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THOUGHT LEADERSHIP:

INFRASTRUCTURE INVESTING IN A DISRUPTED WORLD

Part 4: TELECOMS AND NETWORKS

INFRASTRUCTURE INVESTING IN A DISRUPTED WORLD

TELECOMS & NETWORKS

In this final article in our series on disruption, Whitehelm examines the impact of disruption on the telecoms sector. Technological change has already brought huge change to the telecoms industry, from the huge increase in data requirements brought about by the advent of smart phones, tablets and other devices, as well as the general populations expectations when it comes to the volume and speed at which they receive such data.

The Internet of Things (IoT) and the creation of Smart Cities will also require greater connectivity, data availability and speed, further increasing the current pressures on networks.

Fibre Backbones

The requirement for more bandwidth has fostered the need for greater access to high speed broadband, using optical fibre rather than copper cables. At the moment, fibre is the best solution for ultra-fast broadband (>300Mbps). Once it is laid, it is easy to scale up and therefore has some element of future proofing to it.

A key issue, however, is the expensive installation cost, which explains the significant discrepancies in the development of fibre, even amongst developed countries. The world's first fibre-to-the-home (FTTH) networks were installed in the early 2000s in Tokyo, Seoul and Hong Kong. Given the high cost of deploying fibre, the investment case makes more sense in cities with high density and tall buildings, as once the fibre is connected to a building, it connects a greater number of premises. Government incentives have been required to continue the installation in less dense areas.

Today, the FTTH network covers 97% of population in Japan. In Europe, the situation is mixed, with Portugal and Spain at 86% and 79% respectively, while the UK has less than 2% (albeit broadband (>30Mbps) is made available to 92% of UK homes, using fibre-to-the-cabinet (FTTC) with VDSL modems).

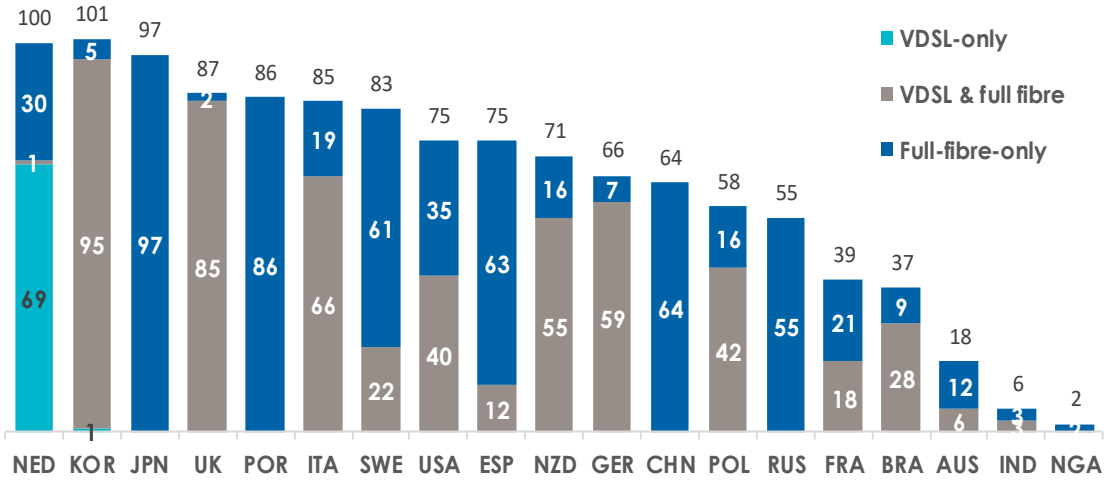
At the same time as the roll-out of FTTH progresses, 5G Fixed Wireless Access (FWA) is being developed as an alternative. This uses wireless network technology rather than fixed lines; an access unit is attached to street furniture which then wirelessly connects to a receiver placed inside a home or business property. The receiver then feeds a router, which provides Wi-Fi signal into the building.

The technology is thought to only be a couple of years away from being ready for commercial implementation and is expected to be cheaper and faster to install than fibre, and with comparable speeds (initial trials have reported download speeds of 10 to 25 Gbps).

Google Fibre has recently retreated from deploying an expensive FTTH network across the US and is now focusing on delivering Fixed Wireless networks instead. 5G FWA is expected to complement FTTH in the future and would cover zones which FTTH does not yet cover. But that brings some uncertainty with regards to the current FTTH rollout programmes, which may cease to be economically viable if 5G wireless can provide similar speeds at a cheaper cost.

However, some argue that the two technologies are complementary, as with the sheer amount of data likely to be required in coming years, fibre will continue to be used in homes and offices, while 5G will be utilised by the mobile phone networks for access while people are out and about.

Chart 1: Fibre Broadband Availability, by Technology, end 2016
Percentage of households served



Source: IHS Markit

Terrestrial Broadcast Networks

Once the only way of watching TV, terrestrial broadcast networks are now facing competition from Over-the-Top (OTT) content, i.e. delivery of film and TV content via the internet. While terrestrial broadcast is still largely used by most people alongside OTT, younger generations are increasingly favouring OTT, making the long-term future of broadcast infrastructure somewhat uncertain.

In the UK, the decline has been very slow, as a result of the UK government's commitment to Freeview until at least 2030. However, for terrestrial broadcast infrastructure owners, it is clear that the market has a finite life and that diversification into other uses for their broadcast towers is essential.

Narrowband Networks

Narrowband networks, as opposed to broadband networks, use a lower frequency spectrum. High frequency spectrum ensures a high data rate, but narrowband consumes less power, has a longer range, and is more resistant to interference. For some uses, such as smart metering or machine-to-machine connectivity, when high data rates are not necessary, using narrowband is more efficient.

Strong growth is expected for narrowband applications. For example, Smart Cities are expected to use a combination of broadband and narrowband.

In the UK, Whitehelm's portfolio company Arqiva has partnered with Sigfox to equip 11 cities with a two-way ultra-narrowband technology, patented by Sigfox. It enables large-scale connection of objects through a simple, low energy consuming and cost-effective subscription-based connectivity solution. The cellular based solution allows connected devices to be completely independent of local networks and thus removes the installation complexity for end users.

An increase in the use of narrowband raises questions of license and regulation. Currently only high frequency spectrum is licensed while low frequency is unlicensed spectrum, which means anybody can use it. There is a possibility that, as the sector develops, governments may seek to regulate it and require a licensing system, impacting today's business cases for investment in narrowband applications.

Data Centres

Demand for data has exploded over recent years, and this exponential growth is expected to continue, largely driven by the proliferation of connected devices, users' demand for faster access to information, the development of 5G and the IoT. Managing this immense amount of data and its growing complexity will require the industry to find more efficient and cost-effective ways of dealing with it.

At the same time as quantity of data is increasing, the speed at which people need access to that data is also increasing. For example, as Autonomous Vehicles are developed and become commonplace, they will need constant access to information from the environment around them and other vehicles. A delay in getting that information could be dangerous, so the speed at which data is shared will become essential. As such, the location of datacentres will also become more important, as the speed of access requirements change over time.

Datacentres have become essential elements of the data challenge, but technology advances are moving fast, and competition is rising. Datacentres need to keep on top of these evolutions and invest in the latest technology in order to be cost effective and remain competitive.

Approximately 50% of data centres' operating expenses are energy-related, primarily for the cooling of the servers. Reducing energy usage of data centres is an ongoing challenge for owners, both from a cost and carbon emissions perspective (servers are estimated to account for around 2% of global greenhouse gas emissions). Some have achieved significant improvements over the past decade and are managing their power costs and emissions through PPAs with dedicated renewable energy generators.

Google states that by 2016 it had achieved 3.5 times the computing power from the same amount of energy used in 2011. Google's focus has been on building super-efficient servers, inventing more efficient ways of cooling and investing heavily in renewable energy. In addition, Google has recently cut its energy use by a further 15% by applying AI to manage adjustments to air temperature, pressure and humidity, which ensures greater efficiency.

In this technology-focused sector, threats could also come from the development of alternative solutions, where data could be stored closer to where it is generated. Wireless personal area networks, driven by concerns over data privacy, could be such a solution.

New Generation of Telecom Networks

As the telecom industry is continuously searching for new ways to speed up connectivity and data transmission, one new technology being developed is Li-Fi, which transmits data using light waves. Li-Fi uses common household LED light bulbs to enable data transfer, with speeds of up to 224 Gbps and the technology may be able to replace Wi-Fi for some functions.

Li-Fi has significantly shorter range than Wi-Fi and the signals cannot pass through walls. In order to obtain full connectivity, capable LED bulbs need to be placed throughout any given location. Li-Fi may therefore not be of interest for public places. But the shorter range makes it more secure from hacking, and with its impressive speeds, this technology may be appealing within households or businesses.

Conclusion

If there is one constant in life, it is change. At no time since the Industrial Revolution has the pace of change and the impact of that change on people and economies been greater.

As this four-part series of articles illustrates, there are a vast number of diverse disruptors that could impact the infrastructure sector in the future, raising significant questions for investors today, both for new acquisitions and for existing portfolios.

Whitehelm believes that the key is to understand the risk and return profile of the particular infrastructure investment. As demand for infrastructure investments has dramatically increased, some players in the market are moving away from traditional infrastructure sectors and into 'infrastructure-like' or 'value-add' sectors. While this is not a problem in itself, caution is needed to understand that the risk profiles of such investments can differ substantially from traditional infrastructure and such investments are unlikely to present the long-term stable cashflows throughout the cycle that traditional infrastructure assets can be expected to provide. It is therefore key to remain true to your investment philosophy and ensure that what you are acquiring is a true infrastructure investment, or that you are being remunerated through higher returns for those investments that fall out of this scope.

Likewise, it remains essential to understand how the risk and return profile of an existing investment can change over time, and how these changing risks can best be mitigated. Whitehelm believes this highlights the significant value that can be added through the dedicated and experienced asset management of existing infrastructure assets. This ensures that appropriate measures are being taken to understand, manage and mitigate risks from disruption and to take advantage of those opportunities that change and disruption provide.

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