



Infratil Market Update February 2017

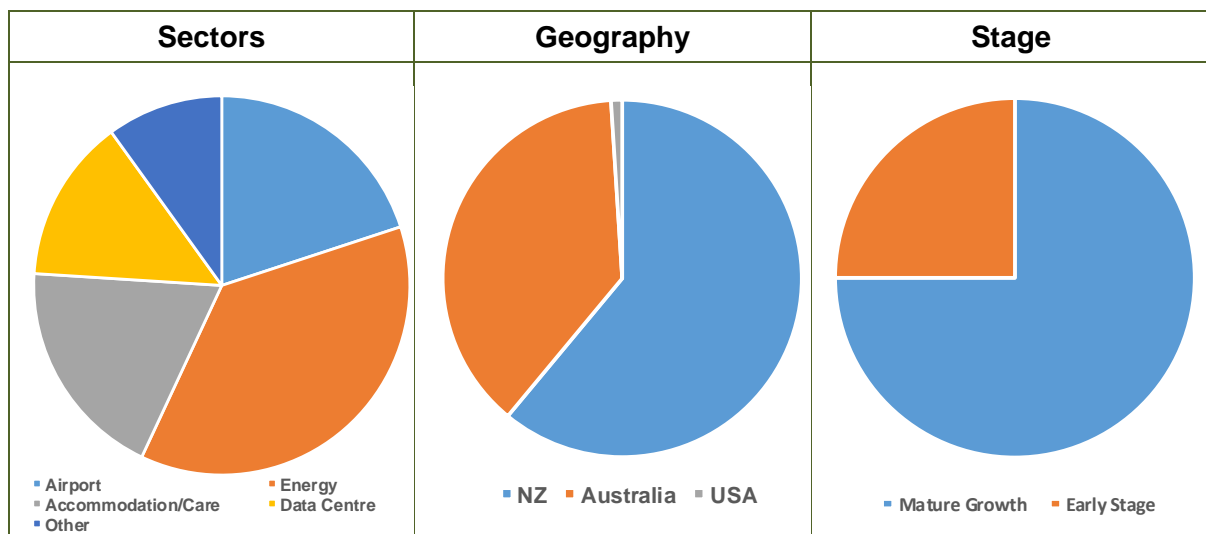
Over the last two years Infratil has increased the breadth of its activity and established important new platforms for future growth. The new areas include retirement living, data centres, student accommodation, and renewable energy in North America. With new sector exposures and important developments in our traditional domestic energy and transport businesses, this market update is designed to provide further information on the prospects for each of our businesses.

Over the three months to 31 December 2016 the NZX50 index fell -3.1%, ten year NZ Government bonds lost 8% of their value. Infratil's shares experienced a -13.2% fall in value (including the dividend), followed by a 9% rise in 2017.

To date, for the financial year since 31 March 2016 the return to Infratil's shareholders has been an unsatisfactory -6.8% (over the last five years compound returns have been 15.4% per annum).

Explaining recent global share and bond price changes has taxed analysts and pundits. An illustration of how hard the 2016 outcomes were to anticipate/explain was provided by a Financial Times columnist who calculated some of the most lucrative trades of the year. Someone who sold short the S&P Clean Energy Index and used the proceeds to buy the Global Coal Index returned 156%. Selling the Chinese share market index and putting the proceeds into Brazil's: +93%. Selling US equity volatility (through the VIX index) and buying US shares: +69% (lest anyone think that the jump in the Coal Index could be a trend, it is still down 80% over the last five years).

The same columnist noted that valuation inconsistencies and highly uncertain market prospects leave only one answer; diversification. As indicated by the following graphs, diversification is something which Infratil provides.



Over the quarter to 31 December Infratil bought back 1,717,464 shares at an average price of \$2.75 and 1,489,000 PiiBs (perpetual bonds) at an average price of \$0.6225. At the end of the period, the net debt of Infratil and 100% subsidiaries was \$890 million and a further A\$45 million of subsidiary debt was guaranteed (Perth Energy). In January 2017 Infratil repurchased a further 1,000,000 shares for \$2.87.

The most recent broker analyst reports of Infratil's businesses gives the following average valuations. The value of debt shown in the table is the actual debt as at 31 December 2016 while the value of Longroad is the sum Infratil has invested as at that date:

Trustpower*	\$749m
Tilt Renewables*	\$355m
Perth Energy	\$43m
Longroad	\$36m
Wellington Airport	\$594m
NZ Bus	\$212m
Canberra Data Centres	\$422m
ANU Student Accommodation	\$85m
RetireAustralia	\$250m
Metlifecare*	\$235m
Other	\$79m
External management contract /corporate overheads	(\$214m)
Net Debt	(\$890m)
Total	\$1,956m
Average broker per share estimate	\$3.49

* Value of Infratil's holding based on the closing share price on the 3rd of February 2017

Investment Strategy

Infratil continues to target relatively high risk-adjusted returns from infrastructure and essential services in sectors with strong long-term secular trends.

Following considerable portfolio activity over the last five years, Infratil has largely established the principal areas of growth for the medium term. With positions in retirement living, renewable energy, data centres and social infrastructure throughout Australia, New Zealand and the USA the strength of the internal development pipeline has increased considerably, as has the value of future options.

The implied net asset value discount on an Infratil share has widened as the new sector positions have been established. In part, this is understandable given the unproven value of the new platforms. The alternative view is that establishment of proprietary platforms is a critical indicator of future success in a competitive market for private market infrastructure.

Other sectors such as waste, telecommunications, and water continue to be scanned but investors should expect the focus to be on maximising the performance of existing assets while prioritising capital for the existing development pipelines and proprietary opportunities. Considerable near-term opportunities to deploy capital at attractive returns are likely within our renewable energy and retirement living businesses in Australia and the USA.

Future portfolio activity is still possible but largely dependent on clarification of a number of current uncertainties – e.g. the outlook for the New Zealand electricity market is evolving as new technologies impact future business models, and industry boundaries are being blurred by utilities offering multiple services to customers. Public transport activity has recently been dominated by the new regulatory regime for procuring services, and in the future will be heavily influenced by electric-powered vehicles and new technologies enabling more convenient ride-sharing services. Regulators and politicians, as always, will have a view on the future development of the politically-sensitive industries within which we operate.

Infratil will adopt a cautious view of markets and position itself to be able to sustain market stresses (or exploit opportunities) if they arise. Regardless, Infratil continues to maintain its management capability, analysis of sector fundamentals, and research and development programme as it pre-positions itself for the likely changes in certain sectors.

Wellington Airport

The Airport experienced its busiest day of 2016 on 23rd December with 4,364 international and 23,650 domestic passengers (almost double an average day). The additional 6,000M² of domestic terminal space commissioned in October was fully utilised (total construction cost \$65 million), as was the recent international terminal upgrade (cost \$8 million).

From two years ago, daily passenger movements are up on average by over 1,000 people on domestic services and almost 350 on international flights (with busy days such as 23rd December higher again).

A notable aspect of the domestic terminal construction project was its safety. Over 460,000 man-hours of work and only one accident required medical treatment (a cut hand). All parties can be justifiably proud of this outcome which reflects the priority given to safety.

The Airport's on-going construction includes further upgrades to its terminal passenger services, a ground-transport hub (including 1,000 car parks) and a 134 room hotel. Planning for expansion of the international terminal is also progressing.

For the full financial year, capital spending is forecast to be approximately \$90 million. To help fund this construction and to repay other debt the Airport has undertaken three bond issues over the year:

\$75 million 4.25% coupon maturing May 2023
 \$60 million 4.00% coupon maturing August 2024
 \$50 million 5.00% coupon maturing June 2025

The third of these issues is still open to investors seeking a BBB+ rated bond at an attractive yield. The 5% per annum coupon reflects the increase in market rates which has occurred over the period since the previous issue.

The expansion of the Airport's facilities to accommodate increasing domestic traffic has been mirrored by Air New Zealand opening a second lounge for its domestic customers. Growth, and changes to airline fleet mix, is now requiring additional airfield infrastructure, including the transfer of a part of the Airport's car park to the airfield for aircraft parking.

Having only started on 21st September, the Singapore Airlines service linking Singapore-Canberra-Wellington is building passenger support, hopefully to levels that will justify an increase in the service in the future.

Wellington Airport Passenger Statistics

Domestic Pax	Month	12 months
December 2016	436,376	5,065,896
November 2016	425,681	5,048,081
March 2016	-	4,900,232
December 2015	418,561	4,818,045
November 2015	430,344	4,791,609

International Pax	Month	12 months
December 2016	85,319	891,998
November 2016	75,259	891,291
March 2016	-	897,359
December 2015	84,612	873,057
November 2015	77,337	860,060

The mid-November earthquake had a temporary effect on domestic traffic, but the flat international figures appear to reflect a more durable problem from long-haul flights not being able to take-off from Wellington's runway. Emirates' new services directly linking the Middle East with Christchurch and Auckland has influenced Wellington international passengers who previously flew Europe-Middle East-Australia-Wellington. And the ongoing increase in New Zealand-China traffic is benefitting other regions but is also out of reach of Wellington.

The November earthquake caused a temporary delay to the Airport's plan to remedy its lack of long haul services. A shortage of court space in Wellington postponed the Environment Court's process pushing out the main hearings to probably June 2017.

MBIE regional tourism spending figures illustrate the cost to central New Zealand of not having air links with the northern hemisphere. Over the last five years the rest of New Zealand experienced a 39% rise in tourist spend; almost double the 20% growth of the central region (Hawkes Bay, Taranaki, Manawatu-Whanganui, Wellington, Nelson, Tasman, Marlborough). Were central New Zealand capturing a share of tourist spend consistent with its 28% share of the national economy, it would amount to an additional \$2,070 million a year.

Tourism Spend

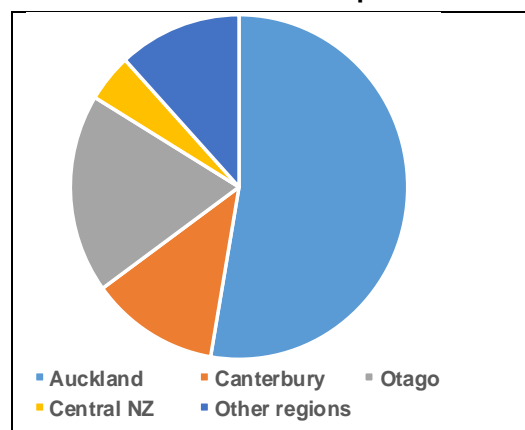
\$Millions	Central NZ		NZ Total	
	2011	2016	2011	2016
Domestic Spend	3,144	3,671	12,079	15,040
International Spend	1,178	1,537	7,152	10,949
Chinese Spend	25	76	432	1,664

These MBIE figures give the twelve month tourism spend in the respective years. Central New Zealand captured 18% of the of the \$2,961 million increase in domestic tourism spend which occurred over the five-year period, but only 9% of the \$3,797 million increase in international visitor spend (its market share of Chinese visitor spend fell from 5.8% to 4.6%).

With Ministry figures indicating that Chinese visitors spent \$1,664 million in New Zealand over the last twelve months, it is easy to appreciate why Wellington+Tasman+Nelson+Marlborough+Taranaki+Hawkes Bay+Manawatu-Whanganui would feel deprived with a less than 5% share.

It's also easy to appreciate the attraction of a longer Wellington Airport runway facilitating direct links between the region and the northern hemisphere.

Where Chinese Tourists Spend In NZ



NZ Bus

NZ Bus is experiencing modest but satisfactory growth in Wellington but falling patronage in Auckland as a result of losing tenders for south Auckland services and because NZ Bus's Auckland routes are on roads more affected by congestion than expressway services which operate on dedicated busways. Auckland's figures for public transport patronage in 2016 relative to 2015 clearly show the benefits of public transport vehicles or vessels not being captured by congestion.

Auckland Patronage	Rapid Bus	Regular Bus	Train	Ferry
2015	3,392,100	57,084,700	15,379,700	5,720,300
2016	4,590,700	56,025,600	18,111,200	6,039,900
Growth	+35%	-2%	+18%	+6%

In Auckland the first stage of implementing the new contracting regime ("PTOM") regime is well advanced with contracts awarded for south and west Auckland, tender results pending for other areas, and terms for many of the remaining contracts under negotiation.

In Wellington/Hutt the first tenders are expected to occur shortly. The regional and city councils and NZTA are however undertaking a new study of the Capital's land transport (called "Let's Get Wellington Moving") and the final report is not due for some months. In the meantime, with the contract for Wellington's 60 electric trolley buses terminating from 1 July 2017, the Regional Council and NZ Bus have agreed a transitional arrangement for Wrightspeed electric buses to replace the trolleys, or diesel buses if the electric fleet is not ready.

PTOM contracts transfer all patronage risk from bus operators to the relevant regional transport agency/council which should encourage them to focus on initiatives to grow patronage.

One illustration of this happening is an innovative idea in Auckland to use the car park of a North Shore church for a "park and ride" bus service, except of course on Sundays.



NZ Bus Patronage

Northern Pax	Month	12 months
December 2016*	2,320,410	37,994,673
November 2016	2,909,784	38,310,802
March 2016	-	39,165,255
December 2015	2,636,539	40,031,954
November 2015	3,355,715	40,154,236

Southern Pax	Month	12 months
December 2016*	1,476,086	20,821,854
November 2016*	1,671,475	20,845,881
March 2016	-	20,743,515
December 2015	1,500,113	20,708,776
November 2015	1,737,102	20,688,142

*December 2016 had fewer business days than 2015. The 14 November 2016 earthquake reduced activity in Wellington for a number of days.

So far the Auckland PTOM contracts have been exclusively for diesel buses, but NZ Bus is progressing its work with electric Wrightspeed powertrains in the expectation of a shift in that direction. The first of these buses is expected to undergo road trials in Wellington in the first quarter of 2017.

As previously described, Wrightspeed combines electric motors, battery energy storage, and a turbine to recharge the batteries. In due course, as recharging infrastructure is installed and batteries become more efficient, the turbine may become redundant.

Globally, electric battery buses are experiencing two speed implementation. There are over 150,000 of them already operating in China, but less than 10,000 everywhere else. However, recent announcements in North America and Europe show that both regions are also pushing electric public transport. The announcements also illustrate that electric buses are a sector of emerging technology.

The modern diesel bus has been honed over a century through millions of vehicles, electric vehicles have to catch up, quickly. The European ZeEUS project (Zero Emission Urban Bus System) is monitoring 61 different field trials in 21 countries and recently published a summary of the trials in the year to 30 August 2016, covering 597,161 kilometres of operation. Some of the trials are summarised below:

City	Vehicle	Battery	Recharge ¹	Comments
Prague	SOR EBN	172kWh	T, D	Daily service distance of 265 kilometres. Hilly and flat routes. A climate range from 30 degrees in summer to sub-zero in Winter.
Berlin	Solaris Urbino	230kWh	T, D, S	Covering a flat 6 kilometre route over 22 hours a day and 168 kilometres.
Bonn	Bozankaya Sileo	230kWh	D	17 kilometre route. 13 hours and 200 kilometres a day. Based on the trial Bonn will be deciding about full bus network electrification in 2017.
Hamburg	Volvo	100kWh	T, D, S	The goal is to purchase only electric buses from 2020. The trial is on a 13 kilometre route for up to 20 hours a day.
Turku Finland	Linkker	55kWh	T, D	13 kilometre route for up to 18 hours a day. Flat topography, cold in winter.
Marseille	Irizar	339kWh	D	6 kilometre route for up to 16 hours a day and 140 kilometres. Moderate topography, hot in summer.
Paris	Bollore Bluebus	240kWh	D	10 kilometre route, 14 hours a day and 180 kilometres. The Paris goal is 100% electric and biogas powered buses by 2025.
Tel Aviv	BYD	324kWh	D	Routes of up to 38 kilometres for 14 hours a day.

City	Vehicle	Battery	Recharge ¹	Comments
Rotterdam	VDL/e	100kWh	D	The goal is to transition the entire fleet to electric over the next decade.
Schiphol Amsterdam	BYD	216kWh	D	Flat route, 120 kilometres a day.
Utrecht	Optare	86kWh	D, T	Flat route, 140 kilometres a day.
Rzeszow Poland	Ursus and Solaris	170 and 210kWh	D	10 kilometre route for up to 9 hours a day and 120 kilometres.
Warsaw	Solaris and BYD	208 and 324kWh	D, T	Moderate topography. Up to 200 kilometres a day.
Bucharest	SOR EBN and BYD	172 and 324kWh	D	Temperature range of -20 to +40 degrees. 24 kilometre route, 12 hours a day.
Barcelona	Irizar, BYD and Solaris	125, 324 and 352 kWh	D	Flat and hilly routes of up to 13 kilometres. 18 hours and 180 kilometres a day.
Eskilstuna	BYD	280 and 330kWh	D	11 hours and 250 kilometres a day.
Umea	Hybricon	80kWh	D, T, S	Moderate topography. Up to 18 hours and 250 kilometres a day.
Inverness	Optare	150kWh	D, T	Moderate topography. Up to 12 hours and 160 kilometres a day.
London	BYD/ADL	324kWh	D, T	Several different buses are under trial on a range of routes. 51 BYD/ADL's is the largest trial.
Nottingham	Optare	95kWh	D, T	Moderate topography, up to 15 hours and 100 kilometres a day.

1. Recharging may occur at the depot (D), at the route terminus (T), and on-route at stops (S). A larger capacity battery and lower daily distance can allow battery recharging over-night at the depot. Smaller batteries and longer distances requires additional recharging.

Tests of charging and battery configurations in different operating conditions are providing data on energy consumption, reliability, functionality (range, noise, comfort), battery performance and driver and customer satisfaction.

In the USA, Seattle has announced the purchase of electric buses from California manufacturer, Proterra. These buses will only cover about 40 kilometres on a battery charge, but can fully recharge in under ten minutes. They reportedly cost NZ\$1 million each.

Auckland Transport has also announced that it has received a government grant to trial two electric buses.

A lot of manufacturers and transit agencies are working on the holy grail of a cost efficient electric bus able to operate without a recharge for 200 kilometres or 16 hours. China, on the other hand, has shortcut the trial stage. In one city alone, Shenzhen, 4,897 electric buses are now in operation.

Ministry (MBIE) figures indicate that New Zealand's current CO₂ pricing imposes a cost of 2.4 cents/litre on diesel. If the cost of CO₂ emissions rises to \$75/tonne by 2020 (the level estimated as being globally consistent with achieving the Paris Accord CO₂ targets) that would be almost 15 cents/litre on diesel.

Trustpower

On 31 December 2016 Trustpower completed its first period separated from Tilt's wind generation. Trustpower now comprises hydro generation in New Zealand and Australia and utilities retailing.

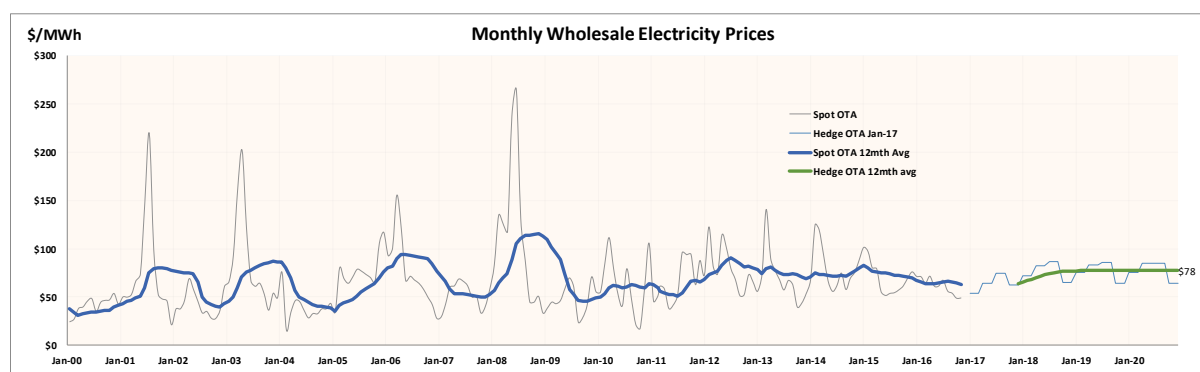
Approximately 75% of Trustpower's value is in the form of its hydro power stations. In a year of normal rainfall they are expected to generate:

- In New Zealand 1,926GWh (including a 187GWh contribution from King Country Energy which is 65% owned by Trustpower).

- In Australia (New South Wales) 244GWh.

Were this amount of output sold at current 2017 hedge prices (New Zealand \$60,000 per GWh and NSW \$85,000 per GWh) total generation revenue would be approximately \$140 million. (The figures are illustrative. In New Zealand, Trustpower's generation is sold to mainly retail customers rather than via the hedge market.)

As the following graph shows, annual wholesale electricity prices in New Zealand have been stable over the last five years and forward prices indicate an expectation of more of the same.



Source: Electricity Authority and ASX

The other source of Trustpower's value is in its New Zealand retailing activities, which encompass electricity, gas and telecommunications (the following table includes King Country's approximately 16,500 electricity customers from that company's acquisition by Trustpower in January 2016).

Customers (000s)	31 Dec 2016	30 Sep 2016	30 Sep 2015	30 Sep 2014
Electricity	279	278	252	234
Gas	32	31	28	21
Telecommunication	73	69	51	35
More than one service	88	84	66	46

Trustpower continues to be highly successful at growing its utility customer base. For instance, adding 863 electricity accounts in just December. While it is apparent from Trustpower's success that a lot of people want to be provided with several utility services by one reliable provider, the challenge is to achieve profitable growth, as customer acquisition is expensive.

In addition to its own generation Trustpower also purchases all the New Zealand generation of Tilt which averages about 650GWh a year. This, and a similar amount purchased in the wholesale market, roughly matches Trustpower's sales to its commercial customers.

Over the short term, Trustpower is largely insulated from wholesale market price movements. Over the medium term wholesale prices will be reflected in retail prices and will either benefit or impact generation activities and valuations. As noted above, the market expectation is for stable wholesale prices for some years into the future, notwithstanding risks.

The following table shows New Zealand's generation over the last five September quarters, which shows very clearly how stable the period has been.

GWh	2016	2015	2014	2013	2012
Total generation	11,312	11,491	11,316	11,078	11,371
Coal/Gas generation	1,558	2,076	2,057	2,688	3,011
% renewable	86.1%	81.8%	81.7%	75.6%	73.4%
Residential consumption	3,911	4,094	3,882	3,944	-

- Electricity consumption has been flat (notwithstanding the economy expanding about 12% over the last five years), as is total residential consumption (even though the number of households increased about 6%).
- Weaker than anticipated demand is causing a reduction of thermal generation (gas and coal fired) because power stations with higher operating costs which also have to pay for fuel get switched off before those powered by water, wind or geothermal.
- This makes for feel-good statistics such as “86% renewable generation”, but the closure of coal and gas fired power stations could have an impact next time it’s a cold dry winter or if demand revives. The reduced reserve capacity will need to be matched by investment in fast-start thermal generation and emerging storage technologies, otherwise the system could face higher and more volatile electricity prices, or worse.

Other sector developments have the potential to alter the current stability of electricity supply and demand;

- Since 1 January 2017 the electricity contract between the Tiwai Point smelter and Meridian Energy has allowed the smelter greater termination flexibility. As it consumes about 13% of total national production, closure (in whole or part) would be a major event. Its owners could provide a surprise, but are more likely to first seek government support and/or lower electricity prices, and the widely held view is that neither are required at present.

Australia has recently shown how far a government will go to retain a smelter (and its associated jobs). A\$240 million in subsidies and lower priced electricity have been provided to retain the Victorian Portland smelter. It produces about the same amount of aluminium as Tiwai Point’s and is 15 years newer. The Australian smelter’s requirement for subsidies was probably largely explained by electricity prices. At current market prices, the electricity required for the Australian smelter would cost about \$100 million a year more than the comparable New Zealand cost (8c/kWh Vs. 6c/kWh).

- New Zealand households continue to install solar panels, but reflecting their marginal economics relative to buying off the grid, total rooftop generation is still only about 50GWh a year (0.1% of total generation).
- New Zealand’s uptake of electric cars is even slower than its uptake of solar panels. The national fleet has just topped 2,200 cars, which may consume about 4GWh of electricity a year (0.01% of total generation).

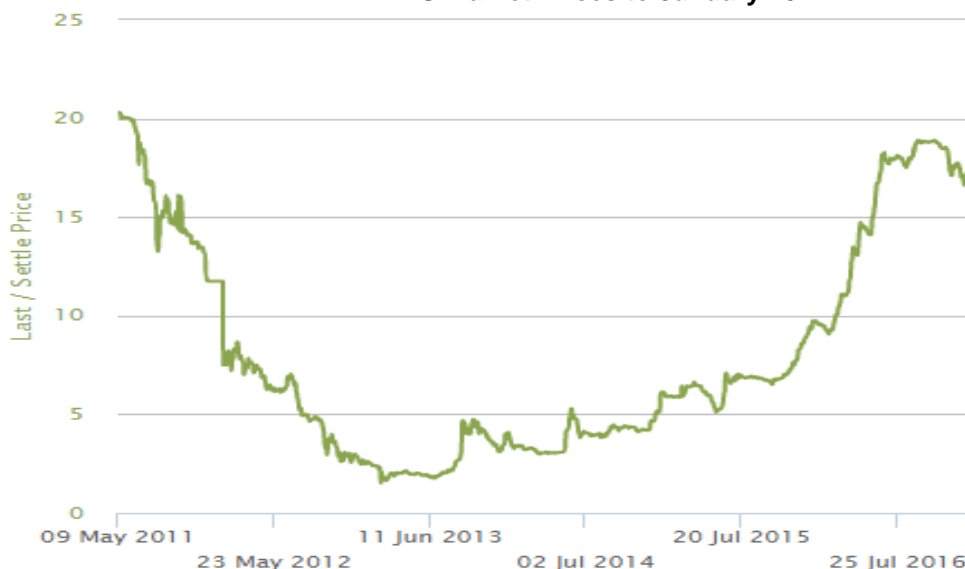
A factor which has nothing to do with electricity supply and demand, but which may still impact Trustpower (and Tilt) are the Electricity Authority’s intended changes to transmission pricing. This has two components. One is a general rearrangement of charges which lowers transmission costs at the bottom of New Zealand and raises them at the top, which is likely to have little effect on generator/retailers. The other change will have the effect of increasing grid charges for “embedded” generation, including some owned by Trustpower and Tilt (embedded generation largely provides energy for local consumers so has less need for the transmission grid). However, the complexity of the new rules is making it difficult for anyone to accurately calculate the financial impact.

New Zealand’s market value of CO₂ is finally getting to levels where it will be having an effect on the economics of thermal generation. The following price graph provided by Westpac is only telling part of the story. Until recently emitters had to only surrender 0.5 of a New Zealand Unit (NZU) per tonne of CO₂ emitted. The ratio is now 0.67 per tonne, and will be 1-for-1 from 1 January 2019.

A modern gas fired power station paying \$25/tonne for emissions will be incurring a cost of about 1c/kWh as it buys NZUs (an old coal fired station such as Huntly will have a cost about twice this level). However, at present the \$18/tonne NZU price and the 33% dispensation makes the cost of carbon emissions for a gas fired power station about 0.5c/kWh. This is still a competitive advantage for Trustpower as its hydro power stations have zero emissions and hence no requirement to purchase NZUs.

With New Zealand having signed the Paris Accord, a more aggressive approach to reducing greenhouse gas emissions is required. It is estimated that to deliver the Paris Accord targets will require a global CO₂ price of US\$55/tonne by 2020 (NZ\$75/tonne, three times the price at which the NZ government has capped NZU prices today). NZ\$75/tonne for CO₂ will add almost 3c/kWh to the price of electricity generated at a modern gas fired power station.

NZU Market Prices to January 2017



Source: Westpac

Tilt Renewables

Following its separation from Trustpower, Tilt has begun life as a standalone generator with a strong focus on building additional capacity in Australia. Its key uncertainties/opportunities are largely summarised in the following table. Recognising the ever present risk of the wind not blowing.

Power station		Annual Production ¹	Status
Existing			
Tararua I	NZ	245GWh	All output is sold to Trustpower at a price fixed for five years. Thereafter the price rises with the CPI or market electricity prices
Tararua II	NZ	318GWh	
Mahinerangi	NZ	101GWh	
Snowtown I	SA	357GWh	89% of output sold to Origin Energy until 2018
Snowtown II	SA	875GWh	All output sold to Origin to 2030. Price fixed with escalation
Blayney	NSW	18GWh	All output sold to Origin to 2021. Price fixed with escalation
Crookwell ²	NSW	8GWh	All output sold to Origin to 2019. Price fixed with escalation
Developments			
Salt Creek	Vic	170GWh	Consented. Construction expected to start mid 2017
Waddi wind	WA	300GWh	Consented. Construction may start later in 2017
Waddi solar	WA	40GWh	Subject to consent applications construction may start later in 2017.
Palmer	SA	1,150GWh	Consented. Appeal underway. Subject to the appeal, construction could start in 2018.
Dundonnell	Vic	1,000GWh	Consenting almost concluded. Planning is underway to allow construction to start later in 2017.
NSW Project	NSW	1,700GWh	Consent applications underway
Rye Park	NSW	1,000GWh	Consent applications underway

1. Forecast average for existing power stations and estimated maximums for developments.

2. 80% owned by Tilt.

Since its establishment, Tilt is pressing ahead with getting its development projects “shovel ready”. Regulatory and market news continues to be largely positive for the economics of wind and solar generation, with some complications;

- In January 2017 the Australian Government Energy Minister announced; "The government has no plans to change the 2020 Renewable Energy Target (RET), which was settled just 18 months ago".

The Renewable Energy Target is 33,000GWh by 2020 which will require that about 15,000GWh of new renewable generation is commissioned, at a cost of over A\$10 billion. Tilt has the potential to make a material contribution to this target.

- Under the RET scheme, wind or solar generation provides income from two sources; the sale of electricity and the sale of RECs (Renewable Energy Certificates) to emitters and energy retailers.

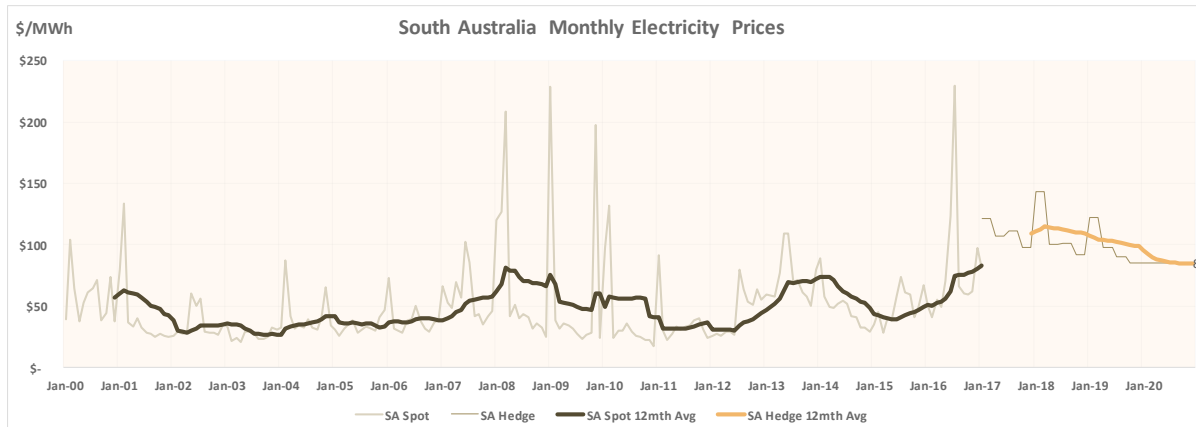
At present the Australian market price for RECs is about 9c/kWh (A\$90,000 per GWh). The price for electricity in the wholesale markets is about 8c/kWh in Victoria and 11c/kWh in South Australia (the REC scheme is national, but each state has its own electricity market and distinct supply/demand features).

- Over the last three years, Tilt's average price for its Australian generation (electricity + RECs) has been 10.3c/kWh. Therefore, if the electricity + REC price is 17c/kWh in Victoria and 20c/kWh in South Australia, it would seem to be lucrative to build and own more renewable generation in those markets.

In reality the situation isn't quite as favourable. The addition of 15,000GWh of wind and solar generation is likely to push down the price of electricity and the price of RECs.

Also, the average price a wind farm receives for its output is below the market average and as wind becomes a larger part of a market's total generation, the more very windy days cause low electricity prices (further reducing the average wind price).

In South Australia, on average wind is forecast to provide about 35% of the state's electricity, but much more on some days. For instance, one day in July 2016 wind turbines provided 83% of the state's electricity, with a very depressing effect on the wholesale electricity price.



Source: AEMO and ASX

The 9c/kWh price for RECs reflects their immediate shortage, which is unlikely to be permanent.

- The REC shortage (hence high price) arose because the last Australian Prime Minister was opposed to the RET scheme and while he tried to dismantle it, the construction of new power stations was put on hold, but the obligation of emitters/retailers to buy RECs wasn't.
- Each day that passes also reduces the REC benefit available to a power station. RECs are only required until 2030, so that Tilt's Snowtown wind farm will be receiving value for its REC's for 13 years, but a wind farm commissioned, say, two years from now will only receive value for its RECs for 11 years.
- To date, Tilt's Australian electricity and RECs have largely been sold on long-term contracts for about 10.3c/kWh. Market changes have made the availability of such long-term contracts problematic so a key aspect of Tilt's preparation for its next wind farm development will be how it sells the output. This may involve fixing prices with short term contracts or through wholesale market hedges.

Infratil has considerable experience of managing volatile Australian electricity prices from the decade-long involvement with Lumo.

Longroad Energy

Longroad was established by Infratil, the New Zealand Superannuation Fund, and an experienced local management team to develop renewable generation projects in the USA; some of which will be held to provide income and some of which are likely to be sold to realise development profits. The shareholders have jointly indicated a willingness to provide initial funding of US\$100 million (Infratil's share NZ\$65 million).

The enormous scale of the US energy market allows much greater specialisation than occurs in New Zealand. Here, companies such as Trustpower tend to undertake all the stages of generation development, construction and ownership. In the US the various stages are likely to be undertaken by separate companies.

A specialist land developer will seek out prospective sites for wind and solar generation, contract access to the site for further development and then sell the contracts to renewable developers for construction. Subsequent stages may be undertaken by one party or on-sold partially completed. Stages involve; arranging the connection with the local grid, construction financing, contracting the sale of output to local retailers or users, procurement of generation plant, construction, and sourcing of equity and debt funding for the operating plant.

It is anticipated that Longroad will undertake all these steps; in some instances retaining ownership of generation and in other instances selling to realise a development margin.

Since Infratil's investment in October 2016 Longroad has announced:

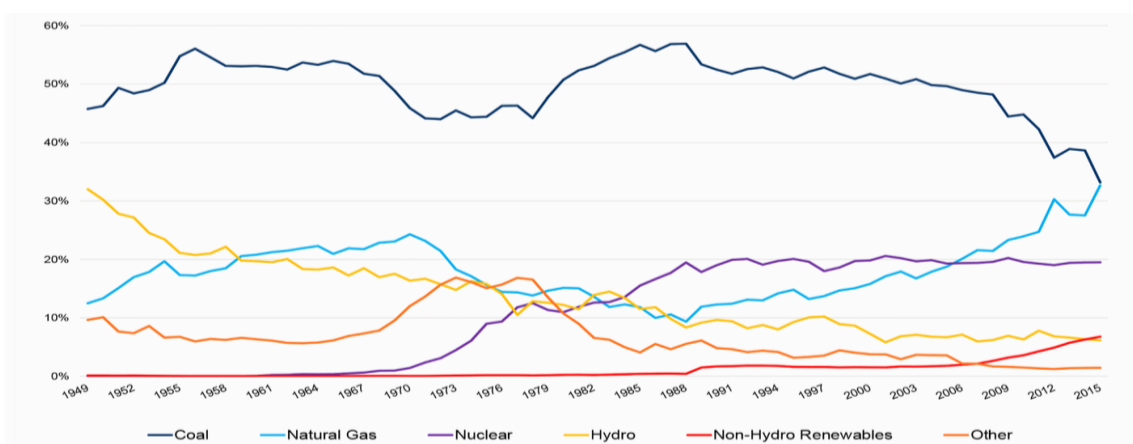
- The purchase of a portfolio of early stage solar development projects across several states.
- The purchase of wind turbines in anticipation of their being deployed as developments become available. The purchase was undertaken because of the exceptional value then available.

At least in the public domain, Longroad's progress has been overshadowed by the potential impact of President Trump's election promises to boost coal. However, the President's comments about each of coal, gas and renewables are inconsistent, making outcomes hard to anticipate. Fascinating research published by the US Brookings Institution tends to indicate that the horse has bolted on coal and that renewable generation is now often cost competitive with gas.

Coal vs Gas

In the USA, 2016 was the first year (ever) in which coal-fired generation ceased to be the leading source of electricity. Over the last three decades, while total coal production has risen slightly, its share of US electricity generation has fallen from 57% to 33%. Not because of subsidies or restrictions but because the economics of coal have deteriorated relative to those of gas. The rise in renewable generation has reflected subsidies, but these are less important now than was the case a few years ago.

USA Generation Market Share

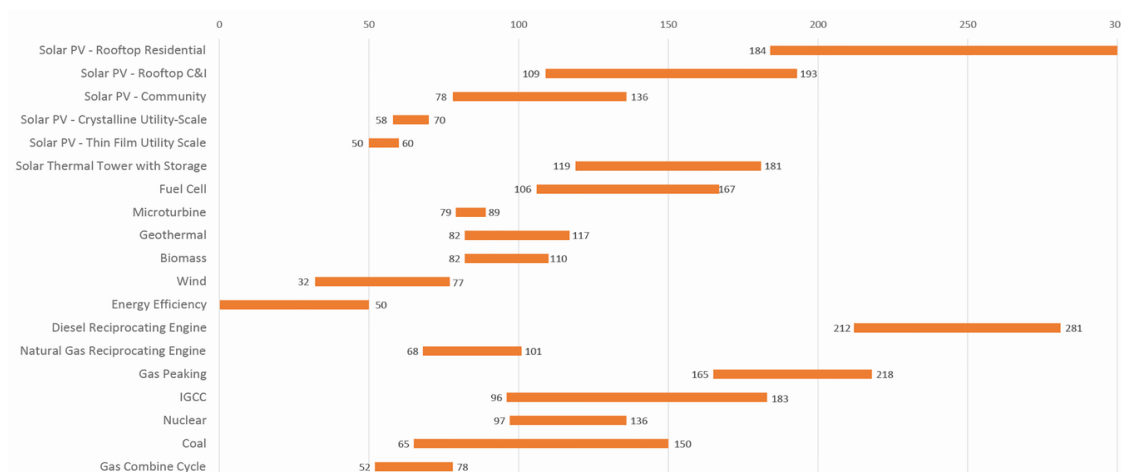


Source: US Brookings Institution

The Economics of New Generation

As the table copied below shows, gas has surpassed coal as the fuel of choice because of lower cost. The table also shows that wind and solar are now cost competitive with gas.

Unsubsidised cost of energy (US\$/MWh)



Source: US Brookings Institution

The Cost of Producing Coal is Rising Relative to the Cost of Gas

Coal could become more attractive as a source of fuel if its cost was to fall relative to the cost of gas (and renewables). The following graph shows the coal industry's generally accepted measure of efficiency, the amount of coal produced per employee hour. Between 1999 to 2013 productivity declined as mining moved to less accessible seams, subsequent improvements in productivity have come from the closure of less productive mines.

Without better production techniques or technology there is no expectation that coal output and productivity could be lifted together.

The weak productivity performance of the US coal mining sector is in stark contrast to what is happening with gas and renewables. Both of which have experienced substantial cost reductions due to improving technology, and while it's problematic that the US President can reduce the cost of producing coal he probably can make it easier/cheaper to drill for gas, which would further improve the relative price of that fuel.

Another factor relevant to the politics of US coal mining is that it is highly unlikely that increased production will increase jobs. In 2016 US coal production was 8% higher than in 1980, but with 57% fewer workers. Any increases in US coal production would almost certainly be limited to only the most efficient (low labour input) mines.

In addition to having limited sway over the unsubsidised economics of different forms of generation, the US President also has little sway over individual state's subsidies and regulations. The state of Oregon for instance has passed laws to mandate the retirement of all of the state's coal fired generation.

The politics of renewables is confusing. The President has said he wants to rein in the Environmental Protection Agency and to have the USA withdraw from the Paris Accord on Climate Change. But Federal tax credits for renewables received bipartisan legislative support as recently as December 2015. Probably of greater relevance, much of the US renewable generating capacity, and the associated manufacturing activity, is in Republican states making it likely that the Republican led House and Senate will work to protect those jobs against unfavourable Executive initiatives.

Canberra Data Centres

Canberra Data Centres' first data centre opened in 2009 with the goal of providing its clients with 100% certainty of data availability, confidentiality and security. Subsequently CDC has opened three more centres in Canberra to meet the growing demand for data centre solutions and services. A fifth data centre is in an advanced stage of preconstruction preparation.

CDC's business has been tailored to its clients' requirements, through the provision of security, energy, cooling and telecommunications infrastructure, and by offering flexibility for customer growth. CDC also provides for data centre redundancy during a catastrophic event by operating multiple facilities and synchronous back-up.

Although outsourced cloud computing only began with the launch of Amazon Web Services in 2006, it has developed enormously as demand has exploded. The next stage of evolution is likely to involve greater penetration by "hyperscale cloud providers".

- Cloud computing involves the delivery of on-demand computer processing and storage capacity over the internet on a pay-for-use basis.
- Sector experts Forrester Research recently forecast global cloud demand to top US\$146 billion in 2017, up from US\$87 billion in 2016. The fastest growing segment of the market are "hyperscale cloud providers".
- They include Amazon, Microsoft, Google and IBM. CDC does not directly operate this type of business, but it does provide an attractive "ecosystem" for their customers and hyperscale cloud providers to work together.

All providers are currently benefitting from the exponential growth in data usage and services. It has been estimated that each day in 2017, as much recorded data will be produced as was produced by the whole of humanity up until 2005.

Recent investment market transactions indicate strong acquirer demand for data storage and processing infrastructure. Although building a new data centre can take less than a year, incumbents can have valuable advantages. Clients benefit from co-location "ecosystems" so an incumbent centre is likely to grow faster than a start-up, incumbents have customer relationships from which to derive further business, and the incumbent may also have access to electricity and fibre networks which are not available to a new build.

Two of the three large investment transactions which occurred over November/December 2016 involved a data centre company buying additional centres. The other acquirer was an investor group.

- Chinese data centre company Daily Tech and partners paid £2.4 billion to acquire a 49% stake and control of Global Switch which owns 10 centres in Europe and Asia.
- Leading US data centre company Equinix paid US\$3.6 billion to buy 29 data centres from US wireless telecommunication company Verizon.
- A consortium of funds paid US\$2.15 billion to US telco CenturyLink for its data centres in North America, Europe and Asia.

RetireAustralia

RetireAustralia is the fourth largest retirement village operator in Australia with a portfolio of circa 4,000 units and apartments in 28 retirement villages in New South Wales, Queensland and South Australia.

Infratil's strategy for RetireAustralia revolves around three central planks.

- Increasing the construction of new units while ensuring existing facilities are upgraded to meet customer preferences to maximise future demand and hence value.
- Introducing a continuum of care services for residents. To ensure that RetireAustralia villages are sought after for needs-based accommodation rather than simply as a lifestyle option. To ensure that RetireAustralia meets the changing needs of an ageing population.

- Ongoing improvements to operations, stock management, and standardisation of contract structures to improve business performance.

RetireAustralia's build-out of its brownfield sites is in line with forecast and is in advanced planning stages on four greenfield sites which, if planning approvals are achieved, will significantly increase RetireAustralia's pipeline.

ANU Student Accommodation

In August 2016, Infratil made its first investment into purpose-built student accommodation (PBSA). This is a major investment sector in the USA, but still in its fledgling stages in Australia and New Zealand and new to most investors.

University development of PBSA recognises that family decisions about tertiary study are influenced by the availability and quality of accommodation. On-campus PBSA provides many benefits.

- Convenience for students. The location minimises transport time and costs. There is no need to arrange furniture or utilities.
- Good value. By taking advantage of University campus land and through purpose built and optimised facilities.
- A safe collegial environment. Perhaps most importantly, PBSA offers a good environment for students moving to a new city, allowing them to establish networks and friendships that become the cornerstone of their university experience. For parents, the security and pastoral care offered by well managed PBSA is invaluable: supporting students as they move away from home (often for the first time), experience the highs and lows of co-habitation and grapple with new academic challenges. In the case of ANU, the university pays to have Senior Residents on every floor of each facility who make contact with new students at the start of semester, help them make contacts with those with similar interests, and organise social activities through the year.

Increasingly, universities seek to offer quality, affordable student accommodation, to attract and retain the best students who will have several options in an increasingly competitive and globalised tertiary education market. Having more of the student body accommodated on campus also creates a more vibrant, appealing and safe environment. And at ANU, accommodation is priced at a discount to private alternatives, providing an added incentive for the best and brightest students.

Universities also have funding constraints and competing demands for their capital; for new lecture theatres, research facilities, etc. Selling the future revenue stream from existing PBSA frees up capital without relinquishing influence over pastoral care, quality and pricing. And it can incentivise the further development of new accommodation.

No doubt other universities in Australia and New Zealand are closely following the ANU transaction.

For Infratil the ANU investment provides a reliable cash yield with low vacancy risk (at ANU demand significantly exceeds supply). Although rents are set below market they are typically indexed providing an inflation protected return. ANU has also provided Infratil with rights with respect to future PBSA developments and it is hoped that the relationship with the university will form the basis for additional investment into adjacent facilities, e.g. the social and cultural amenities required by students.

ANU consistently ranks among Australia's top universities and is 47th in the world on the Times Higher Education world university rankings (for context, New Zealand's top ranked university, Auckland, is 165th). This ranking and the particular suite of specialist subjects make ANU a destination university for both Australian and offshore students. Over a quarter of its student body comes from overseas and half of its domestic students came from other than Canberra to attend. This reinforces demand for PBSA, reducing occupancy risk and providing a strong pipeline of growth opportunities.

These are still early days for Infratil's ANU investment and the immediate priority is building relationships with stakeholders and maintaining the quality of the students' experience.

Infratil Infrastructure Property

The New Lynn development undertaken with Auckland Council (IIP 58%) has arrived at its final phase with the retail properties 90% leased. Their effective cost was \$1.5 million and they have a \$8.5 million valuation.

On the back of this success, the partners are progressing the development of two further Council owned sites in New Lynn with IIP providing capital and leading the development of approximately 200 homes.

These projects are also assisting IIP position for opportunities which are expected to arise following the commissioning of the Auckland Rail Loop. Improved transport accessibility will change commercial and residential demand as well as social and civic requirements altering the optimal land use.

The largest single development IIP is working on at present is its 1.8 hectare Wynyard Quarter leasehold site which today is mainly utilised by NZ Bus as a depot. IIP (as leaseholder) and the landowner recently reset the land rentals for the period to 2035 which has allowed IIP to approach a range of prospective tenants. Stage One is expected to comprise a mixed-use development, including a hotel, carpark and tourism venture. Further areas of the site are being actively marketed for future development.

Although IIP is involved in quite an array of projects, each has a strong connection to Infratil's activities and strategy. The New Lynn and Wynyard developments have arisen to maximise the value of bus depot land which has higher value alternative uses; rather than merely selling the sites to extract this value. The other initiatives have arisen as city councils seek to work with reliable partners to recycle some of their own land into more productive civic uses.

Perth Energy (80% Infratil)

PE owns a fast-start 109MW power station at Kwinana and a retail business with approximately 15% of the Western Australia commercial and industrial electricity market. Over recent years Kwinana has operated profitably, but the retailing business has struggled, which resulted in PE's reported loss in the six months to 30 September 2016.

The poor performance of the retailing business is in part due to the slowdown of the WA economy and in part reflects the structure of the Western Australia energy market. It is physically separate from the other states and is dominated by the State Government owned Synergy which has a regulated monopoly to supply small and medium users of energy and owns or controls approximately 77% of the state's generation capacity.

With residential monopolised by Synergy, the contestable market is limited to large commercial and industrial users of electricity, but with wholesale energy prices also heavily influenced by Synergy.

Now however, the Government's Electricity Market Reforms are intended to allow residential market contestability and changes to the regulation of the state's wholesale market and generation. The overarching objectives are lower cost electricity, lower Government exposure to energy market risks, and greater private investment into the WA energy sector.

Needless to say, whilst the objectives are sound, there are complexities and uncertainties in how the reforms are implemented. An illustration of this is the planned restructure of the state's generation capacity market. Unlike other Australian states or New Zealand, WA has a capacity market for generation which is separate to the energy market. Periodically the state energy agency sets the price for Reserve Capacity which it pays to generators for being available. For the 2016/17 Capacity Year it is A\$121,889/MW.

The proposed reforms will see the introduction of an auction system to determine the price for Reserve Capacity while simultaneously retiring coal fired generation capacity. Shifting to an auction may result in lower income for Kwinana, but how much lower will depend on the level of plant retirement, gas supply costs and future electricity system supply and demand.

While the auction/retirement package is expected to reduce the price of Reserve Capacity it is also likely to raise the overall market price of electricity in the state, which should be beneficial for Kwinana.

Over the next two years, reform of the WA retail, generation and capacity markets will create opportunities and challenges for PE, especially if the state chooses to break up and sell Synergy. But many of the final decisions depend on the state Government elections which are to be held in March 2017.

In addition to navigating externally imposed changes, PE is also undertaking operational initiatives to lift financial performance over what was delivered in the first half of the financial year. As a part of the restructuring, Infratil has guaranteed PE bank facilities, which as at 31 December 2016 were drawn to A\$45 million.

Snapper

The public transport regulatory model now under implementation increases the responsibility of regional transport agencies for a number of activities, including fare collection. The objectives are of course to ensure that passengers pay the right fare, that all fare revenue is received by the relevant agency and that passengers find it all quick and easy.

Meanwhile, transport ticketing technology is becoming account-based (so the fare is debited to a bank account rather than against a sum stored on a card) so passengers can pay with a range of cards or devices such as smartphones and smart watches.

There are obvious benefits, but it is more complex than cash, a cardboard ticket or a stored value card. Transport for London's shift to bank cards and smartphones required agreements with the ticketing system provider, technology providers and banks. And London's experience was that while these payment tools benefited many people, not everyone has a bank card or smart phone, and children, the elderly and people with disabilities who receive concessionary fares still require a public transport ticket/card (in London called Oyster).

New Zealand transport agencies want fare collection which delivers on the objectives noted above and with either the London Transport technology features or with the flexibility to incorporate these systems later.

Since 2008, Snapper has provided fare collection services to both public and private clients: Wellington City Council for curb-side car parking, Wellington Cable Car, Wellington Regional Council's total mobility scheme, many taxi companies, NZ Bus in Auckland and Wellington, and Ritchies buses in Whangarei.

With this experience, Snapper has been able to develop public transport ticketing that meets regional transport agency requirements with a low cost, low risk, product known as Ticketing as a Service ("TaaS"). This gives the transport agency the flexibility to use and pay for services as needed. It's the same concept as successfully implemented by Xero. Centralised scale development of sophisticated technology customised for customers who only pay for what they need.

The first interim implementation of TaaS is to be in Wellington. The Regional Council has contracted its deployment across all Wellington region public transport bus services to support the implementation of the new contracts. It will also form part of the Wellington Regional Council's participation with other transport agencies in the procurement of a New Zealand wide integrated solution.

This will be a boon for passengers as all operators will accept the same card or smartphone. It will also address concerns about fare collection as more passengers undertake multiple vehicle journeys. The fare charged to the passenger (and credited to the Council) will automatically take into account transfers, even between buses operated by different companies.

The Wellington initiatives are expected to position Snapper for further opportunities in New Zealand, as well as through its offshore clients, including projects based in Dublin, Belfast and Riga.