Submission to Infrastructure Victoria on opportunities to reduce greenhouse gas emissions of Victorian Government infrastructure

12 May 2023

Dear Alison,

This submission has been prepared by the Australian Steel Institute (ASI), the peak body representing the Australian steel industry, in conjunction with BlueScope Steel and InfraBuild Steel.

ASI welcomes any further consultation on opportunities to reduce greenhouse gas emissions of Victorian government infrastructure using steel.

Regards,

[redacted]

SUBMISSION FORM

Evidence-based opportunities to reduce greenhouse gas emissions of Victorian government infrastructure – please include references for your evidence.

What are the key opportunities for the Victorian government to identify, prioritise, quantify, incentivise, and track reductions in infrastructure emissions at early strategic planning and investment decision making stages?
• **Early engagement with the steel supply chain** for the design of projects that enables the full supply chain to provide innovative sustainability solutions such as design optimisation and de-materialisation, best practice use of innovative materials [lower embodied carbon] and off-site [factory controlled] prefabrication, as well as the Design for Manufacture and Assembly [DfMA] for prefabricated elements. Refer to *Case Study: Construction of the Murra Warra wind farm* (attached). Early engagement enabled the steel contractor to design and construct an anchor cage solution for the wind turbines using metal reusable rings (rather than traditional rubberised foam ingots) – a more cost effective and low carbon solution compared to using overseas imports. Refer to attached headed 'Robust anchor cage solution', 'Competing on value and innovation, not cost' and 'Project Highlights'. • **Use consistent methods and data to measure embodied carbon**. Appropriate data verification is important when calculating and tracking emissions and embodied carbon. Environment Product Declarations (EPDs) should be used to assess and compare carbon for products using the same Product Category Rules. The best way to compare products

and materiality of differences is to place them into the context of a structure across the whole life cycle.
We support the use of product-specific EPDs as an appropriate measure for tracking and quantifying emissions. It is essential however, that any EPDs which are referenced, are specific to the steel product range being specified e.g., 'structural steel universal sections' would be acceptable but 'structural steel' would be too general.

- Specify materials that are verified by an accredited 3rd party conformity assessment body to ensure that they comply with the relevant Australian Standards, therefore significantly reducing the likelihood of rework or remediation.

How can the Victorian Government improve or amend existing policies, guidelines, regulatory tools, standards, and frameworks for infrastructure investment and procurement assessment to reduce emissions?
Please provide detailed actions for these improvements if possible.

- **Reward and incentivise the hierarchy of circular economy principles in design** (reuse – remanufacture – recycle) – by re-using materials and refurbishing assets rather than remanufacturing/recycling or building new achieves the most significant reductions in embodied carbon. For this reason, a whole life cycle analysis view (rather than just Modules A1-A5 focus) should be considered when designing assets and making decisions. Making decisions based purely on A1-A5 lifecycle stages and not considering end of life impacts (Module D) shifts the carbon burden to future generations.

  Steel enables the transition to a circular economy through its reusability, recycled content, recyclability, recoverability at end of life, and material efficiency in production. The following qualities of steel further support the decarbonisation of infrastructure;

  - Potential to refurb, reuse or recycle construction materials at a building's end-of-life (LCA - module D)
  - High recycling rates (+90%)
  - High strength, durability for long structure life cycles: refer to weathering steel (BlueScope product)
  - High grade / strength products to reduce mass /dematerialisation
  - High design flexibility: significant load spans, light gauge steel solutions
  - Prefabrication and modularisation - pre-engineered structures to minimise transportation footprint
  - Design for disassembly – reduce upfront carbon and cost

  Research evidence
  According to a report prepared for the Clean Energy Finance Corporation in collaboration with the Green Building Council of Australia and the Infrastructure Sustainability Council "majority of the initiatives for reducing embodied carbon emissions in infrastructure projects are based on dematerialisation" (page 33). Data from the Infrastructure Sustainability As-Built rating tool (by ISC) was analysed to understand the scale of embodied carbon reductions and strategies used to achieve them.

  According to a research paper *Design for Deconstruction*, designing buildings and infrastructure with materials suitable for re-use or disassembly can minimise embodied carbon and energy levels for the lifecycle of the asset by increasing the number of times a construction material can be re-used without serious depreciation, loss of strength, rigidity and other factors associated with wear and tear. A re-used material usually has

virtually no embodied energy costs associated with reprocessing (Morgan et. al., 2005, pg., 12).

For real-life examples of how these qualities relate to quantifiable sustainable outcomes refer to the case studies below:

Case Study: ACT Covid-19 Surge Centre Delivered In Record Time With Pre-Fab Steel (attached)
A 17,000m2 medical facility was erected in 36 days using prefabricated wall frames and roof trusses. Approximately 90% of the materials used in the construction of the building can be reclaimed and nearly all the building can be flat packed and re-established in a different location, either locally or internationally. Manteena are currently in discussions with the ACT Government as to where they will relocate and reuse the building. There was also minimal waste as a result of the build.

*Case Study: Berry to Bomaderry Princes Highway Upgrade (*refer to page 7 'Key Benefits Delivered')
The use of REDCOR® weathering steel for two long-span bridges provided a multitude of advantages to the Transport for NSW South Coast Princes Highway Upgrade, and key stakeholders praised the many benefits of this solution.
Two composite bridges constructed using trough girders fabricated from BlueScope's REDCOR® weathering steel. REDCOR® weathering steel has excellent circular economy potential as its inherent properties allow it to be reused, remanufactured or recycled enabling its transformation into new products. Additionally, REDCOR® weathering steel used for bridges is prefabricated meaning minimal onsite waste.

Case Study: Reuse and Recycling on the London 2012 Olympic Park
34 buildings containing steel; 26 steel portal frame buildings and 8 buildings containing elements of structural steel were reclaimed for reuse. In one building approximately 190 tonnes of steel with an embodied CO_2 of 345 tonnes was reclaimed resulting in an embodied CO_2 saving of 84 tonnes compared with recycling, with further reductions once used for another purpose. The embodied carbon reductions exponentially increase each time the steel is reused.

- **Specify sustainability requirements for steel using industry-led specifications.** The Australian Steel Institute (ASI)'s sustainability specifications for steel can be accessed online: https://www.steelsustainability.com.au/resources/specification/. The specification is also freely downloadable in pdf and word format.

- **Procure steel from SSA Certified Steel Suppliers**. The Steel Sustainability Australia (SSA) Certification program accredits steel suppliers against a best practice ESG sustainability standard. It is an open access program that assesses steelwork suppliers and their sourcing, manufacturing, fabrication and/or processing of finished steel products. The SSA certification program is a recognised initiative under Green Building Council of Australia's (GBCA) Responsible Product Framework and Green Star rating tools and assures certified steel suppliers and their products are more sustainably manufactured and processed and are sourced through responsible and ethical supply chains and. It mandates sourcing steel from steel producers that have been verified to be actively decarbonising steel making operations.

- **Don't simply specify high recycled content in steel.** Australian Steel manufacturers are increasing the use of scrap to an aggregated 2.5 million tonnes over the next 5 years, however there are technical and sourcing limitations on how much recycled content can be used. Recycled steel scrap is used in both steel making routes; Blast Furnace – Basic Oxygen (BF-BOS) and Electric Arc Furnace (EAF) however there are currently technical limitations to the proportion of recycled scrap steel that can be utilised in the (BF-BOS) steelmaking process by which all Australian flat steel products, and some long products are currently produced. This technical limitation arises from the fundamental process heat balance whereby heat generated from exothermic chemical reactions is used to melt scrap. EAF steelmaking can utilise 100% recycled content however there is not enough scrap available worldwide to be able to meet the demand of steelmaking via this route. One possible scenario of specifying high recycled content in all steel projects is that steel would need to be imported and the displaced locally produced steel exported. The net outcome would be an overall increase in emissions because of the additional two-way steel 'transport miles' impact, which would be a perverse outcome. It should be noted that the entire steel industry in Australia is actively engaged in the evaluation of a wide range of emission reduction initiatives with impact over the short, medium, and long term, including the ability to increase the amount of scrap being used in primary steel making or replacing coke as the reductant in the primary process with lower carbon alternatives.

- **Exercise caution when setting emissions reductions targets as they relate to steel**
  The decarbonisation of the steel industry is a shared, global challenge and must be addressed at the systems level. Setting emissions reduction targets for steel on projects is unlikely to contribute to the decarbonisation of the sector and may cause perverse outcomes in the steel value chain. New methodologies, tools and guidance are being developed by organisations to enable steel companies to set targets that align with science-based decarbonisation pathways and consider the unique context of the sector. As such, rather than specifying a GHG reduction target for steel products, adoption of steel certification schemes is recommended.
  Refer to the ASI Sustainability specification for full details:
  https://www.steelsustainability.com.au/resources/specification/.

- Support existing sustainability certifications, such as those that are already recognised by the leading sustainability Australian based ratings tools, including GBCA Green Star and IS Council IS Tool.

How can the Victorian Government incentivise or encourage private industry to increase the production and adoption of low-carbon materials and/or delivery methods through infrastructure procurement?

- **Support procurement of local Australian steel which helps to support our economy** through the economic multiplier that flows from local jobs, which in turn encourages local businesses to increase their investment in product and process innovation for sustainability. The steel industry is committed to reducing the embodied carbon and GHG emissions associated with their products. InfraBuild Steel and Liberty Primary Steel have set a net-zero by 2030 target. BlueScope has set a goal of net-zero GHG emissions across its operations by 2050, with a mid-term target of reducing scope 1 and 2 GHG emissions intensity by 12 % by 2030. Australian Manufacturers welcome any questions or discussion on their decarbonisation strategies.

- **Specify steel specific sustainability certification schemes developed by the global steel industry, and recognised by leading authorities on sustainable built environment such as the Green Building Council of Australia (GBCA)** https://www.steelsustainability.com.au/resources/specification/.

What enablers or barriers need to be addressed? What are the impacts on reducing emissions, increasing productivity, and decreasing costs?
Please provide evidence or case studies that highlight the impacts of infrastructure decarbonisation on costs and benefits for stakeholders across the supply chain.

Enablers:

- **Early engagement with the steel supply chain** for the design of projects such that innovative solutions are enabled, as well as the possibility of alternative design approaches being able to be proposed to achieve goals such as de-materialisation.
- **Facilitating outcomes such as more infrastructure is designed for disassembly**
- **Increase procurement of local Australian steel which helps to support our economy** through the economic multiplier that flows from local jobs, which in turn encourages local businesses to increase their investment in product and process innovation for sustainability.

Barriers:

- **Lack of opportunity to propose innovative solutions** due to not being involved at the design and concept stage of a project.
- **De-specification during project procurement/execution**. De-specification is the term given to the practice of a given design being changed after project commencement, typically at the instigation of the project manager, and often in order to reduce costs relative to their tender pricing. De-specification typically increases the risk of fabricated steelwork being non-compliant with Australian Standards and therefore potentially not meeting the required quality. In the context of sustainability, it also runs the risk of undermining the intended ESG benefits that have been embedded in the design parameters if these are changed without the knowledge of the design engineer.
- **Unintended consequences due to lack of early engagement with industry experts**. When the steel industry is treated purely as a supplier of a commodity input rather than a value-adding partner, there is very little or no opportunity to make a positive contribution to the project. Positive contributions could range from suggesting alternative steel types that lower carbon embodied solutions, through to overall supply chain collaboration that may allow the reduction of cost via improved efficiencies in fabrication, logistics, and installation.
- **Regulatory inertia** Product and design innovation is hampered by the extended timeframes required to deliver updates and revisions to Australian Standards. Ongoing innovation in the design process and the individual steel building products is essential to unlock more sustainable construction solutions.

Is there anything specific to the timing or sequencing of recommendations that Infrastructure Victoria should consider in our advice? Please consider how best to maximise long-term outcomes and minimise transitional costs for the government, the industry and the community in your response.

Nil