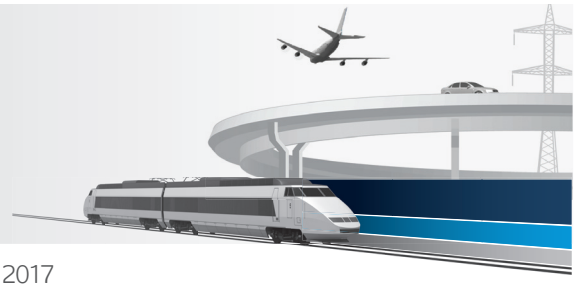
First State Investments

Travel Diary

Global Listed Infrastructure

The customer is always right



Edmund Leung, Portfolio Manager, Global Listed Infrastructure | December 2017

We think US utility investment opportunities remain abundant, driven by modernization, electric vehicles and economic wind generation.

Consumer media consumption habits are changing, causing upheaval in legacy distribution models and reinforcing that the future lies in wireless infrastructure.

5G wireless networks are coming soon; we look through the hype at the potential consequences for mobile towers.

I recently spent two weeks in Europe and the US where I met with infrastructure companies to discuss utility investment plans and investigate the underlying trends in the communications infrastructure sector. It is apparent that the structural trends (and in some cases, disruption) impacting infrastructure investment are strongly influenced by the customer.

In the US, regulated utility capital expenditure (capex) opportunities continue to be abundant (although the scale and pace of this investment is constrained by the impact on customer utility bills / rates). Furthermore, growing demand for electric vehicles and a focus on reducing carbon intensity are creating additional rate base investment opportunities.

In the communications sector, changing consumption of media (especially video) is reinforcing winners (mobile towers) and losers (satellite) in the distribution infrastructure of media content. Lastly, the marketing of 5G is ramping up as agreed technical standards start to emerge.

Utility capital expenditure

I recently attended the annual Edison Electric Institute Financial Conference, where I met senior management of sixteen North American utility companies over two days. Some might say it was speed-dating, utility-style!

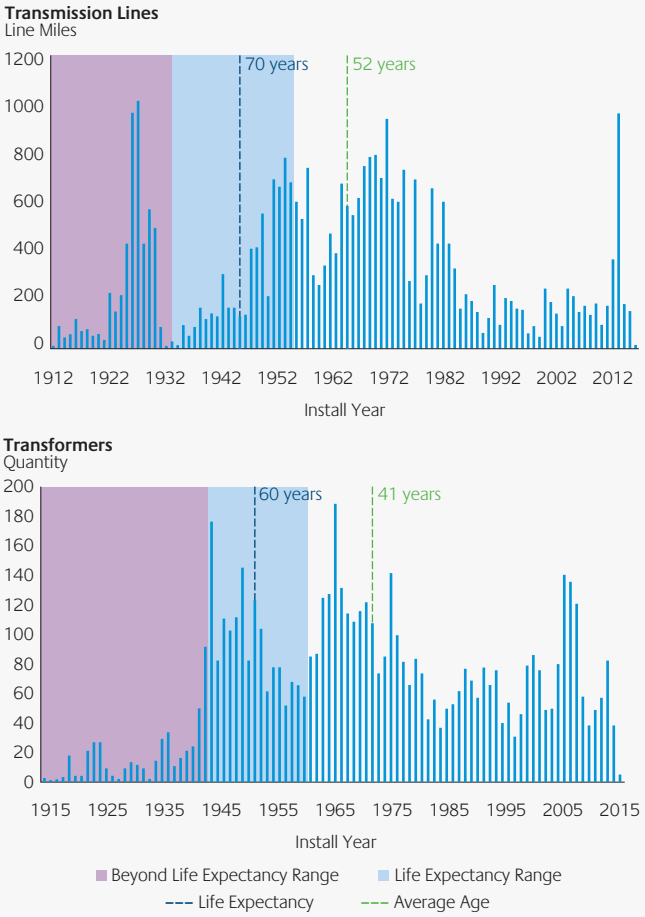
Source: First State Investments.

Replacement and upgrade cycle

Regulated utilities earn an allowed return on their assets (rate base). As a result, the outlook for capital investment and the subsequent change in rate base is key for their medium term earnings profile. Pleasingly we believe that this outlook remains healthy. Utilities are replacing ageing distribution networks, upgrading substations, expanding transmission lines and renewing generation assets.

Much of this work is routine and necessary (and so less likely to be challenged) which strengthens and elongates the earnings runway. A good example is American Electric Power, which has over 6,000 miles of electricity transmission line that has now exceeded its service life expectancy range. Coupled with aging transformers and circuit breakers, the company's capital investment opportunities are significant.

Life expectancy range of AEP assets

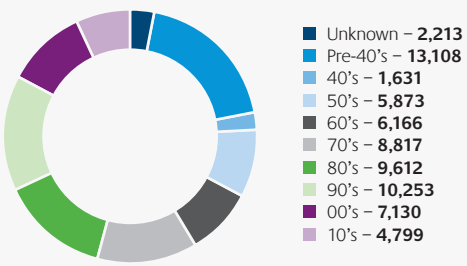


Source: American Electric Power

Customers are an important part of the capex equation as they benefit from improved reliability, while at the same time sharing the financial burden. Utilities spread their capex over multiple years to better manage the impact on customer bills and mitigate 'bill shock'. The informal gold standard for annual rate increases appears to be in the range of low to mid-single digit percentages.

NiSource and its Mid-Western utility peers are proponents of this model. NiSource's gas and electric utility businesses have a US$30 billion pipeline of potential investments, representing more than three times their rate base. In order to keep customer bill increases to single-digit percentages, they are executing their investment opportunities over a 20 year period.

Gas distribution industry pipeline age – 42% of pipes installed pre 1970s



Source: Atmos Energy, using Dept of Transport data

Electric vehicles

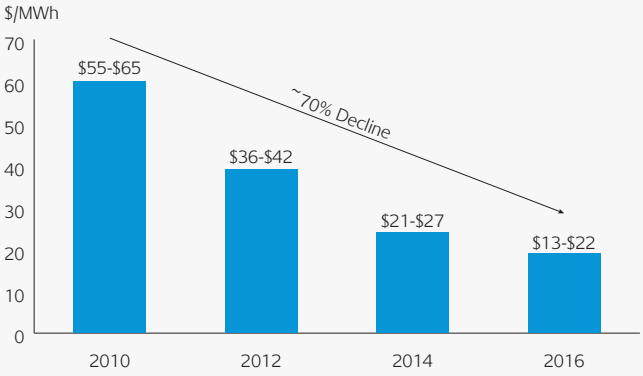
Growing demand for and penetration of Electric Vehicles (EVs) represents an emerging customer-led capex opportunity. Management teams have remarked that EVs are changing the investment landscape faster than expected. EVs are likely to require utilities to expand and enhance existing electric distribution networks. For example: laying wires to establish highway charging stations; and reinforcing existing networks for in-home charging.

To date utilities have appeared reluctant to invest in charging stations. Given the rapidly evolving backdrop, they are limiting themselves to small steps at this stage. PG&E Corporation has been allowed to invest US$130 million to install infrastructure to support 7,500 charging stations. Eversource Energy has proposed investing US$45 million to support approximately 4,000 charging points across the state of Massachusetts.

Wind power

Wind-powered electricity generation is becoming more cost-competitive due to improvements in technology. Longer blades and more efficient turbines are increasing the amount of wind energy that is converted into electricity. This has made the cost of wind generation competitive with the cost of producing electricity using modern combined-cycle gas-fired turbines (CCGTs). In fact, with the benefit of production tax credits, the all-in cost of wind (levelised cost of electricity) can in certain regions be cheaper than the variable cost (fuel plus operating & maintenance costs) of CCGTs.

Declining cost of wind-powered electricity generation



Source: NextEra Energy, Dept of Energy 2015 Wind Technologies Market Report.

We believe this is becoming a compelling proposition for customers. Utilities are now adding wind generation to their rate base (some for the first time) to take advantage of this. Earlier this year AEP announced they were looking to add a 2 gigawatt wind farm[1] to the rate base of two of their utilities. Coupled with the build-out of a large transmission line, this US$4.5 billion project[2] is significant for the company. It is projected to deliver US$2.5 billion in customer savings over the first decade of operation.

[1] This will be the largest wind farm in America and compares to a total of 81 gigawatts of wind capacity in the US as at December 2016.

[2] This compares to AEP's total rate base of US$35.5 billion and annual capex of US$6 billion (2017-2020).

Convergence in an over-the-top[3] (OTT) world

It seems foreign to think back to the time when you couldn't watch an episode of your favorite TV show or part of a movie on your smartphone or tablet. The convergence of the technology, media and telecom (TMT) industries is gathering pace and companies are moving strategically to ensure they remain relevant in the OTT world.

Wireless carriers (or telcos) are moving into media content production (AT&T's bid for Time Warner); television studios are investing in distribution (Fox relaunching Hulu, CBS' success with Showtime); and everyone, including traditional cable & satellite distributors, has a mobile app-based viewing platform. Non-traditional companies such as Apple, Amazon and Facebook are investing in their own content too – it is a great time to be a viewer!

These moves have been triggered by the ease with which consumers today can access high-quality, well-produced video anywhere there is an internet connection. Google believes that 60% of YouTube viewing time is conducted on tablets or mobile devices. Facebook claims almost two-thirds of users return to its app every day. This trend has and will continue to disrupt business models.

The winners from these structural changes are the communications infrastructure companies that provide the wireless networks. What started with email, webpages and simple maps has evolved into the provision of cinema-quality video content. As consumers become accustomed to the convenience of video consumption on the move, demand for high speed data networks continues to grow. US wireless carrier Verizon explained that the reason for re-introducing unlimited data plans was to improve their customer growth, after peers launched similar promotions.

For infrastructure investors this reinforces the essential service nature of towers. Companies such as American Tower and Crown Castle are well placed to benefit from future network investment from carriers.

Legacy video distribution channels such as cable or satellite Pay TV companies are at risk of being disrupted. The days of distributors bundling up content for a package is now less relevant as customers can buy directly from TV studios, without lengthy lock-in contracts.

As viewing moves online and away from traditional platforms (such as satellite TV channels), marginal TV channels are becoming obsolete. Distributors are investing less in satellite capacity and in some cases even starting to return transponders. Satellite operators are in an earnings downgrade cycle, as growth expectations have moderated from low-growth to no-growth. The most recent share price declines may reflect market consensus beginning to price in negative-growth.

5G is coming, but not as you think

The technology sector innovates relentlessly. Just as we had become accustomed to 4G mobile technology, the industry is now discussing 5G. The tower industry has benefitted richly from the first four generations of mobile technology, as faster data networks catalyzed a virtuous cycle of greater data (and leasing[4]) demand. Is this structural growth story intact or will potential changes to network architecture affect future demand for tower leases?

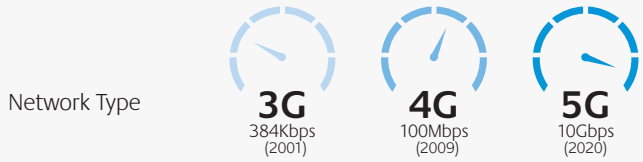
Here's what we know about 5G today:

- it aims to provide more bandwidth at lower latency (i.e. videos should load faster and with less delay)
- there are no formal standards yet, with an expected timeframe of 2019-20
- initial deployments are expected to use higher frequency spectrum
- it is likely be complementary to, rather than a replacement of, 4G LTE (Long-Term Evolution).

Materially shorter download times with 5G

Cellnex's Positioning in a 5G World
What does 5G mean to Cellnex?

Operators have invested more than €100Bn in network deployments over the last 5 years...



...download speed x26,000

Source: Cellnex

[3] Over-the-top refers to video that is delivered through the internet to a consumer's screen, rather than via a proprietary network such as cable, satellite or terrestrial.

[4] Towers lease physical space to telcos to install radios and antenna. Contracts in the US are typically five to fifteen years with annual escalators of two to four percent.

Initial deployments are likely to be on higher frequency bands due to their availability. All other things being equal, these frequencies do not travel as far as the low- and mid-band spectrum that is used today. This change will require networks to be denser, with cell sites closer together.

At the same time as deploying additional equipment on towers, carriers have been busy rolling out small cells[5] as part of their network architecture. Small cells should feature in 5G deployments, through their proximity to mobile users, thus it is fair to expect they will take a share of the capex budget currently reserved for traditional ("macro") towers. Crown Castle is well placed to benefit from this change, following their numerous investments in small cell fibre.

We expect that macro towers will continue to be an important part of wireless networks, given their lower cost[6] of deployment relative to small cells. We also expect they will be well placed to benefit from incremental leasing demand, once 5G is developed on low- to mid-band spectrum.

Crown Castle small cell deployment in Manhattan

Source: First State Investments

Conclusion

Infrastructure assets have high barriers to entry and operate from privileged positions, providing essential services. This suggests customers are typically captive with limited bargaining power.

From my recent travels however, it is apparent that the trends impacting infrastructure (utility capex, satellite demand, wireless infrastructure) are strongly influenced by the customer.

[5] Small cells typically involve a fibre connection that allows a cabinet and antenna to be deployed on a utility pole, building or traffic light.

[6] Macro towers typically propagate cellular signals over a longer distance than a small cell. Thus, a carrier needs to deploy multiple small cells to cover the same area as one macro tower.