

30 Years of the Wholesale Market:

How Has Demand for Electricity Changed?

Welcome to Energy Link's publication of a perspective newsletter. Each publication, we provide insights into news or topics within the electricity industry from Energy Link's perspective.

In this Issue:

Executive Chairman Greg Sise discusses how demand for electricity in NZ has changed over the long term in the third of a series of perspectives on the market.

Disclaimer: The perspectives shared in Energy Trendz may include personal opinions. While we strive for accuracy, we do not guarantee the completeness or reliability of the information. Energy Link accepts no liability for any errors, omissions, or inaccuracies in the content.



30 Years of Market – How Has Demand for Electricity Changed?

Our Executive Chairman, Greg Sise, looks back over 30 years of the wholesale market, in the third of a series of perspectives on the market.

2026 is a milestone year for the wholesale market and for Energy Link, because on 2nd September Energy Link was 30 years old and on 1st October the electricity market will also be 30 years old.

This is the third in a series of articles that are a mix of perspectives on the market, focusing on key elements such as demand and generation, and also on Energy Link, the role that we've played, and how this has changed.

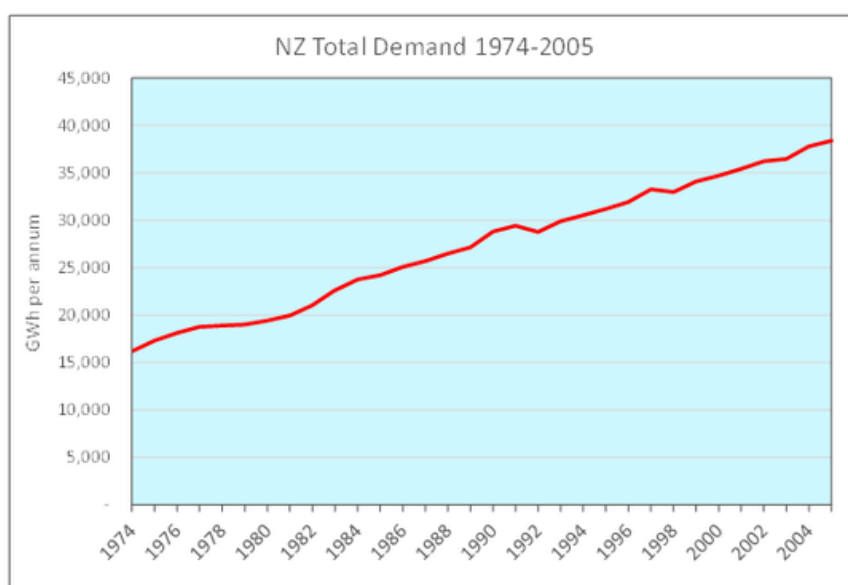
The [first article](#) looked at why we have a competitive market, starting with moves to reform the electricity sector in the late 1980s, through to the start of the spot market in October 1996.

The [second article](#) looked at how the market performed relative to why it was set up.

All markets have buyers and sellers, interacting to trade goods or services, bringing with them demand and supply, respectively. This article looks at how demand for electricity in NZ has changed over the long-term and where it might go in the future.

Looking Back

The gold standard for electricity demand is the data provided in MBIE's annual Energy in New Zealand publication, issued annually. This is the total demand for electricity as measured at consumers' meters, grossed up with estimates of distributed generation that never gets onto the grid, e.g. roof-top solar. Hence it is the total demand for electricity.



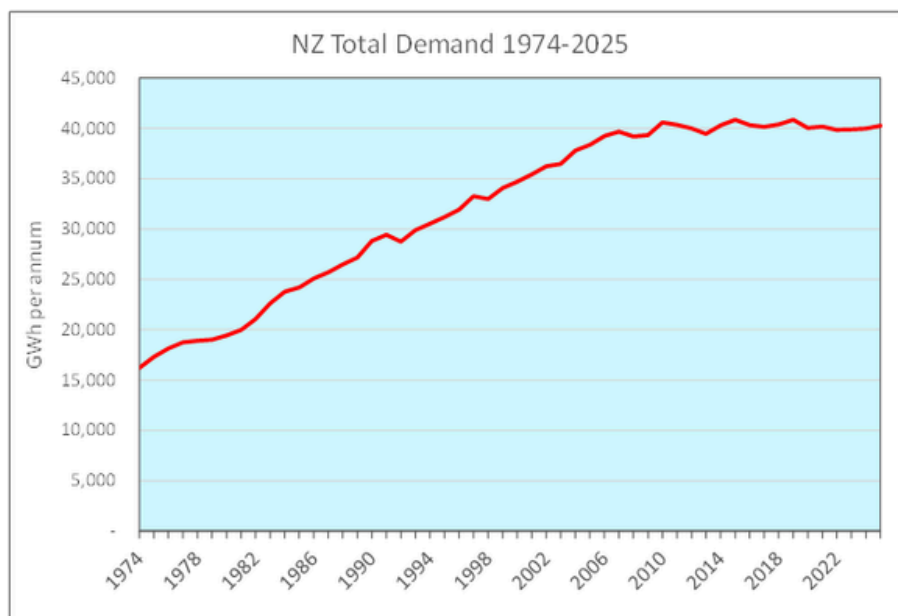
When the market opened in 1996, annual demand was about 32,000 GWh (32 billion kWh) and it continued to grow on a long-term trend, as shown in the chart at right, of just over 700 GWh per annum.



Forecasting demand back then involved having a base scenario which continued the trend, a low scenario with, say 600 GWh per annum, and a high scenario of, say, 800 GWh per annum.

But after 2006, something happened: demand stopped growing, for 20 years.

The next chart shows MBIE's annual demand all the way through to the end of 2025. Demand peaked in 2019 at 40,844 GWh and in 2025 it was 40,259 GWh.



Flipping back to 2006, gentailers and others, including Energy Link, assumed demand would keep growing at the historical rate. I went back and looked at the annual reports of the four gentailers and Trustpower, and it was only in 2011/12 that they all acknowledged that demand had stopped growing. But in the meantime, they continued announcing plans to build new generation, culminating in the commissioning of Mercury's Te Mihi geothermal power station in 2014.

All the new generation meant there was a generation surplus, so in the second half of 2015 Mercury announced the closure of its Southdown gas-fired power station and Contact Energy announced the closure of its gas-fired Otahuhu B power station, both in Auckland.

Then followed a period of relatively high inflows into the hydro lakes, so prices in the wholesale market remained relatively low. Until, that is, the next dry period hit in 2017, and the gas market started to falter in 2018.

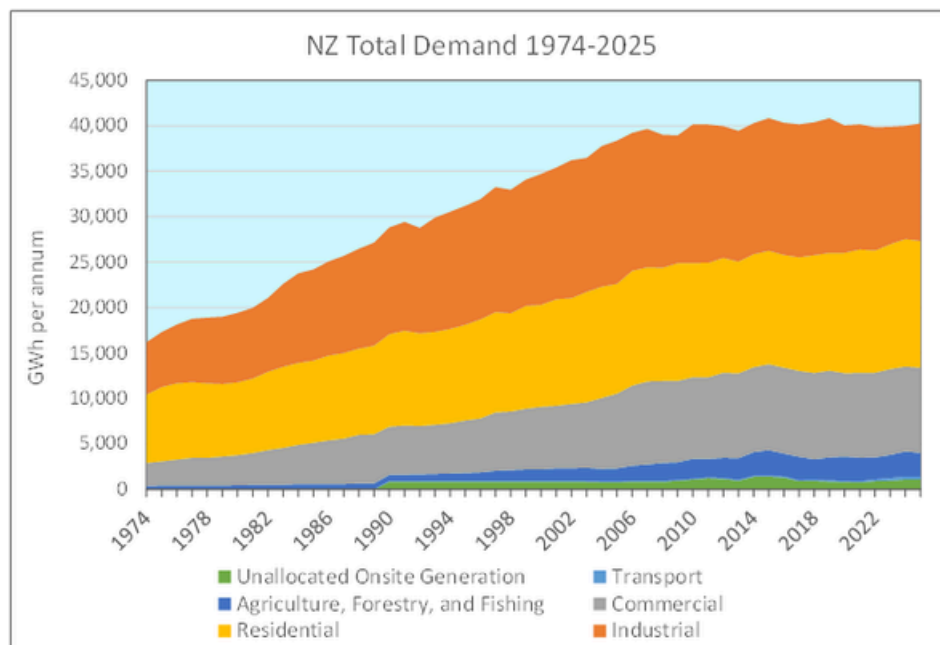
As I noted in the [second article](#) in this series, the market is going through a period where a large amount of new renewable generation is coming online, which raises the question: if demand is not rising, why is all this generation being built?



I will deal with this question in more detail in the next article on generation, but for the purposes of understanding demand, let's just say that one obvious reason is that all the generation developers believe that demand will start growing again, and they want to be in on the action.

But why did demand stop growing? Will it start growing again and, if so, when?

MBIE provides demand data by sector: residential, commercial, ag-fish-forestry, and industrial. The chart also shows demand for Transport and Unallocated Onsite Generation, the latter being generation that consumers have onsite, e.g. a diesel generator or residential solar, which is not allocated to any other sector.



What we see is that residential is the only major sector for which demand has continued growing through until today, albeit with a pause from 2010 to 2017. Commercial demand has barely grown since 2007, and industrial demand started falling in 2006.

The table below shows the change in annual GWh consumption between 2005 and 2025 as a percentage of 2005 consumption.

Sector	Change from 2005 to 2025 (GWh)	
Agriculture, Forestry, and Fishing	1,153	79%
Industrial	-2,825	-18%
Commercial (incl. Transport)	1,133	14%
Residential	1,842	15%
Other	588	71%
Total change from 2005 to 2025	1,891	4.9%



MBIE data allows me to break the industrial demand by sub-sector, shown below. The wood, pulp, paper and printing sector reduced demand by over 3,000 GWh per annum, which is 9% more than the change in the total industrial demand (-2,825 GWh).

Industrial Sub-sector	Change from 2005 to 2025 (GWh)	
Mining	186	58%
Food Processing	1,020	45%
Wood, Pulp, Paper and Printing	-3,068	-74%
Chemicals	-327	-43%
Basic Metals	-722	-11%
Other Minor Sectors	85	5%
Total change from 2005 to 2025	-2,825	-18%

Basic metals reduction is mainly due to demand reduction at the Tiwai Pt aluminium smelter, with about 400 GWh due to the fourth potline being turned off, and the rest due to the demand reduction called by Meridian Energy during the 2024 dry period. The smelter is expected to restart potline four in 2028, and its demand reduction is now more or less over, so this sector will soon recover to 2005 levels.

Allowing for the smelter to come back up to full load, most of the reduction in this sector is due to demand reduction in one sector: wood, pulp, paper and printing. Almost half of the reduction occurred before industrial contract prices started to rise at the end of 2018, so the reduction cannot all be blamed on recent electricity price increases.

For example, the paper mill at Kawerau, established in 1952, reduced newsprint production in 2012 due to declining regional demand for newsprint, an unfavourable exchange rate and oversupply to the Asian region¹. Demand for newsprint continued to fall and the plant closed in 2021.

More recently, the Winstone Pulp International's pulp and sawmills closed in September 2024, which the company said at the time was due to the spike in electricity spot prices during the 2024 dry period. However, Mercury NZ came back and said it had offered Winstone a new deal that would give pricing comparable to Winstone's international competitors. I can't help thinking that Winstone was a marginal business for reasons not just including electricity prices, and that perhaps the 2024 situation was an opportunity to close a loss-making operation. Maybe electricity was the last straw. We'll probably never know all the facts.

1. Wikipedia.



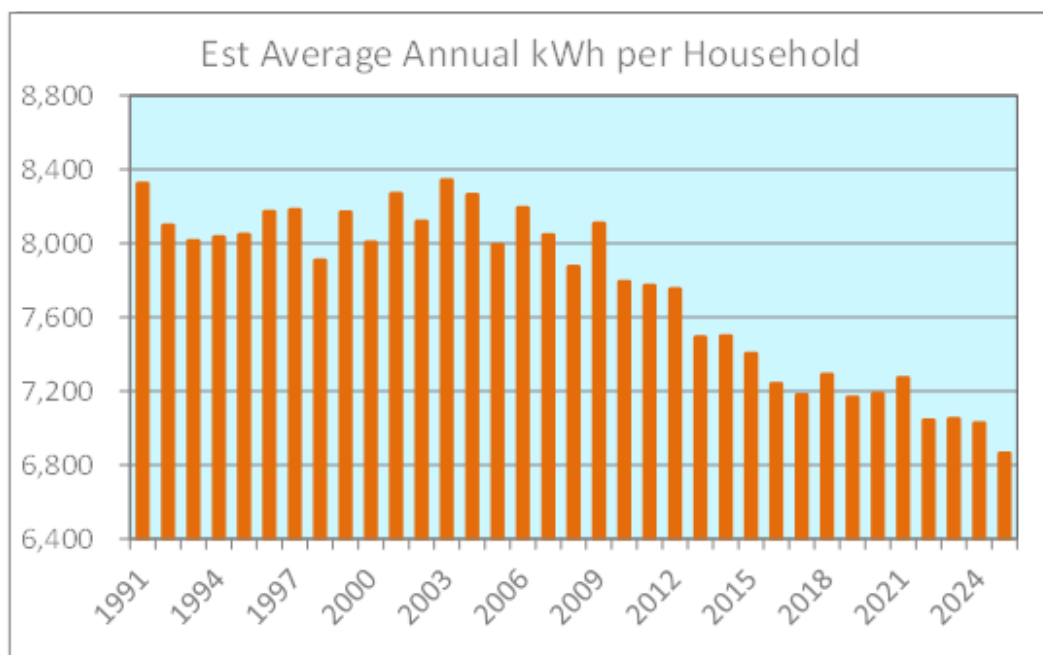
But then in November, Oji Fibre Solutions announced the closure of its paper mill at its Kinleith plant, citing gas prices as a factor making the mill unprofitable, but also stating that freight, labour, maintenance and other support costs have also risen².

If this sector had not shrunk, then total demand today would be about 43,300 GWh per annum, 12.9% greater than it was in 2005. But even then, demand growth from 2005 to 2025 would have averaged about 250 GWh per annum, well down from the pre-2005 value of 700 GWh.

So, what else is going on?

In the residential sector, growth stalled after 2005 and it wasn't until 2017 that it returned.

The chart below shows the average kWh consumed per occupied household from 1991 to 2025. It has fallen since 2005, and is still falling today.



I am not aware of any definitive study on why household energy use has fallen, but there are probably a range of factors at play.

The climate is warming, which means less energy is required to heat homes. Furthermore, heat pumps are now accepted as a reliable and cost-effective heating appliance, and they are many times more efficient than direct electricity heating, e.g. convective and radiant heaters.

When was the last time you bought an old incandescent light bulb? LED lights are now everywhere, and virtually the only type of light used in new buildings. An old-fashioned incandescent light bulb is basically just a heater that emits light, whereas LED lights emit light and very little heat.

²Reported on the Energy News website



Appliances have become more efficient since 2002 when the Energy Efficiency (Energy Using Products) Regulations came into effect and the Energy Efficiency and Conservation Authority started mandatory appliance testing programs.

The price of electricity rose in real terms from 2002 to 2024, which probably caused some consumers in the North Island, where there is access to piped natural gas, to switch their heating to gas.

The average size of new dwellings has fallen, and changes to the NZ Building Code progressively improved the energy efficiency of new builds. It is now standard practice to install insulation when renovations are undertaken on older dwellings.

Demand in the commercial and ag-fish-forestry sectors bucked the trend by continuing to rise after 2006, hitting peaks in 2019 and 2024, respectively, driven by the growth of dairy production and irrigation, in particular. The demand at the Ashburton supply point in Canterbury shows a very marked peak in the spring and summer when irrigation is usually at its peak over 180 MW, then a large drop into winter as milk production falls to sit under 70 MW.

Commercial demand is the sector we understand the least, and it also remained almost constant since 2019. It currently accounts for 23% of annual demand, and is neither growing nor shrinking right now. No doubt energy efficiency has played a role in office buildings in particular, i.e. building code, heat pumps and LED lights, along with the impact of rising temperatures.

But what else is happening in this sector? Are we seeing, for example, the impact of online shopping reducing the number and scope of retail operations, leading to lower demand for electricity?

Commercial demand correlated well with real national GDP until about 2012, after which the economy (represented by GDP) continued to grow but commercial demand remained flat. From 2015 to 2025, for example, the total number of businesses in NZ grew from 489,000 to 599,000 (+22.2%) while commercial demand went from 9,455 GWh to 9,333 GWh (-1.3%) which suggests to me there is more going on than just an increase in the efficient use of electricity.

Commercial demand reached a peak of 9,356 GWh in 2019 but then fell to under 9,200 GWh in 2020 (-3.7%), after which it grew again to 9,448 GWh in 2023 and then fell back to 9,332 GWh in 2025. Obviously, covid had a huge impact on this sector as we all worked from home, or didn't work at all, in 2020, but subsequently people are working from home more, which means that workplaces can downsize or 'no-size' their office space.



Online shopping had to increase in 2020 during lockdowns, and has remained permanently higher than the pre-covid days, which leads to less or smaller physical shops.

The trend toward lower demand growth seen in NZ since 2006 is not peculiar to NZ, with countries like the UK, the US and Australia also showing a change in the rate of growth. In the UK, for example, demand fell significantly after 2006. So NZ is not alone in experiencing de-industrialisation, increasing energy efficiency and changes in the way that we live, work and shop.

Looking Ahead

Demand growth more or less disappeared after 2006 but almost everyone, including Energy Link, is forecasting demand growth to return. Furthermore, as we saw in the [second article](#) in the series, there is a veritable renaissance going on in new renewable generation, which must be partly or wholly due to an expectation of significant growth in demand and a pressing need for more generation to serve that demand.

But how likely is it that demand growth will return?

First, I have to say that forecasting demand is difficult. Government has got it very wrong in the past and the market got it very wrong in the first few years after 2006.

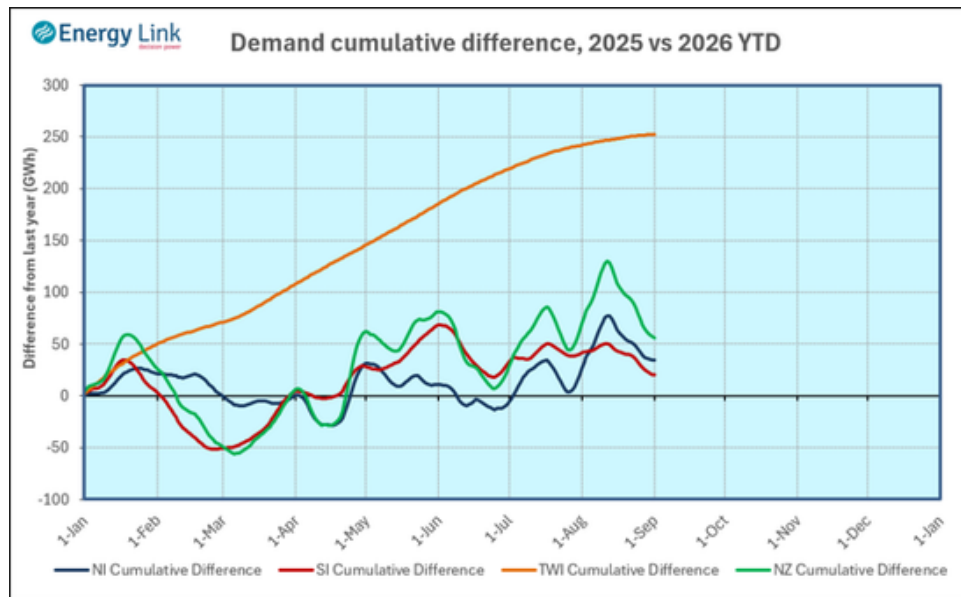
Energy Link's forecasts are made up of five demand scenarios which cover a wide range. Yes, the lowest and highest scenarios have a low probability assigned to them, but they are still possible.

On the low side, the wood, paper and pulp processing sector could continue to shrink if the long-term trend continues. Other sectors could shrink if they cannot find a cost-effective replacement for natural gas for producing process heat, and businesses close as a result. Rising temperatures will keep downward pressure on demand in buildings, until such time that large areas of NZ require cooling in the warmer months, which is still years away.

On the high side, the fourth potline at the Tiwai Pt smelter will restart sometime before the end of 2028, Fonterra has major electrification projects underway, and a hyperscale data centre could be built in Southland to eventually match or even surpass the annual consumption of the smelter, currently around 12% of total annual consumption.



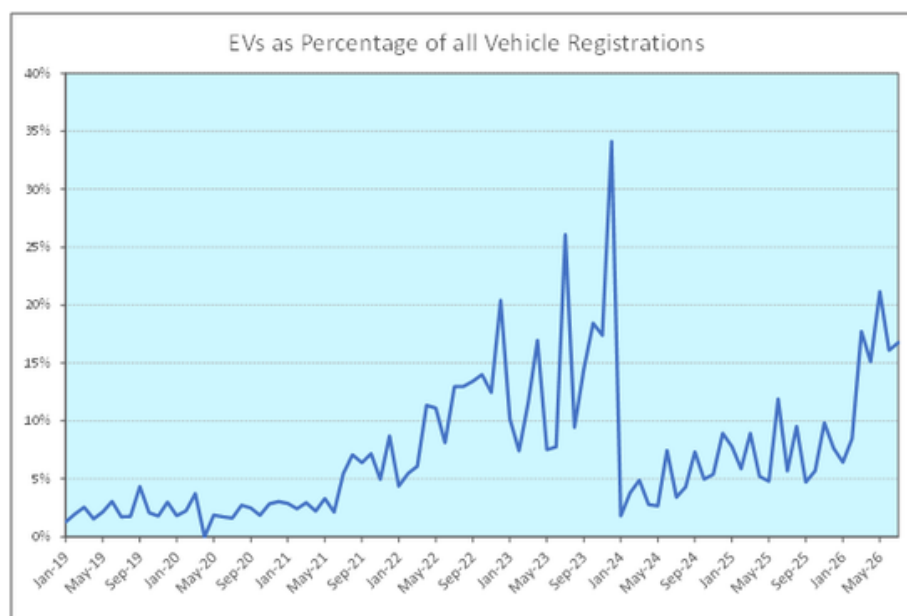
But despite the stagnation of demand since 2006, all the signs are that demand growth will return. The chart at right shows the demand for each island and for NZ relative to the same time last year, each excluding Tiwai Pt demand, and Tiwai is shown separately.



Demand for the year to 31 August is just over 300 GWh higher than it was last year at the same time, although 250 GWh of this is due entirely to the Tiwai Pt smelter returning to its normal demand level after having to turn down in 2024 and 2025 to help keep lake levels up during the dry period of 2024.

Electric vehicles (EVs) have the potential to add 5,000 GWh per annum or more to demand, in the long term, but so far, EV sales have a checkered history.

The chart below shows the monthly registrations of EV and plug-in hybrids since 2019 (the great majority are pure battery EVs). They took off when the so-called 'ute tax' was introduced and you could get up to \$7,500 rebate on a new EV costing up to \$80,000.





This saw EV registrations rise to an average of 15% in 2023, after which they plummeted to less than 5% when the subsidy ended.

But recently, the market is flooded with cheap and solid EV offerings from China which, along with a sharp rise in the price of petrol and diesel when 'you-know-who' started a war with Iran, has caused registrations to hit an average of 17% in the last five months.

There are two EVs in our household and we love the way they drive, their reliability and their low, low running costs. Given their falling as-new prices, increasing availability of used EVs, and the 'network effect' caused by seeing your friends and neighbours with EVs, it is inevitable that demand from EVs will grow. Sales of new technology are known to follow a flattened 'S curve', with sales starting slowly then ramping up over time, before starting to fall again as the market becomes saturated. Currently, we are in the lower part of the S curve, but we expect EV sales to eventually make up the vast majority of new light vehicle registrations (cars and vans), which could happen early next decade in some scenarios, later in others.

A limiting factor is the historical rate at which the fleet turns over, sitting around 5% per annum, so even if all new registrations are electric, it would still take over two decades for the NZ fleet to become 100% electric. I can foresee a day, however, when owners of petrol and diesel-fuelled vehicles look around and think to themselves: "if I don't sell my car soon, and buy an EV, my gas-guzzler's going to be worth next to nothing."

One thing I notice is that the 50 kW EV chargers which are still called (somewhat euphemistically) 'fast' chargers, are no longer looking so fast. Our two EVs both charge at well over 100 kW (closer to 200 kW actually) and some brands available in NZ are capable of charging at over 500 kW.

When we charge at a 50 kW charger, which being older also tends to be less reliable than the larger 'hyper' and 'super' chargers, the wait is noticeably longer and one's mind wanders to thoughts of 'that 200 kW charger at the ... would be better than this'. It's probably like the good old days when my great grandparents, who lived in the country, pulled up at the gas station and had to pump the fuel from the bowser by hand, in the knowledge that city cousins were getting those new-fangled bowsers with electric fuel pumps.

To support the growth in EVs, the charging networks in NZ need to keep upgrading their offerings, so that EV owners can charge reliably and quickly wherever they are. I am sure there is some chicken and egg effect going on here, so I expect that as the EV fleet moves up the S curve, the faster EV chargers will be rolled out and the older chargers phased out. Although it removed the direct subsidy on EVs, the current government introduced a scheme to assist the charging networks deploy more chargers, which will help.



Notwithstanding the historical shrinkage in industrial demand, the Tiwai Pt smelter will restart its fourth potline, adding about 400 GWh per annum, and Fonterra and others are moving away from gas and coal to electricity, due either to market pressure to reduce emissions, or more recently to the dramatic run-down in gas production and reserves.

A wild card is the demand that could arise from data centres, the largest of which is proposed for Southland, a project that could add a few thousand GWh per annum of demand on its own, let alone a range of other data centre projects proposed across the country.

The uncertainty now is not so much will demand growth return, but when will it return and how much will it be? When will EV adoption hit max? When will data centres be built and how big will they be?

We don't see potential for major increases in demand in the ag-fish-forestry sector, but residential demand is now increasing and is likely to continue increasing as the population grows: there is potential for on-going improvements in energy efficiency, but I suspect these have now largely run their course.

Across the five current demand scenarios used in our long-term forecast, adding together the forecasts in each demand sector, the spread by 2030 is from 43,500 GWh per annum to 53,000 GWh, the latter featuring multiple large data centres and the highest rate of industrial electrification.

We don't put the same probability on all demand scenarios, as we'll probably end up somewhere in the middle, but one thing we can be sure of: the uncertainty in where demand will go in future is not reducing anytime soon. We can be reasonably sure that demand will grow, but the degree and timing are as uncertain as ever.

The next article in this series will look at generation and how this has changed since the market started in October 1996.

Greg Sise
Executive Chairman

