



Steel Snapshot



Steel Recycling and Reuse

WHAT

Steel recycling is a common practice in the industry.

The reuse of steel is a massive untapped emissions reduction opportunity.

Stewardship is an ethical value that embodies the responsible planning and management of resources. Steel product stewardship enables the highest-order circularity of steel in the value chain and is a critical decarbonisation lever.

WHY

A reuse level of between 20% and 40% would reduce the environmental footprint of the steel used in the building by 18 to 36%.¹ This markedly improves the already strong position of steel when it comes to making life-cycle-based decisions about material choices for new buildings.

WHO

Stewardship is relevant to all states and businesses in the steel supply chain, civil society groups, and NGOs.

Responsible production and sourcing are emerging through the uptake of the Responsible Steel standard.³

WHERE

Worldwide

WHEN

The goal is a net zero CO₂e emissions global steel industry by 2050₂.

1 <https://worldsteel.org/circulareconomy/case-studies/reuse/#:~:text=The%20partners%20adopted%20a%20number,building%20by%2018%20to%2036%25>

2 <https://www.theclimategroup.org/steelzero>

3 <https://www.responsiblesteel.org>

Recycling

Typical industry product stewardship programs involve a cross-section of manufacturers all accepting virgin or recycled content materials to be reprocessed within their factories. As an infinitely recyclable material, steel has very high potential in the circular economy. Currently, the high input energy required to recycle scrap steel into new steel for buildings presents a large carbon cost.



Good Environmental Choice Australia (GECA) Standard Steel & Steel Products (SSPV1.0I-2019)

7.2 Recyclability

Criterion 35: The coating of the steel product must not make the product unusable for recycling in steel mills.

Demonstration of Conformance DoC 35.1: Evidence that a steel mill is able to take back and recycle this steel product.

7.3 Product Information

Criterion 36: The manufacturer shall provide written information to the consumer clearly stating:

- The intended use of the product;
- Instructions for correct use and storage so as to maximise the product lifetime;
- Maintenance instructions, following AS/NZS 5131, including cleaning instructions, if required. Maintenance instructions shall not specify the use of any chemical or coating limited by any part of this standard; and
- Recycling instructions for the product end of life.
- Demonstration of Conformance DoC 36.1: Copy of documentation to be supplied with the product clearly stating the required information if they are re-used by the applicant or are recyclable in specialist recycling facilities.

<https://geca.eco/standards/steel-and-steel-products-sspv-sspv1-0i-2019/>

Reuse

From a circularity perspective, reuse is better than recycling. Whilst steel is readily collected and sold as scrap for re-processing, there is no formal process for disassembling and re-using elements.¹ There is also a gap in extracting steel reinforcing from concrete and re-using this resource.

Here are some ways industry can optimise the re-use of structural steel sections:

- Increase visibility of available second-hand structural steel materials
- Early engagement, communications and visibility of demolitions; opportunity for pre-demolition audits
- Improve systems, practices and standards, including construction standards, to promote the demand for steel re-use
- Understand potential exposure of sections to extreme fatigue elements
- Increase the demand for re-purposed building materials through design
- Create a steel product traceability system that capitalises on modern digitisation systems, BIM models and unique “chip” identifiers.

Industry Challenge: Promote reuse before recycling of scrap steel in Australia to minimise the emissions to transport scrap overseas and/or to melt and re-form into new steel.

Industry Challenge: Design for disassembly and modularity. Use bolted connections and clearly label strength grade and year of manufacture into each element.

¹ The Structural Engineer; ‘Climate emergency – A circular economy for steel’; Dr Michal P Dreniok; March 2021: “There have been attempts to develop a repository of steel from new projects that could facilitate future steel availability^{7,12} (e.g. by uploading an IFC model from Tekla Structures or STRUMIS to an online database). A similar solution might be considered for further development under the EU-funded Circular Construction in Regenerative Cities (CIRCUIT) project 13. Even with no specific standards, UK regulations simply require proof that a reused element ‘is suitable for its intended purpose and use’”

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