

# Demand forecasts for passive infrastructure equipment and services in Asia



TowerXchange examines demand for six different categories of equipment and services across the dozen most active Asian tower markets



Telecom infrastructure is being transformed in a dozen key markets across Asia, where towercos own and operate between 20% and 70% of each country's towers. What are the implications for the supply chain? What equipment and services are the towercos buying? How do their requirements vary according to the structure of each tower market?

**Keywords:** Who's Who, Meetup Preview, MNOs, Towercos, Managed Services, Steelwork, Access Control, Energy, Monitoring & Management, Lawyers & Advisors, Passive Equipment, Strategic Consultancy, TowerXchange Research, Asia, O&M, Construction, Market Overview, Capex, Batteries, Energy Storage, Market Forecasts, Build-to-Suit, Pass-Through, Fixed Price, Off-Grid, Unreliable Grid, On-Grid, Hybrid Power, Procurement, IBS, DAS, Small Cells, Decommissioning, Sale & Leaseback, Masts & Towers, RMS, Site Management System, Asset Lifecycle Platform, Australia, Bangladesh, Cambodia, China, India, Indonesia, Malaysia, Myanmar, Pakistan, Thailand, Sri Lanka, Vietnam

## Read this article to learn:

- How reliable is the grid, and who is responsible for acquiring and maintaining energy equipment in each market – towercos, or is power a pass through to MNOs?
- Are RMS and access control systems installed on most cell sites? Are Site Management, or ILM, systems used in the NOC?
- How many new towers are being erected and what does that tell us about the opportunity for tower manufacturers and construction firms?
- Are DAS, IBS, small cells and microcells being deployed into urban networks?
- Is there a pipeline of tower transactions – SLBs or strategic acquisitions – to generate substantial advisory engagements?

By way of a preview of the forthcoming TowerXchange Meetup Asia, which represents a unique opportunity for vendors to connect with the leaders of Asia's towercos, TowerXchange examines demand for each of six key categories of passive infrastructure equipment and services in Asia's 12 most active tower markets.

Which Asian tower markets are generating the most demand for energy storage, DG and hybrid energy systems? In which countries is power a pass through?

How widespread are RMS deployments? What about appetite for small cells, microcells, DAS and IBS?

At what rate are new towers being erected, and existing towers reinforced for co-location?

And in which countries will future tower transactions create demand for advisory services from bankers, consultants and law firms?

TowerXchange examines the 12 most active Asian tower markets, predicts demand for passive infrastructure equipment and services, and lists the largest towercos and MNOs active in each country. The following matrix is compiled based on hundreds of research calls and meetings with Asia's leading towercos and MNOs in which we've diagnosed their procurement and capex priorities.

**Meet the key stakeholders at this year's TowerXchange Meetup Asia, taking place on November 24 and 25 at the MBS, Singapore! ■**

| Vendor opportunity matrix | Energy  | RMS, ILM and access control | Tower manufacture | Turnkey infrastructure | Small cells, microcells, DAS and IBS | Advisors | Towercos   | MNOs  |
|---------------------------|---|-----------------------------|-------------------|------------------------|--------------------------------------|----------|--|---|
| <b>Australia</b>          | Low   | Medium                      | High              | High                   | High                                 | Medium   | CCA (now owned by consortium)<br>Broadcast Australia | Telstra<br>Optus<br>Vodafone  |
|                           | <p>Crown Castle recently sold their 1,772 tower subsidiary CCA to a consortium led by Macquarie. Broadcast Australia is the other towerco of scale – they have some MNO tenants on their ~600 towers. A few smaller tower transactions are anticipated to rollup small towercos, but it seems unlikely market leaders Telstra would sell their assets. There are around 9,000 towers in Australia, but many more may be required by the rollout of the National Broadband Network (NBN), a shared LTE network, which means it's a good time for tower manufacturers and builders. RMS adoption will evolve over time. With grid power widely available and backup power sources not often used, Australia is not a priority for towerpower vendors. Power is typically a pass through so MNOs retain responsibility for power.</p>  |                             |                   |                        |                                      |          |  |   |
| <b>Bangladesh</b>         | High  | High                        | High              | High                   | Unknown                              | High     | edotco<br>Bharti Infratel interested                 | Grameenphone<br>Bangalink<br>Robi<br>Airtel<br>Teletalk<br>Citycell |
|                           | <p>edotco has acquired 5,300 of the 27,000 towers in Bangladesh and the VimpelCom (Bangalink) towers may be next. Bharti Infratel are interested in entering the market, but are seeking favourable regulatory conditions. Potential deals make Bangladesh a priority for tower transaction advisors and strategic consultants. 800-1,000 new towers are going up per year, making Bangladesh attractive for tower manufacturers and turnkey infrastructure (TI) firms. The rainy season demands exceptional cell site autonomy which makes Bangladesh a key market for energy, particularly energy storage.</p>  |                             |                   |                        |                                      |          |  |   |
| <b>Cambodia</b>           | Medium  | Medium                      | Low               | Low                    | Medium                               | Low      | edotco   | MobiTel<br>Viettel<br>Axiata<br>SEATEL<br>CADCOMMS                  |
|                           | <p>edotco operates 1,500 towers in Cambodia, where CamGSM and MobiTel have both been rumored to be considering tower sales in the past but not recently. RMS is not yet widely deployed in Cambodia, but edotco plans to invest in a remote tower operations centre in 2016. 20% of sites are off grid in Cambodia. The grid sites are provided both by SOE Electricité du Cambodge and by a range of private microgrids and distributed generation projects. Battery backups are on all sites, with DG on off-grid, MSC, BSC and hub sites. Power is a pass through, so MNOs not towercos remain the buyers of energy equipment. Not much demand for small cells but IBS are starting to be deployed in airports, malls, hotels and condos. With the top three MNOs boasting 90%+ coverage and new entrants increasingly co-locating rather than building, there is limited demand for tower manufacturers and TI firms.</p> |                             |                   |                        |                                      |          |  |   |

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| <b>China</b>              | <b>Medium</b>   | <b>High</b>                 | <b>High</b>       | <b>High</b>            | <b>High</b>                          | <b>High</b> | CTC<br>Q Towers<br>Miteno<br>20+ other independents   | China Mobile<br>China Unicom<br>China Telecom   |
|                           | <p>The tower market is changing in China – around a million towers will be transferred from the three SOE MNOs to newly formed China Tower Company (CTC), which already has a contract to build 120,000 towers. CTC already has 10,000 employees but it’s still a brand new company with new governance processes to be established, new systems to be deployed and new preferred supplier relationships to be established. The creation of CTC has stimulated a previously dormant local independent towerco market, which is supplementing CTC’s build capacity. China is building towers (mostly monopolies), rooftops and installing small cells and microcells at a phenomenal rate (over 100,000 per year), so it’s a great market for all vendors if you can compete with local incumbents like ZNV, who have around 60% of the RMS market. The GSMA reports that more than half the world’s green powered sites are in China, yet local towercos report the grid is extensive and reliable, so the jury is out on the opportunity for renewables.</p>   |                             |                   |                        |                                      |             |   |   |
| <b>India</b>              | <b>High</b>   | <b>High</b>                 | <b>High</b>       | <b>High</b>            | <b>High</b>                          | <b>High</b> | Indus Towers<br>Bharti Infratel<br>Reliance<br>Infratel<br>Viom<br>Networks<br>GTL<br>Infrastructure<br>American<br>Tower<br>Tower Vision<br>Ascend | Bharti Airtel<br>Vodafone<br>Reliance<br>IDEA<br>BSNL<br>Airtel<br>Tata<br>Reliance Jio<br>Several small players with <4% |
|                           | <p>Towercos operate over 300,000 of the 450-500,000 towers in India – at present, a third of the world’s towerco owned towers are in India. Started in 1995, India is the second oldest tower market in the world, so it’s towercos are big, mature and canny buyers! Tower transaction deal flow is returning to India, where as many as 200,000 towers may be coming to market for sale, IPO or carveout (government owned operator BSNL is seeking to create a new 70,000 tower towerco). It’s a great time to be a tower advisor in India! Meanwhile, India is home to the most advanced ESCO projects in the world, and some of the most cost-efficient passive infrastructure manufacturers and service providers, many of which export as well as serve their huge domestic market. Li-Ion is making significant inroads versus VRLA batteries in India. RMS is widely used. And the ongoing spectrum auctions and progress of 3G rollout and eventually 4G mean India may need hundreds of thousands of new towers in the coming years. While there are only a few thousand small cells and microcells in India currently, Indus forecast there will be 50,000 by 2020, making India second only to USA (well, maybe China too) for small cells market potential.</p> |                             |                   |                        |                                      |             |   |   |

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| <b>Indonesia</b>          | <b>Medium</b>   | <b>Medium</b>               | <b>High</b>       | <b>High</b>            | <b>High</b>                          | <b>High</b>   | Protelindo<br>Tower Bersama<br>STP<br>Mitratel<br>IBS Tower<br>KIN<br>Retower<br>Balitower<br>Others  | Telkomsel<br>Indosat<br>XL (Axiata)<br>Hutchison<br>Bolt |
|                           | <p>Towercos own 57% of Indonesia's ~70,000 towers, making it one of the most mature tower markets in the world. XL Axiata (~6,500) and Indosat (~5,800) may have an appetite to sell their remaining towers in the medium term, but the real question concerns the future of Telkom's towers who have about 13,000 sellable assets in their 17,615 tower portfolio, but no apparent incentive to sell. That said, Telkom did create its own towerco, Mitratel, which owns a reported 5,500 towers. Mitratel was to be transferred to Tower Bersama under an innovative share swap agreement which has been postponed pending government investigation. With operator towers to be bought and towerco consolidation continuing, Indonesia is a fertile market for advisors. The reliability of the grid in the dense urban areas means the opportunity for energy equipment vendors is finite, but there are remote sites requiring good autonomy. Note that power is a pass through in Indonesia, so MNOs are the buyers of energy equipment. We've spoken to RMS and access control vendors with substantial Indonesian contracts. Organic growth is considerable: 3,000+ towers are erected in a good year, and the local ecosystem of TI firms is very fragmented.</p> |                             |                   |                        |                                      |               |   |  |
| <b>Malaysia</b>           | <b>Medium</b>   | <b>Medium</b>               | <b>High</b>       | <b>High</b>            | <b>High</b>                          | <b>Medium</b> | edotco<br>Sacofa<br>Touch Matrix<br>D'harmoni<br>KJS<br>Common Tower<br>Infra Quest<br>Yikedbina<br>Perak<br>Asia Space<br>Desabina<br>Others | Celcom (Axiata)<br>DiGi<br>Maxis                         |
|                           | <p>Towercos own around a third of Malaysia's 20,000 towers. edotco has carved out 3,500 towers from Celcom in Malaysia. A further 3,200 towers are owned and operated by a diverse group of State-backed independent towercos. DiGi and Maxis currently retain their towers but there have been rumors they could create their own towerco, so there may be opportunities here for the advisory community. There is plenty of demand for new structures as the 4G era begins, but much of the work is undertaken by the aforementioned state backed towercos who have a dominant position in terms of permitting in half the States, so TI firms and tower manufacturers need to develop relationships with Malaysia's towercos. While only 5% of Malaysia's cell sites are off grid, data demand has driven the load on some sites beyond capacity, so battery banks are widely used. Demand for infill sites makes Malaysia ripe for street furniture, with DAS and IBS starting to be deployed by edotco and MNOs. edotco has already selected its site management system.</p>   |                             |                   |                        |                                      |               |   |  |

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| <b>Myanmar</b>            | <b>High</b>   | <b>High</b>                 | <b>High</b>       | <b>High</b>            | <b>Medium</b>                        | <b>High</b> | IGT<br>Apollo<br>PAMEL<br>Digicel MTC<br>MIG<br>EFT | KGSM<br>Telenor<br>Ooredoo<br>(YPT<br>+partner?)                               |
|                           | <p>At one point it seemed like the busdev team from every telecom vendor in the world was camped out in the Traders Hotel lobby taking meetings, but hyperbole has given way to hard work in Myanmar as the rollout enters phase three. Only towercos offering tower+power have secured phase three contracts, and appetite for opex business models is increasing. While a little over 5,000 of a forecast 17,300 towers by 2017 have been lit, phase one was in dense urban areas, phases two to three are pushing into the suburbs and beyond. While most of the towers built to date have been grid connected, that grid has proved very unreliable, with frequent outages and voltage irregularities. As such, generators are on all ground based sites and battery banks are widely used. We're yet to see the full anticipated demand for cell site autonomy, although hybridisation may be restricted to batteries rather than renewables in the South of the country as wind resources are limited and the rainy season means finite opportunity for PV. Myanmar's ecosystem of TI firms and local subcontractors is maturing fast. RMS and site management systems are widely used. Towerco investment due diligence and consolidation, starting with the sale of Digicel MTC, means the advisory community will remain busy. Some IBS have been deployed in Myanmar.</p> |                             |                   |                        |                                      |             |   |  |
| <b>Pakistan</b>           | <b>High</b>   | <b>High</b>                 | <b>High</b>       | <b>High</b>            | <b>Unknown</b>                       | <b>High</b> | Tower share<br>edotco<br>(AWAL<br>Telecom?)         | Mobilink<br>(VimpelCom)<br>Telenor<br>Zong (China<br>Mobile)<br>Ufone<br>Warid |
|                           | <p>News has leaked of Tower share's acquisition of Warid's 4,500 towers of Pakistan's ~28,000 towers, but the transaction has yet to be formally announced. Both #1 Mobilink (VimpelCom) and #2 operator Telenor's towers have also been rumoured to be coming to market and, with edotco's license now secured, there are at least two prospective buyers to keep the advisory community busy. 1,000-2,000 towers are going up every year in Pakistan, making the country a great target for tower manufacturers and TI firms. The unstable grid means eight hour outages are common, and can extend longer in Summer months. Both edotco and Tower share have spoken openly about plans to hybridise sites with batteries and renewables.</p>   |                             |                   |                        |                                      |             |   |  |

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| <b>Thailand</b>           | Medium  | Medium                      | High              | Medium                 | Unknown                              | Medium   | TRUEGIF<br>DTAC-CAT JV<br>(AIS-TOT JV?)                     | AIS<br>DTAC<br>(Telenor)<br>True<br>CAT<br>TOT                  |
|                           | <p>75% of Thailand's ~47,500 towers have been transferred, or will soon be transferred, to one of three towercos established to resolve BTO disputes. True created and successfully IPO'ed TRUEGIF in late 2013, a fund in which 12,138 towers and over a million kilometers of fibre have been transferred. Meanwhile a joint venture towerco is being finalised between DTAC and CAT, while AIS and TOT seem likely to create a similar venture. New towercos mean new opportunities for vendors. 10,000 AIS and 800 DTAC towers built outside the BTO concession are set to remain operator-captive. Thailand has a degree of parallel infrastructure, suggesting a few decommissioning opportunities, but imminent spectrum auctions for a 4G rollout that lacks sunb-1GHz digital dividend spectrum will maximise demand for co-locations and new builds. Anticipate Thailand's tower stock increasing 50% in the next ten years. While grid power is widely available, electricity is getting even more expensive, fuelling appetite for renewables and energy efficiency. Energy assets are likely to be owned by Thailand's towercos, but utility costs will be a pass through.</p> |                             |                   |                        |                                      |          |   |   |
| <b>Sri Lanka</b>          | Unknown   | Unknown                     | Medium            | Medium                 | Medium                               | Unknown  | edotco  | Airtel<br>Dialog (Axiata)<br>Etisalat<br>Hutchison<br>Mobitel   |
|                           | <p>2,150 transferred from Dialog, Axiata's local opco, have been transferred to edotco Sri Lanka, representing a little over 30% of the country's 7,000 towers. While TowerXchange have yet to study Sri Lanka in detail, we understand that cellsite densification for LTE is driving demand for infill sites, camouflage towers and IBS.</p>  |                             |                   |                        |                                      |          |   |   |
| <b>Vietnam</b>            | Medium  | Medium                      | High              | High                   | Medium                               | High     | Golden Towers<br>SEATH<br>Dozens of small<br>local towercos | Viettel<br>MobiFone<br>VinaPhone<br>Vietnamobile<br>GTel Mobile |
|                           | <p>Golden Towers, a member of the Alcazar Capital family, has embarked on a rollup play in Vietnam where approximately 10,000 of the country's 55,000 towers are in towerco hands. Opportunities for tower manufacturers and TI firms are phenomenal in a fast growing tower market that some commentators have estimated is adding more than 11,000 towers and tenancies per year – that's about twice the rate of Myanmar! Towerco rollups will keep advisors and investors busy now, in the longer term the restructuring of the MNO market could create SLB opportunities. Grid power is extensive and reliable in Vietnam and power is a pass through, so any backup power solutions are retained by MNOs. Battery performance would be improved by more widespread use of RMS. It's early days for small cells and DAS but that may change under 4G.</p>  |                             |                   |                        |                                      |          |   |   |



## Brief commentary on Asia's less active tower markets:

- Afghanistan: Frontier Towers runs ~1,500 towers for Afghan Wireless and Etisalat and MTN attempted to create a joint venture towerco, but IHS weren't interested. No immediate opportunities for tower industry growth, therefore TowerXchange has yet to study the market in detail.
- East Timor: Too small to provide the necessary economies of scale to towercos, therefore TowerXchange has yet to study the market in detail.
- Japan: Tough market for foreign investors, and minimal towerco activity, therefore TowerXchange has yet to study the market in detail.
- Laos: Seldom mentioned in rumors of potential tower deals, therefore TowerXchange has yet to study the market in detail.
- Mongolia: No immediate opportunities for tower industry growth, therefore TowerXchange has yet to study the market in detail.
- Nepal: Despite infrastructure sharing being leveraged to accelerate post Earthquake recovery, we've seen no mention of potential towerco activity.
- North Korea: Impenetrable to a Western research firm like TowerXchange, and probably impenetrable to foreign investors!
- Philippines: No immediate opportunities for tower industry growth, therefore TowerXchange has yet to study the market in detail.
- PNG: Too small to provide the necessary economies of scale to towercos, therefore TowerXchange has yet to study the market in detail.
- Singapore: Market considered both too small and too mature for towercos, therefore TowerXchange has yet to study the market in detail.
- South Korea: No immediate opportunities for tower industry growth, therefore TowerXchange has yet to study the market in detail.

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