Economic update for Long Term Planning

for Invercargill City Council

April 2022

Infometrics

Economics put simply

Authorship

This report has been prepared by Senior Economist Nick Brunsdon and Principal Economist Brad Olsen, with the input of Economist Paul Barkle and Chief Economist Dr Adolf Stroombergen.

Email:

Nick.Brunsdon@infometrics.co.nz

Brad.Olsen@infometrics.co.nz

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Introduction

Invercargill City Council (ICC) have commissioned Infometrics to provide analysis of relevant economic and population inputs for the 2022/23 Annual Plan, and to feed into the 2024-2034 Long Term Plan (LTP) modelling going forward.

This second report details our assessment of the population, inflation, and economic growth assumptions for Invercargill with a focus on the LTP timeframe of 2024-2034.

Key points

- Household growth in Invercargill stagnated over 2020-21 as population growth dried up while New Zealand's international borders were closed.
- The number of households in Invercargill is projected to grow moderately at 0.6% per annum over 2022 to 2034, an average of 140 new households per year.
- The average household size in Invercargill is projected to weakly decrease from 2.39 to 2.35 persons per household between 2021 and 2034.
- Network infrastructure prices are expected to rise by an average of 1.82%pa over the 2024-2054 period.
- Roading-based infrastructure prices are expected to increase by an average of 2.16%pa.
- Pipeline infrastructure prices are expected to increase by 1.74%pa over the same period.
- Strong inflation over the next two years is expected to squeeze household budgets. CPI inflation of 5.9% in the year to December 2021 was estimated to add $70-100 to the cost of household essentials.
- We forecast inflation to peak at 7.6% in the year to June 2022 and remain elevated until 2024. Household incomes are likely to increase in response, but there will be a lag between facing cost increases and receiving cash in hand, which will add pressure to household budgets. This timing lag may limit the ability of some households to afford rates increases.
- We have assumed that the Tiwai Point aluminium smelter will continue to operate in our forecasting, as not to muddy the picture of broader economic and demographic changes.
- Tiwai makes significant contribution to the Southland Region, estimated to employ 764 Full Time Equivalents (FTE) directly and a further 1,500 indirectly through contractors and suppliers.
- Whether the smelter continues to operate after 2024 or not is contingent on negotiations between Rio Tinto and Meridian, and the playing field has tilted in Meridian's favour since their last negotiation in 2020.

- Global aluminium prices have been sustained at a high level for over a year. Wholesale electricity prices are much higher, transmission grid upgrades mean southern-generated electricity can more effectively be sent north, and Meridian is courting alternative industrial users. These factors mean that Rio Tinto will likely have to offer much more for electricity to keep operating Tiwai.
- We estimate that if Tiwai was to close at the end of 2024, it would take up to four years for the displaced workers to be absorbed into the regional economy by filling vacancies in other industries created through growth, attrition, and retirement. Individual experiences may vary widely, and the workers would benefit from support for what may be a challenging transition.
- We expect that international education will follow the recovery of long-haul international tourism, as the two sectors grew in tandem in the last decade. Growth will be slower in the 2020s, as the factors that drove tourism growth in the 2010s – falling cost of air travel and a growing Chinese middle class – no longer apply.
- We expect that international student numbers in Southland won't return to pre-COVID-19 levels until 2028 at the earliest.

Households

We have projected households in Invercargill using our population projection model described in the Stage 1 annual plan report.[1] We project households by applying Stats NZ's projected household formation rates to our projection of population by sex and age locally. This approach means that our household projections capture both age group and cohort trends.

There are several age group trends which are all driving down the average household size, both nationally and in Invercargill. In older age groups, better health and longer life expectancy means that there is a higher incidence of independent living, with older persons forming "small couple" or "single person living alone" households for longer.

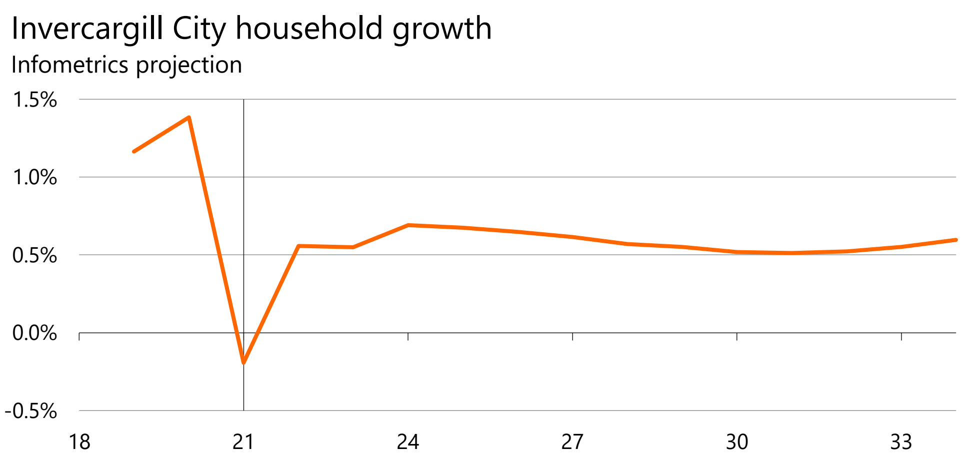
In younger age groups, changing trends around fertility mean that more women are delaying childbirth, having fewer children, or in some cases having no children at all. These fertility changes affect household formation, leading to more "couple without children" households which are smaller than "couple with children" households.

Cohort trends include the large baby boomer cohort moving through the age groups as they age and increasing the number of older couples or singles living independently.

Moderate household growth in the near term

Our household projection[2] shows a stagnation in household growth over 2020-2021, reflecting nil population growth, followed by steady household growth over 2022-2034, with average annual growth of 0.6% (Graph 1).

Graph 1

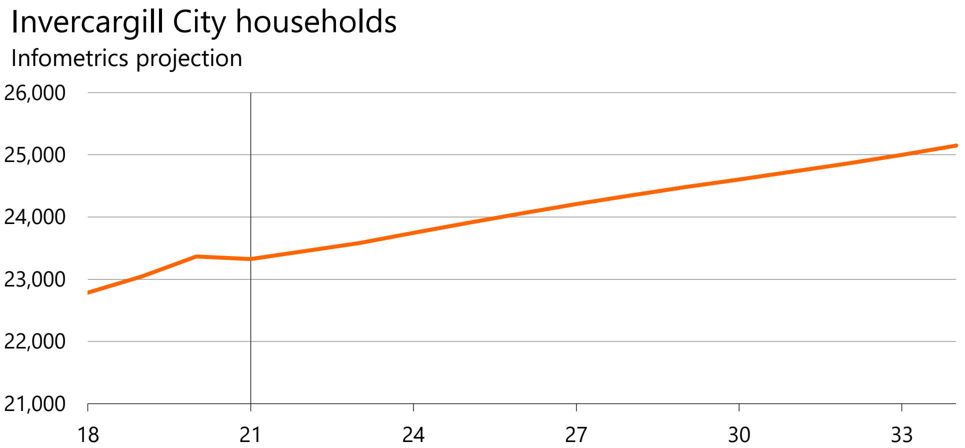


[1] Brunsdon, N., & Olsen, B. (March 2022). *Economic update for Annual Planning for Invercargill City Council*. Infometrics.

[2] Based on Stats NZ population estimates 2018-2021, Stats NZ 2018-base household formation rate projection, and Infometrics population projection for Invercargill City.

The forecasted household growth amounts to an average of 140 new households added per year (Graph 2).

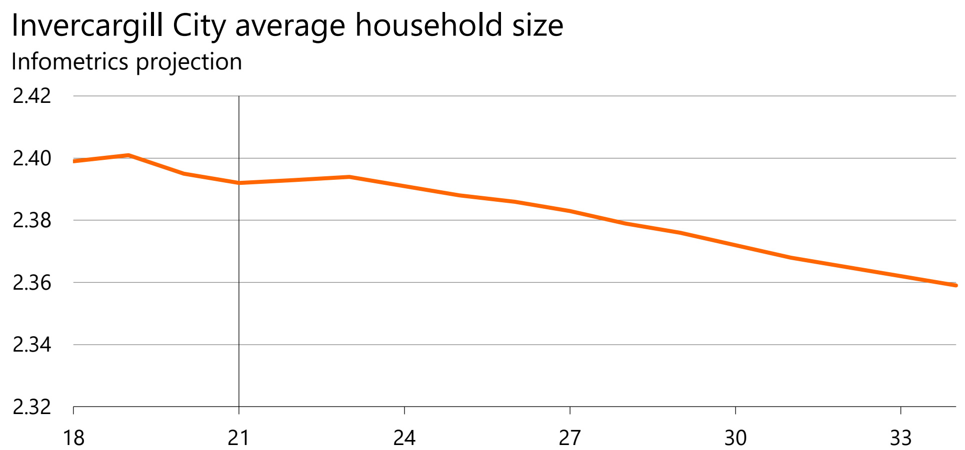
Graph 2



Average household size declines slightly

Invercargill's average household size is projected to be relatively stable, with only a weak decrease from 2.39 to 2.35 person per household between 2021 and 2034 (Graph 3).

Graph 3



The decrease in household size means that slightly more houses would be needed, even if the population remained constant. However, because the change in household size is so small, the growth in the number of households is predominantly driven by changes in population.

Long term material inputs

We have prepared long-term forecasts of key infrastructure price indices to inform price assumptions. Specifically, these forecasts develop a forecast basis for a new assumption for medium to long term material inputs generally, as well as specific forecasts for pipe infrastructure and roading infrastructure. The forecasts have been prepared over the 30 years to 2052.

Approach and underpinning assumptions

These forecasts were developed with a long-term perspective and do not specifically account for near-term fluctuations in prices. An earlier Infometrics report outlined a possible short-term adjustment to local government cost forecasts, based on the current period of high inflation.[3]

Despite the effect of COVID-19 on the current economic environment, and high inflation currently, our long-term assumption is that the economy will broadly return to more normal operations within a relatively short timeframe in the context of our 30-year projections. Our long-term forecasts are prepared on the basis that economic variables return over the medium to long term back to their trend position.

As with any long-term forecast, there are incredibly large confidence intervals, and these forecasts are only, at best, an approximate estimate of what we could expect to occur under a given set of assumptions and continuation of trends under a business-as-usual scenario.

Indices forecasted

Infometrics has forecasted the following price indices from the Capital Goods Price Index (CGPI), produced by Stats NZ.[4]

- CGPI – Civil Construction (covering the general cost of network infrastructure costs)
- CGPI – Transport Ways (covering the cost of roading and transport network costs)
- CGPI – Pipelines (covering the cost of network pipelines)

All indices have been rebased to June 2021 = 1,000.

[3] Brunsdon, N., & Olsen, B. (March 2022). *Economic update for Annual Planning for Invercargill City Council*. Infometrics.

[4] The CGPI "estimates the overall price change in physical assets that the productive sector acquires or builds" and includes specific price indices that measure prices changes for various capital goods including building construction, network infrastructure, vehicles, plant, and equipment.

Material input price growth forecast to average 1.82% over next 30 years

Our long-term forecasts point to civil construction (network infrastructure) prices rising at an average of 1.82%pa over the 2024-2054 period (see Table 1).

Table 1

Long term material price forecasts

By Capital Good Price Index group

	Civil Construction	Transport Ways	Pipelines
30-year annual average (2024-2054)	1.82%	2.16%	1.74%

The specific materials forecasts show slightly faster long-term average price growth.

- Roading-based infrastructure prices (represented by the "Transport Ways" group) are expected to increase by an average of 2.16%pa over the forecast period.
- Pipeline infrastructure prices are expected to increase by 1.74%pa over the same period.

The forecasts show a faster rate of near-term inflation, given New Zealand (and the world) is experiencing considerably higher price inflation than normal. Over the forecast period, price growth is expected to trend back towards the long-term average price growth path of 1.6-1.7%pa.

Technical Overview: Vector Auto-Regressive (VAR) and General Equilibrium modelling method

The forecasts presented by Infometrics use a combination of a Vector Auto-Regressive (VAR) model and a General Equilibrium model. Additionally, near-term forecasts, out to 2026, are partially informed by our latest macroeconomic forecasts at the time of writing.

VAR models consider relativities between indices with respect to historic trends. General Equilibrium models provide an assumption-based scenario output, with our model giving special consideration the impacts of climate change mitigation and fresh-water policies.

By using both models, Infometrics can account for historic trends and expected future conditions and policy settings in the coming 30 years, giving what we believe to be an accurate and reliable forecast given these assumptions.

Full long term price forecast table

The table below presents the annual profile of our long-term price forecasts.

Table 2

Long term price forecasts

All indices rebased, June 2021 = 1000

	Capital Good Price Index group		
Year (June)	**Civil Construction**	**Transport Ways**	**Pipelines**
2020	979	985	959
2021	1,000	1,000	1,000
2022	1,085	1,062	1,127
2023	1,145	1,117	1,187
2024	1,169	1,118	1,227
2025	1,196	1,150	1,244
2026	1,220	1,168	1,278
2027	1,256	1,215	1,308
2028	1,283	1,244	1,337
2029	1,315	1,285	1,361
2030	1,342	1,318	1,386
2031	1,373	1,358	1,409
2032	1,399	1,390	1,435
2033	1,427	1,425	1,459
2034	1,452	1,454	1,486
2035	1,479	1,487	1,513
2036	1,504	1,515	1,540
2037	1,531	1,548	1,568
2038	1,557	1,577	1,596
2039	1,584	1,610	1,623
2040	1,610	1,640	1,652
2041	1,637	1,674	1,679
2042	1,664	1,706	1,706
2043	1,691	1,740	1,733
2044	1,718	1,772	1,761
2045	1,745	1,807	1,788
2046	1,772	1,840	1,816
2047	1,799	1,875	1,843
2048	1,826	1,908	1,871
2049	1,854	1,943	1,898
2050	1,881	1,977	1,926
2051	1,910	2,013	1,956
2052	1,942	2,048	1,989
2053	1,974	2,084	2,022
2054	2,006	2,121	2,056

Cost of living assumption

COVID-19 no longer a large concern in ability to pay rates

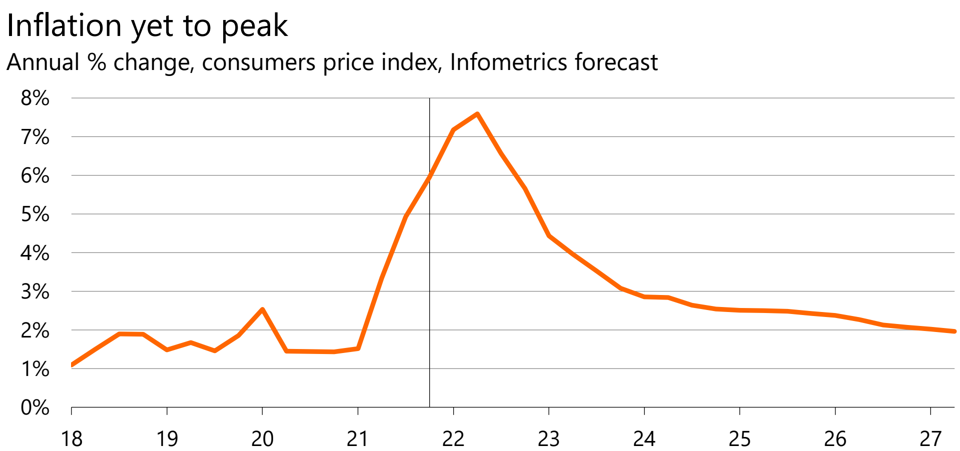
At the time of writing the 2021 LTP, the expectation of widespread job losses from COVID-19 led to concern around the ability of ratepayers to pay their rates. For ICC, this expectation could have led to a cashflow crunch and potentially a large increase in rates arrears. Fortunately, job losses from COVID-19 have been limited and offset by a buoyant economy overall. Overall, most labour market indicators point to strong conditions and robust employment outcomes.

Strong inflation squeezes household budgets

Strong inflation has overtaken concerns around job losses, with inflation squeezing household budgets and potentially limiting their ability to pay rates. Inflation rose to 5.9%pa in the December 2021 quarter, and then further to 6.9%pa in the March 2022 quarter.[5] This rate of inflation is the fastest growth since the June 1990 quarter.

We expect inflation to reach new heights in 2022, peaking at 7.6% in the June 2022 quarter and staying above 3% until 2024 (Graph 4).

Graph 4



This period of higher and more persistent inflation translates to a significant and sustained squeeze on household budgets. We estimate that in December 2021, the households nationally were spending an extra $70-$100 more per week on essentials (mortgage payments, food, fuel, rates, and power) than they were in December 2020.

[5] The most current Infometrics macroeconomic forecasts were finalised and published on 14 April, ahead of the March 2022 quarter consumers price index release on 21 April. However, our forecasts showed an expectation for inflation that was broadly in line with the 6.9%pa outcome.

The effect of higher inflation will vary widely from household to household, with those with large mortgages likely to be most affected as strong interest rate rises are expected in the coming year as the Reserve Bank attempts to control inflation.

Employees in pole position for wage increases

Nationally, the unemployment rate is at the lowest on record (since 1986), at 3.2% in the December 2021 quarter. Given the tightness of the labour market, we expect that wages and salaries will grow in response to inflation overall. NZIER's Quarterly Survey of Business Opinion (QSBO) from April 2022 reported the toughest conditions for finding skilled and unskilled labour on record. These tight labour market conditions mean that employees are in a strong position to demand pay rises that are at least in line with inflation and have generally good prospects if they need to find a new job to achieve this. Some workplaces and industries such as tourism may struggle to give their staff cost-of-living pay raises.

Incomes take time to adjust

The process of adjusting incomes to reflect changes in the cost of living does take time, and the impact of this lag will be more apparent in times of high inflation. Publication of the consumers price index (CPI) lags price increases in the marketplace, and remuneration reviews typically lag the CPI. This lag means that even households who enjoy regular cost-of-living adjustments to their income will face budgetary pressures as their costs increase faster than the incomes.

For those reliant on government support such as benefits or superannuation, they face a longer adjustment cycle. Benefits and NZ superannuation are adjusted on the 1st of April each year, reflecting wage inflation up to the December quarter in the previous year.[6] This indexation timeframe means that households relying on benefits will face a serious squeeze through 2022, as inflation peaks in the June 2022 quarter, but their incomes won't reflect this until the June 2023 quarter. Wage growth being lower than CPI inflation will exacerbate this pressure, although additional benefit increases have recently occurred as part of the Government's Families Package.

Some households will struggle with rates

Significant inflation will affect all household budgets in the coming year and apply acute pressure to those with already finely balanced budgets such as beneficiaries, superannuants, and minimum wage earners. Interest rate rises will add to household cost burdens too. This squeeze will ultimately limit the ability of many to afford rates increases and does raise the prospect of a rise in rates arrears as households balance a multitude of increasing costs. Although inflation is forecast to peak in 2022, it is expected to remain at relatively high levels for the next two years. Inflation enduring at a higher level for longer means that the squeeze on household budgets will persist and compound over several years.

[6] Benefits and NZ superannuation are indexed to wage inflation, rather than CPI inflation.

Specific industry assumption: Tiwai

Our forecasts assume Tiwai stays open

We have assumed that the Tiwai Point aluminium smelter continues operating at its current scale in our employment, population, and household forecasts. This assumption is not because we necessarily consider this scenario to be probable, but that it would make it difficult to communicate other employment and population trends amongst the effect of Tiwai closing. Instead, we discuss a range of factors to consider in forming a view around the future of Tiwai and outline the potential impact of Tiwai's closure.

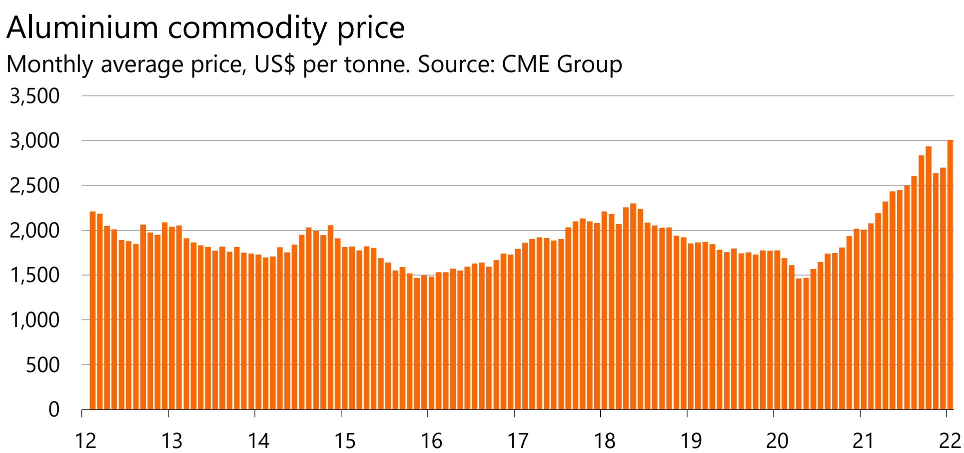
Tiwai makes a significant contribution to Southland economy

Previous analysis[7] by Infometrics for Venture Southland highlights the contribution that Tiwai makes to the Southland Region economy, the majority of which is likely to be felt in Invercargill. With all four pot lines running in 2018, Tiwai employed 764 full time equivalent (FTE) directly, and supported a further 1,500 FTE across Southland indirectly, including contractors and supplying industries. In total, 2,264 FTE across Southland are estimated to rely on Tiwai, amounting to 4.2% of total regional employment in 2018.

Aluminium market at its best

Aluminium commodity prices have been sustained at a high level over the past year, above the previous peak of US$2,300 per tonne for the past 10 months (Graph 5).

Graph 5



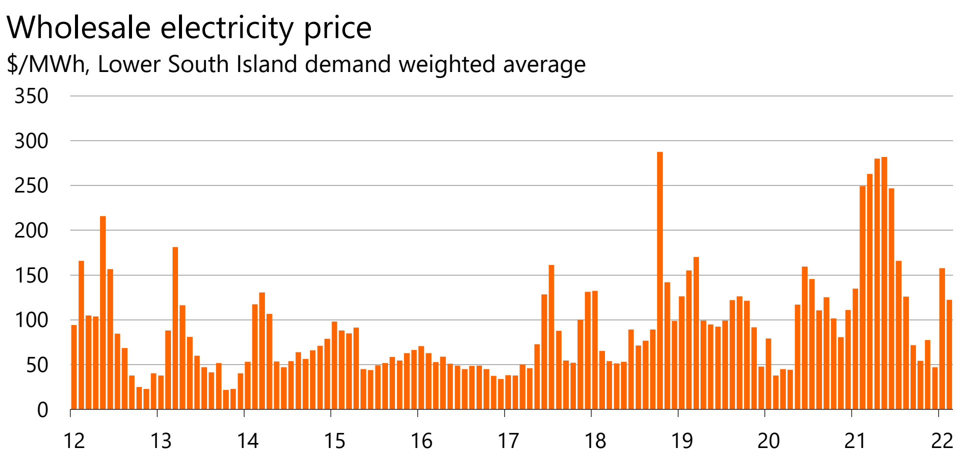
[7] Infometrics (2019). *Estimation of the Economic Impacts of the Tiwai Point Aluminum Smelter on the Southland Economy*. Infometrics.

Average aluminium prices in 2021 were 12% higher than in 2020, when Rio Tinto threatened to close Tiwai and renegotiated its electricity pricing with Meridian. The rise in aluminium prices suggests that the profitability of the Tiwai smelter has substantially improved since then. In addition, there is potential for premium pricing for the supply of high-purity and green (low greenhouse gas emission) aluminium which would further improve Tiwai's profitability.

Electricity pricing a sticking point

Wholesale electricity prices have risen considerably since 2020, when Rio Tinto negotiated with Meridian Energy for a reported $35/MWh electricity supply deal until 2024.[8] The circumstances around the 2020 deal were in Rio Tinto's favour – Meridian had few alternative customers with large, 24/7 demand for electricity located in the lower South Island. However, wholesale electricity prices have risen since then, from an average of $98/MWh over 2017-2019, to an average of $167/MWh in 2021 (Graph 6).

Graph 6



Other shifts in the electricity sector have tilted the playing field towards Meridian too. Transpower has commissioned electricity transmission network upgrades to increase capacity for sending electricity generation to northern consumers, giving Meridian more options for its Manapouri-generated electricity. Meridian has also courted alternative users of Manapouri electricity such as green hydrogen production and conversion of fossil-fuel boilers to electricity at the likes of Fonterra's dairy manufacturing plants.[9] Broader efforts towards decarbonisation across the country mean that more value is being placed on flexible electricity demand, as a substitute for using gas and coal fired power plants to smooth out fluctuations between electricity supply and demand.

Altogether, Meridian is in a far stronger position for negotiating Tiwai's electricity supply beyond 2024. Rising aluminium prices mean that Rio Tinto can afford to pay significantly

[8] Jonathan Milne (August 2021). *Tiwai Point smelter owner 'hasn't read the tea leaves' in dry lakes – Meridian*. Newsroom. Retrieved from https://www.newsroom.co.nz/tiwai-point-smelter-owner-refuses-to-give-power-back-to-the-people

[9] Eric Frykberg. (July 2020). *How Meridian, Fonterra and Tiwai Point's electricity are linked*. Radio New Zealand. Retrieved from https://www.rnz.co.nz/news/business/422440/how-meridian-fonterra-and-tiwai-point-s-electricity-are-linked

more for electricity in future, but it may also be expected to offer more flexibility in its demand for electricity, which would require investment in new technology at Tiwai.[10]

Up to four years to absorb Tiwai workers into labour market

Infometrics employment forecasts can provide an indication of how long it would take for the Tiwai labour force to be absorbed into the labour market, assuming it closes in 2024.

In 2025, we forecast growth of 619 new jobs, and 2,512 replacement jobs. Replacement jobs are created when workers leave employment (such as for retirement or migrating away), net of workers entering employment (such as workers returning from parental leave). At an aggregate level, this growth in employment suggests that the 2,264 FTE associated with Tiwai could be absorbed into the regional labour market within one year, if there was a perfect skills alignment between the departing Tiwai workers and the new or replacement jobs available.

Alternatively, we can form a lower-bound estimate by assuming that the skills of Tiwai workers are only relevant to the construction and manufacturing industries, and looking at the growth and replacement jobs in these industries only. In 2025, we forecast growth 9 new jobs to be created in construction and manufacturing in Southland, and 612 replacement jobs. This estimate suggests that it would take just under four years for Tiwai's labour force to be absorbed into the region's construction and manufacturing labour market.

Taken together, these estimates suggest that it would take between one and four years for the Southland Region to absorb the job losses resulting from closure of the Tiwai smelter. It is likely that a number of Tiwai workers would subsequently retire or leave the region, which will reduce the time period needed to absorb job losses. These effects would be concentrated in Invercargill. In the 2018 Census, 97% of workers commuting to work in the Tiwai/Awarua/Woodend/Greenhills area resided in Invercargill City.

Life after Tiwai will vary for individuals

At an individual level, the ability for a worker, either from Tiwai or a supplier, to regain employment after closure of the smelter will depend on a range of factors such as their specific skills and experience and willingness to adapt. Ideally, support services will be made available to make the transition from Tiwai to new employment as smooth as possible. In practice, some workers will take such an abrupt change as a prompt to retire (early or otherwise) or migrate out of the region, and some may struggle to regain employment.

It should be noted that Infometrics population and household projections consider employment growth in driving net migration. Therefore, population and household

[10] Marc Daalder. (January 2020). *NZ firm promises solution to Tiwai Point*. Newsroom. Retrieved from https://www.newsroom.co.nz/nz-firm-promises-solution-to-tiwai-point

growth would undershoot our projection if the smelter were to close, as displaced Tiwai workers would take up forecast job growth, displacing migrants to the region.

Smelter up in the air

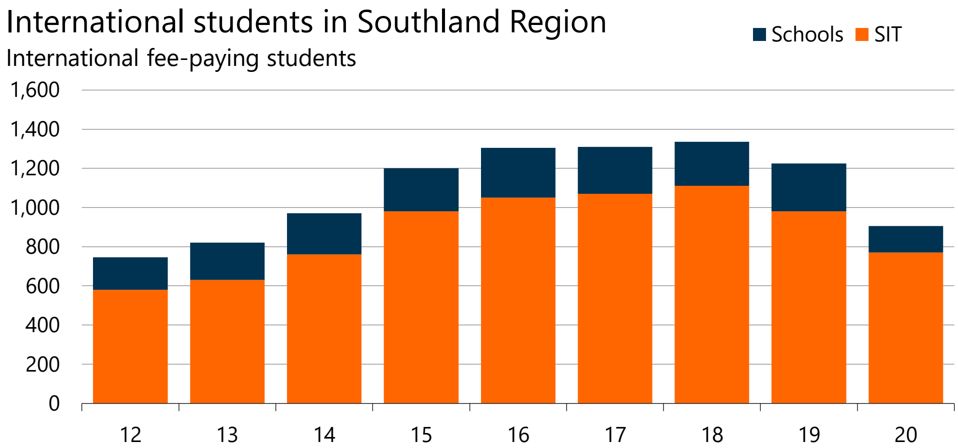
For the Tiwai Point smelter to continue operating beyond 2024, Rio Tinto will clearly need to stump up more for its electricity from Meridian, and may also need to make significant investment to enable flexibility in its electricity demand. At present, high aluminium prices mean that Rio Tinto can likely afford to offer more for its electricity and continue to operate Tiwai profitably. We don't have a strong view either way on whether the smelter will continue to operate beyond 2024, with private business decisions set to define the commercial outcomes. However, it is worth noting that the impact of a 2024 closure would be less than that of the mooted 2021 closure. The Southland economy will be in better shape in 2024 than 2021, so with a tighter labour market, displaced workers should be absorbed into other employment more quickly. Furthermore, development of alternative employment such as green hydrogen production or aquaculture expansion is further advanced, albeit still at a conceptual stage.

Specific industry assumption: International students

Most enrolments at SIT

International student enrolments in Southland Region were concentrated at SIT prior to the pandemic, with 980 international fee-paying students at SIT in 2019, and 245 at primary and secondary schools (Graph 7). The number of international students in Southland dropped 26% in 2020 and has likely fallen further in 2021.

Graph 7



Nationally, the number of student visa arrivals fell to 5% of pre-pandemic levels in 2021.

International education closely coupled with tourism

The growth of international students in New Zealand over the past decade was closely correlated with growth in long-haul international visitor arrivals – this trend reflects that marketing for the two activities is closely coupled and benefited from the same drivers such as improved international air connectivity and marketing of New Zealand as a destination. This trend also reflects that although Australia is a significant tourism market for New Zealand, it is not an international education market in the traditional sense, with Australian students paying domestic student fees for studying in New Zealand. We expect this pre-pandemic pattern to repeat in future years, as the long-haul tourism and international education markets recover from COVID-19 together, although international education may lag tourism due to the time required to market and develop relationships with schools and parents in overseas markets.

Slow road for tourism recovery…

We currently expect international visitors from long-haul markets to reach 46% of pre-COVID (2019/20) levels by June 2023, followed by 79% in June 2024, 87% by June 2025, and 92% by June 2026.

This revival is a slower level of growth than was seen in the past decade, reflecting that the factors that drove such strong growth in international tourism in the past decade are no longer in place. In the past decade, the cost of air travel fell and the middle class in China was growing substantially.

…means slow recovery for international education

For international education in Southland, we expect international student numbers to have eased in 2021 as existing students reach the end of their studies and new student numbers are severely limited. We expect that marketing activities will resume in 2022 as international borders reopen, enabling modest resumption of international student arrivals in 2023 and earnest recovery in 2024.

Based on our expectation for international visitor arrivals and the lag involved in restarting international education marketing and arrivals, international student numbers in Invercargill are unlikely to reach pre-pandemic levels until 2028 at the earliest.

Appendix 1 – Assumptions table

Assumptions	Level of certainty	Impact of uncertainty
Households Moderate, steady household growth of 0.6%per annum or 140 new households per year is forecast over the 2022-2034 period.	Medium	
Long term material inputs Our long-term forecasts point to civil construction (network infrastructure) prices rising at an average of 1.82%pa over the 2024-2054 period.	Medium	
Cost of living CPI inflation has already reached its highest level since 1990 as is forecast to continue go higher in 2022. The strong and sustained pressure of high inflation means some households may struggle to pay their rates, leading to increased rates arrears.	Medium	
Tiwai Point Aluminium Smelter Tiwai Point Aluminium Smelter will continue to operate until 31 December 2024. Its future after this point is uncertain – the smelter has expressed its desire to continue operating, but this will likely require paying more for its electricity.	Low	

International education The numbers of international students studying at the Southern Institute of Technology in Invercargill will recover slowly, reaching pre-COVID-19 (2019) levels by 2019 at the earliest.	Medium	