What you need to know about the rise of small cell infracos

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Data surge in developed markets is leading to densification, and small cells are the most efficient solutions to cope with this need from a network design and efficiency perspective.

Small cell demand is increasing in developed markets, and it is expected to reach its peak with 5G fixed-wireless deployments. As of today, operators use small cells to differentiate their networks, especially in markets where radio access sharing (RAN) of macro cells is common.
Yet the skills required for small cell deployments are different from those required in traditional macro network deployments. The installation of small cells encompasses dealing with different types of landlords, including municipalities and owners of commercial venues. It also requires the deployment of last-mile power solutions and fibre to the nodes.

The above represents an opportunity for small cell neutral host infrastructure providers (“small cell infracos”). In the last few years, we have witnessed these companies getting more traction, first in the US, and today in Europe and developed Asian countries. Neutral host infrastructure providers of macro passive infrastructure (“towercos”) – seeking growth beyond real estate management - have also started to enter the space, either organically or inorganically, bringing additional money to fund small cell infrastructure.

In this article, we look at the factors leading to the operator’s need for small cells and the value proposition of players providing neutral small cell infrastructure as a service. We look at how small cell technology evolution may impact the business model and product portfolio of these players in the midterm.

Data surge in developed markets is leading to densification ...

As we know well, broadband demand is expected to continue growing exponentially in the next few years, driven by photo sharing, music and video streaming, in addition to an increased usage of data-rich apps. An increasing share of this data will be mobile: mobile data traffic is growing two times faster than fixed IP traffic and will account for 20% of global fixed and mobile data traffic by 2021 (up to 8% now). The world reached 1.5 billion LTE subscriptions last year, and it is forecasted to grow 20% yearly for the next five years¹.

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To meet consumers’ data demand, operators must continuously increase their mobile network capacity. This can be done in three different ways: i) using more spectrum, ii) densifying their networks, or iii) improving the networks’ efficiency.

Yet today, spectrum in many markets is already saturated, and the auction prices of the remaining ‘coverage’ spectrum – if any - are becoming increasingly expensive. This means that to cope with the increased data demand, operators in developed

¹ Sources: Visual Networking Index (Cisco), Ericsson Mobility report, Mar’17
markets will focus on increasing capacity with small-cells using higher frequency spectrum and on improving network efficiency. We can therefore expect operators to densify their networks in the coming years, reducing cell size to benefit from spectrum re-use.

In parallel, in the last years telcos have suffered from revenue stagnation as prices do not keep up with data surge and competitive pressure remains, with a direct adverse impact on operators’ bottom-line.

This implies that on top of the increasing need to densify their networks, operators are required to do so as efficiently as possible in order not to compromise their already declining margins and ROI.

While market analysts and players in the infrastructure space have come up with different forecasts on small cell deployments, the consensus is that MNOs will require more than 10 small cells per current macro cell in urban areas to densify their networks in the next few years. This represents not only an enormous cost in terms of equipment, but also in terms of site acquisition, site rent, installation and backhaul provisioning. In addition, venues and municipalities will likely advocate for MNOs to share their sites when possible, in order to reduce the visual impact of deploying such a number of antennae.

All the above sets the perfect context for infra players offering multi-operator small cells as a service to emerge in the coming years.

... in this context, small cell infracos offer MNOs a compelling value proposition

Small cell infracos offer MNOs shared wireless infrastructure in areas where operators struggle with coverage or have capacity issues. Infracos are responsible for investing in and operating the infrastructure, and they typically charge a recurrent fee to operators for their use of it.

Instead of self-provisioning, MNOs benefit from outsourcing such work to these companies due to four main reasons. First, it shortens time to air in prioritised deployment areas where the infraco may have already invested up-front. Second, the MNO transforms CapEx into OpEx, thus

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2 See Maravedis Enterprise and Urban Small Cells, 2015-2020 and Gartner Worldwide Small Cell forecast 2016-2020
improving ROI and saving cash that can be invested in alternative infrastructure projects. Third, it lowers maintenance and upgrade costs as the infrastructure provider benefits from economies of scale through serving multiple MNOs. Last, it avoids the MNO’s operational burden of having to secure different locations, negotiate with landlords, obtain permissions, deal with interference and other technical issues, etc.

Small cells infracos’ operations encompass signing service agreements with real estate landlords, purchasing and installing telecom equipment, including antennas, cabling and headend units, and securing partnerships with MNOs, enabling them to use their infrastructure. The higher the number of MNOs signed up per antenna or module (tenancy ratio), the higher the profitability of the company. Small cell infracos typically charge flat fees to MNOs and, depending on the location, pay a fixed fee to, or has a revenue share agreement with, the landlord for the “right of way” to install antennas in the estate.

As of today, small cell infracos have focused on providing indoor connectivity in large commercial venues. This is explained by the fact that data consumption in these venues has increased exponentially during recent years – in developed markets 80% of data consumption is indoor — whereas thick walls often attenuate the electromagnetic signals from nearby mobile cell towers. The most targeted venues for small cell infracos today are airports, commercial centres, metro stations, university campuses, large office buildings, hospitals and so on. However, in the mid-term we expect infracos to expand their portfolio to high-traffic outdoor venues as well, such as squares and retail streets.

We believe the current business model should allow small cell infracos to thrive in the coming years amidst the global context of rising data needs and pressure from MNOs to execute rollouts as efficiently as possible. However, rapid technology advances and changes in end user behavior are forcing MNOs to constantly evolve their network deployment requirements. In order to stay relevant, infracos will need to adapt their business model and product portfolio to best serve these evolving MNO needs.

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3 Abi Research, Inbuilding Mobile Data Traffic forecast
It is likely that today infracos will need to evolve their product portfolio in the coming years

Strictly speaking, the definition of small cell is that of a radio access node that operates in licensed or unlicensed spectrum and that has a lower power and a lower range (10m-2km) than the so-called “macro” cells (2-50km). This can include anything from access nodes (a little smaller than rooftop antennas), to small outdoor access points that deliver high-speed broadband using an unlicensed spectrum (the so-called fixed-wireless solution).

However, for simplicity, the industry also uses the term small cells to describe distributed-antenna systems (“DAS”), although they are not really low-powered access nodes. A DAS is a point-to-multipoint solution that consists of a clustered installation of antennas through a venue that serves as a repeater that boosts MNO’s cellular network. In essence, the difference between the two is that a small cell constitutes a standalone radio access node, while a DAS antenna is a repeater that needs to be connected to a macro or small cell. The network performance and economics of both solutions are different and depend on a series of factors, making either one better suited to cover a given location on a case-by-case basis.

Today, small cell infracos mostly use DAS technology to expand coverage and capacity of MNOs. This is explained by the fact that until recently DAS was the only technology that supported multiple MNOs within the same deployment. A DAS network requires only the installation of one repeater per sector, and operators can enhance their capacity and coverage through the whole network by connecting to it through a single access point. On the other hand, a multi-operator small cell network requires the deployment of one small cell per operator per sector, resulting in the installation of dozens of boxes through a venue.

Yet a few telco vendors (most notably, Huawei and SpiderCloud) and market analysts have predicted that small cell technologies will eventually replace DAS. This prediction is based on the continuous improvement of the performance and unit economics of small cells.

A few years back, small cells were expensive, not powerful enough to cover large indoor areas, and could not be used by multiple operators simultaneously. Today, small cells’ cost per unit is decreasing rapidly, its performance is improving, and vendors are starting to launch multi-operator small cells.
Simultaneously, as demand from consumers switch to data-only services and calls become VoIP, the main concern of operators and landlords is no longer lack of coverage, but just data offloading. This makes DAS, which was originally designed to address lack of coverage, a less efficient choice when compared to small cells.

This impacts DAS infracos in two ways. First, it decreases the total addressable market for DAS, as MNOs could decide to self-provision some sites with small cells instead of having to share DAS with other MNOs. Second, DAS providers may have to develop the technical capabilities to deploy multi-operator small cells instead of DAS in sites where the business case justifies doing so.

Beyond DAS, WiFi is another technology that may be replaced in the future by small cells in high traffic public or commercial venues. As of today, many infracos around the world deploy and manage WiFi infrastructure in large venues under different models, including marketing and user data monetisation. However, with 5G, one can expect that MNOs will want to deploy fixed-wireless solutions using unlicensed spectrum in many of these locations, making WiFi infrastructure redundant. Unlike WiFi, the fixed-wireless solution will allow operators to maintain operator control of the traffic, in order to ensure quality and predictability of deployment, and to avoid capacity degradation. WiFi offloading however is expected to continue playing a key role in private venues, such as at home and at the office.

As a result, one can expect small cell infracos to replace DAS and WiFi solutions for small cell technologies to cope with the rising data capacity needs of MNOs. In all these cases, it will be crucial for these players to secure the right of use of high-traffic venues to deploy their infrastructure before MNOs do it themselves.

This is part one of a series of articles that will be published on small cells. The next article will focus on the increasing interest of TowerCos on small cells, and what strategies they are following to enter and grow within this space.
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