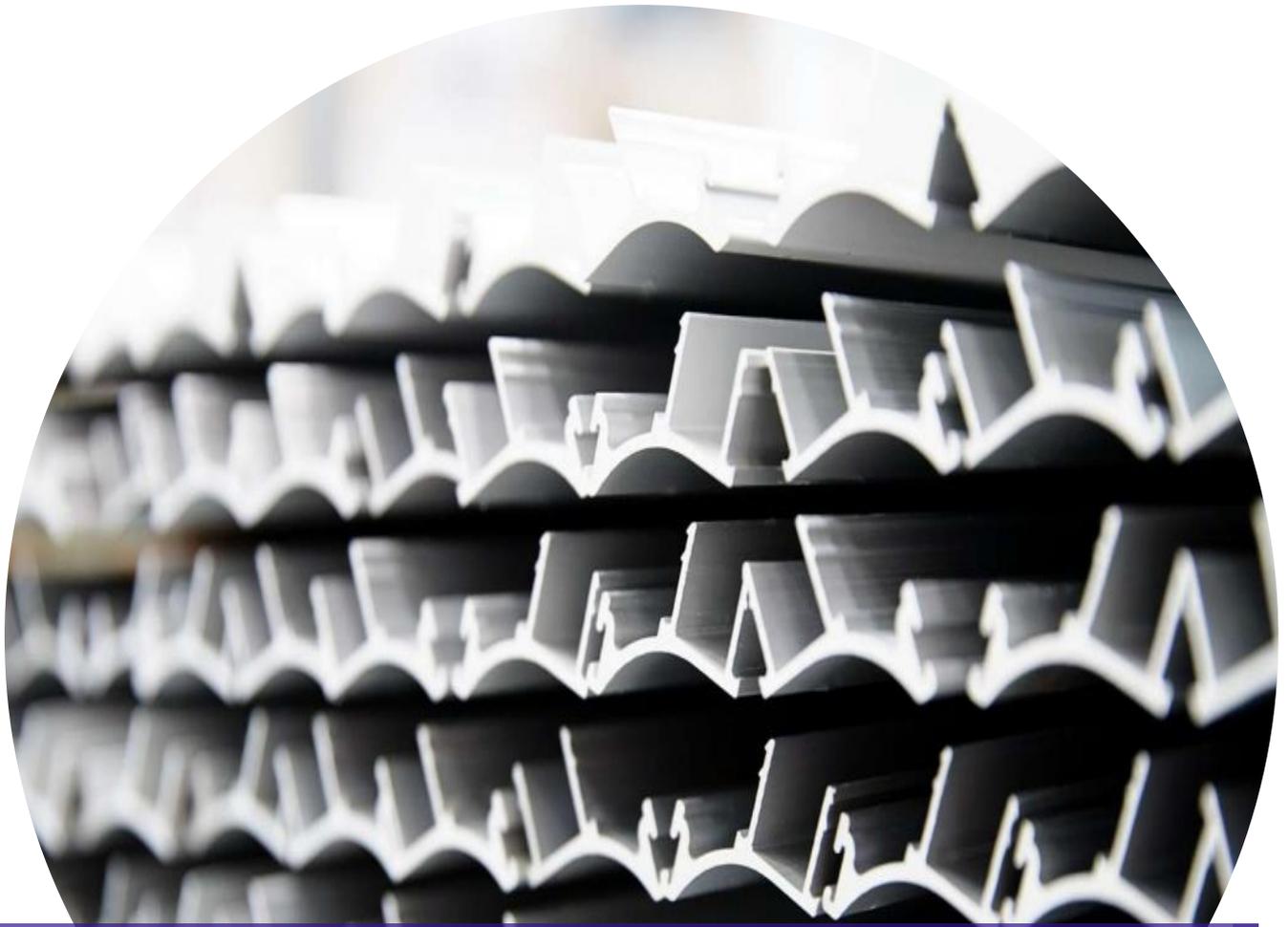




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Waikato Aluminium Industry: Benefits for New Zealand

Image: Inex



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Introduction

The Waikato region is a hub for the production of high-quality aluminium products, and in particular extruded products. Directly, this industry provides hundreds of jobs, and provides the input material for wide range of downstream manufacturers.

Aluminium products are an integral part of keeping our buildings warm and dry, forming window frames, roofing, and cladding, as well as a myriad of other building components. The Waikato aluminium manufacturers also provide key inputs to industries all over New Zealand – their products are used to make internal partitioning, louvred roofs, boats, buses, trains, containers, tanks, gates, scaffolds, ladders and more.

The recent Covid-19 outbreak has reaffirmed the value of having onshore manufacturing capacity, and has also highlighted how New Zealand prioritises the health and wellbeing of its people. The aluminium industry is no exception, and in this study for the Aluminium Extruders of New Zealand (ALENZ), we set out to investigate and quantify the Waikato aluminium industry's contribution to economic activity, good jobs, environmental stewardship, and focus on health and safety.

The frameworks used to gauge these contributions are the Living Standards Framework (LSF) and the UN's Sustainable Development Goals (SDGs). These frameworks are commonly applied in New Zealand (the LSF was developed by the NZ Treasury) and by expressing the sector's contribution to wellbeing within the context of these, the stories are told in a common 'language' understood by all. Additionally, as New Zealand has set targets under these frameworks, the industry is able to communicate directly how it contributes to these.

Why this Study?

Despite the importance of the aluminium industry to New Zealand, many people are unaware of the scale and importance of the secondary aluminium industry locally.

The goal of this study is to investigate how the aluminium industry in the Waikato contributes to wellbeing in New Zealand, across economic, environmental, social and governance indicators. These results can help to inform government, the public, and other interested parties about how integral this industry is to New Zealand. The focus for metrics in this study is on extrusion, since there are three large extruders and one die-maker in the Waikato.

The primary framework to which the industry players have been assessed against is the Treasury's Living Standards Framework (LSF), which measures contribution to wellbeing in New Zealand across a number of indicators. A secondary framework, the UN Sustainable Development Goals, has been used to give further context to the industry's contribution, in a format that is recognised internationally.

Interviews were held with two of the three large extruders in the Waikato region (Inex and Altus), and with Extec, a Waikato-based company that manufactures extrusion dies and supplies to these extruders as well as others. Information from these interviews and through further data collection efforts was matched with the two frameworks, to summarise the important contributions of this often-overlooked manufacturing sector.

The Waikato Aluminium Industry

The Waikato Aluminium Industry

In terms of secondary processing, distribution and manufacturing of aluminium products, a cluster of businesses exists in the Waikato region, as illustrated in

Figure 1. This is the second-largest aluminium-producing region in the Southern Hemisphere.

This study focuses on the secondary aluminium industry in the region. Together, the aluminium industry businesses in the region are estimated to have an annual turnover of approximately \$1 billion (2019), of which secondary industry makes up approximately \$200m.

Primary aluminium inputs are sourced from both New Zealand Aluminium Smelters in Bluff, and from offshore. The main type of secondary processing occurring in the Waikato is extrusion, of which there are three large extruders – Inex, Altus, and Ullrich Aluminium. Combined, these three companies produce close to 25,000 tonnes of extruded product each year. These extruders are supported by die and tool makers, mechanical services, and downstream packaging, freight and logistics, contributing an additional \$50 million of economic activity (estimated) annually.

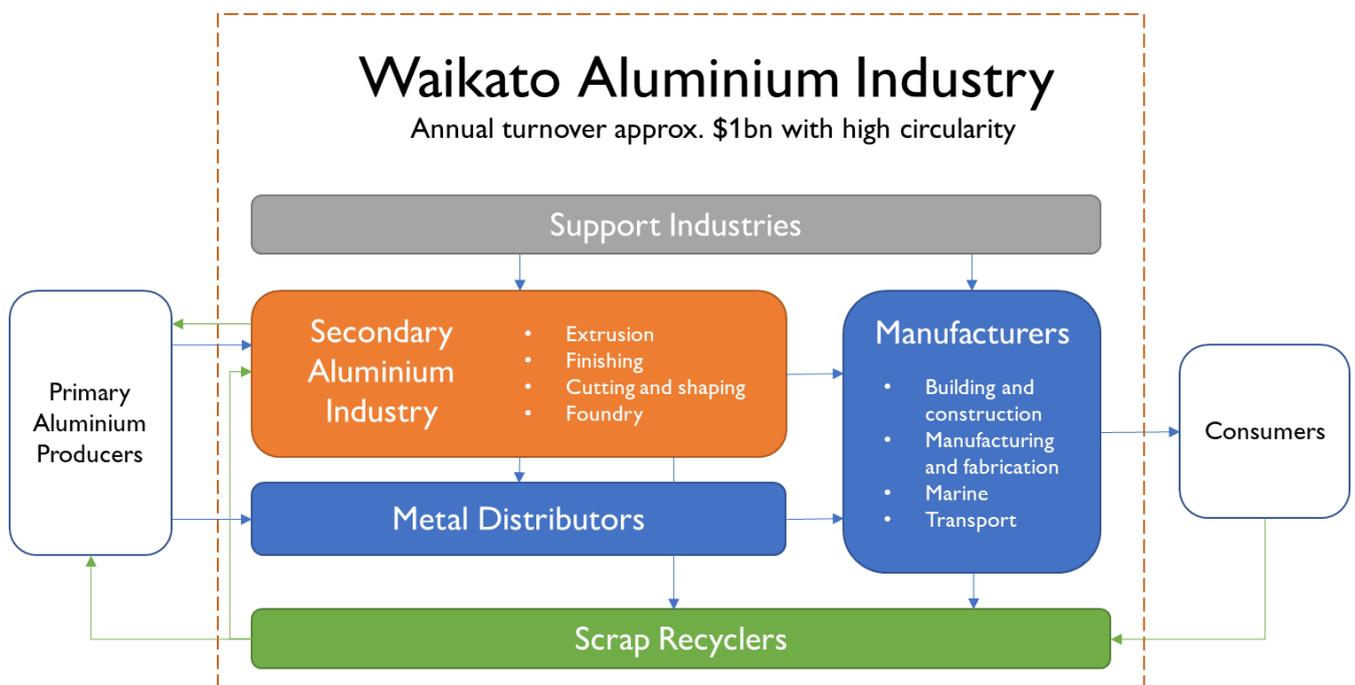


Figure 1: Production and related processes for aluminium in the Waikato Region. Metrics in this study focus on the secondary aluminium industry (orange).

Extruded material then moves along the value chain to metal distributors and manufacturers. Waikato-based metal distributors also import types of aluminium that are not produced in New Zealand, and distribute this to manufacturers; the distributors are estimated to have \$200 million of annual turnover.

Manufacturers within the region use extruded and rolled material for a variety of applications (Figure 2). The collective annual turnover of these Waikato-based manufacturers has been estimated at \$450 million. Support industries to manufacturers and distributors, plus the activities of the Waikato-based

aluminium scrap industry are estimated to contribute an additional \$50 to \$100 million annually. This brings the total turnover of all aluminium-related industry in the region to close to \$1 billion.

Building and Construction	Marine	Transport	Manufacturing and Fabrication
<ul style="list-style-type: none"> •Windows and doors •Louvres •Roofing, cladding, flashing •Internal partitioning •Shade 	<ul style="list-style-type: none"> •Leisure and fishing boats •Yachts, ferries, barges •Racing boats 	<ul style="list-style-type: none"> •Trucks and buses •Trailers •Motorhomes •Trains 	<ul style="list-style-type: none"> •Tanks, vessels, containers •Road Signage •Fences, scaffolding, ladders •Sheetmetal •Fridges

Figure 2: Uses for extruded aluminium products manufactured in the Waikato region, and rolled products imported by Waikato companies

Mapping the Contribution to NZ

Engaging with Industry

Based on the two frameworks discussed later in this chapter, a question list was developed to evaluate the contribution of the Waikato secondary aluminium industry to New Zealand. Structured phone interviews, guided by this question list, were held with the two largest extruders in the region, as well as with a local die manufacturer. The main industry participants in the region are shown below in Table 1, along with their staff numbers and the type of products produced & distributed.

Table 1: Primary aluminium extruders/manufacturers and die manufacturers in the Waikato region

Company	 			
	Inex & Inex Metals	Altus	Ullrich Aluminium	Extec
Interviewed?	Yes	Yes	No	Yes
Employees in Waikato	137	152	70	56
Products Supplied	Extruded product Anodising and powdercoating Rolled products	Extruded product Powdercoating Rolled products	Extruded product Rolled products	Steel dies for aluminium extrusion

Following the interviews, the metrics collected were assessed against the frameworks (below). As companies have different data collection procedures, standards, certifications, and processes in general; data have been aligned as much as possible. In addition, contributions to New Zealand that don't specifically fit into the frameworks have been included.

The Living Standards Framework

The Living Standards Framework is used by the New Zealand Treasury, and was released in December 2018. This relatively new framework guides Treasury advice on how to achieve a vision of a New Zealand that is prosperous, and how that prosperity will be sustainable and inclusive. The framework includes four 'capitals' which generate wellbeing, and twelve 'domains' which are an indication of current wellbeing. These domains cover a broad range of wellbeing indicators, covering economic, environmental, and social aspects.

The capitals used are Natural, Social, Human, and Financial and Physical, which provide a simple way of checking that contributions are made across all of the areas that the New Zealand Treasury monitors. The twelve domains of current wellbeing are slightly more granular, and apply to specific categories of indicators. The domains and indicators can be seen in Figure 3 below.



Figure 3 : Living Standards Framework (Source: NZ Treasury)

An important note about this framework is that some indicators are entirely subjective (many aspects of social capital, as well as the domain 'subjective wellbeing'). This means the data can only be collected at the level of individual people within the industry. Therefore, beyond a general interpretation of wellbeing based on quantifiable metrics such as those following in this report, explicit social capital metrics are difficult to establish and quantify. In this study, the focus has been quantifiable metrics and therefore subjective indicators of social wellbeing have been excluded.

Recognising the subjective nature of wellbeing, Treasury notes that organisations may develop their own wellbeing datasets and indicators to complement this framework.

The UN Sustainable Development Goals

The second framework used is the set of 17 UN Sustainable Development Goals. These goals are used globally to indicate priorities and targets within governments and businesses. Every country in the world has signed up to these goals, and New Zealand released its first [Voluntary National Review](#) in 2019. As in other countries, our government has signalled that it intends to aggregate contributions from industry alongside its own initiatives and submit these to the UN as NZ's response. The goals cover areas that the private sector may only indirectly address (e.g. poverty and hunger), as well as areas that tie in closely with many companies' sustainability and business goals. The full list of goals can be seen in Figure 4.



Figure 4: The 17 Sustainable Development Goals (Source: UN)

Relationship Between the Two Frameworks

The LSF and SDG frameworks exist primarily at a national and international level respectively, but do overlap in terms of the focus on the 'triple bottom line' of economic, environmental and social wellbeing. The New Zealand government has created a diagram of the relationship between specific domains and goals, and this is included in Annex A. The overlap can also be seen in the results section below (Table 2).

Results: Contribution to NZ

A comprehensive summary of the ways in which the secondary aluminium industry (and support industry) in the Waikato region contributes to New Zealand is included in this chapter. The results are presented in three parts:

1. A summary of the main ways the Waikato aluminium sector demonstrably contributes to the economic, environmental and social wellbeing of New Zealand
2. An overview of how the main contributions fit within the two frameworks used in this study
3. Further elaboration on specific industry contributions within each framework

Summary of Contributions

A High-Value Industry

The collective turnover of the aluminium industry in the Waikato is estimated to be \$1 billion. Close to 25,000 tonnes of extruded aluminium is produced annually, which is used in building and construction, manufacturing, transport, and many other applications across New Zealand.

Jobs

The industry provides approximately 350 jobs in extrusion in the Waikato region, as well as approximately 100 more within the region in other finished products, fabrication, and die manufacturing. These are stable jobs with an average wage above \$25/hour, health benefits as standard, and regular training commonplace. As per feedback from participants, workers in this industry can also expect to receive over 40 hours of training every year, putting skills and safety as top priority. Many more local jobs exist in downstream distribution and manufacturing industries.

Low-Carbon Aluminium

The billet used for extrusion is predominantly sourced from NZAS, with a carbon footprint 75% lower than the world average. This, combined with the use of modern electric heating technology and New Zealand's clean grid mix results in a finished product with an extremely low carbon footprint (below 5 tonnes of CO₂ per tonne of finished product) when compared with international product. An added benefit is that the carbon impacts from international shipping are removed when this product is manufactured locally.

Safety

The industry is proud to report very low injury rates, and has had no WorkSafe prosecutions in at least the last five years. An example of this is the injury rate at Altus, which is 1.2 per 100,000 hours worked. All the participants spoken to, stressed the importance of health and safety within the workplace and dedicated meaningful training time to health and safety practices.

Recycling

Aluminium is a high-value metal, and completely recyclable. Inex, for example, has a relationship with NZAS to return pre-consumer extrusion offcuts to the smelter for recycling in New Zealand. As an industry, over 99% of all scrap is recycled, and even dies are recycled at the end of their useful life. This allows the industry to minimise waste by extracting value from spent product.

Keeping Dollars in New Zealand

All three extruders use primarily NZ-made billet, NZ-manufactured dies, and work with NZ-based fabricators and logistics providers to deliver product to consumers. The Waikato aluminium extrusion industry is a crucial supplier to almost all residential and commercial buildings in New Zealand.

Key Supplier: New Zealand Aluminium Smelters

Much of the impact of extruded aluminium products comes from upstream. Approximately 85% of the billet for extrusion in the Waikato region is made in New Zealand at New Zealand Aluminium Smelters (NZAS) in Bluff. This aluminium has carbon emissions below 4 tonnes CO₂e per tonne, primarily due to the use of hydroelectricity in production. For context, the world average for aluminium billet is approximately 17.5 t CO₂e/t, and the average for China is over 20 t CO₂e/t¹. Rio Tinto, the owner of NZAS, co-founded the Aluminum Stewardship Initiative in 2012 as an independent standards-setting and certification organisation. NZAS is certified under the ASI Performance Chain of Custody Standards, meaning the facility meets strict environmental, social and governance criteria, and has a clear chain of custody from mine to market.

Key Supplier: Extec

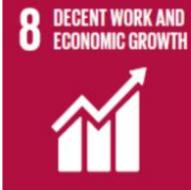
Extec manufactures dies for the aluminium extrusion industry, and is based in Te Rapa, a short distance from the three Waikato-based extruders. This company employs 56 staff, many of whom are trained in-house due to the highly specialised nature of the business. Having a local die manufacturer and expertise means the industry can respond rapidly to manufacturing needs, and can fix problems when they arise – something that is not possible when ordering from overseas suppliers.

Results as Contribution to Frameworks

In Table 2, the LSF Capitals and LSF Current Wellbeing Domains where companies involved in the project have particularly strong contributions have been identified, with the specific contributions listed. The aligned SDGs are included also. Each of the main specific contributions is detailed.

¹ Life Cycle Inventory Data And Environmental Metrics For The Primary Aluminium Industry. World Aluminium, June 2017.

Table 2: Contributions to the Living Standards Framework (LSF) and Sustainable Development Goals (SDGs) from metals suppliers to this project

LSF Capital	LSF Wellbeing Domain	SDG	Contribution from this Project
Human	Health		Private health insurance is standard for jobs in this industry.
	Safety		A strong safety focus means none of the companies in the industry have had WorkSafe prosecutions in the last 5 years, and the reportable injury rate is low, indicating safety as a priority.
	Knowledge and skills		<p>The industry trains employees with specialist skills in-house (e.g. die machining), and takes on electrical and other apprentices</p> <p>All employees get skills and health & safety training, some is NZQA certified.</p>
Financial and physical	Jobs and earnings		<p>Secondary aluminium manufacturers and their suppliers provide >400 good-paying jobs, paying well above minimum wage and most with healthcare benefits.</p> <p>Average wages in the sector are \$24 - \$32 per hour</p>
	Income and consumption		<p>Extruders use over 20,000 tonnes of NZ-made aluminium, and provide material to many fabricators and logistics suppliers. Extruded and rolled material is crucial to a variety of industries: e.g. building and construction, manufacturing, transport, marine, and other fabrication.</p>
Natural	Environment		<p>Approximately 99% of aluminium scrap from production is recycled, the majority of this is recycled in New Zealand. Over 70% by weight of all waste streams from the industry is recycled.</p> <p>Steel used for dies manufactured locally contains 40% recycled content, and all offcuts are recycled, as well as the dies themselves at end of life.</p>
	Environment		<p>For imported material, manufacturers routinely inspect production sites to ensure responsible production procedures are followed. Many of the suppliers are Lloyd's certified.</p> <p>All manufacturers are tracking and monitoring electricity and gas electricity usage.</p> <p>One extruder sends offcut aluminium directly back to NZAS in Bluff to be used in production locally</p> <p>None of the manufacturers have had any environmental prosecutions in the last 5 years.</p>

Natural			
	Environment		<p>>85% of the aluminium used for extrusion in the Waikato comes from NZAS, which has <4 tonnes embodied CO2 per tonne. This is >75% lower than the world average.</p> <p>Very little fossil energy is used for extrusion, with most energy for heating coming from electricity. This results in a very low impact on air quality and carbon emissions.</p> <p>All suppliers are tracking and monitoring fuel, gas, water and electricity usage to maximise efficiency. Capital upgrades happen regularly and induction heaters are becoming standard.</p>
Social	Subjective Wellbeing Cultural Identity		<p>Strong union representation, including support for grievances, fair employment practices and freedom of expression.</p>

Specific Contributions to the LSF

Through the way that the LSF is structured, some metrics only apply at the national level (for example, percentage of people in high quality housing). However, some areas align nicely with some of the Waikato aluminium industry. Relating these to wellbeing (the purpose of the LSF), some that can be highlighted here are:

- Jobs and earnings: Stable jobs paying well above the living wage are the norm in this industry
- Income and consumption: The jobs above allow financial stability, contributing to health, happiness and purchasing power of staff and their families
- Knowledge and skills: Specialist jobs and regular training mean that the employees in this industry are in demand, and have many opportunities for career advancement
- Environment: The industry has a low impact on the environment of NZ, producing a low-carbon product that also contributes to warm housing and lower energy use
- Health: A strong focus on health and safety at work, combined with widespread provision of private health insurance benefits means employees of this sector remain healthy and well

Using this framework, we can see that the benefits to New Zealand extend beyond financial benefits, and contribute to the wellbeing of people in the region and across the country.

Specific Contributions to the SDGs

New Zealand's [dashboard](#) on the SDG Index shows how New Zealand is performing toward achieving all of the SDGs by 2030. Presently, challenges remain in all of the SDGs outlined as applicable to the aluminium industry in Table 2. As such, the industry has an opportunity to frame its contributions as directly contributing to categories in which New Zealand, collectively, needs to do more. Ultimately, our government recognises that industry is an integral component of achieving our SDG ambitions and already looks to industry when preparing our updates to the UN.

Onshore manufacturing using some of the cleanest aluminium production methods anywhere in the world contributes to a number of SDGs. This includes those where New Zealand has some of the most Aluminium Industry in the Waikato Region - Contribution to NZ

significant challenges remaining such as SDG 13: Climate Action and SDG 12: Responsible Consumption and Production.

Additionally the industry contributes directly to SDG 3: Good health and well-being through wellness initiatives and health insurance provided throughout the industry. SDG 4: Quality education is supported by upskilling and training programmes within the industry and SDG 8: Decent work and economic growth which is a result of the economic activity provided by the industry.

To fully understand the contributions to the SDGs, it is useful to envisage an alternate scenario in which the Waikato aluminium industry did not exist. It would mean the loss of over 400 direct incomes alongside all the training, expertise and supply chain resilience attached. The importation of goods currently manufactured in the Waikato would have detrimental effects of SDGs 12 & 13. As such, it is clear that the industry plays a role in New Zealand's sustainability ambitions both on a national and international level when assessed in the context of sustainability frameworks to which we have committed.

Conclusions

This case study indicates the many benefits of supporting onshore manufacturing, especially one that is based on environmentally-responsible production methods. The Waikato aluminium industry is a hub of knowledge and innovation, producing some of the lowest-carbon aluminium extrusions in the world. We can demonstrate that this industry has strong contribution to the wellbeing of people in the region and across New Zealand.

On the other hand, we know little about the provenance and of imported extruded material. Material sourced from places that do not have the same level of regulations, policies and commitment to sustainability that is present here in New Zealand means that material is not contributing nearly as much to the wellbeing of people, especially those in New Zealand.

Challenges and Support Needed

The Waikato aluminium industry is a clear contributor to wellbeing in New Zealand, but does face some challenges. These challenges are mainly in the form of competition from imported extruded material, some of which is 'dumped' below manufacturing cost, and does not meet the same quality standards as locally-made product.

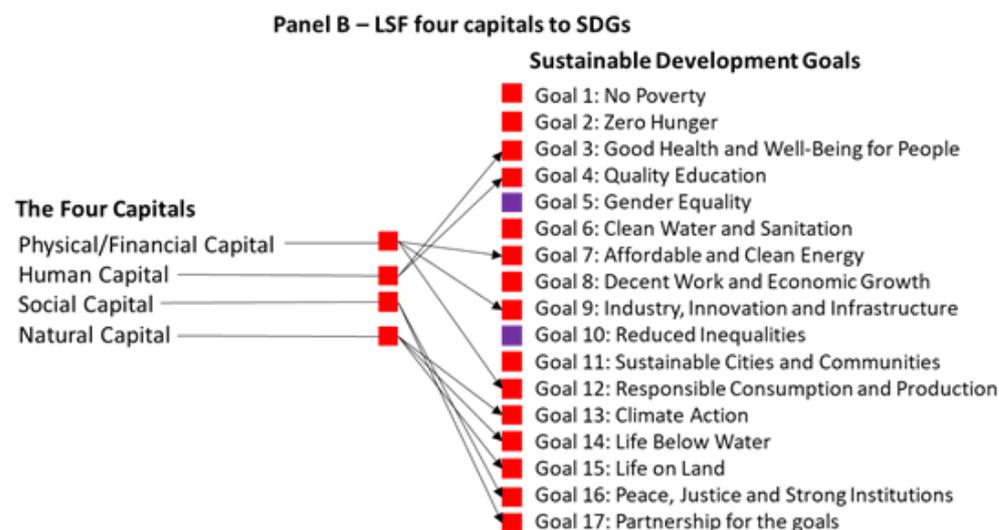
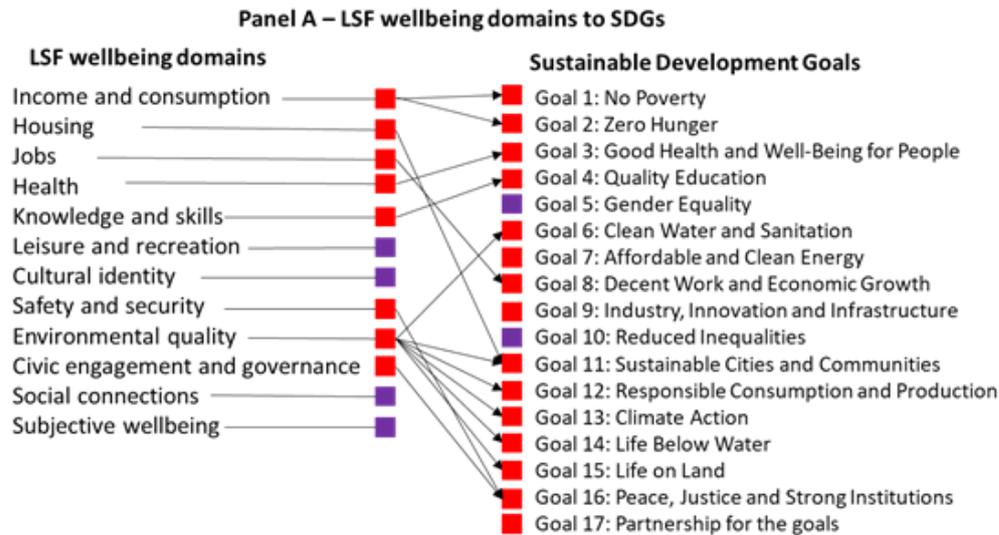
Feedback from industry on this topic provided some insight into the type of support that could help the industry, especially during these challenging times:

- Stronger governmental anti-dumping support and research, including rapid response to necessary investigations
- Easier access to research & development funding, to help the industry adopt the latest technology and improve production efficiency while lowering emissions
- Allowing shorter depreciation timeframes for technologically-advanced capital equipment, in line with overseas competitors

These ideas could help to grow the local industry and grow production of low-carbon aluminium products in the region.

Annex A: Connecting the Frameworks

The diagram below shows how the NZ Government sees the two frameworks used in this study as being connected². Panel A shows how the Living Standards Framework's "wellbeing domains" overlap with the UN Sustainable Development Goals. Panel B shows how the Living Standards Framework's "four capitals" overlap with the UN Sustainable Development Goals



■ Indicates domain or SDG does not map to a specific domain, SDG, capital

² <https://treasury.govt.nz/publications/dp/dp-18-06-html#section-4>