



Steel's contribution to a circular economy and low carbon future

Position Report prepared for the
Sustainable Steel Council

Our social licence to operate is fundamental to the long-term sustainability of the steel industry in NZ.

Steel is the backbone of NZ cities. It is what makes them resilient to climatic and seismic conditions that are prevalent in NZ.

Steel provides a resilient solution to infrastructure and construction needs in NZ's seismic environment: whether it is providing a resilient structural steel core, reinforcing concrete or providing a durable light-weight cladding system. Quality steel design protects us from the impacts of natural disaster.

There is no doubt that NZ loves steel. Steel is everywhere in our lives. We work, live and play amongst steel structures. It is in our bridges, our buildings, our tunnels, our manufacturing plant, our transportation and our homes.

Steel is key to NZ's ability to survive large seismic events and continue to function beyond them. This reliance makes it important to acknowledge that local steel production is an important part of the NZ economy and society.

Reduced CO₂ emissions, increased recycling and improved productivity, with less impact on our environment. This is what NZ wants.

Steel is at the heart of solving these challenges.

Steel is infinitely recyclable and its by-products and waste energies are valuable resources. For example, slag from steelmaking is used for civil works, thereby saving natural resources such as river gravel and scoria. New Zealand Steel, produces up to 60% of its own energy requirements, through co-generation.

The steel industry is integral to the global circular economy. It's core to the successful delivery and maintenance of a sustainable future.

From the car you drive, to the roof over your home, and much more, steel is an essential technology to New Zealand's way of life and to its thriving economy, yet you may be surprised to learn that it contributes to just 2.2% of New Zealand's total CO₂ emissions, much lower than other industries. As a vital part of New Zealand's future, steel therefore has a important role to play in our zero-carbon future.

Reducing carbon emissions is a global challenge that requires a global solution and we want to be part of that commitment.

Steel is a CO₂ and energy intensive industry that enables major CO₂ mitigation in other sectors. For example, steel is a core part of geothermal, hydro, large-scale solar, and wind energy solutions, as well as recycling plant and equipment. Without steel, none of these would be as efficient.

Several NZ manufactured steel products are registered under the environmental product declaration program, which provides detailed information about their environmental performance. This can assist in determining the environmental impact of buildings and infrastructure that use those products and help earn points for Green Star building projects.

Reducing carbon emissions at point of production is important.

Life cycle analysis is also important. And is gaining global recognition as a key environmental measure.

In 2016, the World Economic Forum (WEF) emphasised the importance of life cycle analysis in its Industry Transformation Agenda "Shaping the future of construction". Two out of the total 30 actions within the framework proposed life-cycle analysis as being important.

In March 2017, the WEF released a white paper titled "Shaping the future of construction: inspiring innovators redesign the future". This paper advocated the importance of lifecycle performance- reducing the lifecycle cost of assets and designing for re-use and minimal waste.

This is where steel comes to the fore, as we know that steel assets perform very well in terms of both environmental impact and cost over the life-time of the asset.



A well-structured circular economy is based on lifecycle analysis

Reduce, reuse, reconfigure, recycle and retrofit are all benefits of steel.

In a circular economy, products are manufactured from raw materials, used then repaired, re-used and recycled.

In the linear economy, products are made, consumed and discarded.



Reduce

90% of a building's potential energy reductions are achieved during use of the building over its lifetime, and only 10% in its construction (Source: United Nations Environment Programme presentation at the World Green Building Council in Monterrey, Mexico).

Not only that, steel plays a key role in reducing construction waste because it can be engineered to very accurate specifications. There is minimal waste or offcuts.

Re-Use and Reconfigure

Re-configuration is another reason why steel is such a great lifecycle performer. Structural steel buildings are easily repurposed and reconfigured. This makes them more adaptable to future changes in use.

Resilience

Steel performs extremely well in NZ's severe seismic conditions. This means that our steel-based buildings last longer and require less repairs. This saves resources.

The availability of steel for recycling is limited for a very good reason: steel products, such as bridges and buildings, have very long service lives. This leads to an overall reduction in material requirements.

Recycle

Steel is a unique material in its capacity to be continually recycled without loss of properties or performance. Globally, steel is one of the most recycled materials.

More can be done to support increased recycling at end-of-life by emphasising design for dismantling. However, demand for steel products generally outweighs supply from recycled sources.

Retrofit

A distinctive application of steel is the delivery of resilience through retrofitting old earthquake prone (and non-compliant buildings). These buildings are given a second life through retrofit of seismic steel reinforcing.