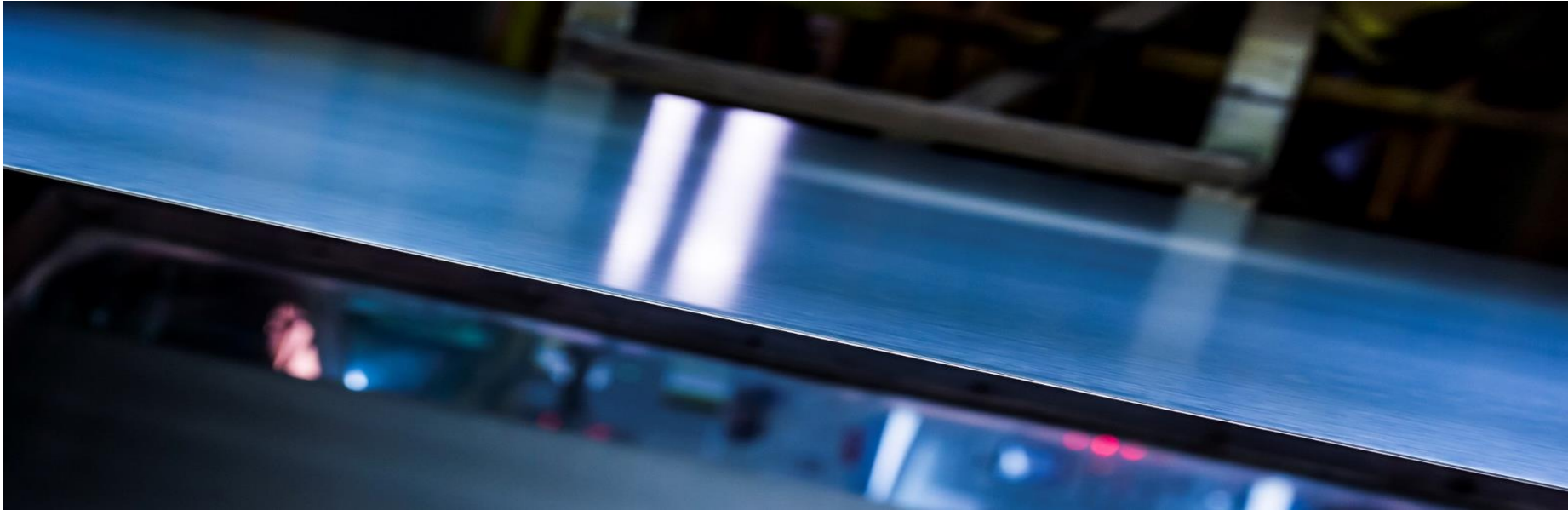


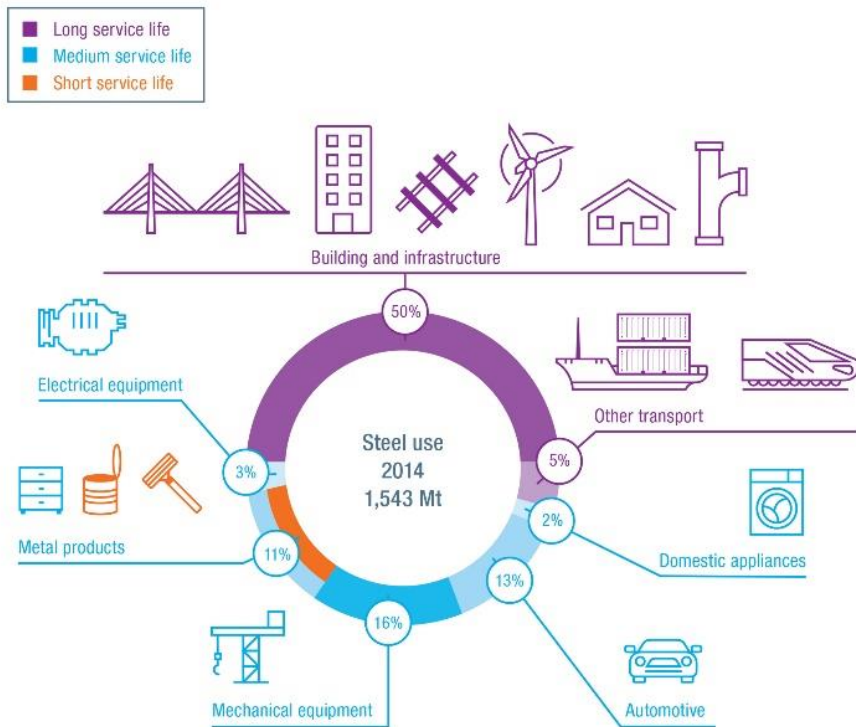
## **IEA – Materials in Construction Circular Economy for Steel in Construction**

Henk Reimink, Paris, 9 March 2018



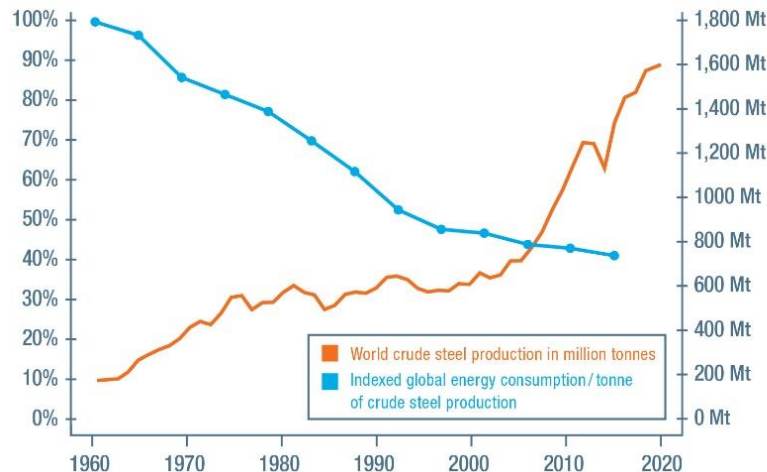
# Steel in Construction – Diverse use – Permanent Material

Steel markets and durability



# Steel Manufacturing improvement impact

## Reduce during steel production



- Global steel production has increased almost fivefold since 1960
- Energy consumption has been reduced by 60% per tonne of steel in the same period

*For every tonne of steel produced today, we save almost 24 GJ per tonne compared to 1960. That's enough energy to drive an average passenger vehicle 17,380 km, which is equivalent to driving across the USA and back more than twice.*

**constructsteel.org - programme**



# worldsteel - constructsteel.org programme

- Collaboration
  - Market information survey (2015) – Architects, IPO's, Structural Engineers.
  - Independent promotion organisations working jointly with regional focus.
  - Build a common approach to bring together Information, Education, Promotion
- Information
  - Market study for steel - study commissioned via IPO's – complete Q2 2018
  - On line information tool - Eurocode based – Easycode extract developed
  - Utilise national & European statistical market information
  - McKinsey report topic – Re-shape regulation and raise transparency.
- Education
  - Bachelor and masters program available in English Q2 2019
  - Turn key Contractual arrangement to be developed (FIDIC style) Support Turn-key as a preference.
  - Architects & Designers & main contractors to be influenced to complete detailed design.
  - Design – build – Maintain – Remodel – Reuse – Recycle option (Circular Economy)
  - buildLCA model developed to promote LCA process as part of the design process in construction
  - Steel makers stimulate via marketing business models and project support.

# Promotion of Steel in the construction market segment

## “constructsteel.org” website the link to steel



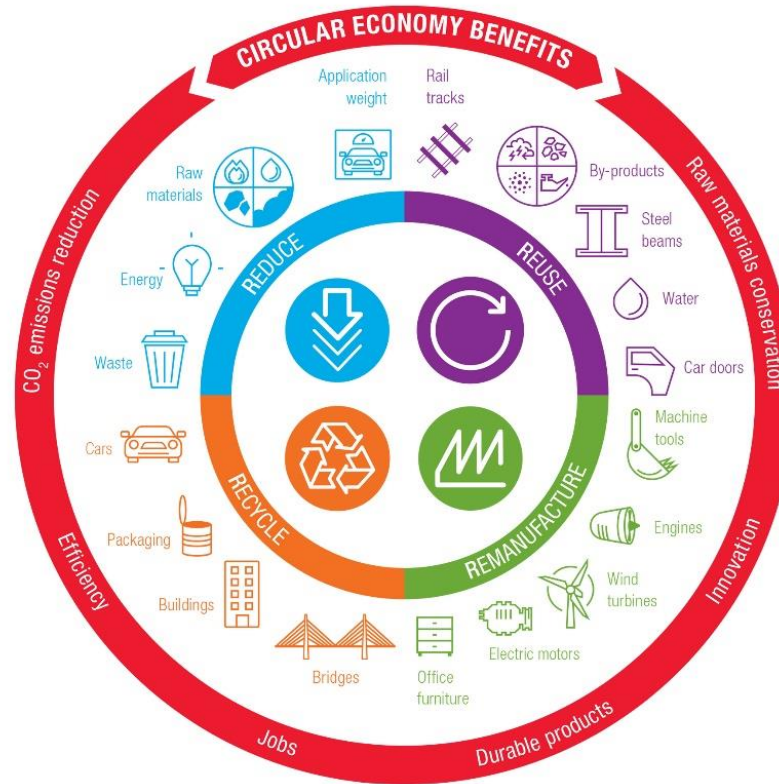
- Umbrella website linking construction industry value chain
- One stop shop for architects & designers for all steel products and design details
- Invite worldsteel members, and construction value chain sectors to link to “constructsteel.org”
- Website launched October 2017
- Invite all construction related industries to join or support.

## **Steel in the circular economy**



# Circular Economy – Reduce – Reuse – Remanufacture – Recycle.

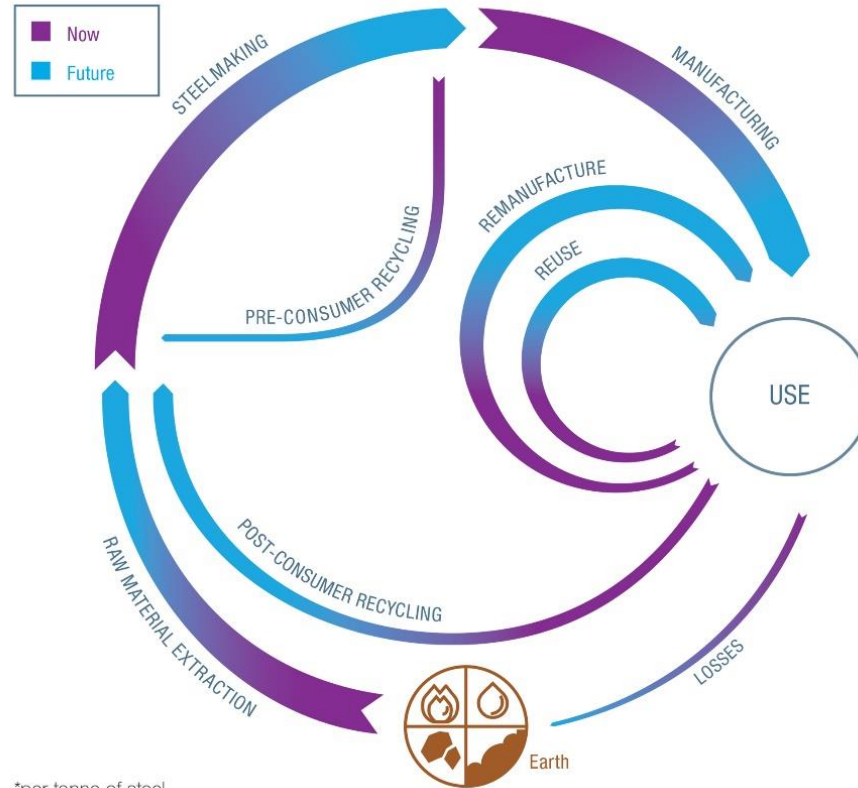
Steel in the circular economy: The 4Rs





# Steel the sustainable material for construction

A sustainable future for steel\*



\*per tonne of steel

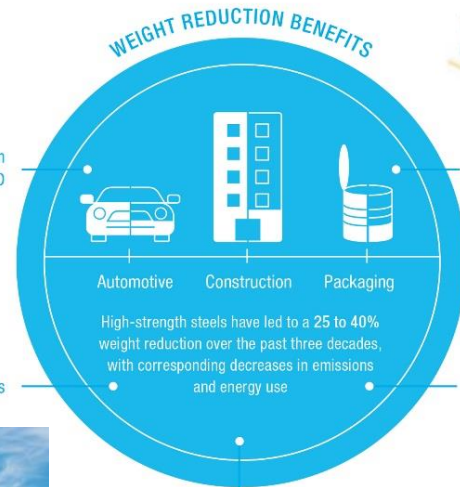
# Steel in construction - Reduce

Reduce in steel applications



Job creation  
in R&D

Reduced CO<sub>2</sub> emissions



Reduced energy use



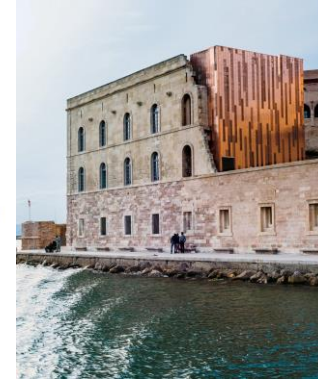
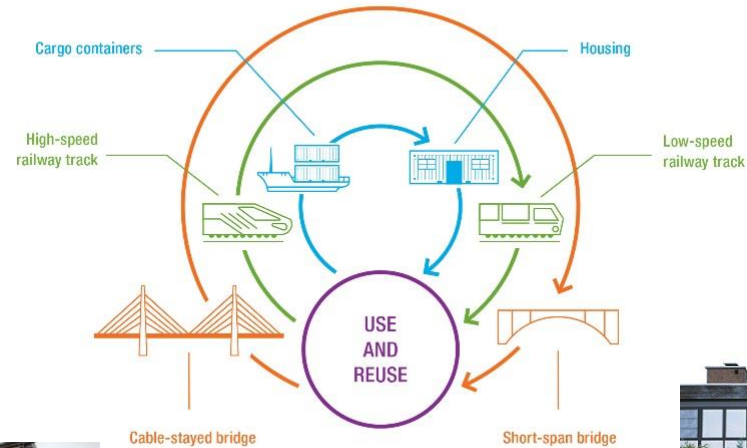
Reduced use  
of raw materials

Reduced  
transport impact



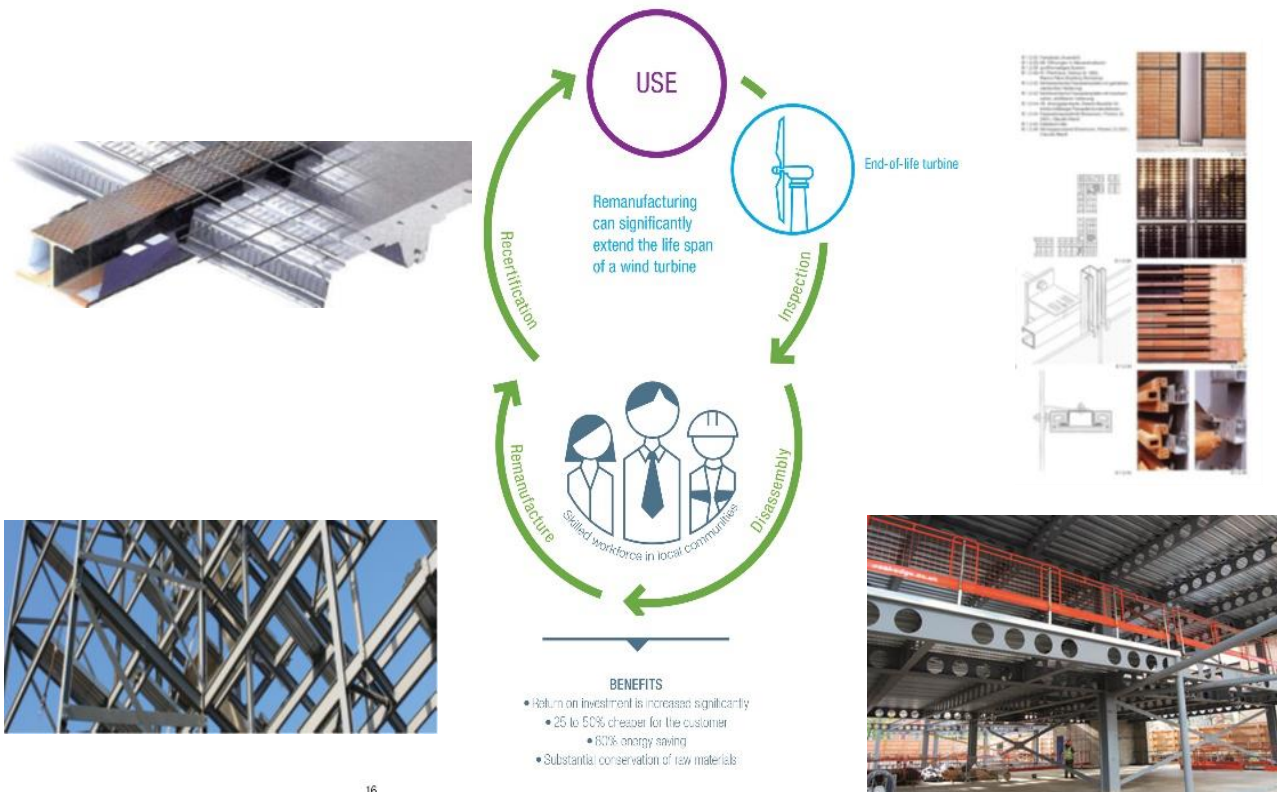
# Remodelling – Renovation – Reuse of steel

## Reuse in steel applications



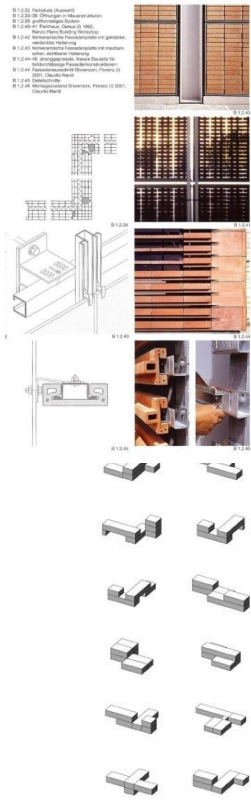
# Remanufacture - use existing building components

Remanufacture of steel applications: Wind turbine





# Recycle – Steel permanent material without loss of quality



## Steel recycling: Attributes and benefits

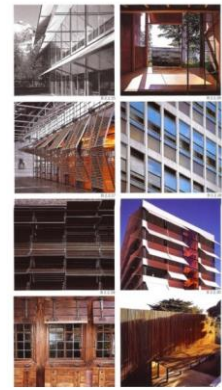


**TODAY**  
650 million tonnes  
of steel are recycled  
every year

## Steel attributes — Benefits of steel recycling

-  Infinite recycling without loss of properties
-  Permanent material
-  Easy magnetic separation and recovery

- Raw materials conservation**  One tonne of steel recycled saves on average:  
1,400 kg iron ore  
740 kg coal  
120 kg limestone
- 70% Energy saving**  Recycling a single steel can saves:  
1 laundry load, or  
1 hour TV, or  
4 hours lighting  
(60 watt bulbs)
- Job creation**  Jobs required for scrap collection, separation and recycling



## **Life Cycle Assessment - buildLCA model**



# Model composition

## ■ Construction stage



## ■ Use stage



## ■ Demolition stage



## ■ Recycling



The stages are in accordance with EN15643-2:2011

Module A

Module B

Module C

Module D

Thank you for your attention.

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# worldsteel

A S S O C I A T I O N

[worldsteel.org](http://worldsteel.org)