



**PROGRESS**<sup>2017-2020</sup>  
PROVISIONS FOR GREATER REUSE OF STEEL STRUCTURES

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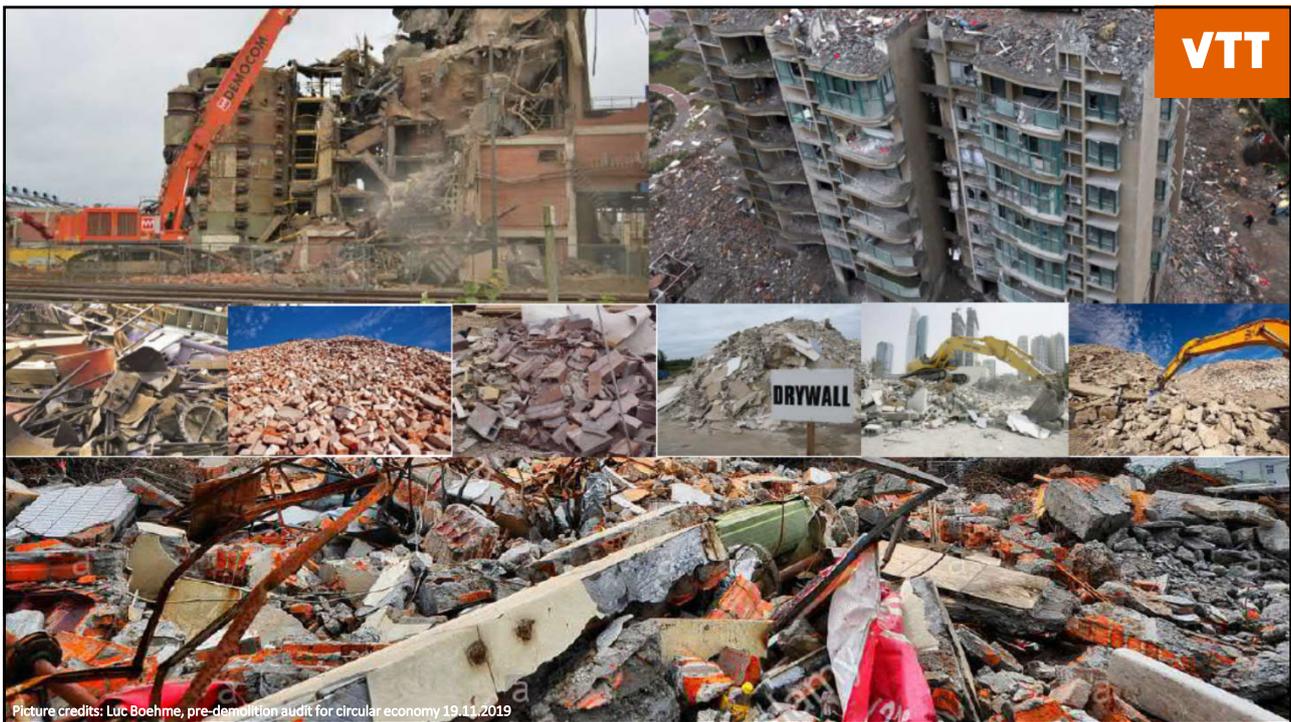
## Benefits of steel reuse for the construction industry and EU strategies

### PROGRESS webinar 4 28 May 2020

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Picture credits: Luc Boehme, pre-demolition audit for circular economy 19.11.2019

## UN sustainable development strategy

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with **increased resource-use efficiency** and greater adoption of **clean and environmentally sound technologies** and industrial processes, with all countries taking action in accordance with their respective capabilities

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



By 2020, achieve the **environmentally sound management of chemicals and all wastes** throughout their life cycle, and significantly reduce their release to air, water and soil. By 2030, substantially reduce waste generation through **prevention, reduction, recycling and reuse**

13 CLIMATE ACTION



Strengthen the global response to the threat of climate change by **keeping a global temperature rise this century well below 2 °C** (Paris Agreement)

## EU Circular Economy agenda



EU scheme for environmental assessment of buildings (2014 - 2016)

Harmonised rules on the declaration of the performance characteristics of construction products in relation to a sustainable use of resources (2013 – 2018)

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Voluntary industry-wide recycling protocol for construction and demolition waste (2016)

Pre-demolition assessment guidelines for the construction sector (2017)

Core indicators for the assessment of the lifecycle environmental performance of a building, and incentives for their use (2017)



Strategy for a Sustainable Built Environment (2021)

Mandatory requirements on recycled plastic content and plastic waste reduction measures for construction materials (2021 - 2022)

## EU waste agenda

1975: Directive 75/442/EEC defines waste as: **“any substance or object which the holder discards or intends or is required to discard”**

1997: European Council confirmed that **waste prevention** should be the first priority of waste management

2002: Decision 1600/2002/EC calls for revision of waste legislation and clarification of the **distinction between waste and non-waste**.

2008: Directive 2008/98/EC introduces **End of Waste** concept

2018: Directive 2018/851 says that: **“Member States shall take measures to prevent waste generation”**

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## Contribution to the sustainability targets



- Reduction of **carbon footprint** of the constructional steel
- Reduction of generated **construction and demolition waste**
- Increasing **safety in construction** with protocols for testing, deconstruction and auditing
- Connecting industrial **supply and demand chain** with online trading portal
- Sustainable **management of resources** by circular business models
- Sharing **knowledge** by design guide, workshops and webinars



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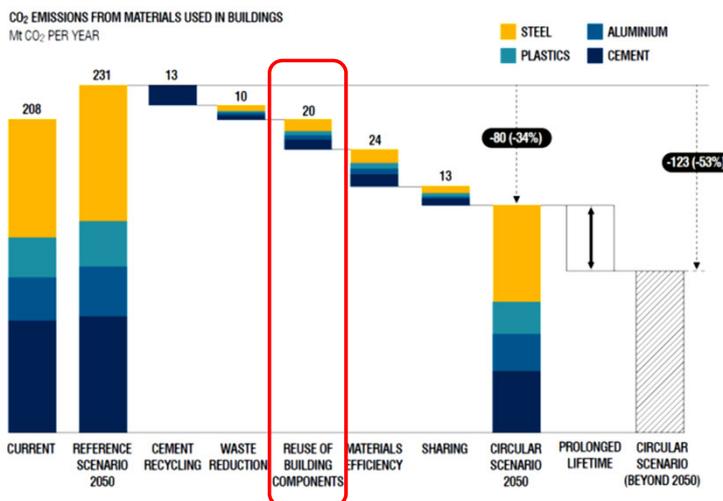
## Reducing the carbon footprint of steel construction industry



According to the study published by SITRA in 2018, reuse of building components can save about 20 Mt CO<sub>2</sub>e per year in Europe with a **major contribution from the steel sector**.



- Method to calculate environmental impacts of reuse [\[webinar 3\]](#)



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## Reducing the carbon footprint of steel construction industry

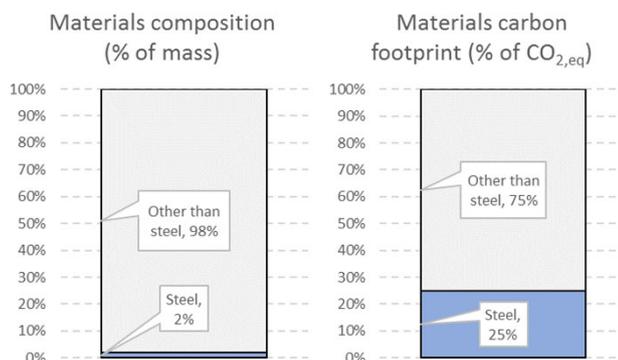


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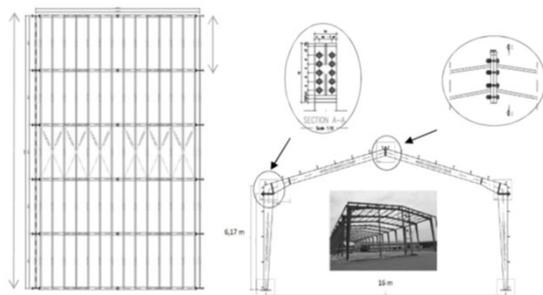
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Source: SITRA 2018



## Reducing the carbon footprint of steel construction industry

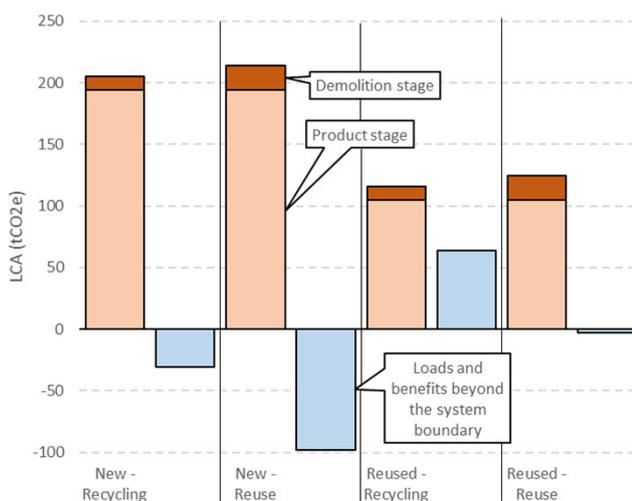


Pre-designed steel hall from PRECASTEEL<sup>1</sup>  
 EPD data from Ruukki Construction<sup>2</sup>  
 LCA includes steelwork, concrete slab and foundations, envelope, windows and doors<sup>3</sup>

<sup>1</sup> <http://www.unav.es/Precasteel/>

<sup>2</sup> <https://cdn.ruukki.com/docs/>

<sup>3</sup> S. Vares, P. Hradil, M. Sansom, V. Ungureanu, Economic potential and environmental impacts of reused steel structures, Structure and Infrastructure Engineering, September 2019





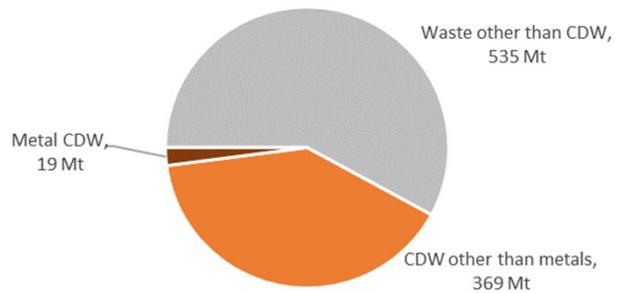
## Reducing the amount of generated waste

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In 2016, nearly 19 Mt of metallic waste was generated by the construction sector in EU

Generated waste in EU-28 (Eurostat 2016)



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- Definition of product status [\[webinar 1\]](#)
- Pre-demolition audit guide [\[webinar 1\]](#)

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## Sustainable management of materials and resources

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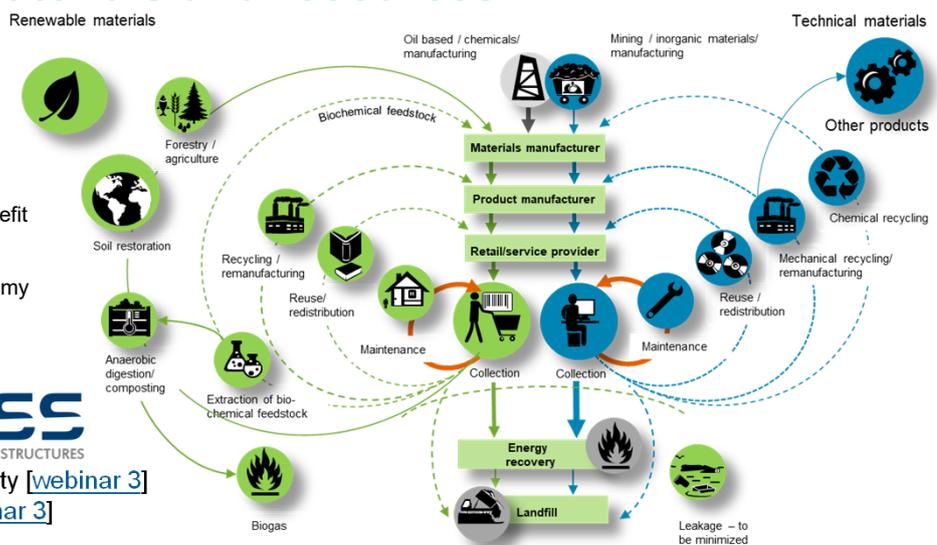
Shorter loop means

- Greater environmental benefit
- Faster circulation
- Support for the local economy

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- Assessment of reusability [\[webinar 3\]](#)
- Business models [\[webinar 3\]](#)

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## Safe design and quality control of the reused steelwork

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Reuse process has to be compliant with

- Construction Product Regulation (CE marking according to the EN 1090-2:2018)
- Eurocodes (recommended partial safety factors to EN 1993 and/or service life to EN 1990)
- Waste Framework Directive and REACH (assessment of hazardous substances)
- Relevant work health & safety regulations



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- Design recommendations for the existing steelwork [[webinar 1](#)]
- Reusing envelope systems [[webinar 1](#)]
- Testing protocol [[webinar 1](#)]

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## Education and information sharing

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Lack of information was identified as one of the barriers to successful reuse implementation. The main target groups should be

- **Facility owners** to recognize the inherent value of their property and possibilities to trade reclaimed steelwork
- **Designers and architects** to be able to offer more responsible sourcing of materials for their design and/or better end-of-life performance
- **Material dealers** and stockists to start dealing with second hand materials and components

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- Webpage
- Workshops
- Case studies
- Publications
- Webinars
- Design guide & protocols
- Online trading portal
- Collaboration with professional associations and industries

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## Summary

- Reuse of steel products has relatively big impact on the carbon footprint of the construction industry
- It supports most of the sustainability goals, especially related to the waste management, resource efficiency and climate change
- Innovations in the steel can be largely transferred to other materials

## Acknowledgements

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