

9 October 2020

Sustainable Steel Council New Zealand submission on the MBIE/Building for Climate Change Programme discussion documents on the *Whole-of-Life Embodied Carbon Emissions Reduction framework* and *Transforming Operational Efficiency*

1. Sustainable Steel Council New Zealand

The Sustainable Steel Council (SSC) is a group of industry leaders committed to the transition to a circular economy and New Zealand's low-emissions future, refer <https://www.sustainablesteel.org.nz/about-us/>

Our Vision

Members of the Sustainable Steel Council are committed to a vision where steel is valued as a critical enabler in New Zealand's journey to a low emission economy. This vision is achieved by an industry which has a strong history of being financially sound, taking leadership in delivering to the living standards framework, measured across human, social, natural and financial / infrastructure capitals.

In 2018 SSC commenced a programme of work with stakeholders to understand key challenges/priorities for our sector. Completing a materiality analysis identified six key priorities which then formed the foundations for the SSC audit tool. Over forty leading businesses have been audited in the last nine months. Members' progress is measured against the UN Sustainable Development Goals and New Zealand's Living Standards framework – refer <https://www.sustainablesteel.org.nz/ssc-certification/>

A knowledge hub has been developed with members working collaboratively to share best practice and work collaboratively on common challenges. For example a group of steel fabricators are currently working with WasteMINZ and Plastics NZ to recycle plastic waste from welding consumables.

The six key priorities are

Safety and Health

Foster well-being of employees. Provide them with a work environment that is, as far as reasonably practical, without risks to their health and safety, enabling them to return safely to their families at the end of each working day.

Climate change

Taking a holistic approach based on the Living Standards framework. Climate Change is a global challenge that affects everyone, everywhere.

Waste and the Circular Economy

Strive to optimise the eco-efficiency of products throughout their life cycle. Design for upcycle, re-purpose, reuse and recycling. Separate the technical from the biological.

Diversity, inclusivity, engagement with lwi and life-long learning

To reduce inequalities, policies should be universal in principle, paying attention to the needs of disadvantaged and marginalized populations. Create the conditions that allow people to have quality jobs.

Product quality and resilience

Strive to meet future challenges of climate change and our shaky isles

Transparency, ethics and legal compliance

Build our knowledge of sustainability and willingly share it with others

The Sustainable Steel Council is committed to the transition to a low emission, circular economy by 2050. Supporting our members on this transition SSC has identified three horizons to achieve the target.

Horizon One – (one to three years) building the capacity/capability of our members in understanding the quantum of the challenge and working collaboratively to understand/prepare their businesses for the challenges.

Progress – SSC’s audit tool (referenced to government’s Living Standards framework and UN SDG’s has been developed, rigorously tested and used by over 40 members. Resources (tool kits, road maps and guides) have been developed to support members. A robust case study framework has been developed to demonstrate how buying local delivers to the Living Standards framework - refer <https://www.sustainablesteel.org.nz/category/case-studies/> New Zealand Steel has committed to a 12% reduction in their Scope 1 and Scope 2 greenhouse gas emissions intensity by 2030¹

Horizon Two – (one to ten years) transitioning from linear to circular economy.

Progress – New Zealand already has a sophisticated steel recycling network, many of our members accept steel back at end of life and little if any steel ends up in landfill as steel scrap has significant commercial value.

SSC members are participating in a recycling project focused on recycling of plastic consumables associated with steel fabrication.

Approaches have been made to key government agencies (MBIE (Economic Transitions team), Ministry for Environment, Interim Climate Change Commission, PM’s Chief Science Advisor) and to Auckland Council re what a transition to a Circular Economy could look like for the steel sector and the offer to work collaboratively to develop a roadmap. Sadly, to date, SSC have been unable to identify government expertise or intent to progress Circular Economy principles for the steel sector.

¹ BlueScope New Zealand Sustainability snapshot. Refer <https://www.nzsteel.co.nz/assets/Uploads/Files/NZPI-SustainabilityDocument-Jul20-web3.pdf>

Horizon three – (ten to thirty years) technologies to develop low carbon steel.

Current reality – iron/steel making is a chemical process which requires carbon. Currently there are no proven technologies to commercially produce steel without carbon.

Progress – Opportunities are emerging to replace coal with hydrogen and biochar technologies. BlueScope, the parent company of New Zealand Steel is currently exploring carbon reduction technologies² for steelmaking using these two energy sources.

NZGBC's 2019 report Under Construction³ provides examples where evolving technologies can significantly reduce carbon in steel by 60-80%.

A pilot plant is being developed in Sweden to make steel using hydrogen as the fuel source – refer <https://www.hybritdevelopment.com>

ArcelorMittal recently announced a group-wide commitment to being carbon neutral by 2050, building on the commitment made in 2019 for its European business to reduce emissions by 30% by 2030, and be carbon neutral by 2050.⁴

The Wellington based MacDiarmid Institute has recently received funding from MBIE Endeavour programme to scale up production of carbon free iron from iron sands – refer <https://www.macdiarmid.ac.nz/news-and-events/news/annual-reports-pages/taking-essential-metals-into-a-zero-carbon-future/>

² BlueScope Sustainability Report 2020, p16, refer <https://s3-ap-southeast-2.amazonaws.com/bluescope-corporate-umbraco-media/media/2915/bsl-2020-sustainability-report.pdf>

³ NZGBC Under Construction p refer https://www.nzgbc.org.nz/Attachment?Action=Download&Attachment_id=2453

⁴ <https://corporate.arcelormittal.com/media/press-releases/arcelormittal-sets-2050-group-carbon-emissions-target-of-net-zero>

2. Building for Climate Change

The Sustainable Steel Council does not support the Building for Climate Change (BFCC) approach.

SSC strongly believes that to achieve the stated goal BfCC will need to work collaboratively with the construction/infrastructure sector to address the challenge, to take stakeholders with them on the journey and to develop a package of regulation and incentives.

We think the proposed approach is fragmented in that it only targets embodied carbon in structures and a very limited perspective of operational emissions. Ignored is the embodied carbon in the remainder of products comprising the building; the actual construction (along with the construction waste generated; the actual operation and maintenance of the building and how the building is addressed at end of life, along with re-use/repurposing and recycling of components or landfill). Such a fragmented approach will not enable New Zealand to reach its goal, is likely to alienate much of the sector and delay New Zealand effectively addressing emissions from buildings.

The Sustainable Steel Council is encouraging the BfCC team to engage broadly with stakeholders across the sector to jointly develop and deliver an effective plan to reduce emissions from the built environment.

SSC joins others in proposing a more holistic approach and our submission lists the components that will be essential to a fair and effective transition to a low emission, circular economy, providing international examples which are pertinent to New Zealand.

New Zealand's journey to 2050 is not just about carbon. New Zealand needs to measure its progress to 2050 across broader frameworks – for example, the Living Standards framework and the four capitals – natural, human, social and financial / infrastructure. New Zealand needs to continue to invest in our workforce; in our businesses, particularly our manufacturing (on which our construction sector depends); and we need strong connected communities along with our stewardship of the natural environment.

3. What will be needed to achieve Carbon Zero in New Zealand buildings by 2050

The context provided in the discussion documents (i.e. pages 3-5) provides the whole of life framework for our buildings – encompassing from raw material extraction, manufacture supply through construction, use, end of life to reuse, recovery and recycling or disposal.

SSC encourages the BfCC team to adopt a systems approach based on Cradle to Cradle methodology which includes existing and new buildings, the operation/maintenance of buildings and end of life/deconstruction, reuse/repurpose or landfill as mapped out in your documents “context”.

SSC also encourages the BfCC team to adopt an approach that considers the current and future context of New Zealand’s built environment, engages all the stakeholders across the built environment and the owners/occupants of our buildings on the journey.

Achieving the goal will be an enormous transition from where New Zealand is currently and to enable the required change process we need to take all stakeholders on the journey.

It will involve significant change of behaviours: from how we design, build/retrofit, operate and maintain our buildings; how we deconstruct, re-purpose, reuse or recycle at end of life; we cannot continue to bury our waste materials, particularly when much of construction waste is new material.

To achieve this transition New Zealand will need a basket of incentives and regulations, a roadmap to guide us on the journey and measurement along the way.

The transition to zero emissions from buildings will need to consider that the built environment is a complex system, some of which is detailed in the following:

Existing buildings will account for approximately 65% of the buildings New Zealand will have in 2050, and given that many existing buildings perform poorly - are high users of energy and water and deliver poor outcomes for their occupants - these surely must be the number one immediate target.

The current building code structure needs to be integral to New Zealand’s climate change response. New Zealand has a robust framework of Standards and code clause requirements developed from International Standards, modified to address seismic conditions and the challenges of the New Zealand climate. New Zealand cannot favour low emission solutions which threaten our very resilience to the threats of climate change and natural events.

New Zealand’s proposed transition must be referenced to international best practice. We must work collaboratively with other jurisdictions to share learning, while giving consideration to New Zealand’s unique seismic and climatic challenges.

We suggest that BfCC consider the RIBA 2030 Climate Challenge⁵ (or similar holistic frameworks which propose robust frameworks. Separating targets for domestic from non-domestic buildings, the RIBA present a hierarchy

Commencing with operational energy, in order of priority

- Building fabric
- Efficient services and low carbon heat
- Maximise on site renewables
- Minimise carbon offsets

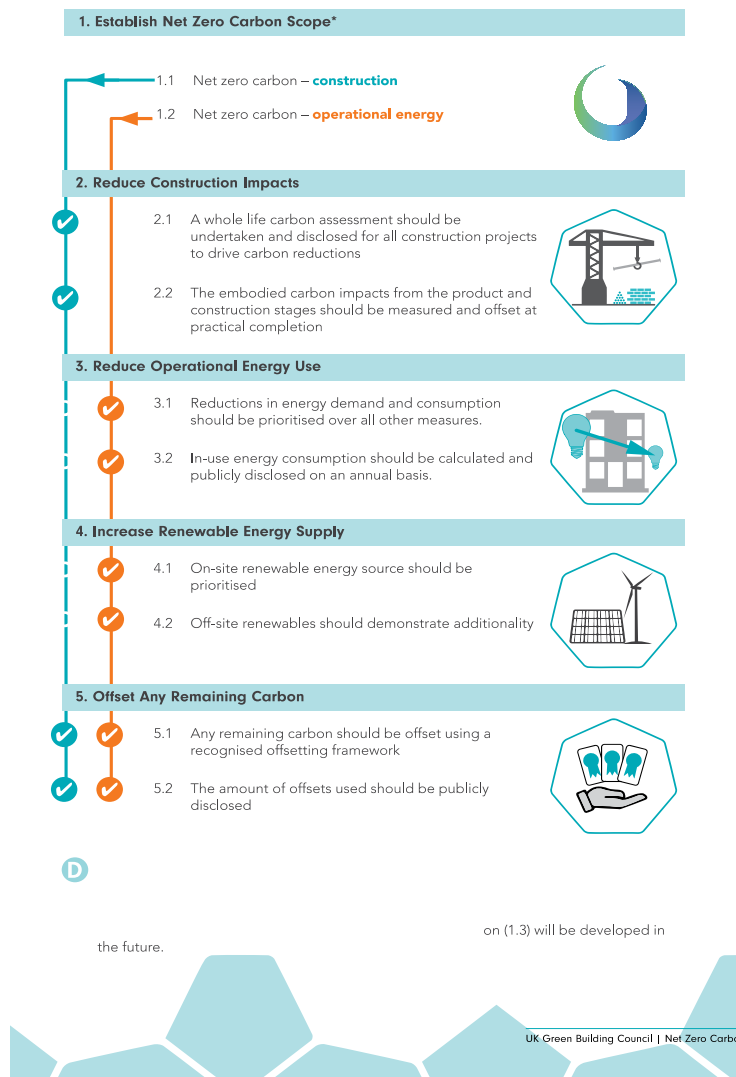
Progressing to embodied carbon, in order of priority

- Building fabric
- Using circular strategies
- Minimise carbon offsets

Finally potable water use

The diagram below from UKGBC graphically depicts the journey⁶ as a useful graphic detailing the whole of system approach to zero emissions.

Steps to Achieving a Net Zero Carbon Building



⁵ <https://www.architecture.com/-/media/files/Climate-action/RIBA-2030-Climate-Challenge.pdf>

⁶ <https://www.ukgbc.org/wp-content/uploads/2019/04/Net-Zero-Carbon-Buildings-A-framework-definition-print-version.pdf>

Renewables and carbon off set instruments will be essential to achieving zero emissions.

Given the quantum of the challenge to reach zero emissions, (from new and existing buildings), on-site renewable generation and carbon off sets will be required and protocols around these need to be developed in partnership with stakeholders.

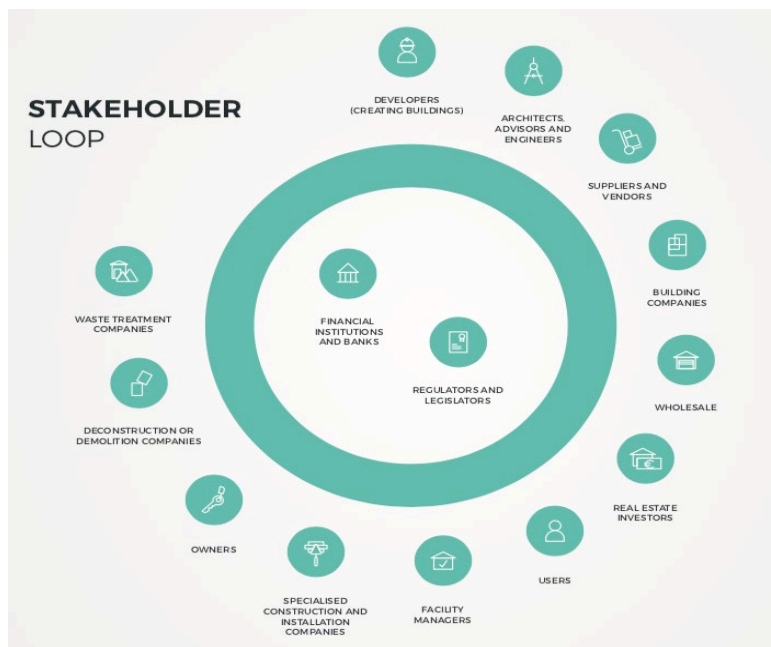
The role of data and tools will be critical.

New Zealand needs to ensure a standardised and moderated approach to data is used, that considers:

- transparency across the whole system;
- standardisation of assumptions being made;
- moderation of the comparisons being made;
- moderation of product boundaries being used;
- standardisation and moderation of the methodologies being used; and
- cradle to cradle scope.

The transition to a circular economy will be critical for the construction sector to achieve New Zealand's zero emission targets from buildings.

Circularity will require significant shifts in all stakeholders across the built environment including owners, financiers, regulators, designers, engineers constructors and those that maintain and deconstruct at end of life ensuring valuable materials can be reused, repurposed or recycled. No longer can we continue to landfill complete buildings. We will need to design to deconstruct, even to upcycle to ensure valuable materials are reused and natural materials can be returned to nature. The diagram below depicts the complex stakeholder loop across our built environment.



More research required to adequately account for the impact of natural systems vs man made systems.

Life Cycle Analysis (LCA) is typically used for the design or improvement of products and processes⁷. LCA considers the breadth of environmental impacts of a product over its life – not just global warming potential, but also ozone depletion, acidification, eutrophication, photochemical ozone creation and abiotic depletion potential. As we noted earlier – it is not just about CO2 impacts.

Comparing natural systems (e.g. plantation grown wood which embodies carbon in trees at the expense of carbon which was embodied in soils and the impact plantations have on the destruction of natural biodiversity and local communities) with man-made systems (e.g. steel and concrete, where there are clear system boundaries and known impacts) is not necessarily the smartest or fairest approach. Natural and man-made systems have different attributes, impacts and service life. On the one hand we have the components of a complex natural system, while the other is a clearly defined mining/manufacturing process.

SSC believes that along with developing a standard, moderated approach to data, further research is needed into the impacts of plantation forestry on New Zealand's natural systems.

Policy framework needs to address the emission profile of imported building products and imported waste

A significant amount of products in New Zealand's buildings are imported. While some are from reputable suppliers with robust data detailing their stewardship and life cycle analysis, others lack credible data. What will be the default position for imported products when there is no available data?

As New Zealand producers are starting to take responsibility for their products at end of life and accepting product back at end of life, there needs to be a similar stewardship obligation placed on the importers of product from off shore.

Policy needs to enable/facilitate transition and incentivise technology advancements

Supporting the transition to a circular, low emission economy, policy needs to ensure it does not disadvantage proven building systems that have delivered resilient building solutions for New Zealand's challenging seismic conditions and varied climatic conditions.

While globally we currently lack the technology to make steel without carbon there are potential solutions being developed here in New Zealand⁸ and in Sweden work has commenced on a pilot plant to make carbon free steel⁹.

Similarly, we should not forget that the process to make iron from iron sand was developed here in New Zealand and the journey to a circular low emission economy needs to incentivise and reward business who invest in R & D to develop future low or zero carbon technologies.

Policy framework needs to recognise the contribution of local manufacturing which delivers significant value to the sector and to the Living Standards framework.

⁷ <https://lcanz.org.nz/lca-guidance/lca-intro/>

⁸ <https://www.macdiarmid.ac.nz/news-and-events/news/annual-reports-pages/taking-essential-metals-into-a-zero-carbon-future/>

⁹ <https://www.macdiarmid.ac.nz/news-and-events/news/annual-reports-pages/taking-essential-metals-into-a-zero-carbon-future/>

In a post COVID New Zealand, international supply chains are proving to be less reliable than the past. New Zealand's construction/infrastructure deficit still needs to be built, and recognising that local manufacture delivers significantly more value to New Zealand than similar imported products, we need to ensure how strategic local manufacturing is fostered and grown through the transition process. For example New Zealand Steel in their 2020 Sustainability report noted that *When you buy \$100 worth of steel made in NZ, \$80 stays in NZ. When you buy imported steel, around \$5 stays in NZ*¹⁰.

Policy to successfully deliver carbon zero buildings will need to be a balanced package of regulation and incentives to support local industry on the transition.

4. Acknowledging complexity and using design led processes with key stakeholder groups will enable New Zealand to achieve its carbon targets

SSC has identified some of the complexity inherent in New Zealand's transition to a low emission circular economy, if it is to be achieved by 2050. No doubt other submitters will add to this list.

We encourage the BfCC to engage openly with our sector, mapping out what needs to be achieved, while working with other government agencies to ensure appropriate incentives and regulations are introduced to achieve New Zealand's carbon targets, while continuing to grow New Zealand's productive manufacturing sector.

In transitioning to a circular, low emission economy in 2050, New Zealand must continue to build resilient buildings which will endure future seismic and climatic events.

Please note we have responded to your on-line survey and this submission should be read alongside the BfCC on line survey.

¹⁰ <https://www.nzsteel.co.nz/assets/Uploads/Files/NZPI-SustainabilityDocument-Jul20-web3.pdf>