor what’s going on in terms of tower deals around us.

TowerXchange: ESCOs are on the rise in the MEA region and have been producing strong results. How open is Etisalat to working with ESCOs?

Hatem Bamatraf, CTO, Etisalat International: The ESCO model is something we are currently evaluating in a couple of our markets and we are open to engaging with ESCO providers. We think that the potential and the attractiveness of such deals depends on the details of the economic model in each market. The key driver of the savings is the deployment of alternative power (solar) meaning the business case improves as fuel prices go up. We need to find ways to make sure that we, as an MNO, also benefit from that upside in the future, especially as ESCO deals are typically agreed for at least 10 years. Another important factor is currency exposure - we believe that the deal should reflect the providers underlying cost base and the non-local exposure should be limited to the capex portion.

In a bid to support the development of the nascent tower industry in MENA and foster improved infrastructure sharing, TowerXchange will be hosting a VIP networking event in Dubai on 29-30 January, welcoming operators, towercos, regulators, investors and other important industry stakeholders to discuss key issues and opportunities. Hatem Bamatraf has already confirmed his participation, as have other regional experts including Saudi Telecom Company, Zain, Omantel, IHS Towers, American Tower, edotco and TASC Towers. For further information, please visit our website at www.towerxchange.com/meetup/meetup-mena/
While the MENA market has several key factors in common, it's also a very diverse region economically, socially and technologically. TowerXchange is delighted to share our most recent research into the key markets in the region, exploring the MNO landscape, mobile market dynamics and operational challenges as well as key tower counts, tower news and activity in each country.

In this section, you can read more about the Saudi and Kuwaiti markets, where IHS Towers is poised to complete the first tower transaction of scale. We also investigate North African markets including Egypt, where new build activity is growing and Algeria and Tunisia, where political developments may catalyse the sale of tower portfolios. We present overviews of the Iranian and Iraqi markets, as well as an interview with Iraq’s Korek Telecom, who are heavily focussed on rebuilding their network across the country. Analysis of the markets in Oman, where a tower sale process is rumoured to be starting, and Bahrain, where the regulator’s new legislation will drive sweeping infrastructure changes are joined by in-depth information and interviews on the markets in Pakistan and Lebanon.

Don’t miss:
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Saudi Arabia makes major strides in the tower industry
Zain reach a deal with IHS plus progress on regulatory issues

On Wednesday 28 November 2018, Zain Saudi Arabia announced that it had accepted an offer valued at SAR 2.43bn (US$647.7mn) from IHS Towers for the sale and leaseback of its portfolio of 8,100 towers in the market. The news follows on from a previous announcement on 2 October 2017 that the two parties had entered into exclusive negotiations regarding the operator's tower portfolio. After a number of stop-start processes in Saudi Arabia, TowerXchange examines the latest developments in the context of the Saudi Arabian tower industry and the knock on effect this may have for the burgeoning MENA tower industry.

The scale of Saudi Arabia's mobile market

Saudi Arabia is the Middle East's largest economy (GDP reported as US$683.8bn at December 2017; Source: World Bank's World Development Indicators Database) and is the Middle East's largest country in terms of landmass, and third largest in terms of population (32.9mn citizens as of December 2017; Source: World Bank's World Development Indicators Database). With 43mn subscriptions, mobile penetration sitting at 132% and mobile broadband penetration at 89% (Source: CITC Q2, 2018) and some of the highest data usage per capita globally, the sheer scale of the market leads it to being considered the Middle East's most important telecoms market.

There are three mobile network operators in Saudi Arabia and two MVNOs. Saudi Telecom Company is the country's largest mobile network operator with approximately 45% market share. The operator is 70% owned by the government's Public Investment Fund, 7% by the General Organisation for Social Insurance and 6.77% owned by Saudi Arabia's Public Pension, with the remaining shareholding free floating on the stock exchange.

Mobily (Etihad Etisalat Co), in which UAE-headquartered Etisalat has a 27% stake, has the second largest market share in the Kingdom, accounting for approximately 35% of Saudi subscribers. The operator launched commercial operations in the country in May 2005.

With 8.0mn subscribers (19% market share),

Keywords: Africa & ME News, Communication Towers, Deal Structure, Etisalat, IHS, IHS Towers, Kuwait, MENA, Middle East, Mobily, Operator-Led JV, Regulation, Sale & Leaseback, Saudi Arabia, Saudi Telecom Company, TASC Towers, Tower Count, Towercos, Zain

Read this article to learn:
- Details of Zain’s tower sale to IHS Towers
- Progress on the formation of Saudi Telecom Company’s Communication Towers
- Previous tower transactions and joint venture discussions that have come and gone in Saudi Arabia
- The size and shape of Saudi Arabia’s mobile market and tower landscape
- What the future holds for towerco activity in Saudi Arabia and MENA
Zain Saudi Arabia is the country’s third largest operator having launched commercial operations in August 2008. The MNO is 37% owned by Kuwaiti-headquartered Zain Group (which also has mobile operations in Kuwait, Iraq, Jordan, Lebanon, Sudan and South Sudan and a minority stake in Moroccan operator, INWI) with 21% shareholding held by a Saudi consortium and the remaining 42% free floating on the Tadawul stock exchange.

The two MVNOs, Virgin Mobile and Lebara have just 1% market share between them.

The tower landscape

Saudi Arabia has an estimated 35,400 towers with Saudi Telecom Company having the largest portfolio (figure three). Infrastructure sharing in the Kingdom has to date been very limited, with fewer than 2% of sites believed to have more than one tenant. In the major cities, Riyadh and Jeddah there has been some infrastructure sharing as part of MNO densification plans to meet growing data usage, whilst in some of the country’s holy sites where access to land is limited, infrastructure sharing has arisen out of necessity. These infrastructure sharing arrangements are typically under bilateral commercial agreements and thus far have only covered passive equipment. With little infrastructure sharing a high degree of parallel infrastructure has developed: 95% of Zain and Mobily’s sites are reported to overlap.

Around 50% of sites are understood to be on government owned land, with 35% of sites on private land and operators owning the land on which about 10-15% of their tower portfolios sit.
MNOs have reported significant upward pressure on lease rates from municipalities and landlords, which is not only having an impact on their bottom line but is also adding to workloads as the operators look to renegotiate.

In terms of power requirements, around 90% of sites are on-grid with an extensive and reliable grid infrastructure across much of the country. What’s more, electricity prices in the Middle East are substantially lower than those in other regions, with some reports suggesting them to be one fifth the level of the global average. With increasing pressure on the economy from declining oil prices however, subsidies relating to electricity prices are gradually beginning to be withdrawn which will have an impact on site opex. Off-grid sites are generally those in more rural and remote areas although reports have emerged that some sites lack grid connections as a function of their lack of key permits. Such sites are reliant on diesel generators 24/7 with low fuel prices meaning that hybrid solutions have not been widely deployed. With the cost of diesel being low, the highest costs for off-grid sites relate to fuel delivery which can be significant for certain regions.

**A history of stop-start transactions in Saudi Arabia: 2011-2017**

As early as 2011, Saudi Telecom Company and Mobily entered into discussions surrounding the potential formation of a tower joint venture into which they would pool their existing portfolios in a bid to reduce passive infrastructure related capital...
and operating spend. The pair were understood to be considering selling off a 49% stake in the projected US$2.5bn venture but talks stalled and plans surrounding a joint venture were shelved.

In late 2014/early 2015, Zain appointed Citigroup to study the potential for a tower sale across its operations in multiple markets. Shortly after, it was reported that Mobily had issued a tender for advisory services to look at options for its tower portfolio, with TAP Advisors winning the contract.

Over the course of 2016, expressions of interest for the two operators’ tower portfolios were invited, with a May deadline being set (Zain also inviting bids for their Kuwaiti tower portfolio). Mobily's larger tower portfolio (approximately 80% bigger than that of Zain) was viewed as the more attractive of the two by bidders, although the potential to acquire two portfolios had a positive effect in pushing up the valuation of both portfolios (a towerco or investor which acquired both sets of assets would own approximately 50% of the country's total tower stock). The deals reached an advanced stage with commercial and technical due diligence completed. Names linked to the transactions included IHS Towers, Digital Bridge, TASC Towers, edotco, Providence Equity Partners and Towershare plus local investors and conglomerates including Saudi Aramco, Al Rahji Group and Al Zamil Group. Mobily received three binding bids, reportedly at terms they were happy with.

Around the same time, Saudi Telecom Company hinted that they too may consider a sale of their assets, before approaching Mobily to reopen discussions around the formation of a joint venture. Whilst one of Mobily's principal drivers to sell towers had originally been to reduce their debt burden (the operator reported substantial accountancy errors in 2014 leading to their profits for the year being revised down from SAR219mn to a loss of SAR913mn in Q1 2015), the appointment of a new management team enabled the operator to refinance its debt at a more attractive rate, thus reducing their pressure to sell.

Mobily abandoned their sale process in favour of continuing joint venture discussions with STC, in a bid to reduce costs and improve EBITDA. The two parties signed an initial three month agreement to study the joint venture in August 2016.
This move put a spanner in the works for the Zain deal. A potential joint venture between Saudi Telecom Company and Mobily could consolidate as much as 70% of the country’s tower stock and up against a strong competitor, suddenly became less attractive to potential acquirers, decreasing the potential value. In December 2016 however, Zain entered into exclusive negotiations with a consortium involving TASC Towers and local conglomerate, ACWA Group with a potential deal value being reported around US$500mn.

Joint venture discussions between Mobily and Saudi Telecom Company were extended with the operators putting out an RFP for an advisor to oversee the JV formation in early 2017. The contract was awarded to Standard Chartered but not long into the process joint venture plans were called off, with reports emerging that STC was not keen to share ownership, a stance which put Mobily off. As such, the second attempt to form a joint venture once again fell apart.

Talks between Zain and the TASC Towers - ACWA Group consortium dissolved, with the potential acquirers reportedly failing to raise the necessary equity for the deal. Advisors Citigroup remarkeeted the deal, attracting the attention of Towershare who had entered into discussions with Zain regarding their much smaller Kuwaiti tower portfolio. Towershare brought IHS into the deal with the two parties submitting bids for both Zain’s Saudi Arabian and Kuwaiti towers. On 6 August 2017 it was then announced that Zain had entered into exclusive talks with with the two parties, with the negotiations “superseding all prior arrangements”.

A first tower deal completed in the Kingdom: January 2017 STC acquires GO sites

Whilst all eyes had been on a first sale and leaseback transaction between the Kingdom’s operators and a towerco, as well as on talks of a joint venture, one tower transaction that flew beneath the radar was Saudi Telecom Company’s acquisition of the towers belonging to operator GO Telecom (Etihad Atheeab Telecom). Reports as to the number of towers acquired vary from several hundred towers up to around 1,000. Saudi Telecom Company played down the deal, telling reporters that the SAR230mn (US$61mn) purchase which was financed through internal resources, would not have any material impact on financial results or their tower portfolio. Whilst no advisors were appointed by either party to run the deal, those close to the matter observed that the towers had received a decent valuation, given the financial stress that GO Telecom was under, providing a first benchmark for tower transactions in the region (albeit a transaction between two MNOs rather than an MNO and a towerco).

Q1 2018: Saudi Telecom Company creates Communication Towers Co. Ltd

During the first quarter of 2018, STC established Communication Towers Co. Ltd., a fully owned limited liability company, with a share capital of SAR200mn. According to STC’s Q1 presentation “Communication Towers Company will be responsible for owning, constructing, operating, leasing and commercialising telecom towers”.

The operator’s total tower portfolio is reportedly 16,400 sites although it is as yet unclear as to whether their full portfolio will be managed by the entity which is yet to commence commercial operations (pending the award of necessary licenses from the relevant authorities).

STC is known to have employed the services of various consultancy firms to study the formation of its new towerco with both Delta Partners and Analysys Mason brought in to advise on the matter. The operator’s preferred model for their towerco has been to retain full equity, whilst enlisting the services of a towerco management partner to get operations up and running for the first couple of years. STC issued an RFP for a towerco management partner, and whilst various towercos from across the globe took a look at the deal on the table, no offers were received due to STC’s reluctance to cede any equity in the venture.

There have been several management changes within STC since Communication Towers was established, with Jeremy Sell most recently appointed to the position of Chief Strategy Officer (Sell having previously served as Ooredoo’s Head of M&A and CSO from 2006-2015, during which time the operator sold their portfolio of towers in Indonesia). Whilst insiders suggest that some at STC retain hopes of securing a towerco management
partner without ceding equity, the towerco continues to explore all its options. Reports have emerged that STC expects to commence commercial operations before early 2019, with progress in securing key licenses having reportedly been made.

**Regulatory barriers to towerco activity**

The Saudi telecoms market is regulated by the Communications and Information Technology Commission (CITC) – a well established institution which manages spectrum auctions, the Universal Service Fund and all other aspects governed by the telecommunications act.

Whilst discussions surrounding towerco activity in Saudi Arabia have been going on for a number of years, limited dialogue with the CITC meant that very little progress had been made on regulatory issues prior to the Kingdom's first deal being announced. With no previous experience of towerco activity in the market, the regulator and government have remained cautious, particularly with regards to the transition of ownership of towers into independent and foreign hands. Concerns over national security and who controls and has access to towers have reportedly been at the forefront of the CITC's reservations regarding towerco activity in the market, although towercos have been keen to point out that access is already granted to a range of contractors and subcontractors currently managing the assets.

In recent weeks, reports have emerged of significant regulatory progress on the towerco issue, with the finalisation of CITC’s towerco licensing regime expected to be imminent. Such a step forward will light the touch paper on towerco activity in the market, paving the way for STC’s Communication Towers and Zain's tower sale to IHS as well as further towerco activity in the country.

**November 2018: Zain announces deal with IHS Towers**

On 28 November, Zain Saudi Arabia announced that it had reached a deal with IHS Towers for the sale and leaseback of its passive infrastructure. The deal, valued at of SAR2.43bn (US$647.7mn) covers the sale and leaseback of 8,100 towers for a 15 year period with the option to renew for five years and also includes the building of an additional 1,500 towers over the next six years. The deal is subject to approval from the CITC as well as lenders.

Commenting on the news, Bader Al Kharafi, Zain Vice-Chairman and Group CEO; and Vice-Chairman of Zain Saudi Arabia said, “The sale of Zain KSA’s impressive tower network is a highly positive move, as it creates shareholder value by helping the company reduce its debt position, as the proceeds will be used to reduce the company’s Murabaha facility. Both the Zain Saudi Arabia board of directors and Zain Group executive management are confident that we have chosen the right partners in IHS, a company that possesses high caliber expertise with sound operational experience in diverse markets.”

Al Kharafi continued, “We recognise and appreciate the efforts made by the Kingdom's CITC in keeping abreast with global trends in the telecommunications sector by offering licenses to provide wholesale services for tower infrastructure, thereby reducing capital expenditure challenges on telecom operators and raising the efficiency of mobile networks. This proactiveness also allows new investors to enter the market, creating job opportunities. These efforts by the CITC that complements our deal with IHS, enhances Zain KSA's mission of playing its contributory role to achieving the Kingdom’s 2020 National Transformation Program and the 2030 Economic Vision ambitions.”

Al Kharafi concluded, “Zain KSA has implemented a transformation program in the Kingdom for some time now, advancing its efforts to become a digital lifestyle provider. The deal unlocks capital and resources, allowing the operator to focus on its core operations and further invest in and deliver the latest ICT technologies to meet the ever-increasing demand for reliable broadband access and data consumption. It also provides Zain KSA additional impetus to focus on the delivery of more data monetisation initiatives and customer enhancing services to offer customers the best data experience in the Kingdom.”

With a portfolio of over 23,000 towers spanning Nigeria, Cameroon, Côte d’Ivoire, Zambia and Rwanda (figure five), IHS Towers is EMEA’s largest independent towerco. Privately owned, IHS’ investors include MTN (with a 29% stake), Wendel, the IFC, FMO, ECP Private Equity, AIIM, GIC, KIC, Investec and Goldman Sachs. IHS commenced
The company is very much positioning itself to be a frontrunner in the burgeoning Middle Eastern tower industry, having also reached an agreement with Zain Group to acquire their portfolio of 1,700 Kuwaiti towers for US$165mn back in Q3 2017 (with the deal expected to close imminently).

**Growth in the Saudi Arabian market**

Whilst 4G coverage stands close to 100% in Saudi Arabia, significant densification is required in the Kingdom to meet the growing data usage of citizens as well as the ICT targets of Crown Prince Mohammed bin Salman’s Saudi Vision 2030. The country has also laid out ambitious plans to bring broadband access with download speeds of 10Mbps to 70% of households in rural areas by 2020, an agreement for the third phase of which having been signed between the Ministry of Communications and IT and Saudi Telecom Company in late November.

The Zain deal includes the build of 1,500 new towers by IHS over the next six years in a bid to improve coverage and capacity, with Zain’s tower portfolio having also grown by several hundred sites between when exclusive negotiations began in late 2017 and today, demonstrating the requirements for new build in the country.

Saudi Arabia is very much positioning itself to be a frontrunner in the move towards 5G and as such, one can expect that towercos in the Kingdom may play a significant role in the rollout and management of small cell networks, as well as macro towers, as we have seen in other markets across the US, Europe and Asia.

Decommissioning is also likely to play an important role in towerco activity in the country, with significant parallel infrastructure understood to exist due to limited infrastructure sharing between operators to date.

**Knock on effects for the tower industry in other MENA markets**

Considered by many to be MENA most important mobile market due to its scale and wealth, a tower sale in Saudi Arabia is likely to have knock
on effects for tower transactions and towerco activity across the region as the whole with a benchmark now being set for such processes. Tower transactions have previously been explored in Egypt, Bahrain and Jordan only for the sale processes to fall apart (read more in TowerXchange’s analysis of the MENA tower industry at the start of the journal), but with deals agreed in both Kuwait and now Saudi Arabia, one can expect momentum to build.

Should the deals prove successful, Zain is likely to explore tower sales in its other markets and other operators are likely to follow suit; Omantel, for example, are expected to formally announce a tower sale process in early 2019. The creation of a regulatory framework for towerco activity in a market as important as Saudi Arabia is also likely to serve as a guide for other regulators across the region and hopefully ease the way for further tower sales should they come to market.

Given the major changes underway in MENA’s tower industry, TowerXchange will be hosting a VIP only Meetup for MNOs, towerco’s, regulators, investors and select supply chain companies on 29-30 January 2019 at Le Meridien Hotel and Conference Centre in Dubai. 250 executives are invited with Zain Group’s CSO Kamil Hilali and IHS Towers’ management team joining other industry leaders including Etisalat International’s CTO, Hatem Bamatraf and Saudi Telecom Company’s new CSO, Jeremy Sell. To find out more and to enquire about joining please visit our website at: www.towerxchange.com/meetup/meetup-mena/
Major new build forecast in the Egyptian tower market

Could we see towerco activity ramp up without a major sale and leaseback deal?

Egypt represents one of MENA’s largest mobile markets. With one of the highest number of SIMs per tower in the region, the entrance of a fourth operator and the awarding of 4G license in the past 12 months, significant opportunity exists for new build, co-locations and tenancy amendments. Such opportunities have piqued the interest of international tower companies. TowerXchange examines the tower landscape and growth opportunities putting Egypt in the spotlight.

Keywords: 4G, Africa & ME, Alkan, American Tower, ARPU, Build-to-Suit, Capacity Enhancements, Co-locations, Construction, Decommissioning, Digital Bridge, Eaton Towers, EEC, Egypt, Energy, ESCOs, Etisalat, HOI-MEA, Infrastructure Sharing, LTE, Market Entry, Market Overview, Masts & Towers, MNOs, Mobiserve, MobiNil, MobiTower, Network Rollout, New Market Entrant, North Africa, Opex Reduction, Orange, Sale & Leaseback, TASC Towers, Telecom Egypt, Tower Count, Vodafone

Read this article to learn:
- Subscriber, mobile broadband and ARPU growth in Egypt
- Market share of Egypt’s four MNOs
- Tower ownership in the market
- Details of the cancelled Orange-Eaton Towers deal
- New build potential and how this is attracting international towercoms
- Challenges towercoms would face in the market

Market expansion in Egypt

In 2017, the number of subscribers in the Egyptian market passed the 100 million mark, only the second country across the whole of Africa and the Middle East to hit the figure (with Nigeria having been the first). Subscriber growth is expected to continue at a rate above 3% annually, further cementing the country as one of the most important mobile markets in the region. Mobile broadband subscriptions continue to show strong growth in parallel, currently sitting at 32.1% (up from just 11% in 2012) and ARPU in the market is also increasing, with market leaders Vodafone reporting a 10% YoY increase at Q4 2017.

Whilst this speaks to a positive story for the country’s MNOs, devaluation of the Egyptian Pound has hit international operators hard. In March 2016, the Central Bank of Egypt devalued the Egyptian Pound by almost 13% as they shifted their exchange rate policy in a bid to boost foreign reserves and increase competitiveness. By December 2017, the exchange rate had fallen to an all time low of EGP18.4 (versus EGP7.8:USD before March’s devaluation), and has hovered between 17.5 and 18 EGP:USD since. Whilst in local currency, MNOs report 2017 revenues significantly up on 2016 figures, foreign currency reported revenues have declined significantly; Etisalat reported a 17% revenue growth in EGP FY16 to FY17, in AED their revenue declined by 38% (Etisalat 2017 financial results).

Egypt’s MNOs

There are four mobile network operators in the
market, with state owned fixed telecommunications operator Telecom Egypt being the newest market entrant, having launched commercial mobile services in September 2017. Telecom Egypt, which operates under the brand “We” joins established operators Vodafone, Etisalat and Orange in the country.

The award of a mobile license to Telecom Egypt was given as part of a new regulatory framework approved in 2016 by the National Telecommunications Regulatory Authority (NTRA). According to this regulatory framework, the existing mobile operators Orange, Vodafone and Etisalat were allowed to introduce 4G service beside their 2G and 3G services, and the incumbent operator Telecom Egypt (TE) was allowed to provide 4G services and provide 2G and 3G services through national roaming with the existing mobile licensees. In addition, the regulatory framework allows Orange, Vodafone and Etisalat to provide virtual fixed-line services using TE’s network.

Telecom Egypt currently holds a 45% stake in competitors, Vodafone and whilst certain onlookers have advised they look to monetise their stake to free up capital to extend their own network, investor relations director Sarah Shabayek, told press “Vodafone Egypt is a very good investment. A sale would only be considered if we reach critical mass in the mobile market to the extent that we start cannibalising on such investment.”

With their mobile business having only been in commercial operations for just over a year, Telecom

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**Figure 1: Egyptian total mobile subscribers 2012 – 2017**

<table>
<thead>
<tr>
<th>Year</th>
<th>Subscribers (millions)</th>
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<tbody>
<tr>
<td>2012</td>
<td>96.8</td>
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<tr>
<td>2013</td>
<td>99.7</td>
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<tr>
<td>2014</td>
<td>95.3</td>
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<td>2015</td>
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<td>2016</td>
<td>97.8</td>
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<td>2017</td>
<td>101.3</td>
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**Figure 2: Egyptian mobile broadband subscribers 2012 - 2017**

<table>
<thead>
<tr>
<th>Year</th>
<th>Subscribers (millions)</th>
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<tbody>
<tr>
<td>2012</td>
<td>96.8</td>
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<td>97.8</td>
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<td>2017</td>
<td>101.3</td>
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</table>
Egypt have a way to go to reach that critical mass. The MNO currently has a 2% market share but hopes to increase this to 15% by 2022. Vodafone is the market leader in Egypt with 42.3mn subscribers (42%) at Q4 2017 (up from 40.9mn in Q4 2016). Orange (which operated under the Mobinil brand until 2016) has 34% and Etisalat, which has been steadily losing market share, has 22%.

Commercial launch of 4G networks by all four MNOs was achieved in 2017, although 4G coverage is primarily only available in Cairo. With high demand for 4G services expected to keep increasing exponentially all four MNOs have requested additional spectrum from the regulator. Whilst it builds out its 2G, 3G and 4G network, Telecom Egypt has wholesale agreements in place to utilise the networks of the other MNOs in the market, agreements which will come to an end by 2022.


**The current tower landscape in Egypt**

There are around 23,000 sites in Egypt with a roughly even split between Vodafone, Orange and Etisalat, with Telecom Egypt having around 2,000 towers. Approximately two thirds of sites are ground based towers, with one third being rooftop sites, primarily in major urban areas. In 2010 and 2011, five Egyptian companies were awarded licenses to lease space on towers. The five companies were EEC, Alkan, ECMTS, Mobiserve’s Mobitower and HOI MEA, with each being awarded...
There has been some bilateral sharing between operators in the market. For example, of the 6,166 towers that Orange owns, they share 20% (1,208) with other MNOs. They also lease space on 1,071 towers owned by other operators in the market. Most of the towers built in Egypt are thought to be relatively robust structures and so capable of carrying two or three tenants and so additional co-locations are thought to require only minor structural modifications. Rooftop sites are prevalent in the major cities, with over 90% of Cairo’s sites being rooftop structures. These structures are inherently less suited for co-location and so the much of the opportunity for increasing tenancy ratios is outside of the major metropolises.

**Orange’s cancelled tower sale to Eaton**
There have been no tower transactions of scale completed in the Egyptian market although Orange had previously agreed the sale of a portion of their sites to Eaton Towers in a deal which was subsequently cancelled. In April of 2015, the operator (then trading as Mobinil) announced the sale of their stake in the company’s tower subsidiary, Egyptian Company for Mobile Tower Services (ECMTS) to Eaton Towers for 1 billion Egyptian pounds (US$131.15 million). The agreement encompassed the purchase of approximately 2,000 towers (around one third of Orange’s total tower count in the country) with a license for a 15 year period. As of June 2018, only HOI MEA has built and leased space on towers but the company is reportedly looking to sell its portfolio of 38 sites.
15-year leaseback contract for the operation and maintenance and also for the additional build-out of new sites. The towers to be purchased by Eaton were in three geographic areas: Delta, Upper Egypt and Red Sea and excluded Orange’s rooftop sites in Cairo.

Eaton subsequently entered negotiations to acquire a second tranche of Orange towers, although no deal was announced. Following the agreement, Eaton Towers and Orange worked on the technical handover of the towers, with Eaton beginning to shadow operations from January 2016. 13 staff were recruited from Orange into Eaton’s Egyptian team whilst Karim El Azzawy (formerly of Egyptian managed service provider, Mobiserve) was appointed as the country manager with Moustafa Sobh appointed as Key Account Manager and his second in command.

In March 2016, the Central Bank of Egypt devalued the Egyptian Pound by almost 13% as they shifted their exchange rate policy in a bid to boost foreign reserves and increase competitiveness. As per the signed agreement between Orange and Eaton, the devaluation meant a revision to the commercial terms of the deal, with further devaluation and revisions expected.

On the 21 July, the longstop date laid out for completion of the transaction, Orange Egypt was still awaiting certain regulatory approvals relating to the change of control of ECMTS, the separate company into which they had transferred the 2,000 towers for Eaton to acquire.

With the prerequisites and conditions necessary for completion of the deal not met, the Orange Egypt board made the decision to not extend the deadline and as such terminated the agreement. With devaluation of the Egyptian Pound, a need to invest in 4G equipment and potentially buy additional spectrum to keep up with 4G demand, Egypt’s MNOs are looking at how to best manage their capex: giving towerco build to suit contracts instead of investing in new site build themselves represents one such strategy.

For a towerco, this presents an exciting proposition; 300-500 new sites per year from Vodafone, Orange and Etisalat plus further upside from Telecom Egypt as they look to build up their network from almost scratch. There is a healthy co-location potential on sites with four major operators and opportunities for decommissioning also exist with significant parallel infrastructure in the country.

Several towercos have been rumoured to be looking at entering the market, with meetings already having been held with the regulator as well as each of the four MNOs. American Tower are reportedly very interested in the Egyptian market and are understood to have had representation on the ground in recent months. Digital Bridge has been linked with the Egyptian market as has TASC Towers, both of which are known to want to further establish their footprint in EMEA. One can also expect interest in the Egyptian market from Eaton Towers, having struck a deal (that was subsequently cancelled) with Orange, the towerco knows the market well. Speaking to TowerXchange at the time of their cancelled deal, Eaton’s CEO, Terry Rhodes said “The imminent rollout of 4G, together with the economic and political changes which have made US dollars very scarce mean the operators will be

Opportunities for towercos in the market

It does not look likely that Orange’s towers will return to the deal table, with the operator preferring to focus on outsourcing power management to ESCOs than completing any further tower deals. Rumours had circulated that Etisalat may consider a tower deal but nothing concrete ever appeared.

Whilst a major tower transaction is usually required to entice most major towercos to enter a new market, the Egyptian market seems to be attracting the attention of a number of towerco suitors without a significant SLB. With one of the highest number of SIMs per tower in the world, a growing subscriber base, rollout of 4G just beginning and a new operator in need of establishing its network, the potential for new build in the market is high. In order to increase capacity, collectively Vodafone, Orange and Etisalat are expected to be planning to add 300-500 new towers per year. Whilst Telecom Egypt was granted a period of five years to roam using other MNO networks, the operator must roll out its own sites ahead of the 2022 cutoff and so their new build is considerably higher. The operator currently has around 2,000 towers and has recently entered its second phase of network rollout with plans to deploy an additional 1,000 sites (a mix of new towers, co-locations and in-building solutions).
under financial and operational pressure to expand their networks. It would be enormously beneficial for this expansion to share infrastructure. Eaton Towers shareholders believe in Egypt, indeed DPI, Eaton’s original institutional shareholder closed its first deal in Egypt only last month, with a US$35m investment in appliance retailer B.Tech. Therefore we will continue our endeavours to enter the Egyptian market.”

The NTRA has voiced their commitment to further develop Egypt’s communications infrastructure. Within the country’s coverage plan of the strategic roads network for sustainable development, around 2,250 km of new roads in the national roads network were covered by mobile services in 2017 and work is underway to cover 5,700 km with mobile services. The NTRA is also currently developing telecom infrastructure in several smart cities within the framework of announced national strategic projects. Plus in 2017, Egypt announced plans for 5G trials, further underscoring the importance of digital transformation in their future.

What challenges would prospective tower cos face in the Egyptian market?

Whilst the power grid infrastructure in Egypt is extensive, grid interconnection processes are extremely slow. With such long timelines to get a license to secure power from the authorities, a surprisingly high proportion of sites in Egypt are off-grid. Many sites in the country are reliant on diesel generators, with the high load on some sites resulting in as many as three generators being required per site. Due to generous fuel subsidies in Egypt, diesel prices are significantly lower than in other markets and as such the business case for hybrid solutions is reduced. With different skill sets required to service hybrid solutions, stakeholders in the market observe that the maintenance costs are higher than that of diesel generators and as such this further impacts the TCO.

Orange Egypt has issued an RFP for an ESCO in a bid to rid themselves of the complexity and inefficiencies of managing power at cell sites. The MNO is understood to have entered late stage discussions with an ESCO with a contract due to have been signed imminently, although at the time of going to press no news has emerged of this. A towerco entering the market would likely also need to offer power as a service, something the African (and some of the Asian) tower cos have more experience in.

Whilst healthy BTS work is likely to come from Telecom Egypt, there have been a number of management changes at the operator since it launched mobile services in 2017 and so there are likely to be a number of stop-start discussions in contract negotiations until some stability is achieved.

The opportunities, however, in the Egyptian market look to be highly enticing to a number of players and TowerXchange awaits eagerly the announcement of a towerco’s entrance into the country.
Oman: on the cusp of a change?

MNO market share, the tower landscape and the entrance of a third operator

With the potential entrance of a third MNO into the market, dynamics in the Omani telecommunications sector may be about to change. What’s more, rumours have surfaced that a tower deal may come to the table in early 2019, further opening the Middle Eastern market to the independent towerco model. TowerXchange examines the dynamics at play in Oman.

**Keywords:** 3G, 4G, American Tower, Digital Bridge, edotco, Friendi Mobile, IHS Towers, Infrastructure Sharing, Middle East, New Market Entrant, Oman, Omantel, Ooredoo, Renna Mobile, Sale & Leaseback TASC Towers, Zain

**The current mobile market**

Oman has 6.6mn mobile subscribers (of which 89% are prepaid) in a population of 4.6mn, leading to a mobile penetration rate of 146% (Source: TRA Q3 2018). There are currently two mobile network operators in the market: Omantel and Ooredoo, and two resellers: Renna Mobile and Friendi Mobile.

Omantel is the incumbent mobile network operator, having acquired its operating license back in 2004. The company is 51% owned by the government and has a 43% market share. Both resellers are hosted on the Omantel network and command an additional 15% market share (split roughly evenly between the two of them). Omantel’s population coverage for 3G stands at 99.0% and for 4G at 93.4% (Omantel Q3 2018 results).

In August 2017, Omantel acquired a 9.84% stake in Kuwaiti headquartered Zain for a total consideration of RO 326.6mn (US$848.25mn), before subsequently acquiring an additional 12.1% (for US$1.35bn) in the following November, taking its total shareholding up to 21.9%, making it Zain’s second largest shareholder after Kuwait’s sovereign wealth fund. The move is part of Omantel’s strategy to diversify its revenue sources and overcome the risks of being present in a single market. Zain Group has exposure to nine markets, being the market leader in five of those.

Qatari-headquartered Ooredoo has a presence

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**Read this article to learn:**

- Mobile market share and population coverage of Oman’s MNOs
- Details around the potential entrance of a third MNO
- Pressures on the telecommunications sector
- The number of towers in Oman and who owns them
- Rumours around a tower deal and who interested acquirers could be
in 12 markets and has a global subscriber base of almost 150mn with just over 3mn subscribers in Oman, equating to a 42% market share. The operator has been aggressively rolling out its 4G network in recent months, taking coverage from 55% in Q4 2017 to 95% by September 2018.

The introduction of a third MNO

In 2017, the Omani government introduced a tender process to award a third MNO license. Bids were received from Zain, Saudi Telecom Company, Etisalat and Sudatel. When Omantel acquired their stake in Zain in 2017, competition concerns were raised surrounding Zain’s bid, leading to the process being put on hold.

The government subsequently cancelled the tender process in favour of awarding the license to a consortium involving local investment funds (potentially led by a flagship sovereign wealth fund) and a global strategic partner. The stated objective for the change in strategy was to enable the local funds to deploy their assets in Oman as part of an overarching economic diversification vision away from oil. Details are yet to emerge of what kind of commercial model is being proposed for the consortium, and whilst an announcement was expected on Oman’s 2018 National Day (on 18 November), no news around the award of a license emerged.

With high mobile penetration rates, any new MNO will struggle to get a foothold in the market rendering it unlikely that the new entity will obtain any significant market share in the short- to medium-term. The current market is evenly split between Ooredoo and Omantel, with resellers focussing on specific niches and segments such as expatriates and blue collar workers, making it challenging for the new player to carve out their own market segment.

Once the license is awarded it is likely that national roaming will be mandated in the short term with network rollout obligations required in the medium term.

Further pressures on Oman’s MNOs

In addition to the introduction of a third operator, several factors are putting increasing pressure on Oman’s MNOs. In 2017, the Omani government increased royalty fees due from MNOs from 7% to 12% whilst income tax increased from 12% to 15%. Simultaneously the impact of declining oil price on the economy continues to impact consumer spending, whilst competition from OTT players continues to place further pressure on operator revenues.

What is the tower landscape and history of infrastructure sharing

Omantel has a portfolio of around 2,900 ground based towers and 5,000 rooftop sites, with Ooredoo understood to have approximately 2,500 ground based towers and also around 5,000 rooftop sites. Whilst a handful of towers are owned by other parties such as the national broadcaster and the...
Ministry of Information, they are not widely open to third party use. TowerXchange has not been made aware of any independent towercos currently active in Oman.

Omantel are understood to be increasing their tower count by about 4-5% per annum, suggesting an average of around 100-120 new towers are built by the operator each year. For Ooredoo, similar numbers are forecast. There are currently no regulations restricting the rollout of new towers.

Infrastructure sharing in the country has been limited to date but has started to increase as the MNOs aim to execute the rollout of 4G more cost effectively, with current estimates suggesting approximately 10% of towers are shared. The MNOs have started a healthy dialogue in regards to joint network planning and the amount of infrastructure sharing is expected to increase.

The vast majority of sites remain on-grid, and with a reliable grid in place, just those in rural and remote areas are reliant on diesel generators. The cost of fuel in Oman is relatively cheap and so running such generators has not created a heavy burden on operators.

**Opportunities for independent towercos on the horizon?**

In February 2018, Oman 70 Holding Company, ActivCo (Camusat’s investment arm) and the Omani Government set up a new organisation called Oman Towers Company. The company plans to build approximately 600 towers in the first five years, and has an interest in acquiring or managing the existing portfolios of Oman’s MNOs.

Rumours have emerged that Omantel is planning the sale of their ground based and rooftop sites (a total of around 7,900 towers), with the operator understood to be in the process of appointing an advisor to run the deal, with a formal process expected to be kicked off in early 2019. With a major shareholding in Zain Group, Omantel has been exposed to tower transactions in the Middle East, with Zain in the process of selling both its Saudi Arabian and Kuwaiti towers to IHS Towers.

Whilst concrete details of a tower deal from Ooredoo have not yet surfaced, insiders suggest that very early stage internal discussions had commenced at the MNO. Ooredoo has experience doing a tower deal, having sold their 2,500 Indonesian towers to Tower Bersama back in 2012 and also has extensive experience of working with towercos in Myanmar. In North Africa the operator has explored active sharing.

A third MNO entering the market is expected to initially heavily leverage both Ooredoo and Omantel’s tower portfolios, presenting a lucrative opportunity for an entity owning such towers to lease space on a commercial basis. The entrance of a third operator will also necessitate a degree of new build in the market, further presenting attractive opportunities to towercos.

**Who could have an appetite to acquire Omani towers?**

Oman Towers Company is one such company that will undoubtedly throw their hat into the ring should a sale and leaseback opportunity arise in Oman. With IHS having reached deals with Zain Group in both Kuwait and Saudi Arabia, the towerco also represents another highly likely contender, given their indirect relationship with Omantel (via the Zain deals) and their appetite to position themselves as MENA’s leading towerco.

Other stop start processes in MENA also give us a clue as to which other companies could bid for a tower portfolio in Oman should it come to market, with companies including edotco, TASC Towers, Digital Colony, Helios Towers, ISON Towers and potentially American Tower all being linked.

Regional funds have also been linked with tower deals in the Middle East in the past and so one could expect the creation of an SPV between a towerco and local investor to be a strong candidate in any sale and leaseback opportunities in Oman.
Kuwait: Poised for a landmark moment in the MENA tower industry

A study of the Kuwaiti market with the closure of Zain’s tower sale to IHS imminent

On 10 October 2017, Zain Kuwait announced that it had reached a deal with IHS Towers for the sale and leaseback of its tower portfolio in the country. The deal, which is expected to close imminently, will mark the Middle East’s first tower transaction of scale. TowerXchange take a closer look at the Kuwaiti market and the Zain transaction.

Keywords: Africa & ME, Communication Towers, Deal Structure, Energy, IHS Towers, Kuwait, MENA, Middle East, Ooredoo, Operator-led JV, Sale and Leaseback, Saudi Telecom Company, Tower, Tower Count, Towershare, VIVA, Zain

Kuwait’s economy and geography

With a landmass of 17,820km² and a population of just 2.9mn (Source: CIA World Factbook) Kuwait is one of the smallest countries in MENA, but is also one of the wealthiest, posting one of the highest levels of GDP per capita in the region. Unemployment is low (less than 1%) with around 75% of the population employed by the public sector. The economy has a heavy dependence on oil but after it shrank in 2017 (linked to falling oil prices), the IMF forecasts a growth of 2.33% in 2018, followed by a growth of 4.06% in 2019. Kuwait planned to introduce 5% VAT in 2018 in a bid to improve the country’s finances but in May announced that VAT introduction would be postponed until 2021, whilst still pushing ahead on plans to introduce excise tax on selected products. 100% of the population lives in urban areas.

The Kuwaiti mobile market

Kuwait is a developed mobile market with a mobile penetration rate of 173% and mobile broadband penetration sitting at 91% (Source: GSMA Intelligence, 2018). ARPU is one of the highest in the region with Zain Kuwait posting a figure of US$25 in Q3 2018, although in line with other countries ARPU has been steadily been decreasing. LTE coverage is almost complete and the country is very much positioning itself to be a frontrunner in 5G, with operators investing in their networks, in preparation for spectrum allocation and handset readiness.

Read this article to learn:
- Key background on the Kuwaiti mobile sector
- Tower ownership, sharing and operations in Kuwait
- Details of Zain’s tower sale to IHS Towers
- Whether we could see further towerco activity in Kuwait
Zain Group, which launched operations in the country in 1983, is Kuwait's leading operator with 37% market share. Omantel acquired a 21.9% stake in Zain in 2017, making it the single largest shareholder after the Kuwait Investment Authority (which owns a 24.6% stake; 5.05% is owned by Nohoudh Development Trading & Contracting with the remaining shareholding listed on the Tadawul stock exchange).

Having acquired Wataniya Telecom in 2007 (Wataniya Telecom having launched operations in Kuwait back in 1999), Qatari-headquartered Ooredoo is Kuwait's second largest mobile network operator with 32% market share. Saudi Telecom Company-owned VIVA launched commercial operations in the country in 2008 and currently sits just behind Ooredoo in terms of market share with 31%.

The tower landscape

There are approximately 4,100 towers in the Kuwaiti market (figure two) and whilst there has been limited infrastructure sharing between the operators, Zain report that, as of Q3 2018, they use 2,360 “sites” whilst their tower portfolio is known to be closer to 1,700 thus suggesting that some degree of infrastructure sharing or use of alternative site typologies is at play.

The deployment and operation of cell towers is regulated by CITRA, Kuwait’s Communication and Information Technology Regulatory Authority, which sets and monitors technical standards and electromagnetic radiation and ensures that environmental concerns are addressed. Around 10% of towers in Kuwait are understood to lack all necessary permits that are required with one of the biggest knock-on effects of this being that they are unable to connect to the electricity grid. As such, in spite of Kuwait's extensive and robust grid infrastructure, approximately 10% of the country's total tower stock (technically classed as temporary sites) are reliant on diesel generators 24/7 as their primary source of power (due to low fuel prices in the country, hybrid solutions have not been widely explored).

New site build in Kuwait is relatively modest. In their 2017 annual report, Ooredoo Kuwait reported that they had added 160 new sites for the calendar year, whilst Zain Kuwait's tower portfolio is understood to have grown by around 100 sites in the past 12 months. To date, no towercos have been active in the Kuwaiti market, with operators and their supply chain partners responsible for deploying, operating and owning the country’s full complement of towers. On 10 October 2017, however, Zain Kuwait announced that it had reached a deal with IHS Towers for the sale and leaseback of its tower portfolio in the country.

Zain's tower deal with IHS

News of Zain's interest in divesting their Kuwaiti towers emerged back in 2015 when they appointed Citigroup to examine a potential tower sale in two Gulf countries. Later in 2015, then CEO, Scott Gegenheimer confirmed the company was opening a process for a sale of both their Saudi and Kuwaiti towers and in March 2016 it was announced that they were narrowing down potential bidders.
In Kuwait, it is understood that interest was received from 15 parties, with Zain Group undergoing a rigorous processes to narrow this down to five shortlisted bidders before finally settling the deal with IHS Towers and Towershare. IHS are understood to have fronted and bought the assets with Towershare acting as a regional partner (with Towershare having since been absorbed into IHS) and Zain retaining equity in the new entity. The division of equity between the parties was not disclosed. With Zain’s retention of residual equity reducing the capital requirement to purchase the towers, and IHS having significant liquidity on their balance sheet, IHS did not have to raise new capital to finance the transaction. Zain’s retention of equity is for financial upside exposure only, with no access to strategic or competitive information, thus guaranteeing the independence of the new towerco entity.

The deal is understood to involve a build-to-suit commitment over the next three to five years and whilst no details of decommissioning plans have emerged, consolidation is expected in a bid to bring efficiencies to the portfolio. Whilst there has been no discussions of the towerco entity expanding beyond the ownership and operation of macro-sites, Kuwait’s plans to become a leader in the rollout of 5G could create a potential role for the towerco entity in small cells and DAS rollout to meet densification requirements.

IHS will take over power as a service and whilst the vast majority of sites are on-grid, Zain had previously been investing in energy efficiency initiatives in a bid to control energy costs and reduce carbon emissions.

Speaking at the time of the transaction, Bader Al-Kharafi, Vice-Chairman and Group CEO of Zain said “This transaction is set to support Zain’s transformational strategy in becoming a digital lifestyle provider as it will optimise operational efficiencies, enhance customer experience, and deliver greater value for its shareholders. This deal will unlock value that can be more efficiently deployed in new technologies and higher yielding investments for Zain, and at the same time pave the way for further network expansion and tower infrastructure sharing in Kuwait. I’m very proud of Zain team for its professionalism in completing the first agreement of its kind in the MENA region. We are confident we have chosen the right partner in IHS, a company that possesses high caliber expertise with sound operational experience in diverse markets. The company has an ambitious team that is focused on expanding their operations across the Middle East and Africa.”

Sam Darwish, Executive Vice Chairman and CEO of IHS commented “We are delighted to partner with Zain on this agreement which will expand our operating footprint into the Middle East. We look forward to a long-term partnership with Zain, where we can demonstrate our strong operating capabilities and service offering in support of their customers. We expect significant growth in wireless phone and data usage in a number of emerging markets over the next few years and we believe, given the significant experience we have gained in our African operations, we are well positioned to meet the growing needs of wireless network operators in these countries.”
The deal is expected to close imminently with just final closing conditions to be determined.

**Could we see further tower transactions in Kuwait?**

In Saudi Arabia, Saudi Telecom Company has explored various strategies for its tower portfolio, proposing the formation of a joint venture with number two operator, Mobily, hinting at their interest in potentially selling their tower portfolio, and more recently creating a dedicated towerco subsidiary - Communication Towers, for which they have looked into securing a towerco partner.

STC’s Communication Towers plans look to be moving ahead, with insiders suggesting that the towerco could commence commercial operations in Saudi Arabia as early as January 2019 (although a change in STC management, coupled with ongoing discussions with regulators has stalled some of the progress). Saudi Telecom Company have remained close lipped as to whether their towerco strategy could be rolled out across their other markets, however TowerXchange consider it unlikely that STC’s VIVA would look at selling their Kuwaiti towers before a decision regarding tower strategy is reached in Saudi Arabia.

Ooredoo have experience working with towercos, having completed a tower transaction in Indonesia, selling 2,500 towers to Tower Bersama and working closely with a number of towercos in Myanmar. The operator has not announced further plans for their towers but is known to be exploring strategies to reduce its opex and capex spend across its different operations.

**Who could have an appetite for towers in Kuwait?**

As a relatively small market, the scope for multiple towercos to operate in Kuwait is limited and one could expect IHS to be the most likely acquirer of any subsequent tower portfolios that should come to market, driving value through decommissioning. Multiple towercos have however been linked to tower transactions in MENA, primarily in the Saudi Arabian market, and so competition for towers could ensue. Should Saudi Telecom Company’s Communication Towers commence commercial operations in Saudi Arabia, one can imagine that the towerco would cross the border into Kuwait in a bid to better commercialise VIVA’s tower portfolio.

Whilst a small market, the imminent closure of Zain’s sale and leaseback transaction to IHS Towers in Kuwait is a landmark moment for the Middle Eastern tower market. Whilst several tower transactions have been agreed previously in the region, the Kuwaiti deal looks set to be the first to cross the finish line, setting an important precedent and benchmark for future tower activity in MENA. TowerXchange remain optimistic that the deal could close ahead of our first Meetup MENA, being held on 29-30 January in Dubai which will welcome speakers from Zain, and IHS amongst other key players. For further information, please visit [www.towerxchange.com/meetup/meetup-mena](http://www.towerxchange.com/meetup/meetup-mena)
TowerXchange’s updated Pakistan tower market study 2018

How the cancellation of edotco’s acquisition of 13,000 towers from Jazz will affect the market, and what might happen next

Following the recent announcement of the cancellation of edotco’s acquisition of Jazz’s 13,000 towers in Pakistan, TowerXchange has updated our Pakistan tower market study to include a deep dive into what this means for Pakistan’s fast-growing mobile market and what opportunities may come to the fore next.

While towercos have been licensed in Pakistan since 2006, towers were initially seen as a source of competitive advantage by fiercely competitive MNOs. Attitudes toward infrastructure sharing have thawed since 2011, with over 10,000 co-locations now on Pakistan’s towers. That culture of infrastructure sharing has now crystallised with the rise of edotco, who remain committed to the Pakistani market despite their latest setback.

Keywords:
3G, 4G, ARPU, AWAL Telecom, Acquisition, Allen & Overy, Asia, Asia Insights, Axiata, Bangladesh, BurQ, CMPak, Capacity Enhancements, DH Corp, Delta Partners, Deodar, edotco, Energy Efficiency, Herbert Smith Freehills, IBS, Infrastructure Sharing, Insights, Jazz, Lazard, Lease Rates, MNOs, Market Overview, Mobilink, Network Rollout, Off-Grid, Pakistan, Pakistan Telecommunications Authority, Qubee, RANsharing, Sales & Leaseback, Tanzanite Towers, Telenor Pakistan, Tenancy Ratios, Towercos, Towershare, Ufone, Unreliable Grid, VEON, Valuation, VimpelCom, Warid, Zong

Read this article to learn:
- Insights into edotco’s acquisition of Tanzanite Towers
- The circumstances around the cancellation of the acquisition of the Jazz towers in Pakistan
- 3G and 4G rollout and other growth drivers in Pakistan’s mobile market
- The evolution of Pakistan’s culture of infrastructure sharing: tenancy ratios and forecast growth
- Improvement capex and investments in cell site energy efficiency

Tower transactions cancelled

In September 2018, edotco and Pakistan Mobile Communications (PMC, operating under the brand name Jazz and majority owned by VEON) announced the cancellation of edotco’s planned acquisition of 13,000 Jazz towers, which had been announced in August 2017.

As Pakistani regulators failed to approve the transfer of control over Jazz’s tower unit Deodar before the specified deadline, despite original hopes that it the deal would complete in Q417, edotco was forced to abandon the process.

Jazz (then Mobilink) had carved out their towers to subsidiary Deodar, consolidated towers acquired from Warid, and had reached agreement to sell Deodar to edotco. edotco was to acquire a 55% controlling stake, while the Dawood Hercules Corporation (DH Corp), would have acquired a 45% stake in edotco Pakistan. DH Corp is a listed investment conglomerate in Pakistan with a US$600mn market cap.

The total proposed deal value was US$940mn, funded by US$600mn of local debt and equity splits of US$174mn from edotco and US$166mn from DH Corp, and would have made edotco the eighth largest towercos in the world.

Commenting on the cancellation, edotco CEO Suresh Sidhu said: “We do not foresee this affecting our business goals. We are confident in the potential of the growing market in Pakistan and are committed to the existing operations there.” With local MD Arif...
Hussain adding: “We have seen strong progress in Pakistan since our first acquisition, and business continues to grow with new orders for sites as well as high demand for adjacent opportunities such as energy solutions. We remain focused on building the business in Pakistan.”

As well as this cancelled deal in Pakistan, VEON-owned assets in Bangladesh, Russia, Ukraine, Kazakhstan, Armenia and Georgia have all come to market in the last three years and failed to reach a conclusion, with only the sale of the Wind towers in Italy to Cellnex completing in 2015.

**Pakistan’s mobile market**

One of Asia’s fastest growing mobile markets, The Pakistan Telecommunications Authority reports that mobile teledensity is currently 72.97% in a country with a population over 200mn. There is ample room for growth in mobile broadband penetration, currently around 34% (an increase of 10% in the last 12 months alone). ARPs are low, reportedly around US$2, but GDP is growing, disposable income is increasing, and the macroeconomic indicators are good for MNO and towerco growth in Pakistan.

3G was launched as recently as the end of 2014, but adoption has been swift, aided by sub-US$30 3G handsets coming on the market. 4G launches commenced in 2015, with compatible devices increasingly available. 3G and 4G rollouts are both continuing, with the current focus being overlaying existing sites, while future densification may prompt some limited new build of infill sites.

<table>
<thead>
<tr>
<th>3G and 4G subscribers</th>
<th>3G</th>
<th>4G / LTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jazz</td>
<td>15,043,373</td>
<td>5,077,651</td>
</tr>
<tr>
<td>Telenor</td>
<td>10,210,801</td>
<td>3,590,494</td>
</tr>
<tr>
<td>CMPak (Zong)</td>
<td>9,034,071</td>
<td>8,131,792</td>
</tr>
<tr>
<td>Ufone</td>
<td>7,472,086</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: PTA October 2018
Following the aforementioned acquisition of Warid, VEON rebranded their Pakistan opco from Mobilink to Jazz, consolidating their market leadership – they currently have 56mn, or 36.39% of the country’s subscribers. In 13 years Telenor and China Mobile’s Zong have acquired 43.3mn and 31.1mn subscribers respectively, while Etisalat’s Ufone has 20.6mn subscribers.

Rural coverage

While Pakistan’s tower network is extensive, and population coverage in Pakistan is believed to be in excess of 90%, population per tower is ~6,000 compared to ~1,500 in Malaysia.

Pakistan has a Universal Service Fund which actively awards capital to deploy towers in remote locations.

As Pakistan’s oldest and market leading MNO, Jazz has Pakistan’s largest network, and is often the sole service provider in rural areas...

Tower strategies: Jazz

After initial reticence to share infrastructure in the last five to six years a culture of tower sharing has blossomed in Pakistan. In particular market leader Jazz, then Mobilink, grasped the opportunity to lease out the country’s largest and most pervasive tower portfolio on a commercial basis since 2011-12, adding significant co-locations and value to the assets.

The original Mobilink towers account for around 8-9,000 towers in the current Jazz portfolio, with another 4-5,000 towers formerly owned by recent acquisition Warid, a deal which created estimated 2-3,000 sites in overlapping locations (within 250m of each other). While many towers will be retained for densification, there are significant opportunities to create efficiencies by decommissioning adjacent sites, saving land costs, and increasing the tenancy ratio of the remaining tower.

VEON-owned Jazz announced the plan to divest 13,000 towers to Malaysian towerco edotco in August 2017. The cancellation of this deal was announced in September 2018, mainly due to regulatory obstacles. It remains unclear what Jazz plans to do with their assets in light of this cancelled deal, and whether another agreement would come up against the same barriers. With an increasing number of MNOs choosing to retain assets globally, Jazz may choose to retain Deodar in the medium term and operate it as a more commercial towerco, or they may follow the lead of their sister opco Beeline in Russia, and reabsorb the SPV into the wider organisation now the deal is cancelled.

Tower strategies: Telenor Pakistan

Telenor has leveraged infrastructure sharing to accelerate time to market since entering Pakistan 12 years ago. Telenor Pakistan is a strong promoter of all forms of network sharing; towers (sharing primarily with Jazz), fibre (sharing with Zong), and has taken a lead role in exploring active infrastructure sharing. Telenor and Zong undertook Pakistan’s first RANsharing trials across around 30 sites, while the Norwegian-owned MNO has also shared IBS, both under the MORAN model where spectrum is not shared.

While Telenor has been mentioned on the grapevine as potentially interested in the sale and leaseback of their Pakistani towers, the company...
has little history of tower monetisation, and no need to release capital; their partnerships with towercos are likely to remain focused on co-location and BTS. Telenor are believed to have ~7,400 of their own towers, but may prefer to leverage co-location for future rollout: they already have over 2,000 co-locations in Pakistan.

**Tower strategies: Ufone and Zong**

Ufone has been exploring the potential sale and leaseback of their towers in Pakistan for some time. The process was stalled by the de facto merger of PTCL and Ufone, and associated management changes, but Ufone could yet contribute over 6,000 further assets to the pool of commercially shared towers.

China Mobile’s Pakistan opco, which trades under the brand name Zong, has around 9,100 sites, of which around 2,000 are co-locations.

**Tenancy ratio growth**

TowerXchange estimate the prevailing tenancy ratio (the average number of tenants across all towers in the country) to be around 1.25x in Pakistan, with a clear pathway to 1.5x. Of around 10,000 co-locations in the country, most originate from barter arrangements, with some application of commercial lease rates, but often offset against one another so no cash changes hands. These agreements will continue to be converted to commercial leases as towercos continue to become more prevalent. Tenancy ratios on commercially leased towers are reportedly rising at a respectable 0.06 per year in Pakistan, but that could accelerate with the rollout of 4G.

Non-traditional MNOs may represent potential upside on tenancy ratio growth in Pakistan, exemplified by LTE service provider Qubee and Wi-Fi Broadband provider BurQ.

Tower lease rates in Pakistan are believed to be in the US$800-1,000 range.

**Towercos in Pakistan**

A towerco licensing regime has been in place in Pakistan since 2006, and the Pakistan Telecommunications Authority (PTA) has set unofficial targets to increase the infrastructure sharing ratio in the country. That said, the usual local site permitting challenges persist, with differing policies from region to region, and multiple layers of taxation.

edotco acquired Tanzanite Towers for US$88.9mn, consolidating Tanzanite’s existing 700 towers while buying out a rival who had been rumoured to have entered exclusive negotiations to acquire the Jazz towers which edotco subsequently agreed to buy. 70% of Tanzanite’s towers are in urban locations, and 40% are ground based towers. The tenancy ratio was 1.6, and Tanzanite reportedly had a pipeline of 200+ new build towers, derived from contracts with all four of the country’s MNOs. Prior to the acquisition of Tanzanite, edotco’s footprint in Pakistan consisted of around 20 towers, plus 13,000km of fibre, acquired when they entered the country in 2014.

While edotco has consolidated Pakistan’s previous number one towerco Tanzanite Towers, since 2006 several local entities have been licensed as towercos, although only AWAL Telecom appears to be actively trading as such.

**Operational challenges**

Pakistan’s MNOs cite power as the number one operational challenge in the market, followed by security and landlord issues.

While Pakistan’s electricity grid remains unstable, and outages can last eight or more hours, the situation has improved notably in recent years. Backup diesel genset (DG) runtime is being reduced at sites on the country’s better grid connections, with DGs increasingly being removed from such sites.

edotco offer a full tower+power service in Pakistan, meaning they lease tower and ground space as well as providing DC energy.

“Edotco Group is expanding rapidly in Pakistan, and today we have 2,000 co-locations across the country, up from 200 just a few years ago. We have invested heavily in power infrastructure to ensure high availability, and we are seeing a significant improvement in revenue per tower,” said a representative.

“In recent years we have invested US$30-40mn every year into power infrastructure to ensure high availability,” continued the same MNO. “It will be interesting to see if the towercos are open to making that magnitude of investment.”
The range of operational challenges in Pakistan is huge. “We understand Pakistan – we know it is not an easy country in which to operate a tower network,” said one towerco. “But there are commercial implications of this; for example the lease rate for a tower in Karachi and a tower in the FATA have to be different.”

**Conclusions**

The cancellation of the edotco/Jazz deal is a blow to the tower market in Pakistan, where parallel infrastructure is highly prevalent and a decommissioning programme would have been highly beneficial to efficient infrastructure sharing. Rather than open up 13,000 towers to commercial co-location, and drive independent ownership of infrastructure to support the rationalisation of infrastructure, edotco has faced a setback which will put the transformation of the Pakistan tower industry on hold.

However, as Ufone have expressed an interest in selling their ~6,000 towers in Pakistan, and Telenor Pakistan have also been rumoured to be interested in a deal, there may be other avenues to rapid inorganic growth for edotco once the dust has settled. In a market where tower sharing is encouraged by the regulator, several of the MNOs have expressed an interest in divesting their towers and there is an active and committed towerco with a war chest of capital for acquisitions. In addition, Jazz may yet find another buyer for their assets or choose to retain them as a carve out towerco.

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29-30 January, Dubai

**Meetup Europe 2019**  
9-10 April, London

**Meetup Americas 2019**  
9-10 July, Boca Raton

**Meetup China 2019**  
August, Beijing

**Meetup Africa 2019**  
8-9 October, Johannesburg

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Edotco on Pakistan: new build, decommissioning and strong uptake for a complete service

Despite the cancellation of the Jazz deal, edotco sees plenty of opportunity in Pakistan

In September 2018 edotco announced the cancellation of their agreement to acquire Jazz’s 13,000 towers in Pakistan. While this was a blow for edotco’s growth plans in the country, TowerXchange caught up with Arif Hussin, country managing director at edotco Pakistan to discuss edotco’s continuing growth narrative in the country and why they’re as committed as ever to fibre, towers and their neutral host service offering in Pakistan.

Keywords: 3G, 4G, Acquisition, edotco, Energy Efficiency, Fibre, Hybrid Power, Investment, Jazz, Market Overview, Middle East, O&M, Off-Grid, Pakistan, Renewables, Sale & Leaseback, Solar, Towercos, Unreliable Grid, VEON

TowerXchange: Can you give us an overview of your portfolio in Pakistan as it stands now? What % of your towers are urban vs rural? When you acquired the towers from Towershare their tenancy ratio was 1.6x. What's edotco's tenancy ratio in Pakistan now?

Arif Hussin, Country Managing Director, edotco Pakistan: Our portfolio of over 800 towers is 97% concentrated in urban areas. Currently, we count all four mobile operators of Pakistan as our customers, with nearly 1,200 tenancies. This translates to a co-location ratio of about 1.4x, which is slightly below the tenancy ratio we acquired due to new build to suit tower additions in 2018 for one of the major mobile operators’ 4G coverage expansion programme. We have a strong pipeline with demand for both build to suit and colocation and expect to further improve our co-location ratio in the coming year.

TowerXchange: Can you share insights in to why the Jazz deal didn’t work out?

Arif Hussin, Country Managing Director, edotco Pakistan: Parties involved agreed to terminate the transaction due to the non-fulfilment of the conditions precedent to the SPA before expiry of the Long Stop Date, in particular regulatory approval for the resulting change of control contemplated under the SPA. We will continue to engage the relevant authorities to seek a better understanding of the causes that resulted in the delay of approvals. Meanwhile,
our focus is on organic growth, given the healthy demand.

**TowerXchange: How does edotco view the Pakistan market now? Do you see further opportunity for significant growth?**

*Arif Hussin, Country Managing Director, edotco Pakistan:* We remain positive about the country and its outlook as a key market for us. The opportunities for organic and inorganic growth in the country continue to be strong. Pakistan, with its high demand for sites driven by exponential 4G demand and adjacent opportunities such as energy solutions, remains an attractive market for edotco.

We have a long-term commitment to Pakistan. Our existing operations continue to progress well with securing substantial orders and rolling out sites for top tier customers. edotco will remain focused in Pakistan and we look forward to investing in further growth opportunities, both organically and inorganically.

**TowerXchange: Your first moves into the Pakistani market were in fibre. Can you talk to us about how this helped your tower offering and how the two verticals are developing in Pakistan today?**

*Arif Hussin, Country Managing Director, edotco Pakistan:* That was actually an entry by Axiata, our parent company, which to date they have diversified in full. We, as edotco, look to partner with fibre providers to connect our sites to allow for better back haul connectivity for our customers. Today Pakistan has one of the lowest number of fiberized tower sites (industry estimates are <5%) which to us is a substantially underserved market and an opportunity. The last mile fibre market is quite fragmented and is one of the reasons for low penetration. We are actively working on partnering with multiple players to provide a unified offer that meets the demands for an enhanced user experience. For edotco, a site fully energized and fiberized for an operator to come in as a plug and play tenant is the ultimate goal and we continue to make progress towards that.

**TowerXchange: When we spoke to Suresh last September, he said he anticipated high take-up of your complete service offering, given the security and power issues in Pakistan. Has this proved to be the case?**

*Arif Hussin, Country Managing Director, edotco Pakistan:* We definitely see a high demand in terms of our full offerings – build to suits, O&M and energy. To date we provide complete end to end solutions which, when coupled with our regional experience, allows us to bring in best practices from across our footprint and enables...
We continue to focus on reducing the reliance on diesel gensets for backup power by deploying longer battery backups, which is also a more cost effective option for customers.

us to meet the varying needs of our customers.

Pakistan is investing in and rapidly developing its infrastructure and energy grid and our regionally experienced design teams are able to provide a level of flexibility as well as a set of choices which are able to meet needs of customers from all the regions across Pakistan.

TowerXchange: What power and site management solutions do you find are working best in Pakistan?

Arif Hussin, Country Managing Director, edotco Pakistan: Li-ion batteries which are deep-cycle batteries with a longer operational life as compared to the conventional VRLA batteries are an ideal fit for the operational environment of Pakistan. They are also environmentally friendly making them a good fit for our GOOD (Get out of Diesel) initiative. We continue to focus on reducing the reliance on diesel gensets for backup power by deploying longer battery backups, which is also a more cost effective option for customers.

As a company we embrace investing in automation to reduce cost and increase uptime. We are committed to echo, our comprehensive remote monitoring solution to deliver more efficient O&M, including power management and site security.

TowerXchange: In 2015 edotco told us that it was expecting the site count in Pakistan to double from ~28,000 over the next five to eight years. Is the market on track for this? Can you talk us through new build and decommissioning needs in Pakistan?

Arif Hussin, Country Managing Director, edotco Pakistan: The current number of sites has substantially grown since 2015 and currently stand at around 42,000 nationwide according to the PTA, providing about 92% geographical coverage. Data from Analysis Mason forecasts that 35,000 new towers will be built between now and end of 2022. Operators continue to aggressively plan new sites and we are seeing strong organic demand from them to fulfil extending 4G coverage and urban 4G densification needs.

The Pakistan tower market remains nascent with substantial overlapping coverage. There has been some proof of concept bilateral initiatives between operators in the last 18 months towards site consolidation, but these remain few and far between.

We still believe there are further requirements for decommissioning of overlapping infrastructure. Typically, the acquisition of tower assets by a neutral party towerco can help change the dynamics of consolidation resulting in increased sharing which translates into substantial economic benefits for operators.
A new type of communications infrastructure in Bahrain

An overview of the Bahraini market as the regulator proposes rebuilding towers from the bottom up

Governments, regulators and MNOs in the Middle East are starting to think carefully about how best to use and deploy their wireless communications infrastructure, and nowhere more so than in Bahrain, where the Telecommunications Regulatory Authority has published an extensive new report which assesses both the quality and quantity of towers needed in Bahrain. As a result of this report, which carefully considers social and environmental factors as well as commercial drivers, we can expect to see as much as 90% of Bahrain’s tower stock being re-built over the next 15 years. TowerXchange takes a look at the Bahraini market, the history of the existing infrastructure and how ready the country is for a third party towerco.

Keywords: 4G, 5G, Africa & ME Research, Bahrain, Batelco, Co-locations, Consolidation, Infrastructure Sharing, Market Overview, Middle East, Saudi Telecom Company, Viva, Zain

Read this article to learn:
- The key players in the Bahraini mobile market
- Critical information about MNO performance in Bahrain
- The state of towers in Bahrain currently
- Opportunities for towercos to enter the Bahraini market

Bahrain

The Kingdom of Bahrain is, in fact, an archipelago of 33 islands covering 741 square kilometres in the Arabian Gulf, a fact which further complicates achieving connectivity for Bahrain’s 1.41mn inhabitants.

As one of the first countries in the Middle East to discover crude oil, fossil fuel revenues make up a large chunk of Bahraini GDP, although the country is working hard to diversify with growth in financial services, real estate, manufacturing and construction driving a GDP growth of 2.5% in 2017, despite the stagnation in the oil sector.

The Bahraini mobile market

The Kingdom of Bahrain has three mobile network operators: national incumbent Batelco, Saudi Telecom Company-owned Viva and Zain serving a subscriber base of 2.2mn (source: TRA Q2 2018).

Established in 1981 as a public joint stock company listed on the Bahrain Bourse, Batelco’s major shareholders are mainly government entities such as the Mumtalakat Holding Company and Amber Holding, as well as the Social Insurance Organisation. Batelco held on to a monopoly for more than 20 years after its creation, reaching 100,000 mobile subscribers by 1999, before pressure from international bodies prompted the government to pass the telecommunications law in 2002.

Batelco’s monopoly officially ended in 2003 with the entrance of MTC-Vodafone, which rebranded as...
Zain in 2007. The TRA had received 10 applications for the licence from various international and regional applicants, indicating high demand to enter Bahrain’s then-untapped market.

In 2009 VIVA, the Kingdom’s third major operator and a subsidiary of Saudi Telecommunications Company (STC), was granted the third operator licence.

Since then, telecommunications in Bahrain have gone from strength to strength, with mobile accounting for 48% of all retail revenue in 2017, the biggest single category, and mobile broadband traffic increasing 12% from Q217 to Q218, according to the TRA. However, although data usage climbed in 2017, mobile revenues still dropped by 4% between 2016 and 2017, continuing a trend of declining ARPUs across the board.

The current tower landscape

With Bahraini operators finding themselves under the same pressures as operators all over the world: declining or static ARPUs coupled with increasing pressure to spend on infrastructure in order to support technology rollout for data-hungry subscribers.

This need to review infrastructure may be exacerbated by new regulations as in 2016 the Telecommunications Regulatory Authority of Bahrain (TRA) commissioned a study to examine the rationalisation of the Kingdom’s total tower count from the current total of 1,500 towers down to a core network of 400 sites. In early 2018, the TRA introduced the new Public Radio Communications Stations Regulation (PRS Regulation) to regulate the deployment of new towers and “rectify existing ones in accordance with best practice”. The detailed legislation lays out key specifications for new and existing towers, specifying everything from the type of concrete used in the foundations to key health and safety requirements. The rectification plan is to take place over the next 15 years, with more than 90% of the towers requiring modification and the TRA setting out a goal of increasing the percentage of sites being shared from 12% to 40% in the country.

Towerco opportunities in Bahrain

It seems that the TRA is very open to relieving pressure on the MNOs to bear the brunt of this infrastructure overhaul by opening the market up to a third party infrastructure provider. When questioned by TowerXchange on different business models to reach the targets set in place, the TRA stated “Currently there are three operators who are licenced to deploy masts and towers in Bahrain. As a result there are three different mast and towers networks, i.e. one for each operator. The Authority considers there is room for improvement by merging these different networks into one or at least two. This could be done either by introducing a towerco company, a joint venture between existing operators or other feasible business models.”

Bahrain’s attitude towards towercos has long been positive, with Batelco formally opening a process to sell its towers in 2012 and attracting several interested parties, before deciding instead to focus on sharing infrastructure more effectively with Zain and Viva. In addition, Zain are known to be open...
to the sale of their telecoms assets, agreeing to a sale and leaseback deal with IHS Towers in Kuwait and Saudi Arabia, and Saudi Telecom Company have taken steps to reform the way in which their towers are managed, establishing a new (although not yet commercially operating) towerco business, Communication Towers Co Ltd, in Saudi Arabia.

In 2012 much was made of Batelco's debt-free status, and the fact that they were under no pressure to sell the towers to pay down debt, unlike many MNOs who have brought towers to market in Europe, Africa, Latin America or Asia. However, as ARPs have declined since 2012 and infrastructure owners are being pushed to upgrade and rationalise their networks by the regulator, it would seem that now is an optimal time for Bahraini operators to review how they manage their tower assets.

**What shape could a third party take?**

The TRA has been careful not to specify whether they are encouraging the entry of an independent towerco into the market, a joint venture between the MNOs or another 'feasible business model', but the Bahraini operators will be summing up the pros and cons of each.

With a proposed reduction in tower numbers by as much as 73% (from 1,500 to 400) and a total of as many as 90% of towers needing to be decommissioned, re-built or upgraded, whoever takes on this work will need a healthy appetite for new build and operational excellence. While a JV between the operators may allow them to distribute the pressure on their network upgrades more evenly, it's also possible that a tower sale in Bahrain could allow one operator to benefit financially from their tower assets, while ensuring that a third party takes on the pain and financial commitments needed to overhaul and rationalise Bahrain's infrastructure. In a market where the regulator is very hands-on, a third option, where a deal could be brokered between all three operators and an independent towerco also seems viable.

**Who could bid for the Bahraini towers?**

The towerco which enters the market will need to have experience of building and managing networks in tough climates. As a small country with urban populations, a towerco entering Bahrain would most likely need to see their entry into the country as part of a broader MENA play as a portfolio of this size is unlikely to achieve the scale to transform a towerco's portfolio. IHS Towers, of course, have a strong track record here and the added benefit of an existing relationship with Zain. American Tower, Helios and Eaton have experience of building and managing towers across Africa and edotco are present in Asia and Pakistan already.

Entering the Bahraini market won't be as straightforward as other sale and leasebacks, not least because the scale of new build and mandatory upgrades will far outweigh the towers which can be acquired with an operational lifespan of over ten years, but the opportunity to enter a well regulated market with three tier one operators will no doubt pique the interest of the international tower community.
Bahraini regulator encourages tower sharing through new legislation

Bahrain’s PRS Regulation will drive tower sharing from 12% to 40% and see 90% of the tower stock renewed

Bahrain’s Telecommunications Regulatory Authority has recently produced an extensive Public Radio communications Stations Regulation which covers the planning, design, installation upgrading and maintenance of masts and towers in the country. We spoke with Mohamed Abdulla Ramzan Alnoaimi, Director of Technical & Operations at the Telecommunications Regulatory Authority (TRA) to find out more about the motivation behind the new framework and how the TRA anticipates it will change the telecoms infrastructure landscape in the country.

**Keywords:** 5G, Bahrain, Camouflage, Infill, Infrastructure Sharing, Market Overview, Masts & Towers, Middle East, Operator-Led JV, Regulation, Rooftop, Small Cells, Solar, Telecommunications Regulatory Authority, TowerXchange Research

Read this article to learn:
- An overview of Bahrain’s Public Radio communications Stations Regulation
- How and why as much as 90% of Bahrain’s tower stock will need to be rectified
- The TRA’s stance on tower sharing and the potential entry of a towerco into the market
- How the TRA anticipates the regulation will affect 5G rollout in Bahrain

**TowerXchange:** As much as 90% of the tower stock will need to be rectified – what are the major changes which will need to be made and how involved with the TRA be in specifying which new solutions and structures are used?

Mohamed Abdulla Ramzan Alnoaimi, Director, Technical & Operations, Telecommunications Regulatory Authority: The rectification process of existing PRSs (mast and towers), as specified by
PRS Regulation, is intended to reasonably address the requirements and concerns of the various stakeholders within the telecommunications sector, including those of residents, relevant bodies and operators. The aim is to ensure that the proposed solutions and outcomes of the process balance the needs and expectations of all relevant parties involved.

As the cost of rectifying existing PRSs is tremendously high the rectification will take place over a span of 15 years. In order to assist in reducing the cost, the Authority has issued a zoning map classifying Bahrain into six different zones with only certain types of PRSs applicable in each zone with emphasis on shared use of such PRSs.

TowerXchange: Much of the aim of the regulation is to minimise the impact of towers on the environment – do you have requirements in terms of the power sources used for the towers? And is power back up and resilience a part of the document?

Mohamed Abdulla Ramzan Alnoaimi, Director, Technical & Operations, Telecommunications Regulatory Authority: The PRS Regulation requires operators to make reasonable efforts to ensure the sharing of existing and new PRSs in order to optimise the use of stations and avoid replication of networks. The PRS Regulation along with Schedule of Fees Regulation establishes incentives to encourage operators to share their stations. The authority aims at increasing the sharing percentage to around 40% of macro sites from a current sharing percentage of 12%.

TowerXchange: What’s the new regulatory stance towards tower sharing in Bahrain? What do you see being the main areas for regulation in terms of infrastructure sharing and what would the aim of your regulations be?

TowerXchange: Can you share your plans for the rollout of 5G infrastructure? Do you specify how small cells and street furniture must be used?

Mohamed Abdulla Ramzan Alnoaimi, Director, Technical & Operations, Telecommunications Regulatory Authority: The PRS Regulation predicts considerable increase in the number of small cells, in the near future, to ensure effective delivery of 5G services. Accordingly it has introduced clear processes and incentives to enable and encourage operators in deploying increased small cells and street furniture. This will undoubtedly contribute into the environmental responsibilities as well as efficient 5G services delivery by operators.

TowerXchange: Are you speaking to other regulators in the region about their plans? Where are you looking for information and guidance about how best to regulate this system?

Mohamed Abdulla Ramzan Alnoaimi, Director, Technical & Operations, Telecommunications Regulatory Authority: The Authority had some communication with other regional regulators during the development of PRS Regulation, but undoubtedly the new approach adopted by the Regulation is unique and has placed the Authority in a pioneering position with respect to the permitting of deploying masts and towers.
Rebuilding and expanding Iraq’s telecommunications networks

Investment into the Iraqi telecoms sector begins

Following the end of three years of conflict, reconstruction of Iraq’s infrastructure and economy is now beginning: $30bn has been pledged by the international community, with the Iraqi government aiming for total funding of $88.2bn. Rebuilding and expanding telecommunications infrastructure will form a central part of the work ahead. TowerXchange examines the telecoms and tower landscape in the country and the roadmap ahead to restore and improve connectivity.

Keywords: Asiacell, Construction, Country Risk, ESCO, Energy, Fastlink, Goran-Net, Iraq, Korek Telecom, Kurdistan, MENA, MNOs, Middle East, Mobitel, Network Rollout, Ooredoo, Orange, Tisknet, Towercos, Zain

The macroeconomic situation

Iraq is a nation beginning its recovery after more than three years of conflict in the country. In December 2017, the Iraqi government announced that its war against Islamic State was over, having liberated all territories formerly held by militants and regained control of its border with Syria. Examining the impact of the war, Iraq’s Planning Ministry have forecast the cost of rebuilding the country’s infrastructure to reach $88.2bn, with widespread devastation having destroyed homes, schools, hospitals, power stations and highways as well as caused extensive damage to telecommunications infrastructure.

On 14 February, international governments, investors and donors gathered in Kuwait for a conference on reconstructing Iraq’s economy. Stability and a healthy economy in Iraq is of global concern, with the United Nations warning that a failure to help rebuild Iraq could further breed sectarian conflict and give rise and strength to terrorist groups such as ISIS. $30bn in investment and credit lines were pledged at the summit with a follow up summit to further discuss use of the funding scheduled for March.

Over 200 projects from power stations, highways and a train line to schools, hospitals and homes are expected to receive support, with telecoms companies heavily involved in ensuring connectivity is brought to the country. Whilst the $30bn fell short of the $88.2bn the Iraqi government

Read this article to learn:

- Funding being channelled into rebuilding Iraq’s infrastructure and economy
- The mobile landscape and potential entrance of a fourth MNO
- The scale of damage to Iraq’s telecoms infrastructure and new build forecast
- Power issues and operational challenges in the market
- Opportunities for towercos and tower sales
- The role for ESCOs
is aiming for, they remain hopeful that further funding will be received and the $30bn pledged to date will enable key projects to get off the ground.

The mobile market

Iraq has three nationwide MNOs; Zain, Asiacell (owned by Ooredoo) and Korek Telecom (in which Orange has a stake). Zain has the largest mobile market share, with Asiacell close behind, whilst Korek Telecom is the country’s fastest growing operator which is dominant in the Kurdistan region. In addition to the three nationwide operators, there are a host of 4G LTE players in the Kurdistan region, Fastlink being the largest of these with Tishknet, Goran-Net and Mobitel amongst the other players. The government had proposed the introduction of a fourth national operator (in which the ruling government would have a stake) although further details are yet to emerge with political issues thought to be holding the process up.

Zain, Asiacell and Korek Telecom hold only 2G and 3G licenses (the latter having been obtained in 2016) and it is thought that 4G licenses will only become available once the fourth MNO has been introduced. The MNOs’ 3G networks require a large amount of investment with poor coverage even in urban areas in Kurdistan and data prices remain high; Kurdistan’s 4G LTE players are offering comparably better coverage and speed leading to their growing popularity. Zain, Asiacell and Korek Telecom remain dependent on voice revenues, with revenues continuing to decline.

The tower landscape and infrastructure sharing

Each of Iraq’s MNOs’ networks sustained heavy damage from the years of conflict in the country. Korek Telecom state that in the regions surveyed, 100 of their towers were completely destroyed with a further 800 sustaining significant damage. Areas considered too dangerous still to enter are yet to be surveyed and further damage is expected there. Estimates suggest approximately 10-15% of the country’s total stock of towers were destroyed during the war meaning that major repair works are required. Additionally, there has been significant under-investment in expanding networks throughout the conflict so the rolling out of new sites is desperately required in conjunction with the reparatory works. Korek Telecom forecast that their current portfolio of 3,600 sites needs to be extended to 6,000 sites, with similar growth understood to be required for the other MNOs. In June 2018, the IFC pledged US$269mn in Zain Iraq to help it rebuild and expand its networks over a seven year period. Local factories have the capacity to produce some of the steel required for tower strengthening and one local tower manufacturer has emerged, otherwise new towers are generally sourced from Turkey and, to a lesser extent, India.

As it stands today there are approximately 14,000 towers in Iraq (figure two) with the vast majority of towers only having the structural capacity for a single tenant. This fact, coupled with the intense competition between operators in the market, means that there has been little infrastructure sharing to date.

Some infrastructure sharing has begun between the 4G LTE players and the three nationwide MNOs, with Zain and Fastlink sharing an estimated 200 sites and Asiacell sharing an estimated 200-300 towers with their sister 4G LTE company. In order to add the 4G equipment to their sites, Asiacell has been strengthening their towers on an almost daily
basis to improve the structural capacity and wind load.

There have been early stage discussions within the government surrounding infrastructure sharing, with the introduction of a government owned MNO and its infrastructure requirements a motivating factor in discussions.

Power issues and operational complexities

Iraq’s MNOs are struggling with high OPEX, attributable in large part to security and logistics issues across the country. Power remains a major challenge and whilst figures for power availability vary by region and by time of year (ranging from zero grid to 16-18 hours in Kurdistan in summer), the vast majority of sites are reliant on two diesel generators. Hybrid solutions are yet to have any large scale trials in the country, and whilst fuel is not expensive by a global comparison, the costly and difficult logistics associated with fuel delivery and generator maintenance means that a switch to hybrid solutions is attractive.

Managed services in the country have generally been split between the big OEMs and in-house management. Korek Telecom uses Ericsson in central regions of Iraq and Nokia in the south whilst managing their Kurdistan network in-house; Zain are understood to have a managed service agreement in place with Ericsson and TowerXchange are yet to confirm Asiacell’s partner. Each of Kurdistan’s 4G LTE players have shied away from managed service agreements, with the exception of Goran-Net who has some limited managed service contracts in place. Power is generally managed by separate companies, often subsidiaries of larger corporations with investments in the MNOs.

Could we see tower sales and towerco activity in Iraq?

The ingredients are there to entice towercos to the Iraqi market; three nationwide MNOs either fully or part owned by tier one operators, the potential entrance of a fourth operator, a host of growing LTE only players to provide incremental revenue, major expansion of 3G networks required, significant new tower build activity on the cards plus talk of infrastructure sharing being pushed by the government.

For operators, ridding themselves of the complexities of operating towers in one of the most challenging markets is attractive. What’s more, significant investment is required to rebuild and expand their networks, and a towerco taking on new site build and sharing sites between multiple operators offers a much more cost effective solution. Operators continue to face increasing financial pressure with taxes having been raised and competition between different players intensifying; which again could further motivate MNOs to sell or consider towerco contracts. Plus if the government were to make infrastructure sharing mandatory with the award of a fourth countrywide mobile license, perhaps now could be a good time to sell?

Zain Group has shown their appetite to divest.

Figure two: Ownership of Iraq’s 14,769 towers

Source: TowerXchange

| TowerXchange MENA Dossier 2019 | www.towerxchange.com/meetups/meetup-mena |
towers, agreeing the sale of their Kuwaiti and Saudi Arabian portfolios to IHS Towers. Whilst the operator may want to first take stock of their first tower deals before proceeding with another transaction, the appetite to sell in Iraq may well be there. Ooredoo has experience of doing a tower deal, having sold 2,500 Indonesian towers to Tower Bersama back in 2012 and has further experience of working with towercos in Myanmar. Korek Telecom's shareholder, Orange has experience of doing tower deals and working with towercos across Sub-Saharan Africa.

Yet would a towerco consider entering the Iraqi market? A politically unstable country exiting three years of conflict is not for the faint hearted. Many (if not most) investors lured by the stable returns promised by towercos will likely see Iraq as too “frontiersy” and shy away from the country. What’s more, with the vast majority of towers unsuitable for sharing, the need for either significant upgrade work or replacement will significantly impact economics.

But fortune favours the bold and significant opportunity exists for those willing to take on the risks and find a business model that works. A significant portion of the $30bn pledged by the international community in February will channel its way into the telecommunications sector and separate direct discussions have been initiated between MNOs and development finance institutions regarding investment in rebuilding networks, thus showing that sources of finance are there.

One could argue that the market is better suited to a local player with knowledge and on the ground experience of operating in Iraq, a company which has honed relationships with operators and developed a local supply base already. TowerXchange has been made aware of at least one local tower builder which had expressed an interest in owning and leasing space on sites and anticipate further players to emerge as Iraq’s network continues to see fresh investment.

An emerging opportunity for ESCOs

All Iraq’s MNOs complain of high operating costs and severe power challenges creating a strong case for an ESCO willing to take on power management across sites. TowerXchange has been following the emergence of the telecom ESCO market closely, with the business model gaining momentum as the first wave of contracts are signed and an increasing number of players enter the market.

Zain is reportedly in late stage discussions with an ESCO to take over management of power across 1,500 sites with a deal is expected to be announced imminently. Whilst some ESCOs TowerXchange have spoken to have been deterred by the country’s macroeconomic environment others have a strong appetite to take advantage of the lucrative opportunities arising.

The Iraqi telecoms sector is on the cusp of a major transformation and whilst political and operational challenges remain significant, the level of new business opportunities for those with an appetite to work in the country is high.
TowerXchange: Please can you introduce Korek Telecom and where they sit in the Iraqi telecoms sector?

Zardasht Khalid, Site Management Director, Korek Telecom: Korek Telecom is Iraq's fastest growing mobile network operator serving over 7 million customers across the entire country. In the Kurdistan region we are the dominant operator and we are also the leading MNO in Iraq's second largest city, Mosul.

We have both a 2G and a 3G license and compete with Zain and Asiacell on a national level. In Kurdistan there are also a host of 4G only players including Fastlink and Tishknet.

TowerXchange: How has Korek Telecom's network been impacted by the conflict in Iraq?

Zardasht Khalid, Site Management Director, Korek Telecom: All of the operators in the country have sustained significant damage to their networks. In Korek Telecom's case we had around 100 towers which were completely destroyed and need to be fully replaced. In addition to this, a further 800 towers sustained some kind of damage and need to be repaired. In terms of the sort of damage, the power equipment on site has been the most impacted, with a lot of generators needing repair or replacing, cabling to the sites has also been cut or stolen and so also must be repaired.

Whilst we have found a total of around 900 towers impacted in our network, there are areas of the...
country which we are yet to survey, areas where security is still too big a concern, such as the main highway leading towards Syria and Jordan.

We expect that there will be further significant damage in these regions.

As of today, Korek Telecom have a total of 3,668 towers and so you can see that almost one quarter of our towers have been affected by the conflict. Zain and Asiacell have larger tower portfolios than Korek and so they are likely to have a higher number of damaged towers.

TowerXchange: Can you explain some of the work that Korek Telecom has been doing to restore connectivity across Iraq

Zardasht Khalid, Site Management Director, Korek Telecom: One of the most high profile projects I have been involved in was bringing connectivity back to the city of Mosul. In 2014, ISIS took control of Mosul, one of Iraq’s largest cities with a population of 3.3mn. In the November of the same year, ISIS switched off our mobile networks, exploding the core and cutting off all cables to our sites, putting our entire team in jail and cutting off all connectivity to the city.

With no mobile networks for those caught in the conflict, the following February we started to install special sites on top of the surrounding mountains to try and give some coverage. This was met with a backlash from ISIS who quizzed our team in jail on why there was mobile coverage and took the steps to kill anyone who was using a mobile phone.

Korek Telecom persisted however and from May 2015 to July 2016 we continued to increase the number of sites on top of the mountains as traffic inside the city continued to increase. On 16 July 2016 we held our first meeting with the army to put in place plans for liberation of the city and restoration of our network. It was my role to lead the project and by 31 August we had all the plans in place; everything from making sure we had all the necessary materials ready to having security arranged.

The 16th October 2016 was the first day of Mosul’s liberation, and over the course of the next few months we worked in parallel with the army to install mobile sites and repair the backbone, often working with fighting and snipers a matter of only a few hundred metres away. Inside the city we installed cells on wheels for the United Nations compound, and international journalists used our network to report back on developments in the city, commenting on the quality of network that enabled them to report directly from a warzone. The 10th July 2017 was the final day of liberation and by that time we had restored 405 sites, repairing 2G and 3G services. There is still some work to do but the project has been a huge success, made even more special by the fact that all engaged in the network rebuild were local Iraqis.

Prior to ISIS’s siege of Mosul, Asiacell had been the dominant operator in the city but since our work during the liberation, Korek Telecom has become the lead operator.
We have been working to restore coverage over the rest of the country and will continue repairing our old network throughout 2018 before embarking on much needed expansion projects.

**TowerXchange: Can you tell us about some of the scale of expansion that you are expecting?**

**Zardasht Khalid, Site Management Director, Korek Telecom:** Telecom: We currently have 3,668 towers and forecast that we need to build our network up to about 6,000. In addition to ground based towers and rooftop sites we are also looking at in building solutions which are essential in the large number of high rise buildings in Iraq.

In Kurdistan there is increasing sensitivity around the proliferation of towers that are considered an eyesore. Looking out of my window in the capital of the region, Erbil, and I can see ten towers all in close proximity. Because of this we are also starting to look for camouflaged solutions and alternative tower designs from light poles to palm trees for some areas.

Iraq is about to take a major economic leap as international investment is funneled into the country to rebuild basic infrastructure and repair the economy. Last month, at a conference of investors and donors, $30bn in investment was pledged by the international community, with the Iraqi government hoping to push this figure beyond $80bn.

A whole host of major infrastructure projects will be the recipients of these funds and telecommunications will be an essential component. Korek Telecom will be working closely with each of the different projects to build out networks and repair and improve coverage. More details will emerge in March when the final projects are awarded and from then we can work with the different stakeholders to plan investment in telecommunications.

**TowerXchange: What can you tell us about the complexities of operating cell sites in Iraq and how is this currently managed?**

**Zardasht Khalid, Site Management Director, Korek Telecom:** There is a very high cost to operating towers in Iraq, with the majority of opex attributed to security and logistics. In Kurdistan it is a lot more stable but in central and southern Iraq security is a major concern.

The second biggest factor contributing to the high opex is the lack of commercial power. Once again, in Kurdistan, the situation is a lot better with up to 20 hours of grid availability per day but throughout the rest of the country, grid availability can drop a lot lower and a large number of sites have no grid connection. The majority of our sites have two diesel generators in place, with some having just the one. To power our sites, Korek Telecom use Perkins engines and Stamford alternators; we prefer to work with the same suppliers in order to have better spare parts management and cost is also a major concern for us. We are yet to install any hybrid systems, and there are no large scale pilots in the country to examine, but our power team is studying different technologies with a view to potentially deploying them next year.

In terms of how the O&M is managed, we have managed service contracts in place across central and southern Iraq, working with Ericsson in central regions and Nokia in the south. In Kurdistan, in the North we manage all the maintenance in house.

**TowerXchange: Do you see a role for infrastructure sharing and independent towercos in Iraq’s network?**

**Zardasht Khalid, Site Management Director, Korek Telecom:** To date, infrastructure sharing in Iraq has been extremely limited but it is something that requires further study. There have been some very early discussions at the Iraqi telecoms regulator, the Communications and Media Commission (CMC), but to date nothing concrete has emerged. The Minister of Environment has also expressed a desire to promote infrastructure sharing, reducing the number of towers which are springing up across the country.

At the moment, all the towers which we use belong to Korek Telecom and there are no independent towercos in the market. The entrance of independent towercos in Iraq would be a positive development, promoting infrastructure sharing and better managing the high opex costs associated with the market.

Zardasht Khalid will join the speaking faculty at this year’s TowerXchange Meetup MENA, hosting discussions around opportunities and challenges in the Iraqi market. For more information please visit our website at: www.towerxchange.com/meetup/meetup-mena
North African potential: towers in Algeria

We investigate the obstacles and opportunities in launching independent towers in Algeria

Market overview

Algeria is one of the largest countries in the MENA region, with a population of 41.7mn (source: World Factbook). Since independence from France in 1962, Algeria’s primary political party, the National Liberation Front (FLN) has held sway, with President Abdelaziz Bouteflika in power since 1999.

The Algerian economy relies heavily on hydrocarbons, accounting for roughly 30% of GDP and nearly 95% of export earnings. Algeria's economy has been hit hard by declining oil prices, which have resulted in public spending cuts and increased taxes, putting pressure on Algerians’ spending power. GDP per capita has remained relatively flat at ~$15,000 for the last three years, with the Algerian dinar depreciating 4% year on year.

Telecoms Operators and ownership

The Algerian mobile market is tough, with a sluggish economy and an annual ARPU of $78 (source: The Economist), ranking Algeria as the 49th market for mobile revenue by ARPU globally. Pressures on MNO profit margins were exacerbated by tax increases implemented in January 2017, which increased tax on data from 7% to 19%, tax on voice from 17% to 19% and taxes on recharges going up from 5% to 7%. With tough competition in the market impacting data prices as well, Algerian MNOs have found revenue and EBITDA numbers have taken a beating over the last couple of years.

There are three operators in Algeria, each with a very different background.

Keywords: 4G, ARPU, Algeria, Carve Out, Co-locations, Country Risk, Djezzy, Editorial, Fibre, Market Overview, Mobilis, North Africa, On-Grid, Ooredoo, RANsharing, Regulation, Tax, TowerXchange Research, VEON

Read this article to learn:

- An overview of the economic and political situation in Algeria
- Which MNOs operate in the country and their market share
- Who owns towers in Algeria and where opportunities may arise
- The potential for an independent towerco to enter the market
Mobilis
100% owned by Algerie Telecom, the state owned telecom operator in Algeria, which is active in fixed and mobile telephony, internet and satellite communications. There were rumours as recently as 2016 that Algerie Telecom may sell off or list part of Mobilis, but this has not materialised, and in fact the Algerian government has put a stop to any privatisation policies they had in the last few years.

Djezzy (OTA)
Djezzy was 100% owned by VEON, through their Egypt-based subsidiary Global Telecom Holding (GTH) until 2015. After several years of wrangling with the Algerian government left them unable to import infrastructure into Algeria or pay out dividends from local businesses, VEON overcame the issue by selling a 51% stake to the Algerian National Investment Fund (FNI) for $2.6bn. Although the minority shareholder, Veon, through GTH, retains control of Djezzy under the terms of the deal. This unsettled timecost Djezzy their place as number one in the Algerian market, losing out to Mobilis shortly after the deal was struck. Despite successful efforts to grow data usage and subscribers, Djezzy has seen revenues declining over the last 18 months due to new taxes and tough market competition.

Ooredoo
Ooredoo Algeria is owned by Qatari operator Ooredoo.Ooredoo Algeria has also struggled in the last few months, with customer numbers dropping 3% in Q1 2018 and EBITDA declining 23% yoy, which Ooredoo has put down to ‘the increase in taxes, weak economic environment and intense competition in Algeria’.

Fibre in Algeria
Algeria’s relatively well developed infrastructure includes a national fibre backbone which was improved with a new subsea link to Valencia in April 2017. Algeria is also part of the 4,500km terrestrial Trans-Saharan Backbone network which will connect the national network with other fibre networks in the region. In Q118, Algerie Telecom launched Idoom fibre, as part of a $320mn network deal announced in October 2017. The deal has been controversial, with stakeholders complaining about the bidding process, won by Huawei. Algerie Telecom aims to connect 1.5mn homes in 725 municipalities in their initial rollout, with other regions coming on line subsequently. Algerie Telecom’s fibre network spanned 76,515km in 2017, with ambitious plans for further growth over the coming years.

4G rollout
All three Algerian MNOs (Ooredoo, Mobilis and Djezzy) launched 4G services in October 2016, after being granted licences which required them to each cover a different set of provinces, under a government scheme to accelerate nationwide rollout. Once this was achieved, each operator has been able to apply for permission to cover additional regions, with Ooredoo and Mobilis covering 31 wilayas (Algerian provinces) and Djezzy reaching 20 wilayas by February 2018, with Ooredoo the first MNO to receive permission from the Authority for Regulation of Post & Telecoms (ARPT) to expand to all 48 wilayas earlier this year.
The size and growth of the tower market
There are ~19,000 towers in Algeria, with Mobilis having the largest portfolio with 7,500 sites, Djezzy 6,500 and Ooredoo 5,000. In addition, state-run TDA (Télédiffusion d’Algérie) operates the broadcast media and carries programming in Arabic, Berber dialects and French, and has around 3-400 towers in Algeria, many of which are available on a commercial basis to Algerian mobile network operators.

At present there are no independent towercos active in the Algerian market. A company called Infrashare, launched by execs with strong North African credentials, including Malek Bouteraa, former CTO of Ooredoo Algerie, has been looking at opportunities in the Algerian maket and is exploring ways to get the traction needed to do a deal.

In terms of new site build, Mobilis plan to build a further 1,400 new sites, Djezzy have plan to deploy between 150-200 sites per year and Ooredoo have launched a site builder tender for three years for around 500 towers. These new build plans have been slow getting off the ground, however we expect to see them gather momentum over the next year or so. The Algerian Telecoms regulator L’Autorité de Régulation de la Poste et des Communications Électroniques (ARPCE) is believed to be applying pressure on Algieran MNOs to share their infrastructure more effectively, only permitting new tower build where it is not possible to share existing infrastructure, and is rumoured to be aiming to consolidate all telecoms infrastructure in Algeria into one organisation.

The power situation
The vast majority of sites are on-grid with very few generators (apart from core sites) – in this respect, Algeria is a developed market. Whilst the country has abundant sunshine, making solar a viable option, the low diesel costs (US$0.18/litre) means that the business case for alternative energy sources is greatly reduced. The government of the oil producing nation has been proposing reductions to the generous fuel subsidies for a number of years. Whilst the economy has been struggling and there will most likely be a gradual withdrawal of subsidies, we don’t expect anything dramatic that would necessitate the use of alternative generation sources any time soon.

Ownership of Algeria’s ~19,000 towers

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<th>Ownership</th>
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<td>Djezzy</td>
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<td>Mobilis</td>
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<td>Ooredoo</td>
<td>5,000</td>
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<tr>
<td>Télédiffusion d’Algérie</td>
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Source: TowerXchange

Infrastructure sharing
Whilst Mobilis and Djezzy signed a tower sharing agreement in 2014 to enable bilateral swaps on a few hundred towers, infrastructure sharing in the country has not been widespread and not carried out on a commercial basis. For all operators only 2% to 3% of their sites are shared, but the sharing activities are moving very slowly, mainly due to two main factors; firstly many applications for site sharing are rejected because the tower or rooftop site cannot receive additional equipment; and secondly due to disagreements between operators on which sites are fair swaps for each other, with each viewing a different “valuation” of their sites.

Ooredoo and Djezzy signed a RANsharing agreement in 2016, with plans to increase active sharing as they rolled out 4G, however, this was brought to an end by the Algerian regulator within six months, with no further plans for RANsharing in Algeria being made.
### Potential for deals

Algerian law has stipulated since 2009 that all commercial companies in Algeria must be at least 51% owned by an Algerian entity, making the entry of a large international towerco into the market under current conditions seem unlikely. However, VEON-owned Djezzy has expressed an interest in tower divestment previously, and the Algerian government seems close to bowing to pressure to encourage external investment by dropping the ownership law. For a towerco (or aspiring towerco) keen to grasp an opportunity in the region, taking a gamble on acquiring towers sooner could pay off, however most towercos with the level of capital needed for such an investment are far more risk averse than they would need to be to jump into the Algerian market now.

As Algeria is one of the biggest North African markets, once the market opens up we may well see towerco activity developing quite quickly in Algeria. Eaton Towers have already attempted to enter North Africa, in their aborted deal with Orange Egypt in 2015. IHS, currently moving into the Middle East through a deal with Zain, may well have the appetite to expand further in the region. Larger international players such as SBA or American Tower may well investigate the opportunities in Algeria as well.

Despite the strict rules on ownership, Algeria has an MNO who would be keen to divest their towers, three solid potential tenants in the market, a regulator which discourages RANsharing, good grid coverage and plenty of room for growth: watch this space.

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### See you at our future events!

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<tr>
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<td>8-9 October, Johannesburg</td>
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Market overview: Tunisia

No clear route to independent tower ownership but good government support for telecoms infrastructure.

There are 14.2mn active subscribers (source: INTT Q1 2018) and three MNOs in the Tunisian market; market leader Ooredoo, Orange and Tunisie Telecom. We take a look at the background factors which have affected the fortunes of Tunisia’s MNOs, assess current market tower ownership and introduce the local towercos carving out a niche for themselves in this developing market.

Keywords: 3G, 4G, Africa & ME Research, Build-to-Suit, Fibre, IPO, Infrashare, IoT, LTE, Market Overview, NATIC, North Africa, Ooredoo, Orange, Private Equity, RANsharing, Research, Smart Cities, Tunisia, Tunisie Telecom

Read this article to learn:

- How the Tunisian economy has developed since the Arab Spring
- The ownership and successes of Tunisian MNOs
- Tower numbers and ownership in Tunisia
- Forecasts and predictions for the development of Tunisia’s tower industry

Market overview

While politically Tunisia has seen rapid development towards an open and democratic system since the Arab Spring began in 2010, economically it still has some way to go. The country saw some economic acceleration in 2017, however the political situation, while more democratic, is still fragmented, resulting in a lag in passing reforms which would help to boost the economy. The Tunisian economy has not been helped by low oil and gas prices, with the services sector showing the strongest growth over the last year, but investment, exports and productivity are still below the levels of ten years ago.

Governmental austerity measures and continuing high unemployment are causes of ongoing social unrest, seen by many to be driven by a loan from the International Monetary Fund agreed in 2014 for $2.8bn, which is placing the Tunisian government under pressure to devalue the dinar.

Security issues, including terrorist attacks, have also destabilised the country over the last few years and have had a significant impact on income from the tourist sector.

However, Tunisia has a young and growing population and the government has identified communications as a sector for wealth and job creation, to which it has committed funds to projects in the sector and is planning for the expansion of state operator Tunisie Telecom. After the next election, due in 2019, we may see businesses more willing to commit to the country in anticipation of a longer period of stability.
Tunisia’s mobile network operators

Despite the current economic situation in Tunisia, it has one of the most sophisticated telecommunications and broadband infrastructures in North Africa. The government’s Digital 2020 programme, running from 2018-2022 and anticipated to cost US$153mn, is driving growth in this area. Much of the programme will be funded by a loan of $85.1mn from the African Development Bank, with Tunisian Minister of Communication and Digital Economy Anwar Maaroufi claiming that “Digital Tunisia 2020 will enable the country to become the first at the African level to invest in the digital economy.”

A number of further regulatory measures and infrastructure projects have been put in place to improve connectivity across the country, including a reform of the Telecommunications Act in 2013 which officially abolished government censorship, as well as laws supporting e-commerce and digital signatures.

The government is pushing ahead with plans to list its 65% stake of Tunisie Telecom on the Tunis stock exchange, with the expectation that the funds raised could be ploughed back into the company’s expansion plans, which include the acquisition of Maltese quad-play operator GO in 2016.

The government also announced its intention to sell its stakes in Ooredoo and Orange in Tunisia (10% and 51% respectively) at the end of 2016, although this has not materialised as yet.

Tunisia has a strong nationwide fibre backbone and international access to submarine and terrestrial fibre. Tunisie Telecom owns fibre and both Ooredoo and Orange own fixed line licences in Tunisia, competing with a dozen other players in the sector.

**Tunisie Telecom**

With 31.9% market share, Tunisie Telecom is the second biggest operator in Tunisia. The incumbent is leading the way in investment in its LTE network, building up a vectoring VDSL and rolling out an extensive fibre infrastructure.

65% of the company is owned by the Tunisian Government, and the remaining 35% by Emirates International Telecommunications (EIT). In late 2017 EIT had agreed the sale of their stake to private equity firm Abraaj Group for $2.25bn, which would have been the biggest ever private equity investment in Tunisia. The deal was announced as cancelled, however, in April 2018.

It’s not clear what the future holds for Tunisie Telecom’s ownership, but EIT are believed to have had a rocky relationship with the Tunisian government, in particular over the cancellation of Telecom Tunisie’s first IPO attempt, which was announced in 2010 and cancelled in 2011. It’s believed that the Tunisian government intends to press ahead with the IPO of their 65% stake, although EIT’s plan remains unclear.

Operationally, Tunisie Telecom has the most comprehensive network in Tunisia, and in June 2018 signed a new Partner Market agreement with Vodafone, a non-equity agreement under which Vodafone will provide strategic and operational support in a number of areas for three years, including roaming and carrier services agreements, enterprise, consumer, technology and procurement.

**Ooredoo**

Market leader Ooredoo Tunisia has 40.3% of the
Tunisian market, and evolved from the second GSM network in Tunisia in 2002, originally operated by Egypt’s Orascom under the name Tunisiana, before being acquired by Ooredoo. The Tunisian government owns a 10% stake in the business, and although they made noises about selling this stake in 2016, as yet nothing has been announced.

Ooredoo launched Tunisia’s first IoT network with Sagemcom in Tunisia in 2017, aiming to facilitate Smart City (smart parking, presence detection, etc.), Smart Industry (machines predictive maintenance, asset management and tracking, logistics, etc.), Smart Environment (fire detection, etc.) and other uses in health, transport and agriculture.

Orange
Orange entered the Tunisian market as the third operator in 2010 and launched Tunisia’s first commercial 3G service, they currently have 26.1% of market share. Orange Tunisia is 51% owned by the Tunisian government, and, as with Ooredoo, has mooted the sale of their stake but as yet nothing has been confirmed.

Towers in Tunisia
There are an estimated 8,383 towers in the Tunisian market, split between the region’s MNOs. In addition, there are two new towercos active in North Africa, NATIC and Infrashare, which are setting their sights on the limited build to suit activities in the country, which is relatively well built out. NATIC has suggested that they see little opportunity for a sale and leaseback in the short term in Tunisia, while Infrashare hopes to enter Tunisia on the back of success in the larger Algerian tower market.

Infrastructure sharing exists, for example Orange report that approximately a third of its Tunisian sites are shared with other MNOs. In addition to passive infrastructure sharing, Tunisie Telecom and Ooredoo have a RAN sharing deal in the country into which there had initially been discussions to include Orange.

Opportunities in Tunisia?
The Tunisian government is certainly open to promoting the growth of communications infrastructure, and as the economy stabilises, this market will see significant mobile data growth. However, the Tunisian government, similarly to Algeria, demands that 51% of businesses must be owned by Tunisian investors and the uncertain future of Telecom Tunisie means that, while the most likely candidate for a tower sale, it is less likely that the towers will come to market than it seemed a year ago. Neither Orange nor Ooredoo have yet sold any towers in the MENA region.

For the right towerco, with an eye on the long term convergence of Tunisia’s datacentres and fibre with passive infrastructure as 5G begins to roll out, there may be an opportunity, but in the short term it will be hard to achieve scale. We will follow with interest the growth of NATIC and Infrashare, whose excellent local knowledge may allow them to convert small built to suit growth into more fruitful relationships with Tunisia’s MNOs as the market develops.
Lebanon, in Western Asia is bordered by Syria to the north and east, Israel to the south and the Mediterranean to the west. The country has a landmass of just over 10,000sq km and a population of 4.5mn which has swelled to over 6mn in recent years, primarily due to an influx of refugees from neighbouring Syria. Close to 90% of the population lives in urban areas, with the capital, Beirut, being the largest city with a population of around 2.4mn (CIA World Factbook).

Lebanon’s GDP was US$51.8bn at the end of 2017, with GDP per capita sitting at just under US$7200 (World Bank). The country scores highly on the UN’s Human Development Index and education standards and literacy rates are similarly high.

**The history of Lebanon’s mobile sector**

Mobile telecommunications first came to Lebanon back in 1994, when BOT contracts were awarded to two private GSM companies; Libancell and Cellis. The contracts were awarded for an initial 10-year period, after which time, the networks were scheduled to be returned to the government. The two operators were required to pay a percentage of their annual revenues to the government and obliged to charge identical tariffs for postpaid customers whilst a ceiling was set for prepaid charges. Cellis was 67% owned by Orange (then France Telecom) with the remaining shares held by Lebanese InvestCom, whilst Libancell was owned by various Lebanese investors including the Dalloul family and the Lebanese

**Keywords:** Africa & ME, Alfa, ARPU, Energy, ESCO, IPT PowerTech, Lebanon, Orascom, touch, Zain
Telecommunications Company (with Finland’s Sonera having originally owned a 14% share).

In the mid-2000s, a bitter dispute ensued between the government and the mobile network operators, with the government claiming that the MNOs had not delivered the agreed proportion of revenues and had broken stipulations on the maximum number of subscribers each network was permitted. The government announced fines of US$1bn per operator and the World Bank was forced to intervene. The operators offered US$1.35bn to convert their BOT contracts into 20 year operating licenses but the government refused, subsequently cancelling the BOT contracts. The control of the networks and revenue returned to the state, with Cellis and Libancell being paid management fees to manage the networks until a new management tender was issued and contracts awarded in 2004. Zain, (formerly known as Mobile Telecommunications Company of Kuwait) assumed control of the Libancell network, operating under the brand “touch”, and a consortium led by Detecon International (part of Deutsche Telekom) took over management of the Cellis network, operating under the brand “Alfa”. Zain still retains the management contract for touch, whilst Orascom took over management of Alfa in 2009, with the management contracts having been extended regularly ever since.

The telecoms sector remains a major contributor to the country’s GDP, providing the second largest source of state revenue after taxation. The country has some of the highest mobile tariffs in the world, a fact which has led to protests from the general population. Whilst talks have occurred regarding re-privatisation of the sector, it looks unlikely that the government would want to cede ownership of the two profitable businesses.

touch and Alfa have a roughly equal market share, with touch’s Q2 2018 results reporting the operator to have a 54% share and Alfa to have a 46% market share. 3G mobile services were launched in the country in 2011, with 4G services launched in 2013.

The growing fibre market

In addition to the two state owned by mobile network operators, Lebanon has a state owned, fixed line fibre operator called OGERO which owns all of the country’s fibre. A major fibre rollout plan has been recently announced to bring fibre to the cabinet, with contracts awarded to three partners for the rollout; Serta Channels in partnership with Huawei, a joint venture involving BMB Group and Calix, and IPT PowerTech in partnership with Nokia. US$100mn was approved by the Cabinet for the project in October 2017 with the overall project cost expected to total US$283mn. OGERO plans for the project to be completed in a 40-month time period, with contracts having been awarded in February 2018. Companies are required to ensure a minimum transmission speed of 50Mb/s. Three local operators - Connect, Globalcom Data Services and TriSat, have been licensed to provide FTTH broadband services using OGERO’s fibre network. OGERO will remain the sole owner of the fibre network, with the three additional operators only allowed to deploy fibre where cabling is not available (expected to be less than 5% of the overall network). Revenues from fibre are expected to contribute significantly to state coffers, alongside existing revenues from the telecoms sector.

The tower industry

There are 2,600 towers in Lebanon, evenly split between the two mobile network operators, touch and Alfa. Around 75% of sites are understood to be ground based towers with the remaining rooftops. In spite of the two operators having a common owner in the government, there is little to no infrastructure between the two players. There are currently no independent towercos operating in the country.

In order to improve coverage and capacity, plans have been laid out for each operator to add 300-400 new towers starting in 2019, an almost 30% increase in the country’s total tower stock. The budget still requires approval from the government (with both operators being state owned) and so whilst the proposals have drawn interest and excitement, observers remain cautious as to what timeframe this will be realised in.

The power situation

Of the 2,600 towers in Lebanon, 15% enjoy
excellent grid with 24 hours of availability. Such sites are located on or around key government buildings and hospitals. Between 10-12% of sites are completely off-grid with the remaining 73-75% on poor grid. The definition of poor grid ranges anything from 6-18 hours, with better grid the closer the sites are to the capital city, Beirut. Whilst power availability is low in some regions, the introduction of a schedule of when power will be on or off makes for more refined management of poor-grid sites, creating less complexity than in poor-grid African countries for example.

Alfa recently signed an ESCO contract with IPT PowerTech in the country, whereby IPT PowerTech has taken over the power management across the operator’s full portfolio of sites. Speaking on the ESCO project, Khaled Habbal, COO, IPT PowerTech said

“Recognised as Leading T-ESCO globally”, with the largest number of ESCO sites worldwide, IPT Powertech Group decided to initiate the T-ESCO model in Lebanon by signing long term contracts with Alfa. We are a Telecom Energy Service Company (T-ESCO) company that invests, and provides comprehensive energy, and site infrastructure solutions and services to its customers, from auditing, to redesigning, procuring, and implementing innovative site solutions, all the way to managing networks, on a full OPEX model while guaranteeing savings and efficiencies. IPT’s T-ESCO model will serve MNOs and the Lebanese Government in a way to reflect the appetite for capex spending or capex leasing, all the way up to optimal TCO.

By introducing this model, the the Lebanese telecommunications sector will greatly benefit from IPT Powertech’s advanced expertise and knowledge gained from international experience in Africa, Middle East and South East Asia. The T-ESCO model will ensure guaranteed savings to MNOs and contribute significantly to the Lebanese government.”

Operating conditions

Whilst power remains a challenge in Lebanon, those active in the market report that operating conditions in Lebanon are relatively straightforward. The country is compact and safe to work in, albeit with a few more challenges closer to the borders.
Iran is the Middle East’s largest mobile market and, with infrastructure sharing having been limited to date, significant parallel infrastructure and inefficiencies exist. In early 2017, number one and number three operators, MCI and RighTel joined forces with Fanasia to create a new towerco, Iranian Towers, an entity designed to bring new efficiencies to the MNOs’ networks. TowerXchange speak to Morteza Taheribakhsh, Chairman of Iranian Towers.

Keywords: 4G, Access Control, Africa & ME, C-Level Perspective, Co-locations, Decommissioning, Fanasia, Infrastructure Sharing, Iran, Iranian Towers, Leasing & Permitting, LTE, MCI, MNOs, MTN, MTN-Irancell, Network Rollout, Operator-Led JV, Opex Reduction, Opex Sharing, RighTel, Rooftop, Sale & Leaseback, Site Management System, Towercos

Read this article to learn:
- The current structure of the Iranian telecoms sector
- Why MNOs MCI and RighTel decided to join forces in the creation of Iranian Towers
- Phase one of the towerco’s planned operations
- How the towerco will use third parties and what equipment they are assessing
- The scope for including further locations and assets

Iran is the Middle East’s largest mobile market with 118mn subscribers. There are three national operators in the country of which MCI (Mobile Communication Company of Iran) is the largest with 59% of the market share. The company became public five years ago and is the 15th largest operator globally. MTN-Irancell, a joint venture in which MTN holds a 49% stake, is Iran’s second largest operator with 38% of the market share; and RighTel, is the third largest operator with around 3% market share. In addition to this there are a number of FCP players and WiMAX operators who make up the balance of the market share (figure one).

There are currently around 38,000 towers in the Iranian market (figure two) and with very little infrastructure sharing between the operators there is a significant degree of parallel infrastructure. In 2014, Fanasia, an Iranian company with a background as a turnkey service provider to the country’s MNOs, started their own towerco business. Their first project on Kish Island, conducted with the support of the Kish Free Zone Organisation, was to rationalise the number of towers on the island. With 110 sites on the Island, each with a single tenant and unsuitable for the addition of further tenants, Fanasia built 27 new sites which the operators were mandated to use, whilst existing sites were decommissioned. The municipality benefited from a revenue sharing model on top of the land rental fee and further benefited from the freeing up of land under the old towers. Following the success of the Kish Island project, Fanasia reached a similar agreement with the municipality of Mashhad, Iran’s second most populous city, to develop a core network of 350 sites in March 2016.
In early 2017, in response to the growing trend towards infrastructure sharing in Iran, a new tower company, Iranian Towers, was formed. The three shareholders in the company are MCI and Rightel, Iran’s first and third largest operators and Fanasia, Iran’s first towerco. TowerXchange were delighted to speak to the CTO of MCI and Chairman of Iranian Towers, Morteza Taheribakhsh, to learn about the new venture.

**TowerXchange: Please can you introduce Iranian Towers and the rationale behind its formation**

**Morteza Taheribakhsh, Chairman, Iranian Towers:**

Iranian Towers is a new tower company whose three shareholders are MCI, the number one operator in Iran, RighTel, the country’s third largest operator and Fanasia, the Iranian towerco with operations on Kish Island and in Mashhad. I currently serve as the Chairman of Iranian Towers with Saeed Karimzadeh, representative of RighTel and Hossein Khodayari, representative of Fanasia also on the board.

Iranian Towers was established to act as an exclusive towerco for both MCI and RighTel. It is expected that most new sites required by both operators will be built and operated by Iranian Towers. Furthermore, we will gradually proceed to purchase and leaseback the existing sites of MNOs. Therefore both build to suit and buy-leaseback scenarios have been considered by Iranian Towers.

In Iran, as with the rest of the world, operator voice revenues and ARPU are continuing to decline whilst demand for data continues to increase. Significant capital is required to deploy 4G and 4.5G technologies...
which are required to support the increased data requirements. This places significant strain on mobile network operators and as such cost saving measures become increasingly important. Considering this fact, the primary motivation behind the creation of Iranian Towers is cost management. Sharing the cost of new site deployment as well as site operations will bring considerable savings to the business. Having Iranian Towers in place will enable MNOs to invest in their technological requirements without worrying about site infrastructure costs.

Furthermore, MNOs expect a higher degree of operational efficiency and faster rollout through Iranian Towers’ agile organisation. In other words, Iranian Towers’ mission is to cut the cost of operations and to contribute to MNO revenue through faster rollout and site build. It is worth mentioning that involvement in Iranian Towers will also bring a new revenue stream to MCI and RighTel and it will allow us to benefit from co-locations on the sites.

**TowerXchange: What is the initial scope of Iranian Towers?**

**Morteza Taheribakhsh, Chairman, Iranian Towers:**
The first phase of Iranian Towers’ operations will be the construction of approximately 1000 new sites which are capable of accommodating multiple tenants. These sites will be constructed primarily in the major cities in order to accommodate 4G and 4.5G rollout. The new rollout will include both ground based and rooftop sites and will be conducted with the coordination of municipalities. In terms of the buy and leaseback phase, we have not decided the exact number of towers, but the team is working on it to finalise details. Soon after launching the new build sites, the buy and leaseback process will start.

**TowerXchange: How will the site rollout be managed? Do Iranian Towers have a full team in place and have they selected their partners?**

**Morteza Taheribakhsh, Chairman, Iranian Towers:**
We have a temporary CEO in place for Iranian Towers but we plan to recruit a neutral CEO who also has strong experience in the Iranian market. In terms of the broader team, our aim is to outsource the majority of the works in order to keep the company small and agile.

The Fanasia team already brought a considerable experience of working with municipalities and will manage these relationships in order to expedite planning and permitting. Having two operators on one site is a much more attractive proposition to the municipalities who have strict criteria for allowing new sites to be built.

In terms of other equipment on the sites, we have spoken to a number of the leading suppliers of site monitoring and management systems and are currently evaluating our options. We are also examining various energy and space saving solutions including new racks and solutions for outdoorisation.

**TowerXchange: Will all sites host both MCI and RighTel equipment? What potential exists for the co-location of additional tenants beyond MCI and RighTel on sites?**

**Morteza Taheribakhsh, Chairman, Iranian Towers:**
RighTel have a smaller subscriber base than MCI and so will not require as many sites as MCI. If only one operator requires the site, then there will be negotiations between the two operators on how this is managed.

In terms of the scope for further co-locations on sites, in addition to MTN-Irancell there are a number FCP operators and WiMAX players in the Iranian market who could serve as additional tenants on sites, thus further improving the economics.

**TowerXchange: Are there plans to transfer MCI and RighTel’s existing sites into Iranian Towers?**

**Morteza Taheribakhsh, Chairman, Iranian Towers:**
MCI own approximately 21,000 sites in Iran, many of which are in particularly attractive locations, in addition to this, Rightel own 4,000 sites. The goal is for a gradual transition of existing locations into the portfolio but with a lot of parallel infrastructure between operators it doesn’t make sense to transfer all. What’s more, the majority of sites are unsuitable for additional tenants and so new towers will need to be constructed and agreeing a fair valuation for locations and towers will be a challenge. Whilst our current focus is on an initial scope of 1000 sites, over the next 4-5 years we plan for further consolidation and integration.

Iranian Towers will be joining the 5th Annual TowerXchange Meetup Africa and Middle East on 3-4 October in Johannesburg. For more information please visit [https://www.towerxchange.com/meetup/meetup-africa/](https://www.towerxchange.com/meetup/meetup-africa/)
Meetup MENA 2019

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Enhanced security and operational efficiencies through improved access control

An interview with leading access control provider - Acsys

Poor access control can not only lead to security concerns but it can also have a significant impact on a company’s operational efficiency and bottom line. In this interview, we speak to leading access control system provider, Acsys, to understand how the telecom tower industry has been affected by poorly managed access control and discuss the advantages that mechatronic locks can bring to the sector.

Keywords: Access Control, Acsys, Africa, Health & Safety, Job Ticketing, KPIs, Logistics, Masts & Towers, MLA, MNOs, Monitoring & Management, NOC, O&M, Operational Excellence, RMS, Site Level Profitability, Site Surveys, Site Visits, SLA, Towercos

Read this article to learn:
- Limitations with mechanical locks
- Challenges in controlling access to NOCs
- The importance of access control in enforcing SLAs
- How mechatronic locks can contribute to increased efficiency
- Safety and security benefits afforded by mechatronic locks

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

Rani Ariss, VP Sales EMEA, Acsys: There are several limitations in the use of mechanical locks and keys; keys can be copied, lost and forgotten or unreturned and the cost of replacing the lock is often higher than the lock itself. In managing keys, operators need to employ numerous amounts of workers who require training and the wrong keys can be given to the vendor. With traditional mechanical lock and key there is no way to prevent collusion, and users can forget to close sites (intentionally or not).

Regular audits need to be undertaken to ascertain the amount of keys in use and the keys’ location and the management of keys and locks requires dedicated space and security. Managing keys on weekends or during an emergency is a problem as staff will not be present, it is critical to be able to respond quickly to downed sites but if access is prevented in the absence of keys then the only way is to cut the locks which will require a lock replacement and sites can stay unsecured for quite some time.

When keys are copied it is difficult to detect when a theft or loss occurs and with picking and bumping there is no proof of break and entry and as such there are high insurance premiums. The result of these inefficiencies is that some vendors eventually make their own copies of the keys to gain access.
TowerXchange: In relation to controlling access and NOCs, what are some of the operational challenges faced?

Rani Ariss, VP Sales EMEA, Acsys: The NOC deals with a complex set of equipment that is scattered around a region and is impossible to control efficiently with mechanical locks. The NOC also deals with a large amount of vendors, who are responsible for site maintenance. It is hard for the NOC to respond efficiently to emergencies as they don’t know where the vendors are located and false alarms can cause disorder.

Access to the NOC is impossible to control. Vendors are requested to do maintenance and only do it when they are able to do it, not necessarily when the NOC has requested that they do it. When sites are down it can be difficult to find the vendor, the NOC then needs to call other support to get someone to the site.

The NOC is looking for a solution whereby tickets are issued and acted upon as quickly as possible in a first phase. In a second phase the NOC needs to 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 challenges can poor access control systems have on SLA implementation and adherence?

Rani Ariss, VP Sales EMEA, Acsys: MNOs and towercos will have SLAs in place with their vendors to regulate site maintenance. These SLAs have escalation clauses that dictate when a vendor should arrive on location. It is hard for the NOC to see when vendors are going to the sites and if they completed the job correctly making SLAs redundant.

The lack of data prevents an operator from setting operational KPIs to benchmark the performance of the various vendors between each other. The fact that there is no or little data from the performance on the SLA also means that the NOC and operator need to rely on the vendor to obtain performance information which creates a conflict of interest.

TowerXchange: What are the advantages of implementing mechatronic locks for remote site management?

Rani Ariss, VP Sales EMEA, Acsys: Mechatronic locking systems cannot be picked/bumped, hacked, copied or corrupted in any way. Telecom customised software enables the NOC to manually or automatically control where users can go, for how long wirelessly and in real-time with minimal cost.

Mechatronic solutions allow the NOC to control precisely what assets can be opened and when. All keys and locks memorise the last thousand actions giving an incorruptible record of the user’s actions, providing the NOC and operator with valuable operational data.

The mechatronic locks combine four important solutions into one system; a wireless and real-time access control system, a high security lock and key solution, a time and attendance solution and a key management solution.

TowerXchange: What are some of the basic practical advantages of mechatronic locks?

Rani Ariss, VP Sales EMEA, Acsys: The solution is a standard padlock and Euro-Din cylinder configuration meaning that no modifications are required to install them. The padlocks and cylinders can be fitted on all equipment and no maintenance is required. The stainless steel plating prevents corrosion on the padlock body and cylinder and what’s more anyone can use the solution.

The operational advantages of using mechatronic locks are instantly visible after deployment and lasting over time, uptime is increased and the solution prevents keys being copied, stolen, lost or unreturned, locks being picked, issues around collecting and returning keys, the requirements for lock and key audits and unauthorised access.
TowerXchange: How do mechatronic locks contribute to increased efficiency?

Rani Ariss, VP Sales EMEA, Acsys: Users can service more sites in one day and a user's position and length on site is controlled and monitored. The NOC can have a real-time view of site status looking at the number of sites, which sites have guards and are they present or not, which site is in need of maintenance and for what reason and which and how many vendors are on the site.

By implementing mobile apps, the NOC is now able to receive real-time site information and user performance, such as when did the user receive the task, accept the task, arrive on and leave the site. This system can also monitor what the user did on the site (watermark GPS pictures) and can also receive information on whether the user closed the locks after leaving the site.

This data has significant value to determine SLA adherence because the tower owner can now see exactly what is happening on their site. Being able to understand who is going where and for how long means that the owner can make smarter business decisions. Data collected by mechatronic locks gives concrete undisputable data on whether the vendor has been meeting the SLAs. Furthermore upon additional analysis of the data, site operators can create and negotiate more suitable SLAs using the information collected.

TowerXchange: How do mechatronic locks increase site and user security and reduce theft?

Rani Ariss, VP Sales EMEA, Acsys: With regards to safety and security, as the NOC knows who is on the site and for what reason, in the case a vendor does not request a locking code (because of a fall or injury) the NOC is able to act on that.

In relation to thefts, most thefts are caused by people who had a mechanical key at one stage and copied it. The mechatronic keys can have an embedded feature that monitors where the key is being used, if the user tries to fraudulently use the key three times, the key will automatically block themselves thereby forcing the user to go back to the NOC or programmer to update his key.

TowerXchange: What information can be collected to monitor behavioural patterns and how does this translate into more cost effective operations?

Rani Ariss, VP Sales EMEA, Acsys: The NOC will be able to download the access logs stored on the key through programmers and study what sites or assets were accessed and when, how long the vendor spent on each site, whether the user tried to access sites or assets without authorisation and on which day, time or location.

By collecting data on user performance the NOC and operator are now able to obtain site maintenance benchmarks which in turn allow them to set KPIs for certain tasks.

In addition, mechatronic locks allow for increased flexibility. When a technician is unavailable, another can be called as a substitute with no wasted time or resources. A temporary access can be instantly granted 'on the fly' for a site normally outside of this technician’s work zone.

By collecting data on behavioural patterns, the financial department is also able to control how much time was spent on site by users, thereby gaining a better control over payment of billable hours to vendors.

TowerXchange: How will the data that mechatronic locks provide influence the way in which the telecoms sector works?

Rani Ariss, VP Sales EMEA, Acsys: Using the data that mechatronic locking systems provide effectively will lead to more efficient access policies, enhanced SLA agreements and increased productivity. The data collected does not only benefit the site owner, but is also valuable for tenants and vendors. The data helps build relationships between the ecosystem by aiding their understanding and giving evidence of site activities. The more a database is built and the further it is integrated the more valuable it becomes to its users.
Micro Turbine technology makes once a year site maintenance visits a reality

Cost effective innovative solution has up to 8,000 hour service intervals, is cleaner, quieter and can use multiple fuels including diesel, kerosene or paraffin or a mixture to reduce costs and deter fuel theft by up to 60%

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’s Micro Turbine gensets (MTG), we had to find out more! While the MTG is cleaner and quieter than a traditional DG what makes the MTG particularly interesting to towercos is the fact that they require as little as once a year maintenance. A key business requirement we continuously see from mobile operators and towercos is to reduce site visits to once a month or less.

Read this article to learn:
- How Bladon harnessed the power of microturbines for telecom power solutions
- The advantages of Micro Turbine Gensets (MTGs) over conventional DGs
- How the product addresses the weakness in all hybrid genset solutions – reinventing the diesel genset
- More about the ultra-low maintenance solution: no engine oil, no water, only one 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
- Time to breakeven/crossover in different scenarios, compared with traditional DGs
- Details of the World’s only EURO V emissions standard compliant diesel genset (12kW)

TowerXchange: Where does Bladon fit in the telecoms infrastructure ecosystem?

Stuart Kelly, VP Market Development, Bladon:
We have invested considerably in R&D over the last 5 years and perfected the design and manufacture of a genset that has a microturbine technology at its core. A Micro Turbine Genset (MTG) is an evolutionary step in replacing conventional diesel gensets in a prime power, hybrid or standby power application. Without making any drastic changes in business process, supply chain or taking a risk on new technologies towercos can drastically reduce their daily fuel and maintenance costs and see those reductions immediately. The MTG’s superior reliability and performance along with its multifuel capabilities nicely positions it to be the ideal replacement of noisy, inflexible and high maintenance diesel generators. Bladon’s MTGs are ultra-quiet, cleaner and greener, which is critical for towercos and mobile network operators alike that have strong corporate social responsibility and environment friendly agendas.

Gas turbines aren’t new. This is a 70 year old technology, and is the method of choice for providing ultra-reliable power as a utility to millions of people and businesses globally. Bladon has innovated the application of turbines to telecom tower power by making a microturbine fit into the space where normally diesel gensets are situated. 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. 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 turbine engines evolve as a solution for cell sites?

Stuart Kelly, VP Market Development, Bladon: Bladon has been working on turbine and gas turbine technology for over 10 years now, with special projects for the automotive industry funding a large part of that work. Then realising that almost 20% of the 2,000,000 diesel gensets sold globally are purchased by the telecoms market we saw an opportunity. An opportunity to show off Bladon’s technology in a single vertical market and evolve the way distributed power is deployed on telecom tower sites. Realising that the lion’s share of opex incurred by telecom towers was in fuel and maintenance costs we knew immediately that Bladon could offer a compelling value proposition.

TowerXchange: Which telecom markets are you targeting and why?

Stuart Kelly, VP Market Development, Bladon: The amount of activity in rejuvenation, investment and growth in the telecom tower market is most impressive in Africa, especially sub-Saharan Africa. That’s why we are using the TowerXchange in Johannesburg to formally launch our 12kW Micro Turbine Genset (MTG). We have conducted field trials in Africa over the last year and learned valuable feedback from our partners there. Some of our field trial units have been running nonstop for 3000+ hours without ANY filter changes or servicing. Whether an MTG is deployed as a primary power or hybrid installation servicing the MTG will be maximum once a year. 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. The Bladon MTG allows MNOs and towercos to evolve their energy strategy, take advantage of serious opex savings without drastically changing the business model or increasing their energy capex budgets.

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

Stuart Kelly, VP Market Development, Bladon: Microturbine engines are an ultra-low maintenance solution. Unlike a diesel reciprocating engine, there is no engine oil and no liquid coolant. The turbine itself consists of just one moving part, which runs on air bearings. 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 achievable. Our MTG unit has robust telemetry built in, so you need fewer field engineers as many of the MTG 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. We have standardised also on the DeepSea Controller 7320 MKII to make it even easier for towercos and MNOs to fold the MTG into their estate and manage it through their NOC will minimal disruption.

TowerXchange: Okay, so what are the advantages of microturbines over other alternate energy solutions such as fuel cells or solar?
Stuart Kelly, VP Market Development, Bladon:
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. 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 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 start up issues even if it’s left idle for some considerable time between uses. 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:
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:
We go into production this year (2018). The first run of MTGs have already been ordered, and we’ve signed distribution agreements already with partners in Africa and Australia. Our production factory headquarters is also where our R&D team is based; in Coventry, UK.

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

Stuart Kelly, VP Market Development, Bladon:
Our Bladon MTG12 MTG delivers up to 12kW, with 230V AC output. 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 conventional DGs.

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

**Stuart Kelly, VP Market Development, Bladon:**

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.

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

**Stuart Kelly, VP Market Development, Bladon:**

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 from other cell site energy solution providers.

**Stuart Kelly, VP Market Development, Bladon:**

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 gas turbines, 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.

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**Sample - Telecom tower 3 year OPEX savings**

![Diagram showing 3 year OPEX savings comparison between DG, MTG diesel, and MTG kerosene.](image-url)

- **Fuel costs**
  - DG: $60,000
  - MTG - diesel: $50,000
  - MTG - kerosene: $40,000

- **Maintenance costs**
  - DG: $20,000
  - MTG - diesel: $10,000
  - MTG - kerosene: $10,000
A new power offering from GCC market leader

Byrne Equipment Rental are adding a complete tower power vertical to their extensive equipment hire business

Having operated across the GCC for almost 30 years, Byrne Equipment Rental understand the regions climate issues and ensure their extensive fleet of equipment can support their client’s requirements in the Oil & Gas, Medical and Telecommunication’s sector.

After identifying an opportunity to leverage their skills and capital to work more closely with mobile network operators in the region, they’ve spent the last 18 months developing an OPEX-led, complete tower power solution which will dramatically simplify a problem which has caused GCC tower owners a headache for many years. TowerXchange caught up with Steve Caygill, Regional General Manager and one of the experts spearheading the new model, to find out more about Byrne Equipment Rental’s new offering.

Keywords: Batteries, Byrne Equipment Rental, Capex, ESCOs, Energy, Energy Efficiency, Energy Storage, Fuel Cell, Fuel Security, Market Entry, Middle East, Multi-Country Partner, Off-Grid, Opex Reduction, ROI, Rectifiers, Rental, United Arab Emirates, Unreliable Grid, Uptime

Read this article to learn:

- About Byrne Rental's pedigree and footprint in the GCC region
- How their new complete power solution will work
- How the tower power business fits into Byrne's wider organisation
- The importance of power for network resilience in the GCC region
- Developments in Byrne's ownership structure and how this will help them grow

TowerXchange: Please introduce Byrne Rental, your history and footprint.

Steve Caygill, Regional General Manager, Byrne Equipment Rental: Byrne Equipment Rental was established in the early 90s and for almost 30 years we have evolved to having 19 offices and depots across the GCC region. We have formed the ‘Byrne Group’ of companies which includes our traditional rental business alongside other entities we own including Spacemaker (UAE) and Byrne Technical Service (KSA), which manufactures high quality temporary and permanent structures; Byrne Gulf Oilfield Rental Solutions, which is our main operation in oil and gas; Yas Petroleum, our fuel management and distribution service in the UAE and our most recent launch; Byrne Medical Equipment Rental, offering operating lease options for specialist equipment to the medical sector. All in all, we have about 1,500 people working across our operations & 10,000 assets in our rental and lease fleets.

TowerXchange: You work across multiple industries. Can you tell us about your work in telecoms infrastructure and how important the sector is to your larger organisation?

Steve Caygill, Regional General Manager, Byrne Equipment Rental: Over the last 18 months we’ve been trialling a new product in the market by working with mobile network operators to find out where they have issues powering their tower assets in both standard and remote locations. There are a
lot of mobile network operators looking to reduce CAPEX and replace with an OPEX option. The challenge is in maximising the useful life of power assets – many tower owners aren’t quite getting the mix right in the form of battery type and rectifier and the amalgamation of the two, which means their equipment isn’t realising its full life potential and the additional OPEX needed to manage them is becoming costly, particularly for a non-core element of their business.

Power generation is over 40% of our Capital Investment profile which amounts to 488,000Kva of managed power in our fleet. Over the last 18 months we’ve been building our proof of concept, integrating world class products to create a single hybrid product for the market, with specialised lead crystal batteries, bespoke rectifiers coupled with a 1,000-hour service interval engine which requires less maintenance. We underpin this with a dedicated management system to get the most out of the solution. We are tailoring this to the market, to provide a single source for mobile network operators to reduce their operating overheads, remove capex and de-risk their business with a single source product which we own, operate and manage. This hybrid product reduces fuel consumption by up to 75%, we marry this product with the fuel delivery service which we currently offer in the UAE and hope to develop across the GCC countries where we are represented, and it’s a very compelling offering.

Our plan is to launch the solution at TowerXchange Meetup MENA, where we can demonstrate the value of the solution to tower owners across the region and beyond.

**TowerXchange: Can you talk us through the model for your new solution?**

Steve Caygill, Regional General Manager, Byrne Equipment Rental: We have no interest in owning towers at this juncture, but the power is our fundamental aim as we can finance and manage that as a core efficiency. We don’t want to tread on the core business of our customers, we want to power their asset and take away operational risk. We have a 20 unit trial pending in the GCC alongside significant interest in the UAE, and certain MNOs are holding off on tender releases until we can get this product to market. We’ve tested this solution in isolation and as a unified product: it works in this climate and we’re confident we can launch at TowerXchange MENA with a strong commitment. We think this will become the ‘new normal’ for the telco market.

**TowerXchange: Tell us about how this fits into your existing business?**

Steve Caygill, Regional General Manager, Byrne Equipment Rental: This is an expansion of what we already do. We are a plant generalist, we own and rent assets, provide a one stop solution to our clients, and we can provide anything from a portaloo to operating accommodation O&G camps offshore. This managed power solution is effectively an extension of what we’re already doing, just with a new product vertical already complementing our core functionality.

**TowerXchange: Resilience is becoming increasingly key for telecoms networks across the world. What do you see as the main threats to uptime in MENA, and how can this be combatted?**

Steve Caygill, Regional General Manager, Byrne Equipment Rental: It’s a collection of everything. Mobile network operators find themselves executing elements which are not in their core focus. It’s a core focus for us, and the challenge is acquiring and depreciating assets not delivering full useful life. They must be suited for the GCC market where you have a lot of Heat/Humidity & dust, of which have a massive impact on how well rectifiers perform, which knocks on to battery life, meaning assets are carrying cost and overhead beyond useful life. We see this solution as taking away all that headache and hassle. We’re offering a fixed fee, which is a big “risk off” position for our clients but we are very confident of what we have developed, we’ve sourced key supply change partners from Europe and Asia to ensure we are offering the very best solution.

**TowerXchange: How do you differentiate yourselves from other ESCOs entering the MENA region?**

Steve Caygill, Regional General Manager, Byrne Equipment Rental: They’re new to the region and
we've been here for almost 30 years. We have a
19 office footprint and 1,500 staff, so we know the
market and the risk profile. We are an established
brand with over 10,000 assets supporting clients in
the market. We've built up a reputation for quality
and reliability, and if we are willing to put our name
behind a certain product, it's our reputation on the
line, so we know we must always deliver quality.

TowerXchange: Can you tell us more about
your plans for the future and where you see the
business going?

Steve Caygill, Regional General Manager, Byrne
Equipment Rental: We recently had a restructure
in our ownership, with new investors Citic Pacific
and Vpower joining Itqan as our shareholders.
Citic Pacific are a HKD 9trn company, listed in
Hong Kong and the private investment arm of
the Chinese Government, while VPower is one of
the largest power manufacturers globally. We're
proud that Byrne Equipment Rental is their first
investment in the Middle Eastern Region. A natural
progression for us would therefore be to expand
our geographical reach, and offer our services into
the Asian market. The product line of our mobile
network operator offering with a managed power
solution would naturally follow into that territory.
We have what we believe is the required scale, size
and financial strength to allow us to roll out at scale
when it comes to deployment in the GCC and into
new geographies - it’s a matter of penetrating those
markets and creating the awareness of what we can
offer with our solutions to the Telco sector

See you at our future events!

Meetup MENA 2019
29-30 January, Dubai

Meetup Europe 2019
9-10 April, London

Meetup Americas 2019
9-10 July, Boca Raton

Meetup China 2019
August, Beijing

Meetup Africa 2019
8-9 October, Johannesburg

Meetup Asia 2019
3-4 December, Singapore

TowerXchange

www.towerxchange.com
Delmec: The truth behind your assets
What you need to know about whose equipment is hanging on your towers, and how safe they are

With asset registers incomplete or out of date in many parts of the world, tower owners are getting a shock when it comes to the capacity of their structures, the safety of the sites and, most shockingly, the legitimacy of the hardware hanging from their towers. Spencer Crawford-White from Delmec talks us through some of the major challenges tower owners face in managing their assets and how a tower portfolio can be brought back into line.

Keywords: Interview, Monitoring & Management, East Africa, Southern Africa, West Africa, Europe, Delmec, O&M, Construction, Installation, Investment, Capex, Due Diligence, Opex Reduction, Co-locations, Infrastructure Sharing, Capacity Enhancements, Health & Safety, Bankability, Site Level Profitability, Operational Excellence, Off-Grid, Unreliable Grid, ROI, Site Visits, Site Surveys, Asset Register, Masts & Towers

Read this article to learn:
- The most common hurdles faced by tower owners in terms of updating and maintaining an asset register
- How to bring an asset register back up to 100% accuracy
- How and when tower portfolios should be audited
- The benefits of portfolio certification to investment, expenditure and business development

TowerXchange: Tell us about Delmec’s current footprint and key markets.

Spencer Crawford-White, CTO, Delmec Engineering: Our company is based in Ireland, with operations in Africa, Asia, UK, Europe and the Middle East. Projects in North and South America are growing at present with Central America, India and Western Europe also markets of interest for us.

Our core offerings are centred around our highly skilled technical team who are totally telecoms focused. Our core offerings include:
- Portfolio assessment & management;
- Structure refurbishment solutions;
- Technical due diligence;
- Structural engineering and design;
- Design & supply of structures;
- Training & certification;
- Installation & project management services.

TowerXchange: What are the core capabilities which Delmec offers to the tower industry?

Spencer Crawford-White, CTO, Delmec Engineering: The assessment and certification of structures and people is our core capability – it’s what we do best. Our services have all been designed around supporting our customers’ needs and requirements. There’s a certain synergy and efficiency in what we offer – we’re not the cheapest but we are the most cost effective when we combine all our offerings together for our clients. What we offer is the means to get the job done right first time and reduce
timescales allowing sites to support additional equipment quicker, which can have an enormous revenue benefits.

We recognise the value of utilising local resources, it is inefficient to fly direct resources to the field for day to day maintenance and survey works so we have developed dedicated courses where we train and certify local contractors to our recognised standards. Increasing their quality assists us by improving the quality of the site data received. Site data is collated into TiMs our custom in house software system that allows management and sharing of site data with our team and clients.

**TowerXchange: Where does Delmec see the biggest growth in the tower industry taking place over the next few years?**

Spencer Crawford-White, CTO, Delmec Engineering: The African market needs to build more structures for network in-fill but the headache of leases and planning isn’t interesting to an MNO. Towercos are more focused on the infrastructure and are well positioned to offer large scale build programmes to support MNO expansion plans. Overall the global market will move towards the independent towerco business model, meaning you’ll have infrastructure owners and MNOs totally separated. Tower networks have been traded for over 20 years now, but I think towercos are now doing it on a greater scale than before. Post the down turn investors are more cautious and are looking to place money in secure tangible assets with recurring revenue from blue chip customers. This is fuelling the tower portfolio industry and Delmec are well positioned to advise and support clients when buying or upgrading these assets.

**TowerXchange: Given Delmec’s track record in auditing asset registers, what would you say is the most common problem which towercos and MNOs face in creating and maintaining accurate asset registers?**

Spencer Crawford-White, CTO, Delmec Engineering: Globally, maintenance and inventory records are not well maintained and verified. Every single company we’ve spoken to has issues with asset data around both the active and passive infrastructure. They have an idea of what they have on their asset register, but this rarely has the detail of what they have in each location from a safety or structural perspective. The more we’ve gone to Africa and started helping, the more interest we’ve had from their European counterparts, which leads us to believe that even assets there don’t have as good a set of records as possible.

Maintaining site data generally is a big issue globally both in terms of the structure and recording what’s on it. Most site providers that we do physical reviews for are surprised by the equipment on their towers. There are huge implications for lost revenue and also significant safety concerns if you don’t have a handle on what’s hanging on your towers. Unregistered equipment hanging on towers is a huge loss in terms of revenue and capacity. It’s mostly down to poor record keeping but there’s also the odd opportunist – smaller radio broadcasters or broadband microwave solution companies who might have reached a private arrangement with the land owner where the site is located. There are also instances of unapproved power connections, which of course is the biggest cost to infrastructure managers in Africa due to the lack of reliable grid provision.

**TowerXchange: How would you go about rectifying problems with an asset register?**

Spencer Crawford-White, CTO, Delmec Engineering: The main reason we’re employed is because at the starting point, towercos often struggle to align the recorded data they received with what is on the ground. They’ll do an audit on 10% of the proposed sites before an acquisition and ask questions like can you get there? Is there a tower? Has it got a fence and does it look okay? No other information comes back, not even photos in most cases. When we go out we’ve often got nothing beyond co-ordinates and a theoretical size of structure. They might have pictures of 10% of the towers if we’re lucky, we help them assess every tower and ensure collection of a complete active and passive data set for every site.

How do we rectify problems? Initially we carry out a Red Amber Green (RAG) report of the portfolio, which guides and prioritises our action plan for the sites. We train and certify local contractors and employees to survey the sites. The data gathered is
fed to our in-house team who create an analysis and design solution for each site. Reports are tailored to suit our customers’ needs from basic summaries through to full rectification instructions and bills of materials.

Part of our solution is to arrive at a certificate of conformity when we know 100% that the site is okay. We will give clients a report detailing what and how to improve, then we will sign off on a local contractor for them, then certify the structure on a scale from ‘gold’ to ‘white’. For gold certification we go and inspect the site ourselves, silver is checked by one of our approved contractors, bronze is certified by the client’s contractor and for white certification the client details what they have done and we take their word for it. Unsurprisingly everyone wants gold level certification once they have committed the time and funds to the upgrades. They can take the certificates to the bank for investment for the future as our certificates are well known in the market.

TowerXchange: So tell us about the full benefits of certification?

Spencer Crawford-White, CTO, Delmec Engineering: A reduction in insurance premiums, ability to increase borrowings, getting a higher (and more reliable) calibre of customer. MTN, Tigo or Vodafone want to protect their network and they’re looking for something of this standard, which is important to ensure their SLAs are met. It’s also very useful for further investigation – we receive a 40% return rate of business, so having that data in our system means it can be very quick for us to help customers know how they can maximise their assets.

The site owner is responsible for safety and security of the site, whether they are independent owners, towercos or mobile network operators, certification gives them peace of mind.

TowerXchange: Who should use an asset register auditing service and why is it important? When is it most effective to review an asset register?

Spencer Crawford-White, CTO, Delmec Engineering: Commercially, of course, it’s critical. Maintaining an accurate asset register is critical when aiming to maximise a tower portfolio’s earning potential and capacity.

Accurate asset registers are also important for safety – keeping an accurate accident register is vital. Commercially, of course, it’s also critical.

When should they be reviewed? If you look at the standards there are significant variations across the type and location of a structure. Yearly inspection should really be the norm, but certain clients could see that every couple of years is enough. Some might leave it five years but in our experience it’s a lot cheaper and more effective to keep on top of problems as they arise than to wait for something serious and risk having to make major repairs or even replace infrastructure.

Meetup MENA 2019
29-30 January, Dubai
Meetup Europe 2019
9-10 April, London
Meetup Americas 2019
9-10 July, Boca Raton
Meetup China 2019
August, Beijing
Meetup Africa 2019
8-9 October, Johannesburg
Meetup Asia 2019
3-4 December, Singapore

www.towerxchange.com
In poor or unstable grid scenarios, batteries installed on cell sites are regularly subjected to uncontrolled partial state of charge (PSOC) conditions and medium to high cyclic use. This, coupled with the often high ambient temperatures at such sites, puts significant stress on the energy storage system in place. Enersys’ deep discharge capable batteries have had significant success in other applications and the company is now introducing their PSOC capable Genesis EP battery to the telecom market. TowerXchange speak to Enersys, one of the global leaders of energy storage solutions to learn more.

Keywords: Batteries, Capex, Energy, Energy Efficiency, Energy Storage, Enersys, Monitoring & Management, Outdoor Equipment, ROI, Unreliable Grid, Who's Who

Read this article to learn:
- Enersys’ history and experience in the telecom sector
- How Enersys’ Genesis EP battery is ideally suited for unstable grid conditions
- Key factors to consider in TCO calculations and battery selection
- Theft protection systems inbuilt into Enersys’ cabinets
- How remote monitoring and control systems enable better battery management

TowerXchange: Please can you provide an introduction to EnerSys® for those who are not familiar with the company?

Anssi Laitinen, Marketing Director, Reserve Power EMEA, EnerSys: EnerSys is the global leader in stored energy solutions for industrial applications. We manufacture and distribute reserve power and motive power batteries, battery chargers, power equipment, battery accessories and outdoor equipment enclosure solutions to customers worldwide.

Motive power batteries and chargers are utilised in electric forklift trucks and other commercial electric powered vehicles. Reserve power batteries are used in the telecommunication and utility industries, uninterruptible power supplies, and numerous applications requiring stored energy solutions including medical, aerospace and defence systems. Outdoor equipment enclosure products are utilised in the telecommunication, cable, utility, transportation industries and by government and defence customers. EnerSys also provides aftermarket and customer support services to customers from over 100 countries through our sales and manufacturing locations around the world.

We have extensive long term experience in power management in Middle East and African telecom backup power applications. EnerSys has also introduced many innovative solutions, such as SBS® EON Technology® batteries that provide up to four times more cycles than the standard Absorbent Glass Matt (AGM) batteries in hybrid applications.
We have recently introduced a PSOC capable Genesis EP® battery which is based on thin plate pure lead technology and has enhanced the ability to recover from deep discharge. This helps in case the battery has entered to this state of discharge, which is quite common in these grid type conditions.

In the off-grid scenario we typically find a diesel generator and battery as a 'hybrid' solution. The hybrid solution can also incorporate renewable energy sources such as a wind turbine or photovoltaic array. Warm ambient temperature and regular cyclic use in the off-grid scenario place again different demands for the battery. Understandably it is challenging to choose the right battery, and in addition one needs to also consider related equipment such as outdoor enclosures. A one fit for all approach does not work in these scenarios.

In terms of reducing the total cost of ownership of power management there are multiple choices available for equipment such as cabinets, cooling and rectifiers. How does the choice of each affect costs and what recommendations does EnerSys have?

Anssi Laitinen, Marketing Director, Reserve Power EMEA, EnerSys: This is a question that may need a webinar or a lecture to answer in detail, but I will try to provide a short answer here.

TowerXchange: Considering that poor-grid is still quite common in most parts of Africa what new solutions are available for sites situated on poor-grid? How extensively have these been deployed?

Anssi Laitinen, Marketing Director, Reserve Power EMEA, EnerSys: When there is a poor or unstable grid this often means that there is a condition that we call uncontrolled cyclic use of batteries. Very often there is also a warm ambient climate. The battery solutions available should match to the uncontrolled partial state of charge (PSOC) conditions and the medium to high cyclic use of the battery. We have recently introduced a PSOC capable Genesis EP® battery which is based on thin plate pure lead technology and has enhanced the ability to recover from deep discharge. This helps in case the battery has entered to this state of discharge, which is quite common in these grid type conditions. EnerSys has earlier introduced these type of deep discharge capable batteries in other applications such as renewables and home energy storage, and now we are introducing this to the telecom environment.

TowerXchange: Why is it imperative for tower companies and operators to consider the location of the towers when deciding on their choice of batteries? How does grid availability and reliability affect battery choice?

Anssi Laitinen, Marketing Director, Reserve Power EMEA, EnerSys: In general, the grid connectivity or lack of it can be divided to three main areas: in the stable grid environment there is only minimal cyclic use for batteries and a relative stable ambient temperature. The stable grid does not necessarily demand a battery compatible with harsh conditions.

The unreliable grid may need a battery capable of withstanding partial state of charge and to handle more repeating cycles.
installation and overheads. The Opex (Operating Expenditure) costs then cover energy consumption and maintenance of the backup power solution. We have TCO (Total Cost of Ownership) calculators in place for discussion with our customers to assist them with their choices.

However, in the hybrid scenario, the generator maintenance costs and the fuel savings and site visit costs are important considerations. The battery needs to recharge quickly and withstand the high cyclic use. The EnerSys hybrid calculator provides guidance for even the most complex total cost of ownership questions.

The cabinet TCO calculations are covering the capital and operating expenditures but are also based on the following criteria: need for equipment protection in general, free cooling, air conditioning and need for anti-theft features. The outside temperature places demands for the cabinet and cooling method choices. In comparison with batteries, one deployment strategy rarely fits. You will need to consider the need for cooling batteries and other equipment such as rectifiers and power equipment. Some batteries can withstand higher temperatures so you may not want to have the most expensive cooling method, however, in the hybrid scenario the cycles may kill the battery before the temperature element starts to affect the battery life.

TowerXchange: Battery theft is a major issue at the moment. Are there new ways to combat this?

Anssi Laitinen, Marketing Director, Reserve Power EMEA, EnerSys: There are two ways to look at battery theft from the site operations perspective. If the strategy is to retrofit existing sites with battery protection, then we have battery protection alternatives. If however you want to start a green field operation and need both new battery cabinets and batteries, our outdoor enclosures can provide anti-theft features today.

There are more than half a dozen different protection features available in our cabinets. Thus if you are considering a new site with new cabinet options then you should look at the anti-theft features available both in the cabinet and in the batteries.

TowerXchange: Should tower companies look at remote monitoring of batteries and what benefits this will bring?

Anssi Laitinen, Marketing Director, Reserve Power EMEA, EnerSys: Most definitely they should. With remote monitoring, one reduces the need for site visits. Many industries are already using remote monitoring of their equipment. The benefits are key here with the protection of assets. This can be 24/7 and this can be crucial for instance in the hybrid-off grid scenario as in these sites the backup power solutions provide for the real operation of the site, hence the need for better monitoring. There are additional benefits available if one wants to consider even more advanced solutions: remote management. Instead of sending someone on site, the voltage of a battery can now be corrected remotely, saving an unnecessary site visit.
Enough is enough: why you shouldn’t put up with poor rectifiers any more

You wouldn’t keep a car which kept breaking down, so why do so many tower owners battle on with sub-par rectifiers?

In an industry where towercos are spending as much as 60% of their opex on fuel consumption, capex-heavy investments such as deploying solar power or switching from lead acid to lithium batteries can help them to make gains and improve margins as they decrease their reliance on an unpredictable fuel supply chain. However, as much as towercos might spend on their power systems, they have still had to put up with unreliable rectifiers which have struggled to cope with the dust, heat and humidity at many locations. According to Mattias Karlsson, Vice President eSite at Flexenclosure, as many as 20% of rectifiers can fail each year in off grid and poor grid locations across Africa, Asia and the Middle East, adding costs through downtime, replacements and man hours across the maintenance cycle.

**Keywords:** Africa & ME, Batteries, Burkina Faso, Capex, DG Runtime, ESCOs, Energy, Energy Storage, Flexenclosure, Fuel Security, Lithium-ion, Off-Grid, Opex Reduction, RMS, ROI, Rectifiers, Renewables, Risk, Skilled Workforces, Solar, Unreliable Grid, Uptime

Read this article to learn:
- Why rectifiers aren’t performing in developing markets
- How the industry has been coping with poor rectifier performance to date
- What solutions can make a difference
- How a sealed system can deliver results for off grid and poor grid sites

Towercos, particularly those in emerging markets, are under two competing pressures: the need to offer a reliable service to their tenants – to meet SLAs and to create resilient and robust networks – and the downward pressure on pricing driven by huge leaps in data consumption with static or declining ARPUs. This pressure to deliver uninterrupted uptime while at the same time needing to drive down opex, is forcing towercos to re-evaluate their operations and maximise performance.

The environment at sites in much of Africa and parts of Asia and Latin America is tough: they are typically hot and dusty, often with high humidity. To make matters more difficult still, the electrical environment – both from poor grid supply and from diesel generators – is very inconsistent, with ageing gensets often producing damaging voltage spikes.

To date, most of the rectifiers in the market have been designed for indoor, on-grid use in developed markets like Europe or the USA and have been designed under the assumption that they would be working with a high quality and consistent power supply – something which simply doesn’t exist in most developing nations. They’re also often being repaired or maintained by field teams who lack the appropriate specialist training. If towercos can’t rely on rectifiers to get uninterrupted DC power it has an immediate effect on uptime, meaning their bottom line is hit by both the cost of replacement...
or repair and penalties imposed by their tenants as part of their SLAs. Even if a failure doesn’t lead to downtime, it will result in higher operational costs as batteries and generators won’t be performing optimally, creating a lot of pain for the site owner.

Mattias Karlsson thinks the problem comes from how telecoms infrastructure has evolved. ‘Telecoms first rolled out in Europe and the US in nice and reliable on-grid areas, and that’s what the technology was developed for. When wireless communications rolled out in less developed countries, the suppliers in those markets tried to create the illusion of a safe indoor setting by putting low cost indoor rectifiers inside a cabinet. The fact is though that even protected by a cabinet, these rectifiers simply aren’t robust enough for the more extreme operating environments that their cabinets were put in. But with no alternative available, towercos had no option but to accept the situation and try to push away the pain of dealing with rectifier failures to their suppliers.’

**Why hasn’t a solution been found before?**

Rectifiers are delicate bits of kit in terms of power generation, more prone to falling foul of the local climate than batteries or gensets. With cabinetry offering limited protection, the scope of solutions to address the problem was also limited so nothing much changed.

In addition, the problem was perpetuated by the way that RFPs and many procurement functions were set up. With no accepted alternative in place, RFPs based around traditional power systems requested the same elements and configurations that had always been used and didn’t leave much room for innovation in terms of the whole power system. And introducing something completely new would take time to find acceptance in slow moving supply chains.

The result was that towercos had no alternative but to accept poor rectifier performance as the status quo. With the available solutions having been created for other environments, expectations were low in terms of how fit for purpose they could be. However, Flexenclosure has been working to change this. ‘No one really looked at sub-Saharan
Africa with a view to designing and building solutions specifically for that market,’ says Karlsson. ‘So that’s exactly what we’ve done. We solved a problem that towercos in developing nations face every day, with a solution specifically designed for them and the very difficult environments in which they operate.’

What’s the solution?

Thanks to Flexenclosure’s extensive experience working in off-grid and poor grid areas, there is now a much better solution for this. They redesigned every component from the ground up – specifically to withstand the harshest possible conditions – and then encased the electronics in a totally sealed box, thus creating a true outdoor product which will never be exposed to dust or humidity and is completely tamper-proof. Their eSite x10 site power solution is designed to address fluctuations in voltage, varying environmental conditions on site and is purpose built for the market.

‘People have tested so many brands and types of rectifier and they all fail in the same way, so why should they trust us?’ challenges Karlsson. ‘They need to see how radically different our solution is. If we think back to the days of rotary dial telephones, if someone had come along then and said ‘you don’t need that any more, here’s an iPhone’ we would never have believed it. But that’s what we’re doing with our eSite x10 as it’s so fundamentally different to how site power has been done in the past. We’ve completely overcome the technology issues. The challenge now is to help towercos in developing nations understand that they really don’t have to put up with second-best anymore.’

Where is it working?

‘In the three years since we launched eSite x10 and started to deploy it across Africa, the Middle East and Asia, we’ve had zero failed rectifiers. It is deployed in around 20 countries now and we’ve had no failures in that entire time,’ stated Karlsson.

Operationally, around 20% of rectifiers in off-grid and poor grid locations are replaced every year, so
Flexenclosure’s initial findings support their belief that the eSite x10 solution could completely change the game in terms of rectifier performance.

But that’s not all – when Flexenclosure works with a towerco, their eSite x10 systems connect to a server and their built-in eSite Tools RMS collects data which can support customers in optimising their power performance at a site level. Flexenclosure has found ESCOs in particular have understood the benefits of the eSite Tools offering as they seek to further optimise their operational spend.

‘We worked with an ESCO in Burkina Faso, across different sites with batteries or solar depending on grid availability, and then used our eSite Tools RMS data to optimise the settings not for the network as a whole but for each and every individual site. This ability to monitor and fine-tune performance at a site level will make a big difference, not just to fuel consumption or maximising battery life, but to an ESCO’s overall profitability,’ added Karlsson.

**Site data: an added benefit**

While the eSite x10 is maintenance free, with no filters or fans to maintain, it can also drive down maintenance needs for the rest of the site by improving operational performance. One major benefit of such a robust rectifier is that it can significantly improve the efficiency of a site. ‘In a standard system, the rectifier can only harvest power from the grid when the supply is good, whereas eSite x10 can safely and effectively harvest any available power regardless of how bad the grid is. This can mean that at some sites a genset isn’t needed at all,’ says Karlsson.

Flexenclosure has patented its own inbuilt ATS, which protects the system and makes intelligent decisions about when to switch between grid and genset power. It can also log all grid parameters so it’s possible to track exactly how the grid is behaving. This is a powerful tool for towerco’s or operators when they're negotiating with their grid power supplier, as they can show what they're actually receiving versus what they are paying for.

‘Customers want reliable site data,’ says Karlsson. ‘We can show in real time how the grid is performing and the data we collect can help site owners make important decisions for investment in battery capacity. eSite Tools not only measures ROI on our x10 system, but on the peripheral equipment they already have, meaning we can offer solid data analysis which will help overall site planning decisions. We see towerco’s asking for this kind of information, and the transformative power of our optimised data and reports where it’s implemented.’

As with all cutting-edge technology, Flexenclosure anticipates it will take some time for this solution to change the mindsets of towerco’s and operators who have been working in the same way over the last two decades. But with the evidence speaking for itself, there’s no doubt that the eSite x10 will change the game in terms of improving the reliability and efficiency of tower power across off-grid and poor grid locations worldwide.
GRIDSERVE® develops best in class ‘SEC12’ plug and play hybrid solution that eliminates installation and maintenance challenges

Hybrid energy innovator leverages unique modelling capability to forecast up to 95% opex reduction

GRIDSERVE® develops best in class ‘SEC12’ plug and play hybrid solution that eliminates installation and maintenance challenges

Hybrid energy innovator leverages unique modelling capability to forecast up to 95% opex reduction

Hybrid energy can deliver transformational opex savings in telecom, but advanced solar power systems are notoriously difficult to install and maintain. In response to some tough lessons learned in Nigeria, GRIDSERVE has developed a genuine plug and play solution that could push out maintenance visits from monthly to every 18 months. To understand the origination and specification of the unique 12kW(dc) Solar Energy Centre (SEC12), TowerXchange spoke to GRIDSERVE’s CEO – APAC Heston Harper.

Keywords: Bankability, Batteries, DG Runtime, Dimensioning, ESCOs, Energy, Energy Efficiency, Energy Storage, GRIDSERVE, Hybrid Power, Installation, Lithium-Ion, Logistics, Multi-Region, O&M, Opex Reduction, RMS, ROI, Rectifiers, Renewables, SEC, Site Visits, Skilled Workforces, Solar, Spare Parts, Who’s Who

Heston Harper, CEO – APAC, GRIDSERVE: In 2016 our team won a contract with one of Africa’s largest tower companies to supply energy equipment to 2,000 cell sites in Nigeria. The dialogue started in January but negotiations dragged on and ultimately we didn’t get the purchase order until August – with a delivery deadline just four months later! It was an astronomically large order: 50 sea containers of solar modules, 130 containers of batteries, gensets from Italy... 280 sea containers in total. Despite the compressed lead time, we worked round the clock to deliver everything on time and on budget.

However, after we overcame the delivery challenges, we encountered the struggles of integrators and installers in Africa. We’d send clear instructions on how to install the equipment, but they’d ignore them – I remember seeing one site where they had welded the battery to the masthead of the engine!

That equipment is still running successfully on 2,000 sites in Nigeria, but the project taught us that we needed a solution to the installation and maintenance challenges of deploying hybrid power systems in Africa.

TowerXchange: Tell us about the origins of your unique plug and play solution, and your experiences working with an African towerco?

TowerXchange: How have your experiences working on that large emerging market project refined your understanding of the market need for a plug and play solution like the SEC12?
Heston Harper, CEO – APAC, GRIDSERVE: For decades we’ve had MNOs and managed services providers ringing us up complaining that batteries are failing in as little as two years, yet when we explore the situation we find that there might be no diesel in the fuel tank due to theft, or the air conditioning hasn’t worked for nine months, or the rectifiers are not giving the appropriate charge – yet it is always the batteries that are blamed!

The reality is that a disparate supply chain serves most emerging market cell sites, and experience of installing and maintaining hybrid energy systems is still in short supply. When we examined those first-hand experiences, and our experiences in Nigeria, they led us to the conclusion that we needed to develop a fully integrated, containerised solution where we could optimise the selection and integration of best-in-class components. And those experiences collectively led us to design the SEC12.

Typically you might find the power systems at a cell site come from a variety of suppliers for the control system, rectifier, solar array, batteries and fuel tank.

**Heston Harper, CEO – APAC, GRIDSERVE**

“He swore he would never build another business dependent on fossil fuels. So in 1977 my father envisioned some of the very first energy efficient housing concepts, and he founded Solar Energy Centre. I remember he told us he started selling solar at US$77 per Watt – now we’re selling at sub 40 cents per Watt! Solar Energy Centre became SEC – a family owned business specialising in supplying solar panels and batteries – and we supplied components worldwide for 40 years. We were the first foreign battery manufacturer to sell to NTT in Japan, and SEC still provides the batteries for all the trackside communications for Network Rail today.”

“My father Brian Harper was an entrepreneur who at first specialised in the plastics needed to build petrol stations, but the oil crisis in the 1970s nearly brought his company to its knees,” his son Heston Harper, now CEO – APAC for GRIDSERVE, told TowerXchange.

“Over time solar panels and batteries became increasingly commoditised, and we struggled to maintain margins and volumes. When my father passed away five years ago, it was time to take stock, modernise and reinvent the brand. We migrated to the cloud. We transitioned to lithium ion, and ultimately we decided to launch GRIDSERVE, a plug and play, integrated turnkey power solution provider.”

Toddington Harper runs the GRIDSERVE business in EMEA from Iver in Buckingham, UK, while brother Heston runs the APAC business out of Hong Kong. They’ve also headhunted David O’Connor and Ian Stamp to lead sales and business development respectively.

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**GRIDSERVE – energy efficiency is in the family**

“Off grid macro economics”

**10 Year Network Wide TCO Savings**

<table>
<thead>
<tr>
<th>Number of BTS</th>
<th>SEC 12 6.6kW</th>
<th>SEC 12 4.4kW</th>
<th>SEC 12 2.2kW</th>
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<tr>
<td>1000 BTS</td>
<td>$50 Millions</td>
<td>$40 Millions</td>
<td>$30 Millions</td>
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<tr>
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<td>$10 Million</td>
<td>$8 Million</td>
<td>$6 Million</td>
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<tr>
<td>10 BTS</td>
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<td>$1.2 Million</td>
</tr>
<tr>
<td>1 BTS</td>
<td>$0.2 Million</td>
<td>$0.16 Million</td>
<td>$0.12 Million</td>
</tr>
</tbody>
</table>

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Integrating and getting all these diverse components to talk to, and work optimally with each other is challenging. We wanted to be proactive not reactive to these challenges, so we came up with the concept behind the SEC12: a genuine ‘plug and play’ turnkey solution to the extent that the end user just needs to lay a concrete plinth, we send you a unit ready to plug in.

There are sensors everywhere in the SEC12 which, in accordance with the level of importance, will raise any performance alarms with the local field office – for remote or onsite fix – or escalation to our NOC in Iver (UK). While the SEC12 is specified to achieve an incredibly long maintenance window, the reality is that these units will often be helicopter lifted into remote locations, so if you do need to send a maintenance team, it is essential they show up equipped with the right parts and knowledge as to what needs servicing.

**TowerXchange:** Can you tell us more about the specifications of the SEC12 that maximise autonomy and minimise site visits?

**Heston Harper, CEO – APAC, GRIDSERVE:**
Everything is contained in one box: the remote monitoring system, air conditioning, a Vertiv control unit, atmospherics, and a double bonded, sensor-fitted fuel tank with a 600, 1200 or 1800L capacity. We use a sophisticated DC genset from a world-leading third party partner. We have strong supply relationships with LG and Samsung for their Lithium-Ion batteries, selected because they offer the best combination of performance, cycle-life, longevity, and lifetime cost.

We can provide canopy, ground or unit-mounted bifacial solar panels. We have found that bifacial solar panels can increase yield by as much as 30%, which is why the tops of our units are now painted white to maximise albedo (“light bounce”).

**TowerXchange:** Why use a 12kW genset for a cell site with as little as a 1.5kW load?

**Heston Harper, CEO – APAC, GRIDSERVE:** We deduced that a 12kW DC generator is optimal for maintaining overall system performance and efficiencies for hybrid telecom BTS power solutions. As an example, having more power available than...
the load requires enables us to charge batteries faster than would otherwise be possible, and this means less running hours for the genset. When we combine this with solar and a relatively large battery bank it’s possible to go for days without ever turning on the genset, and the combination of all these factors is how we are able to both reduce running costs and extend maintenance timeframes so dramatically.

TowerXchange: How do you simplify logistics and the customisation/expansion of the power system as the load changes?

Heston Harper, CEO – APAC, GRIDSERVE: We’ve been very focused on genuinely realising the ‘plug and play’ concept – making the SEC12 an ‘off the shelf’ solution in a market that historically has been anything but ‘off the shelf’! But of course, we still had to make it customisable to suit different logistical and power requirements.

The SEC12 can be made available fully containerised to transport, whether fork-lift, crane lifted or helicopter dropped to site, or it can be provided flat-packed for sites where the last mile delivery can be by donkey or even by hand.

The power and energy storage capacity itself is provided in modular format – fully customisable to different and changing power requirements.

TowerXchange: How is GRIDSERVE able to so confidently model and forecast the total cost of ownership of your solutions over a 10-25 year period?

Heston Harper, CEO – APAC, GRIDSERVE: Our team has an enviable track record in delivering hundreds of megawatts of large scale solar and utility scale battery projects for investors. This requires sophisticated and ‘bankable’ technical and financial modelling capabilities, which we have now also customised for the benefit of our SEC12 customers.

We understand our modelling capabilities to be at the forefront of what has ever been seen in the telecom power area, and this provides invaluable business intelligence to both ourselves and our customers. We have a proprietary in-house developed model that processes gigabytes of business intelligence including: modelling projected sunshine levels on an hourly basis throughout the year for any location on earth; albedo effects; lifetime energy storage cycles; degradation levels; generator efficiency and fuel consumption, temperature, and many other factors. These collectively enable us to size plant and forecast financial returns, yields, risks and build mitigation models.

This foundation enables us to build highly predictable, bankable business models for the deployment of the SEC12. By simply entering a cell site’s load profile, grid-co-ordinates and currency into our model, then adjusting parameters according to the client’s priorities (are you focusing on opex reduction, service intervals etc?) we can forecast a 25-year life on our kit, we can tell how long the batteries will last, and we can customise and send it ready to go.
currency into our model, then adjusting parameters according to the client's priorities (are you focusing on opex reduction, service intervals etc?) we can forecast a 25-year life on our kit, we can tell how long the batteries will last, and we can customise and send it ready to go.

Once installed, we can dial in and monitor the performance parameters, for example tracking the depth of battery cycles, enabling us to schedule predictive maintenance.

**TowerXchange: That confidence in modelling Total Cost of Ownership (TCO) over 10-25 years sounds particularly useful for the emerging telecom Energy Services Companies (ESCOs). Do you see GRIDSERVE as a potential future ESCO or as a partner to ESCOs?**

Heston Harper, CEO – APAC, GRIDSERVE: GRIDSERVE itself is well-financed, and with a background and considerable expertise in in financing power projects, we are well positioned to deliver both capex or opex models: lease-hire or selling on a consumption basis – we’re exploring all sorts of business models with multiple funding partners.

But we’re more likely to be a partner to ESCOs than to start up our own ESCO proposition. We continue to find that many towercos remain a little wary of ESCOs, preferring to keep energy efficiency products in-house. In such scenarios, GRIDSERVE can provide them with high level access from their own NOC, and potentially deliver bespoke funding to suit particular customer requirements.

**TowerXchange: What sets apart GRIDSERVE from alternate hybrid energy solution providers?**

Heston Harper, CEO – APAC, GRIDSERVE: It’s the unique combination that really differentiates GRIDSERVE, from the best-in-class nature of every single component in the SEC12, our unique modelling capabilities, the genuine turnkey plug and play nature of the SEC12, the full system warranty, our heritage in renewable energy which means we truly understand lifecycle modelling and bankability, and ultimately our desire to exceed expectations in every area.

The way we select and integrate our equipment also makes us nimble and future proofed. For example, we invested millions into lead acid, but we weren’t ever wedded to the chemistry, and with the emergence of competitively priced lithium ion we’ve transitioned. We also always remain on the lookout for further innovations that can improve performance, and provide greater benefits for our customers.

We’re confident that the SEC12 is in pole position compared to other containerised telecom power systems in terms of delivering the lowest fuel consumption, lowest DC ripple, longest potential maintenance intervals, pretty much all the key metrics in fact. That said, we believe there is no-one else really offering a single fully integrated solar hybrid – most alternate solution providers specialise in one or more aspects such as manufacturing control equipment or gensets, whereas GRIDSERVE’s specialism is turnkey plug and play.

**TowerXchange: What does that translate to in terms of TCO savings?**

Heston Harper, CEO – APAC, GRIDSERVE: On a portfolio of 500 off-grid BTS, using GRIDSERVE could yield a US$35-$45mn saving, depending on load, over a ten year period. We’re using a free feedstock (sunlight) which can enable up to a 95% reduction in opex.

Diesel is costly of course not just in direct cost but in maintenance. DG runtime in emerging markets might mean in best case scenarios a standard cell site might require one site visit per month – under the right circumstances we’re aiming to push that out to one site visit every 18 months!
Kingdom, infrastructure experts, ieng Group, expand their support to the telecom industry.

Leading turnkey infrastructure provider ieng Group has further expanded its capabilities in tower design, power system provision and tower services through the integration of GreenPole and Eki.Struct and formation of their new ESCO sister company, CREI. TowerXchange speak to ieng Group’s Co-CEO, Kadri Hakim to catch up on the company’s latest developments and how ieng Group is strengthening its position as an invaluable partner to the African and Asian telecom markets.

**Keywords:** Africa, Camouflage, Capacity Enhancements, CREI, Densification, Eki.Struct, Energy, ESCOs, GreenPole, ieng Group, Multi-Country Partner, Network Rollout, O&M, Site Surveys, Urban vs Rural, Who’s Who

TowerXchange: It was a while since TowerXchange last interviewed ieng Group and the company has expanded and integrated new companies since then. Please can you introduce i-eng Group and its subsidiaries.

Kadri Hakim, Co-CEO, ieng Group: ieng Group is a leading turnkey infrastructure solution provider active in both the African and Asian market providing end-to-end engineering infrastructure solutions to the telecommunications and power industries. The company was founded in 2007, initially focused entirely on EPC (site build and refurbishment), and then in 2009-10 we moved into also providing O&M services to the telecom sector. We now have 11,000 sites under management with plans to increase this to 20,000 sites by 2020.

ieng Group has recently integrated tower design and manufacturing business, Eki.Struct into our group. Eki-struct produces a broad array of different tower designs; from lattice, tubular and hybrid (a combination of angular and tubular towers) solutions to low cost, quick deployment towers and camouflage designs. With a fully-fledged design and engineering office in Croatia, adopting a customized approach to designing towers for our clients, Eki. Struct has acquired more than 120 tower structure certifications for various clients across the globe, from a library of more than 200 solutions.

In addition to Eki STRUCT, ieng Group recently integrated power business, GreenPole into the group. GreenPole designs and co-manufactures intelligent hybrid power systems for telecom clients across the globe. Our system combines battery power cabinets

Read this article to learn:
- How ieng Group’s structure, subsidiaries and service offerings have expanded
- The role that ieng Group is playing helping operators improve rural coverage
- Details of Eki.STRUCT’s Multi-Tenant modular solution and how it can revolutionize the way Towercos specify sites
- ieng Group’s ambitions in the ESCO market
with gensets and/or grid connection, with our smart controller allowing for remote monitoring, control and optimization of the system.

ieng Group is also expanding into the ESCO space through our new sister company, CREI which has entered into negotiations with telecom companies in multiple markets.

Headquartered in Lebanon, ieng Group has a presence in 20 countries (figure one), employing over 1,500 staff. The integration of Eki.Struct and GreenPole and creation of CREI enables ieng Group to offer a more holistic service offering to the industry (figure two).

TowerXchange: There is a major focus in Africa at present on improving rural coverage, something that ieng Group is heavily involved in. Please can you tell us more about this?

Kadri Hakim, Co-CEO, ieng Group: In Africa, all MNOs are focused on finding ways to access the 20-30% of the population that they are yet to connect, most of which live in rural and remote areas. With typical high sites costs being around US$80-100k to build with an annual opex of around $1500-2000 (depending on the country), the revenue that could be generated in such rural and remote areas would not be sufficient to cover costs.

We have developed the ieng low cost rural (iLCR) and ieng ultra low cost rural (iULCR) sites to address this area of the market. The solutions, combining both active and passive infrastructure as well as a power source (solar) can deliver coverage for dramatically

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**Figure one: ieng Group’s geographical footprint**

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**Figure two: ieng Group’s range of telecommunication services**

<table>
<thead>
<tr>
<th>Network deployment</th>
<th>Fibre optics</th>
<th>Managed services</th>
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<td>Site planning, acquisition and property services</td>
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<td>Design engineering and construction</td>
<td>Testing and commissioning</td>
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<td>Towers and masts solutions</td>
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lower capex and opex. Our iLCR sites, which cover a radius of approximately 15km cost US$50k to build, whilst our iULCR sites which cover a radius of around 3km cost US$35k, including passive and active material; both have an opex of around $400-500 per month. As simpler systems, deployment is rapid, with it taking around a week to build a site.

Different contractors are offering a range of different business models to operators to deploy low cost rural sites. A large number of players offer a revenue sharing model, others offer a pure capex model and others offer an opex model. ieng Group offers the capex model to MNOs, with some opcos opting for a capex model and others opting for opex and revenue sharing models.

With operators competing to cover rural areas in Africa, we are getting a huge amount of interest in our iLCR and iULCR solutions and we expect demand to continue to increase dramatically over the next 3-5 years. There is a big race between operators to be the first into a given market, capturing market share ahead of their competitors.

TowerXchange: What about new build outside of ultra-rural areas, have you seen this picking up in Africa? What demands do you see from clients and how is ieng Group addressing these?

Kadri Hakim, Co-CEO, ieng Group: We have seen new build picking up across Africa; the market is turning a corner following the recession and 4G rollout is requiring an increased number of sites.

In terms of requests from clients, the one constant is the need to push down prices. For this, you need to take into consideration both the tower structure and the foundations. Eki.struct tower designs are particularly efficient, being able to take the same load whilst using less steel. In terms of foundations we have explored different options including towers that are up to 55m high without conventional foundations. In this instance, boxes filled with stones at each of the corners are used in place of concrete foundations. The result is that the sites are much quicker to deploy with a lower TCO, such sites are useful in rural areas.

In urban areas we’re seeing increased rollout of sites to improve capacity for 4G and even for 3G. We see lots of demand for monopoles with a smaller footprint (although these are typically more expensive than angular towers), as well as for demand for alternative structures such as advertising boards and street lights. We are currently looking at the potential to develop a smart street pole solution.

TowerXchange: Ease of upgrade is an important feature in tower designs, particularly for Towercos whose business model is predicated on securing additional tenancies. Can you tell about Eki.Struct’s multi-tenant modular solution and the benefits this can offer?

Kadri Hakim, Co-CEO, ieng Group: Our Multi-Tenant modular, is a single tenant tower which is upgradable to a two, three or four-tenant tower in a single day. This allows Towercos to deploy towers with lower initial capex, safe in the knowledge that they are able to upgrade them to sites capable of hosting multiple tenants within just a few hours. It is a groundbreaking solution for Towercos, allowing them to deploy lower capex solutions without slowing their ability to add further tenants. Towercos save around 15-20% on capex by deploying a single tenant tower and only need to pay the additional amount when upgrading to multiple tenants. This generates considerable savings for the Towerco and changes the way that Towercos prepare for tower specifications.

TowerXchange: And finally, looking more towards the power side, we have seen ESCO activity picking up considerably in the telecom sector at present with several contracts now signed and further RFPs live. Can you tell us more about ieng Group’s ambitions in the ESCO market?

Kadri Hakim, Co-CEO, ieng Group: ieng Group has formed our new ESCO sister company, CREI which stands for Communication and Renewable Energy Infrastructure. CREI has been involved in pilot projects in Afghanistan and Myanmar and we are also participating in a number of RFPs, hoping to be able to make some announcements this year.

Whilst it is not a requirement, our expectation is that we will use GreenPole power equipment in our projects, whilst also leveraging ieng Group’s extensive field experience in operating sites. We offer both an ESCO model and a guaranteed savings model to the market, anticipating that Towercos will have a stronger appetite to invest the capex themselves and opt for the guaranteed savings model, whilst MNOs will lean more towards the ESCO model (although there are always exceptions!)
Unlock a million dollars in hidden savings by streamlining site operations

Infozech’s CEO describes how the company’s easy to use and cost-effective platform incorporates all phases of site management into a single enterprise solution

With a keen focus on an easy to use and cost-effective platform, Infozech has an impressive record of deploying IOT and site management solutions for various telecom infrastructure companies and operators across the globe. Infozech manages over 150,000 tower sites, tracking over 42 million litres of fuel per year, reconciling bills worth US$228 Million, reconciling 7.6 million+ assets. TowerXchange speak to Infozech’s CEO, Ankur Lal to understand how Infozech solutions are generating value for the telecom industry in terms of revenue assurance, operational efficiency and cost optimisation.

Keywords: Africa, Asia, Asset Register, Energy, Infozech, KPIs, Logistics, Monitoring & Management, O&M, Operational Excellence, QoS, RMS, Site Level Profitability, Site management system, Site Visits, SLA, Who’s Who

Read this article to learn:
- The different modules in Infozech’s site management platform
- How Infozech support tower owners in better management of their billing
- Ways that Infozech enables tower owners to streamline tower operations and optimise costs
- The sorts of savings that can be achieved through their platform
- Why it makes sense to outsource your IT to a third party

TowerXchange: Please introduce Infozech’s site management platform and what parameters it is able to manage and monitor?

Ankur Lal, CEO, Infozech: Monitoring tower sites from a centralised location is becoming increasingly difficult with growing networks, increasing OPEX and significant security threats. Poor maintenance of assets and non-visibility on energy consumption only add to the complexity. Profits are getting leaner and SLAs tighter. Infozech’s end-to-end site management solution (iTower) built on a unified platform could be the solution for tower infrastructure companies’ concerns.

We have developed an enterprise solution - iTower box for telecom tower infrastructure companies which incorporates complete tower site lifecycle management from site acquisition to decommissioning of the towers. iTower expedites efficient operations, cost optimisation and revenue assurance for tower operators and managed service providers. It is a purpose-built solution designed with highly effective field management processes in mind. It unifies the field force by providing a flexible platform for users to collaborate and manage projects from one source, while capturing detailed data and real-time site activity. iTower’s data validation layer helps reduce common data errors, omissions that stand in the way of efficient field operations and provides the relevant insights through a dashboard.

The primary concerns in streamlining site operation are an asset’s visibility, efficient field...
operations, security assurance, optimisation of energy consumption, accurate invoice generation and well-maintained remote sites. Infozech’s iTower manages and monitors all of these essentials to assist tower operators in achieving operational excellence, reducing OPEX and optimising CAPEX.

**TowerXchange: Please explain some of the challenges that tower owners face in collecting revenues from tenants and the role that your platform plays in addressing this.**

Ankur Lal, CEO, Infozech: For any telecom tower operator to sustain and grow, billing/invoicing has been playing a vital role. It not only helps invoice the customers and collect revenue but also helps maintain a dispute free relationship with the tenants.

Telecom passive infrastructure companies receive large sums of money from the tenants for infrastructure management and energy consumption on a monthly basis. In India alone, this number is about US$310 million/month inclusive of infrastructure (physical asset) as well as energy usage (power) charges. With such large scale billing, there are bound to be inefficiencies in the billing protocol if handled manually or excel based or ERP. The inefficiencies in billing occur due to:

- Complex MSAs and multiple billing contracts with the same tenant on a different set of sites
- Unauthorised charging
- Sites being invoiced/billed on incorrect asset data
- Manual bill calculation errors

- Lack of accurate and reliable asset and energy data

Tower operators with billing inefficiencies face possible difficulties such as declining revenue and revenue leakage which directly hits the business and impacts customer delight.

Infozech’s infrastructure and energy billing system (iBill) is a cloud based indispensable billing engine capable of processing thousands of records within a few minutes to generate accurate and precise bills. iBill addresses all billing related challenges faced by tower operators:

- Eliminate all billing errors through data validation algorithms
- Build overall efficiency by eliminating recurrence of errors and help improve quality of data in upstream and downstream systems
- Support different MSAs and contracts with minimal changes and faster turnaround
- Better visibility of the revenue across the region
- Provision of historical data for reference purposes during dispute resolution for aged transactions
- Standardisation of the billing process across different countries irrespective of different contracts and billing parameters
- Efficient and economical Cloud-based model

Through these functionalities, tower operators can maintain a dispute free relationship with tenants and prevent revenue losses and leakages.

**TowerXchange: How is Infozech’s platform helping tower operators in taking a proactive approach to streamlining site operations?**

Ankur Lal, CEO, Infozech: In today’s market scenario, the complexity of telecom sites and their business models has become critical and has taken its toll on the tower operators by pushing newer technologies and services into their legacy systems. Managing these environments with disparate tools from multiple vendors and technologies makes it extremely tough for tower operators to stay competitive and achieve operational excellence. The result of this increased complexity is higher total cost of ownership, operational inefficiency and degraded customer experience.

With this site complexity arises the need for a unified site management tool like iTower with an end-to-end view of the faults at site, performance, and service quality parameters in order to remain agile and competitive. The underlying fundamental to achieve this, is a robust data management strategy that can handle the complexity and variety of site data.

When we talk about data management, two key aspects are (i) collation from multiple points of origin and (ii) the sanctity of the received data. The biggest challenge is to have a federated view of data and to manage the “single source of truth”. Another issue of increasing concern is missing and incorrect data.

To maintain a single version of sanitised data, Infozech ensures seamless flow of information from
one mode of operation to another such as viewing site information in real time in iROC, energy in iETS, action assignments in iMaintain, accurate asset data in iAsset and error-free billing data in iBill. iTower also utilises reconciliation of data at various levels:

**Data Validation:** Infozech’s platform has been designed in a way that it automatically eliminates the repetitive inflow of the same data, selecting the same value and capturing it. The captured data is verified against permissible ranges and likely values based on business logics. Every raw data packet and its value is validated against its defined type and threshold value to filter out the garbage values, what we term as noise associated with the data. The data discrepancies are highlighted and filled in using the Smoothing Algorithm and Fill-In feature that Infozech has developed.

**Reconciliation:** multiple channels of data coming from machine sensors and the manual data feed from mobile applications are all reconciled and a clean version is achieved. This enables the user to interact with the single version of data, post all the vendor negotiations. Data for grid energy usage is also reconciled with the power bill and a final version is maintained in the system. This verified data now serves the purpose of providing insights on how to plan and make relevant decisions.

A unified platform with validated data and an operations data insights dashboard enables tower operators take a proactive approach to streamline site operations.

**TowerXchange: How does Infozech’s site management platform help tower operators optimise costs?**

**Ankur Lal, CEO, Infozech:** A competitive market exerts constant pressure on tower operators to look for extra cost advantages; cost saved is profit earned. iTower helps tower operators in optimising OPEX and in the right allocation of CAPEX while enhancing the quality of site operations:

- **OPEX optimisation can be achieved by streamlining site operations:** Streamlining site operations means the better sizing of both field force teams and central functions such as real time site monitoring, maintenance tracking, accurate billing and removal of non–valuable activities done by technicians. The operational improvements that can be gained by using Infozech platform are:
  a) The planning of site technician’s activities are optimised through insights generated by Infozech’s Preventive maintenance and incidence management module (iMaintain)
  b) Constant monitoring of KPIs (time to repair, average number of activities per technician, MTTR, site visits etc.) enhances productivity
  c) Reduces energy consumption through real-time tracking of key parameters like equipment usage pattern etc. can lead to tremendous cost savings
  d) Enhanced tracking of spare parts can lead to the removal of unnecessary replacements of non-faulty spare parts.
  e) Accurate billing data gives better visibility of the revenue across each region.
  f) Asset warranty, insurance and AMC tracking - Removes excessive repair and replacement expense through granular-level accurate warranty tracking

These enhancements can help tower operators in reducing OPEX by 10-25% depending on the number of tower sites and site configuration.

- **Right CAPEX allocation:** CAPEX optimisation can be achieved by outlining the right balance between asset maintenance and replacement through the asset lifecycle management solution:
  a) Centralised asset repository which helps keep all asset data at one place
  b) Monetise end of assets life
  c) Optimise asset utilisation by reusing stranded, unutilised and under-utilised assets
  d) Save manual asset audit cost through electronic site audit

These asset based insights can help tower operators in the right allocation of CAPEX.

**TowerXchange: Why should tower owners look to use a complete end-to-end site management system such as Infozech’s rather than developing an in house system?**

**Ankur Lal, CEO, Infozech:** Very good question. While looking for site management software solutions, tower operators often analyse the different scenarios to choose between outsourcing and in-house development. This strategic choice may have a significant impact on cost, quality and resource aspects of the telecom tower company.
Thus more and more telecom tower companies prefer to choose IT outsourcing models rather than looking for specialists in-house. Subject matter expertise, access to exceptional capabilities and reduced costs are some of the major factors driving the IT outsourcing market.

If you consider market trends, the Global IT outsourcing market is expected to reach US$481.37 billion by 2022 growing at a CAGR of 6.2%. To choose the right strategy on digitalisation of telecom site management, let me take you through the potential benefits of outsourcing IT infrastructure:

- **a)** Faster approach to high-quality software development resources
- **b)** Flexibility – specialized vendors like us are flexible to provide support in accordance with project schedule and needs
- **c)** Cost Savings – Outsourcing can help achieve a high level of productivity at reduced costs.
- **d)** Broader range of subject matter expertise - We have built industry expertise and on field experience by working with different customers in different geographies and are at a different maturity level. We can actually work as an extended arm.
- **e)** Solves capability issues
- **f)** Enables focus on core business functions

Infozech’s platform and support teams are experienced enough to be key business enablers for tower operators rather than just a cost saving tool. Infozech’s commitment to faster deployment and great quality to price ratio has helped us grow to the next level, becoming the right technology partner for telecom tower operators.

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### Meetup Africa 2019

29-30 January, Dubai

### Meetup Americas 2019

9-10 July, Boca Raton

### Meetup MENA 2019

8-9 October, Johannesburg

### Meetup Europe 2019

9-10 April, London

### Meetup Asia 2019

3-4 December, Singapore

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**See you at our future events!**

[www.towerxchange.com](http://www.towerxchange.com)
TowerXchange: Can you tell us some of IPT Powertech’s major achievements for the benefit of readers not familiar with your company?

Khaled Habbal, VP & COO, IPT Powertech: IPT Powertech has been a first mover in the industry at multiple times throughout its 24-year-long history. Back in the 1990s, we started out as a provider of starter and specialty batteries. We were the first to introduce and stock sealed and specially application batteries. When the telecom sector picked up in 1995-1996, we immediately noticed the great value we can add, so we started offering battery systems to telcos. A few years later, we expanded into selling power systems, and we were also the first to foresee the need to integrate power into outdoor cabinets, so we made a strategic decision to manufacture our own cabinets independently, and hence became a full-fledged energy system integrator. We were also the first to launch the hybrid battery concept, we became one of the few companies in the region, if not the only one, to combine product R&D to our assembly facilities in Romania and Lebanon.

In parallel, we had launched our telecom services division, which consists of three main pillars: 1) site construction service, that is, building telecom sites and laying optical fibers; 2) telecom installation and network services; and 3) field managed services and maintenance.

Our ability to combine our power expertise, telecom services, and managed services at the same time became our differentiation factor, and this
propelled our recent success in introducing and implementing the Guaranteed Savings and T-ESCO models.

Our journey has been a rapid evolution to becoming one of the regional players in our field with reach to more than 50 countries coupled with a geographic presence in 11 countries in Africa, South East Asia and the Middle East.

The past year has been an exceptional one. We ventured into two large projects for a major towerco in Nigeria, supplying energy efficient power solutions including a long-term management, maintenance, and guaranteed opex optimisation contract.

We also signed a long-term contract with one of the major operators in Myanmar, providing managed services through a combination of a guaranteed savings model and T-ESCO models for their entire network.

All these achievements would not have been possible without the dedication of our 2,500+ experts who live our slogan “Redefining Power Solutions, Reinventing Telecom Infrastructure.” They relentlessly serve the top clients in the region and deliver projects to more than 60 operators in more than 50 countries.

**TowerXchange: How have you adapted the Telecom Energy Services Company (T-ESCO) business model to better serve MNO and towerco needs?**

Khaled Habbal, VP & COO, IPT Powertech: We have been serving the largest MNOs across many continents for more than 20 years by providing a wide range of products and services from comprehensive and tailor-made power solutions through to passive and active infrastructure. Throughout the expansion of our business and diversification of our activities, our broad array of offerings has seen a considerable evolution across the whole telecom and power value chain of MNOs and towercos. As for telecom power, we adapted our business model to fulfill the needs of our customers by providing an holistic solution of energy efficient products and managed services as a Telecom Energy Services Company (T-ESCO).

Our own energy services offerings are categorised in two main streams, one called The Guaranteed Savings Model and the other T-ESCO model and both serve MNOs and towercos in a way to reflect the appetite for capex spending or capex leasing. Both models ensure the deliverables of power availability and reliability to the network respecting all Service Level Agreements (SLAs) related are met.

We have seen in some instances in Africa, MNOs that are not planning to divest their towers however are looking to divest their power equipment. In those instances, with the pressure coming from the global profitability of the MNOs, we are providing the T-ESCO model whereby all investment to modernise power solutions and making them efficient and deliver the required availability are provided by IPT Powertech Group. Naturally, servicing a long-term contract for the same is a key factor for its success. On the other hand, we have noticed that towercos have access to investment resources and strategic directions whereby they invest themselves through innovative and energy efficient power solutions; however, they need the deliverables to be met and the promise of those solutions to be achieved which is reflected in our guaranteed savings model.

**TowerXchange: What is your approach to eliminate the ‘blame game’ where energy equipment manufacturers and O&M service provider blame each other for any performance failures?**

Khaled Habbal, VP & COO, IPT Powertech: It has always been a dilemma between the energy equipment manufacturer and O&M service provider where one side blames the other side either on the actual specs of a product and its deliverables or on the service level and the maintenance operations.

Our approach is simple: combine energy equipment provider, system integration, and O&M service contracting services to create a single point of accountability. By being the energy system integrator and the contractor at the same time, we are able to manage key points in the value chain, thus leaving no room for performance failure—or for the ‘blame game.’ In fact, we believe that our group is one the few solution providers globally offering and merging hybrid and renewable energy solutions with telecom infrastructure services and offering field managed services and maintenance all at the same time.
Managed services contractors buying energy solutions and managing them will only be able to cover themselves during the warranty period. Their real challenge starts after the warranty period expires.

The combination of expertise all under one roof makes IPT Powertech Group one of the few global parties able to eliminate the blame game and provide top-notch services to towercos, MNOs and ultimately power availability for the telecom networks.

**TowerXchange:** We understand IPT Powertech operate power systems at over 3,200 Ooredoo Myanmar towers - can you give us a sense of the operating conditions and challenges in Myanmar?

*Khaled Habbal, VP & COO, IPT Powertech:* IPT Powertech Group is enrolled in an end-to-end managed service contract with Ooredoo Myanmar including rollout services, operation and maintenance, grid connection, generator fueling, power management and power colocation which is extremely challenging from a geographical, political, operational and financial perspective.

From an operational and organisational perspective, the situation is very challenging as we are covering the totality of the country with its area of 677,000 sq km ranging between mountains, forests and tough terrains through to rivers, lakes and oceans. Out of the total universe of Ooredoo’s 4,500 sites, Linfra Myanmar is currently managing 3,200 sites which are divided between edotco’s 1,250 sites, PAMEL’s 1,250 sites and 700 Ooredoo self-built sites which are spread-out all over Myanmar across the 15 regions. Approximately 65% of the sites are off-grid while the remaining are grid connected. The grid availability and reliability is not consistent which means lots of outages, both planned and unplanned. The off-grid sites by themselves bring tremendous challenges from regular fueling to preventive maintenance ensuring mean time to repair (MTTR) is in line with our committed SLAs.

With a five month season of ravaging monsoon and rampant floods, operating conditions become extremely stringent, whereby we take necessary measures to overcome such constraints by deploying additional resources and enhanced logistics to maintain the quality and best performance of our services. We also face access, security and political issues in some regions which are handled by our CSR team who is strongly engaged with local communities and groups to come up with proper resolutions. Availability of stable power remains a major challenge to our operations and service level agreements.

**TowerXchange:** How do you see the future of cell site energy in Myanmar, given that edotco has committed to provide full power as a service, and that the towerco which owns the other substantial portion of Ooredoo’s towers, PAMEL, is for sale? Other Myanmar towercos provide energy equipment with energy costs passed through to the tenant - how can we correct the disincentive to invest in energy efficiency this results in?

*Khaled Habbal, VP & COO, IPT Powertech:* The tower landscape in Myanmar is divided between seven tower companies surpassing the 10,000 towers mark during 2017. Major players are edotco, Pan Asia (or PAMEL), Irrawaddy Green Towers (IGT), Apollo Towers, OCK, EFT and MIG. Under our managed services contract with Ooredoo, we are fully responsible in managing the energy consumption on sites comprising of supplying and delivering generator fuel and managing the electricity supplied by the national grid of Myanmar. The energy pass-through model does not have a disincentive outcome for us to invest in energy efficiency for two main motives:

- Our objective is to optimise the operational expenditures (opex) of our customers notably on the energy consumption.

- Our guaranteed savings model starts with the design, engineering, manufacturing and supply of power-efficient solutions to ensure lowest capex, opex and TCO to our customers. Moreover, we are committed to our environmental values in protecting the environment and reducing carbon footprint by continuously optimising the use of generators, and by reducing engine run-hours while minimising noise pollution to local communities.

**TowerXchange:** Let’s talk about Nigeria. How have IPT Powertech come to be so trusted by Nigeria’s leading towerco, IHS?

*Khaled Habbal, VP & COO, IPT Powertech:* We started working with IHS in 2003. At that time, IHS
was a site construction contractor. Over the years, we developed a strong relationship with IHS by repeatedly reengineering our proposed solutions to fit with their growing site requirements. It wasn’t long before IHS became the largest tower company in Africa. Our stellar achievement was the deployment of hybrid concepts on their sites, which was recognised when IPT Powertech was selected as the preferred power solution vendor of several towercos in multiple countries.

Now, we are engaged with IHS in Nigeria on the largest project of Guaranteed Savings across the African continent. We are proud to be one of the largest suppliers of power efficient solutions and one of the main contractors ensuring the Guaranteed Savings Model.

The Guaranteed Savings Model is a risk-free approach for securing full economisation and savings for the operators and towercos. The model works by reducing the capex and opex to reach the optimal Total Cost of Ownership (TCO), while maximising the lifetime of the equipment.

TowerXchange: We understand IPT Powertech manages the energy equipment at a large number of Nigerian cell sites for IHS. How does the contract structure and operating conditions in Nigeria compare to those in Myanmar?

Khaled Habbal, VP & COO, IPT Powertech: As I mentioned, IPT Powertech Group is engaged in Nigeria with the largest towercos on the major project of Guaranteed Savings across the African continent, supplying energy efficient power solutions—including management and long-term maintenance — and opex optimisation under a long-term contract.

As for Myanmar, we established our business there a little less than two years ago, by offering the Guaranteed Savings Model and T-ESCO Model. Myanmar has interesting potential for the future, and our growth there is stimulated by the need of this region for energy-efficient products and infrastructure services adapted to the local market’s requirements. Based on our agreement, all future expansion of the network comes as a kWh model which is effectively our T-ESCO model.

According to this model, energy is sold as a service. We guarantee that no capex, nor capex replacement investment, is required from the operator. The operator will only be charged based on a consumption scale of our own solutions. We will be responsible for all the investment in capex, opex, replacement of spare parts over time, and system management.

TowerXchange: Who defines your energy equipment selection policy? Is it driven by your clients, Ooredoo and IHS, or does IPT Powertech decide what equipment to buy and install?

Khaled Habbal, VP & COO, IPT Powertech: Our selection of energy equipment is a two-phase process that run simultaneously: on one hand, our team undertakes extensive and thorough site surveys to gather useful information that will help us determine the appropriate type of energy equipment; in parallel, we conduct several meetings with the client to clearly understand their needs, then we croscheck their requirements with the survey results to decide on the best course of action. The findings of the field study and the customer’s main demands are communicated back and forth with our IPT design team, who are always on standby mode to create customised solutions that fully compliment the client’s requirements.

Our positioning in the market as the complete solutions provider has provided us with the expertise to propose the right solution that the client is looking for, and we move forward with development, manufacturing the equipment, integrating it within the system, and maintaining our own solution for optimal performance. In short, we provide customers with a complete and hassle-free service, so that they can focus their attention on their core business.

A key element behind the successful relationship with our clients is our common focus on the Total Cost of Ownership “TCO”, and in particular that we work with IHS and Ooredoo on long-term contracts.

TowerXchange: Providing energy as a service in Myanmar and Nigeria is a costly undertaking. How is your business financed? Would you welcome third party investment to finance further deals of this nature?

Khaled Habbal, VP & COO, IPT Powertech: One of IPT Powertech’s strengths is that it is self-funded, and this has given us an inherent autonomy when it comes to decision-making. Naturally, we take well-calculated risks, which is why we were able to grow
exponentially over the past years without needing external funding. Being highly capitalised with good financial backing from commercial banks allowed us to internally invest in and finance the Guaranteed Savings and T-ESCO models. The introduction of the Guaranteed Savings and T-ESCO models has been extremely successful and has gained the attention of new clients.

In order to accommodate this exponential growth and finance further opportunities, we have recently started looking for external funding through third-party investment or other type of financial means.

TowerXchange: There is often a tradeoff between capitably intensive hybrid and renewable energy equipment with lower operating costs and longer lifecycles, compared to other proven DGs and battery combinations that might have less longevity but which might be more familiar to field engineers - what is your energy equipment investment philosophy?

Khaled Habbal, VP & COO, IPT Powertech: Switching from the conventional solution to hybrid solutions has been an on-going dilemma in the last couple of decades for MNOs and tower companies.

Hybrid solutions were born from the need to reduce opex, which basically consists of maintenance expenses, fuel expenses and energy bills. When any of these expenditures increase — consequently increasing the opex — clients start searching for alternative power solutions. Therefore, we tailor our power solutions based on the country conditions and specificities such as solar and wind applicability, geographic and land conditions, accessibility to sites and the spread of sites and operation method.

When fuel prices skyrocketed in 2007-2014, the majority of the MNOs easily made the decision to switch to hybrid solutions and put an end to this dilemma. Nevertheless, it is not easy to identify the starting point of this switch since the investments and networks are huge. So the focus was on reducing the cost of diesel, which reached unprecedented levels and put a huge stress on MNOs on many levels: operation, logistics, vandalism, cost, and so on. Accordingly, we have designed solutions that reduce diesel consumption drastically. That was an appealing strategy since it eliminated the client’s fuel stress while achieving a short payback time, given the high fuel price back then.

IPT Powertech always emphasised to the clients the required resources to run the solution and provided all the training needed accordingly.

Each country and operation has its own specificities and accordingly, their own suitable solutions. Therefore, and after the fuel price went back to lower levels, MNOs and tower companies started to focus more on optimising the maintenance expenditures to control opex. More attention was given to technologies used inside the solutions and its compatibility to the operation and country. Available technologies in the market were not an issue by themselves since they are mature enough and tested, but the technical capabilities of the technical teams and the available business model had a more direct effect on the operation of the solution.

To conclude, each time and period has its own energy equipment investment philosophy. With the price of oil today and the need to reduce opex, we are developing solutions that answer our clients’ need.

We can assure that operational excellence is a strategy that proved successful across all times and this can only be driven by operational leadership and by continuously investing in our people.

TowerXchange: Finally, what lessons have you learned that might be transferrable in other countries where MNOs or towercos are considering partnering with ESCOs?

Khaled Habbal, VP & COO, IPT Powertech: Based on our experience, we believe that the long-term partnership between towercos, MNOs and powercos is essential and driven to deliver the lowest TCO.

Our group is proud to be among the few global players that have presence in multiple geographies in different continents along with power system integration expertise putting us in a unique position to be able to offer this end-to-end solution eliminating the otherwise unavoidable blame game which is seen almost everywhere.

Therefore, the single point of responsibility is key to the success of outsourcing power to become a service.
How NEXSYS-ONE is driving operational excellence for telecom infrastructure owners

From Project Management to IFRS 16 lease Management to drone survey technology, NEXSYS-ONE’s flexible software solutions create seamless processes to enhance the operating performance of tower companies and mobile operators.

Most of the NEXSYS-ONE organization has a background in telecoms infrastructure, a fact which has given them unique insight into the operational and administrative challenges infrastructure owners face today, whether that’s complying with international standards or simply coordinating field techs to resolve cell site problems. They’ve built a solution which is designed to work with existing platforms and technologies to deliver maximum efficiency as well as removing complexity from the lives of PMOs, C levels and field teams. We spoke to David Gater, Global Head of Business Development at NEXSYS-ONE, to find out how the solution has evolved and how it’s working for the telecoms industry today.

Keywords: 5G readiness, Asia, Asset Lifecycle Platform, Asset Register, Co-locations, Europe, Europe insights, Health and Safety, Insights, Leasing and Permitting, Logistics and warehousing, MENA, Middle East, NEXSYS-ONE, Project Management solutions, RMS, Site auditing, Site quality Management, Software Solutions, USA, Work Force Management

Read this article to learn:
- Who NEXSYS-ONE are and their global footprint
- How NEXSYS-ONE observes the difference between the key markets in which it operates
- The measurable ROI NEXSYS-ONE can deliver and use cases from the field
- How NEXSYS-ONE can help drive 5G rollout

TowerXchange: Please introduce NEXSYS-ONE, your history and footprint.

David Gater, Global Head of Business Development, NEXSYS-ONE: NEXSYS-ONE was initially an internally developed platform for a global systems integrator deploying and operating 350 network technologies across 40 countries since 2001. Today we operate globally and serve multiple channels through towercos, tier one operators, and systems integrators from our HQ in Dubai with presence and subsidiaries in key strategic locations: Myanmar, United Kingdom, The Philippines, USA, Germany, Australia and Iraq.

NEXSYS-ONE is a proven software platform differentiator that enables the rapid deployment and maintenance of mobile network infrastructure across the globe. The product is a cloud native, configurable “off-the-shelf” platform incorporating industry best practice and functionality enabling support for multiple technologies and applications across a wide variety of uses. We capture the network requirements around quality assurance, project management, tower sharing, IFRS compliant lease management, work force management, procurement and supply chain processing, warehouse and asset management, health and safety, access and RMS solutions, fibre/TRS/RF tracking and risk management.

TowerXchange: You offer several modules, spanning different functions within telecom infrastructure owners’ businesses, can you talk to us about the models, how they work and typically what your customer uptakes are like?
David Gater, Global Head of Business Development, NEXSYS-ONE: For the complete 360 operational requirements for building and maintaining today’s network infrastructure we offer these modules based on innovative scalable software solutions improving efficiencies and performance whilst eliminating unwanted costs due to lack of visibility or operational process failures. If you use one or all modules they can be tailored to ensure processes throughout the organization and through the platform are interconnected and seamless enabling transparency of synchronisation and synergies across the organisation through enhanced visibility.

Due to our unique history and telecom experience we have open dialog with our clients speaking directly the same language, understanding the underlying issues and being able to tailor our solutions to meet their individual needs and solve complex problems. Our best sellers are by far TOWER-ONE closely followed by TASK-ONE where

350,000 cell sites deployed using NEXSYS-ONE / LNT
Used in 40 countries across all continents
Serving the Telecoms industry since 2001

COST SAVINGS
Less extra site visits 39%
Payment performance 40%
Process efficiencies 56%

OPERATIONAL
Effective organization levels to deliver roll out peaks and troughs within a structured team when using NEXSYS-ONE to control the rollout.

REDUCED STAFF CHURN
81% less staff churn within a company or project when proper efficient tools are used to deliver the organizations services.

ASSET HANDLING PERFORMANCE
Less lost assets 20%
Less HW defects 15%
Asset visibility improvements 45%

OBJECTIVES
360 operational requirements
Building and maintaining todays network infrastructure

IMPACT

35% Less extra site visits
40% Payment performance
56% Process efficiencies
35d Implementation lead time
78% Site works performance
81% Reduced staff churn
45% Tenant ratio improvement
30% Staff-ONE

Source data: Statistics were obtained by Lecom Networks, a telecom global systems integrator under Lemminkainen Finland who used Nexsysone for 10 years from 2001 to 2013.
our customers immediately benefit from our off the shelf functionality.

The key modules of NEXSYSONE consist of:

**TOWER-ONE**  Tower-one offers customers a tower sharing solution to centralize all site information into one platform whilst enabling unique techniques to obtain additional tenants per site. The TOWER-ONE project management solution tracks and reports any project to completion. This module is the most used module of NEXSYS-ONE for tower companies and mobile operators.

**TASK-ONE** is our award winning comprehensive task management solution that coordinates deployment and maintenance field activities. It features a reliable and accurate interface that processes organization or supplier task work flows processes to completion

**ASSET-ONE** tracks assets across all warehouses, vehicles and cell sites by bringing together operations to manage inventory, repairs, spares management and reporting. It makes asset information available to all involved personnel in the network, engineering, logistics, finance and planning.

**FIBER-ONE** with FIBER-ONE you’ll have the visual interface to help you understand and manage your entire Fiber optic network deployment. FIBER-ONE delivers information in a seamless, map-based data format and provides an array of software solutions to help deploy and maintain your fiber network. FIBER-ONE makes it easy to enter, update and understand the connectivity of your network. You’ll be able to quickly establish and insert connections within splice enclosures, patch panels, optical network devices and passive optic network splitters used in the fiber network.

**SITE-ONE** enables IoT sensor monitoring of the cell sites to measure and monitor energy usage and fuel consumption, track access and potential theft of cell site equipment. The uniqueness of the NEXSYS-ONE RMS solution is that its connected also with a satellite backhaul for emergencies when the cell networks fail.

**SAFETY-ONE** provides customers with the visibility and oversight required to effectively implement their health and safety management systems by driving the ownership and accountability needed to ensure compliance with legislative and corporate responsibilities.

Each module fits a purpose to ensure processes throughout the organization are seamless. Modules are interconnected to push and receive information to synergise departments. Our customers typically
enjoy the visibility and transparency our modules offer. Customers also prefer our scalable solutions to meet their exact requirements.

**TowerXchange:** Tell us about how your solutions work in different markets. What kind of pressures do you see MENA tower owners coming under and how does that differ from elsewhere in the world?

**David Gater, Global Head of Business Development, NEXSYS-ONE:** Our global experience indicates the majority of tower owners will face the same key challenges in the near future where infrastructure needs to be strengthened and future proofed ahead of 5G combined with some requirement for acceleration of co-location and an industry need to reduce OPEX. Some MENA countries have infrastructure, security and access challenges but, the same fundamental pressures remain around the push for colocation, minimizing site costs, increasing tenant ratios, providing adequate tower services and processing to completion lease contracts with landlords or tenants. Our out of the box solutions meet the many local pressures and requirements for customized features, The IFRS 16 compliant lease Management solution we offer is proving a very popular pressure point eradicator with our clients.

**TowerXchange:** Talk to us about the benefits of your platform. As well as delivering higher standards in software to support tower management, is there a measurable ROI which comes from your solutions?

**David Gater, Global Head of Business Development, NEXSYS-ONE:** I mentioned earlier that our offering is a cloud based, configurable off-the-shelf platform, enabling multiple technologies and applications across a very wide variety of uses which resonates with our customers, this proven software platform combined with unrivalled industry expertise provides as a differentiator to most deployment and maintenance organizations where the most notable benefits can be noted as: 39% less site visits, 40% improvement in payment lead time, 45% tenant radio improvements, 56% process efficiencies, 78% improvement of implementation quality, 20% reduction in lost assets, 15% reduction in hardware defects and a staggering 35-day turnkey implementation lead time improvement. In 2017 the NEXSYS-ONE module Task-One was awarded as best task management and ticketing system of UAE.

**TowerXchange:** Can you give any use cases of where your solutions have been implemented and how they have helped your customers with
key decision making or meeting critical business objectives?

David Gater, Global Head of Business Development, NEXSYS-ONE: The financial burdens on a company who operate without detailed visibility into their operational performance can be substantial. In the US, a turf vendor customer required immediate transparency across its operations for a major Tier-one operator with complex deployment processes. With our web service API capabilities, we synchronized their internal financial systems with the operators supply chain platform and deployment management system. NEXSYS-ONE bridged the gap between the systems whilst empowering additional control with advanced features to enable visibility and transparency throughout their organization. Our customer could see immediately in which areas needed focus so we worked together and found areas of improvement where they were failing or losing money and implemented tailored solutions to improve their operations or renegotiate their contract terms when clearly, they were not in their favour.

TowerXchange: Infrastructure will have to change significantly to meet the needs of 5G rollout. Can you talk to us about how NeXsysOne can support the changing shape of infrastructure, and any new solutions you’re working on to develop this?

David Gater, Global Head of Business Development, NEXSYS-ONE: We’ve been around in the telecoms sector since the beginning. We’ve gone through the technology life cycles before and we’re truly excited to welcome 5G. The networks will indeed change substantially and so will the user experiences. 5G requires a huge back haul capacity upgrade that by no means should be underestimated. Coordinating such an upgrade requires proven software solutions as FIBER-ONE. Mobile operators have already embraced the challenge and FIBER-ONE is in big demand. Cell site capacity upgrades and configuration change management requires proven work force management systems, that are tailored around Telecom implementation processes. Between TOWER-ONE, ASSET-ONE and TASK-ONE, every aspect to upgrade networks to 5G is covered.

The industry cannot underestimate the volume of work required to upgrade networks through 5G and beyond. The evolution of the systems used in most cases to support the deployment and maintenance of required infrastructure are no longer fit for purpose. Operators, systems integrators, OEMs and towercos will need to make bold decisions and implement new “user” friendly project management solutions with advanced features that seamlessly process the required complexity.

Our journey as a company has and is enabling and guiding many organisations to consistently and continually implement, maintain and upgrade tens of thousands of network infrastructure through the 2G > 3G > 4G technology evolutions. NEXSYS-ONE delivers on the tough questions being asked from tomorrows networks, whilst preserving the old with increased efficiency. We welcome the challenges the future brings and would encourage interested organisations to get in touch so we can enable effective management of this complexity for them.
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. And 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

Read this article to learn:
- Why premium lead-acid batteries remain the best compromise between capex and opex
- How to choose the right battery for the grid profile and application
- How to overcome common problems in the installation and setting of batteries
- How to cool batteries with just 40W, even at 30-40°C ambient
- How to protect batteries from theft and vandalism

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...**

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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 2.5X 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
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 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’!
TowerXchange: Please introduce your company and history in the telecoms industry.

Jin Li, CEO, Shandong Zhaowei Steel Tower Company: The company was established in 2007 in the development area of Dezhou City, Shandong Province, China. Zhaowei has flourished as a result of the accumulated experiences from our parent company, adoption of scientific management, use of advanced equipments and the hiring of many talented staff.

Since its creation, the company tackled aggressive domestic expansion and nurtured overseas growth at the same time. And after ten years of intense work on R&D to improve the quality of our products and develop new solutions, Zhaowei has become one of the leading steel tower manufacturers in China, with a worldwide footprint.

Our products have been exported to Central America, Ireland, Kenya, Somalia, Angola and many other African countries. In Asia our clients are spread across the Philippines, Myanmar and Cambodia; we are also an audited steel tower supplier for China Tower Corporation, and work with Huawei, ZTE and Ericsson in the telecom sector.

We now have after-sales teams in Manila, Yangon and Dhaka. Our expansion also includes a new fabrication plant that is currently under construction in Ethiopia and will begin operations next year.

Shandong Zhaowei Steel Tower Company: trusted supplier to MNOs and towercos worldwide

Footprint spans thousands of sites in Africa, Central America and Asia

From its roots in China, Shandong Zhaowei Steel Tower Company (Zhaowei) is now expanding to include manufacturing capacity in Ethiopia. With ten years of experience, the company has grown to 20 engineers and 400+ staff. Since its early days, Zhaowei has paid great attention to the overseas market, while at the same time building its domestic presence as the audited supplier of China Tower Corporation and the State Grid of China. With a keen focus on quality and customer satisfaction, Zhaowei has an impressive roster of MNO and towerco clients around the world, as well as tier one OEMs Huawei, Ericsson and ZTE in the telecom field.

Keywords: Africa, Asia, Cambodia, Capacity Enhancements, China, China Tower Corporation, Construction, Ericsson, Ethiopia, Huawei, Installation, Interview, Masts & Towers, Meetup Preview, Myanmar, Philippines, Steelwork, Who's Who, ZTE

Read this article to learn:
- History and footprint of Shandong Zhaowei Steel Tower Company
- How to recognise a high quality steel tower
- Finding the balance between standardisation and customised towers
- How to make camouflaged towers more affordable
TowerXchange: The first question our readers want to know is ‘how proven are the structures in the field’ – please tell us about some of your clients and projects.

Jin Li, CEO, Shandong Zhaowei Steel Tower Company: Our products and services have been proven by our customers, by our ten years of history, and by the thousands of towers standing worldwide.

Currently, we have a lot of projects in the Philippines, where we fabricated the first set of hybrid steel towers in the market and won the praises of our MNO customers. We are the preferred weather test tower supplier for the nuclear power stations in China, where almost all are 100m (and over) guyed towers and survived the beating of multiple typhoons.

TowerXchange: How should buyers distinguish between the quality of products offered by different tower manufacturers?

Jin Li, CEO, Shandong Zhaowei Steel Tower Company: Towers can be easily judged by appearance. For example, at a glance, you can see if the cutting is straight, if the Hot Dip Galvanisation (HDG) surface is smooth and if the welding is clean and neat. If you have test tools, you can test the HDG thickness, the welding quality and the strength of the steel and bolts. You can’t hide quality issues with towers, because everything will be exposed during the installation!

TowerXchange: How should MNOs and towercos strike a balance between the cost and volume benefits of standardisation versus the needs to customise structures for different environments and wind loading?

Jin Li, CEO, Shandong Zhaowei Steel Tower Company: Yes, it is like the two side of one coin.

If a customer decides to standardise the structure across all sites, this will most likely result in higher costs as all towers will need to meet the highest requirements. Customers could decide to customise each site to their specific conditions, which may be a more affordable option. But on the other hand, standardisation could bring savings, since a lot of the work could be simplified and clients can also prepare stock towers.

In general, it is best to divide into several standard zones, in order to minimise the waste that may come with one set of standardisation.

TowerXchange: What are the most economical ways to strengthen a tower structure to accommodate extra tenants and handle more wind load?

Jin Li, CEO, Shandong Zhaowei Steel Tower Company: Firstly, for new tower sites, towercos should consider upfront possible extra tenants and wind load, since strengthening a tower is not always an easy thing to do.

When it comes to existing sites, clients ask for economical yet efficient tower strengthening. As a steel tower manufacturer, we’ve worked on many strengthening orders and the way to approach this differs depending on the type of tower. For each project, we perform a structural analysis and decide the best way forward.

TowerXchange: How do you ensure the deliverability and easy installation of your structures?
Jin Li, CEO, Shandong Zhaowei Steel Tower Company: Nowadays most tower structures are quite similar so the key when it comes to delivering and installing a tower is the quality control. We have a comprehensive QC system that spans the drawings, production and tower installation phases. We are always in communication with our clients to improve or revise our designs and to ensure ease of installation. And our large production plant (200,000 sq. mt.) ensures the fast deliverability of orders.

TowerXchange: When designing new sites, how do you balance the concerns of camouflage, cost and structural capacity?

Jin Li, CEO, Shandong Zhaowei Steel Tower Company: Camouflage is becoming more and more important in the telecom field, however these solutions usually are more expensive than traditional towers. One of the ways to balance this is to adopt new or high strength materials, to reduce total weight, which then contributes to both cost savings and extra capacity.

TowerXchange: Please sum up how you would differentiate your solutions from your competitors?

Jin Li, CEO, Shandong Zhaowei Steel Tower Company: As a private company, we have the flexibility to work and make decisions in an efficient way, and we really try to take advantage of that. Secondly, we always set up local after-sales teams for major projects, in order to provide attentive service to our clients. We also prioritise quality control and delivery time. In addition, we are building a fabrication plant in Ethiopia, which would allow us to shorten delivery times and enhance customer service for clients in the African region.
The devil is in the detail – the detail of painstakingly constructed and hard negotiated Sale and Purchase Agreements (SPAs) and Master Lease or Service Agreements (MLAs) that define the main terms in any tower transaction. Jeff Eldredge and Rob Dixon, Partners at Vinson & Elkins, have advised on numerous sale and leaseback transactions in the last few years across Africa, Asia and Europe. Rob and Jeff kindly agreed to meet with TowerXchange and to provide us with an overview of tower sharing SPAs and MLAs.

Keywords: Anchor Tenant Privileges, Due Diligence, Infrastructure Sharing, MLA, Novation of Leases, Regulations, SLA, Service Level Agreements, Transfer of Assets, Vinson & Elkins

Read this article to learn:
- The conditions precedent that need to be fulfilled before assets are transferred
- What happens to towers that aren't transferred in the first close
- Why the real value lies in the MLA
- How critical towers are sometimes treated differently

The buyer will require a certain number of towers before the deal is economically viable. Typically, therefore, the deal will be structured so that closing does not happen unless and until a certain number of towers are ready to be transferred (i.e. the tower-specific conditions precedent are satisfied or waived).
Jeff Eldredge, Partner, Vinson & Elkins: One key point in the process is the extension of ground lease terms. Towers deals can involve thousands of different parcels of land. Different ground leases will expire at different times, giving uncertainty on future costs. The buyer will therefore seek to have the ground leases extended for a reasonable period as part of the transfer process.

Rob Dixon, Partner, Vinson & Elkins: As a result of that and certain other conditions taking time to satisfy, there are typically a number of closings at different times, giving uncertainty on future costs. The buyer will therefore seek to have the ground leases extended for a reasonable period as part of the transfer process.

TowerXchange: What happens to any towers for which the CPs cannot be satisfied?

Rob Dixon, Partner, Vinson & Elkins: The treatment of ‘stub sites’ depends on the deal. The operator is unlikely to have the ongoing capability (or desire) to maintain and operate the sites so the towerco may agree to manage the sites (with the operator retaining ownership). The buyer is likely to conduct legal diligence on a representative sample of sites so that it has a reasonable idea of the position before signing the deal. The SPA is, of course, only one part of a sale and leaseback deal. It’s relatively short-lived compared with the MLA which will often govern the parties’ relationship for many years. The MLA needs to be as future proof as possible.

TowerXchange: So tell us about the critical consideration when drafting Master Lease Agreements.

Jeff Eldredge, Partner, Vinson & Elkins: The MLA is where the real value is for the tower company and where most of the real complexity lies in a deal. It’s a long term contract (with a significant initial term and then options to renew) and a large value contract. The operator needs sufficient flexibility to manage its needs to deploy and maintain equipment, while the towerco needs sufficient control to maximise the co-location opportunities and create a robust long term revenue stream – that’s how they build value. Thus, there’s a natural tension that needs to be resolved to everyone’s satisfaction. Effective governance mechanisms are important.

The MLA is an umbrella agreement which – traditionally – defines the operator’s rights as anchor tenant in terms of leasing space and capacity (wind load) on the transferring towers and the towerco’s obligations to the anchor tenant in terms of such space and capacity (including the service levels which apply). Different rights and obligations typically apply to different towers. For example, network planners can get very nervous about sharing particularly critical towers with other operators and therefore a small number of the towers might be identified as exclusive to the anchor tenant.

Rob Dixon, Partner, Vinson & Elkins: The service levels for different classes of towers are also likely to vary and be closely negotiated. These will typically be set out in a service level agreement, which may form part of the MLA. The impact of IFRS16 on the way in which tower companies provide services is a key topic. There are also of course other agreements which are important in most towers deals – for example the Build to Suit Agreement – but perhaps all of that is for another time!
See you at our future events!

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