54th ECCA Autumn Congress
Online (23-24 November 2020)

Recycling of Steel

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Head of Sustainability
World Steel Association

worldsteel – who we are

- The World Steel Association (worldsteel) is a non-profit organisation with headquarters in Brussels, Belgium. A second office in Beijing, China, opened in April 2006
- worldsteel represents steel producers, national and regional steel industry associations, and steel research institutes in every major steel-producing country
- Members represent around 85% of global steel production.

worldsteel – our key focus areas

worldsteel is active in key areas of interest to the steel industry:


Automotive


Climate change and environment


Communications


Construction


Education and training


Life cycle assessment


Raw materials

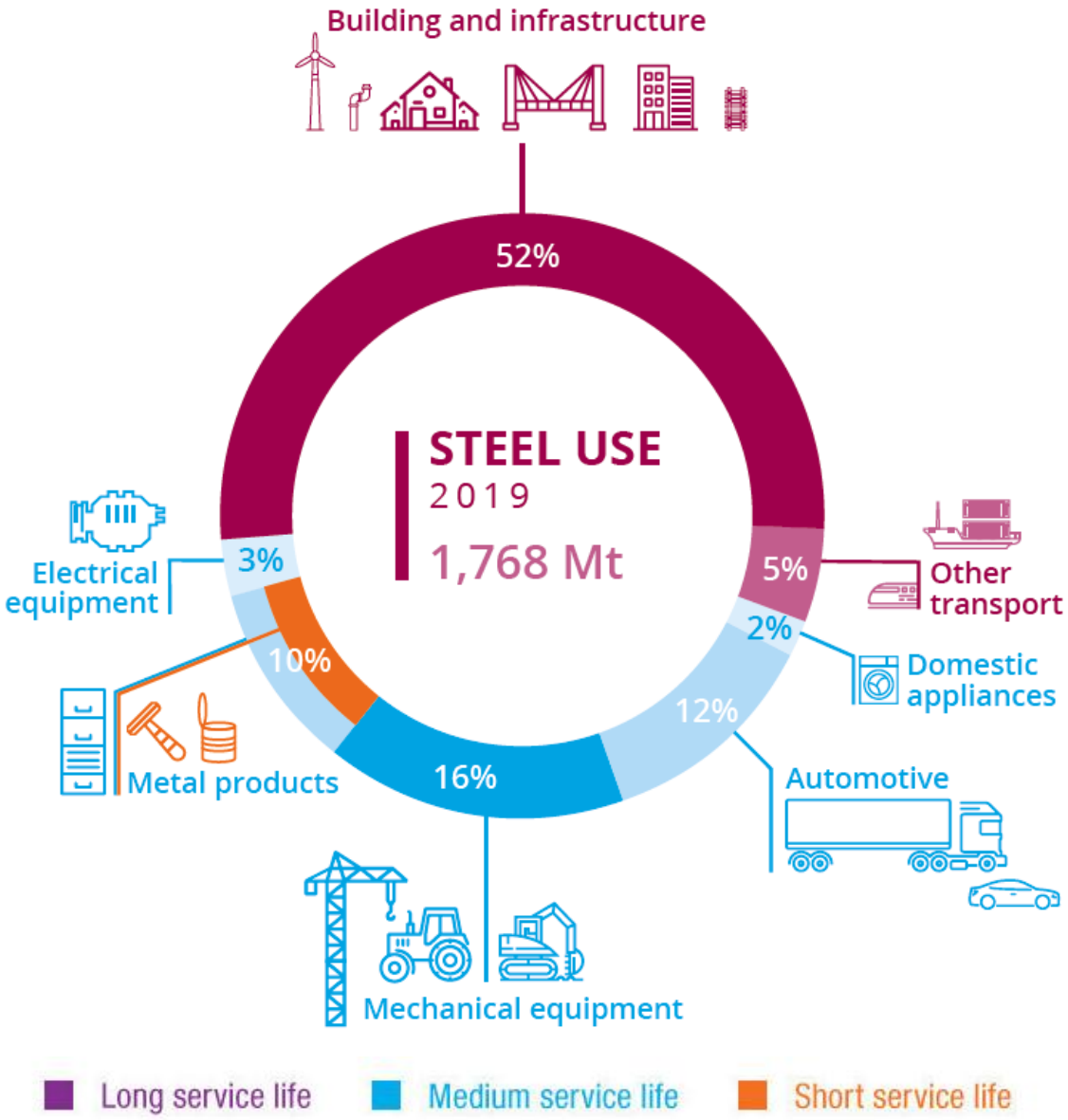

Safety and health


Sustainability

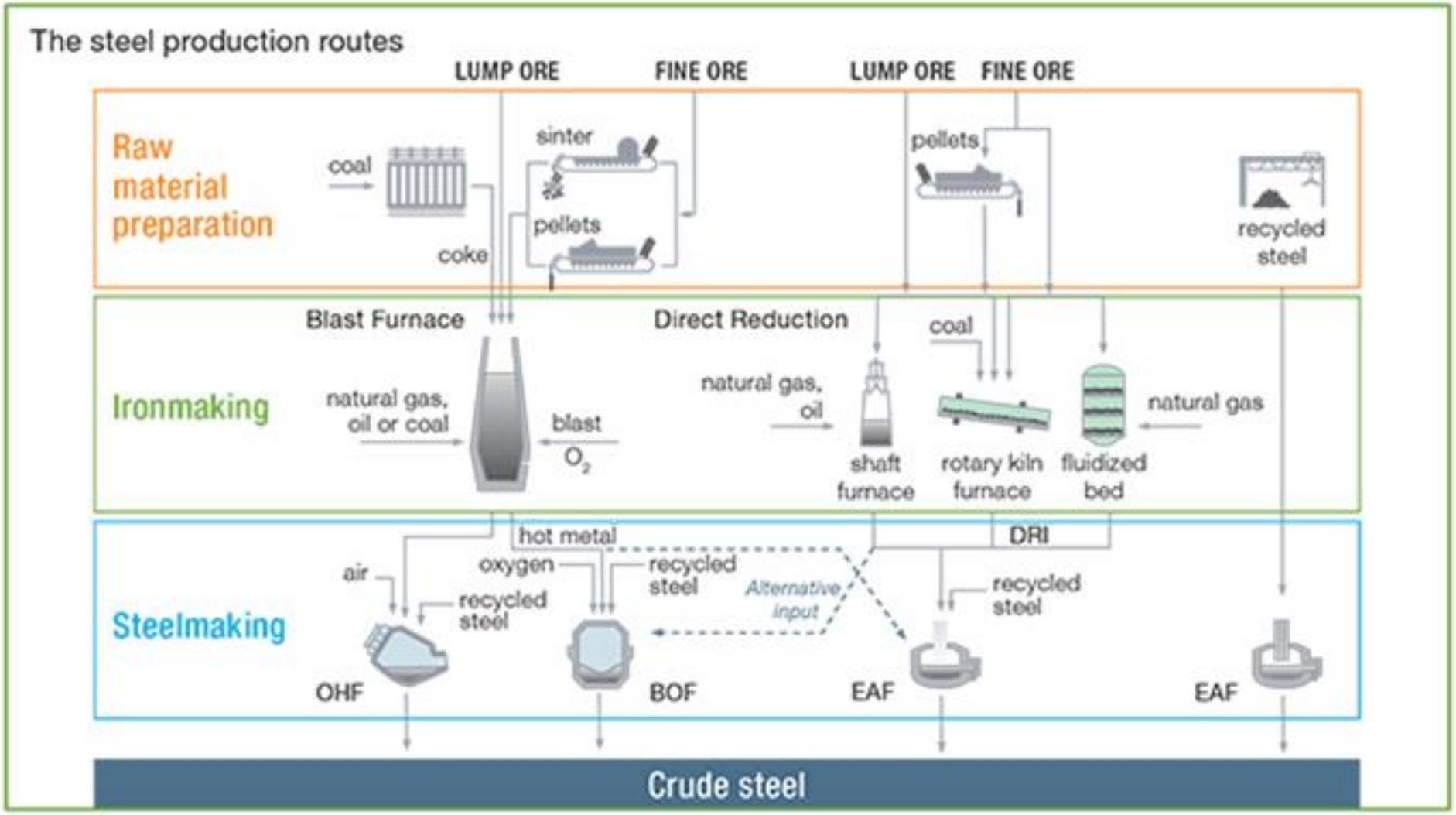

Steel market analysis


Technology

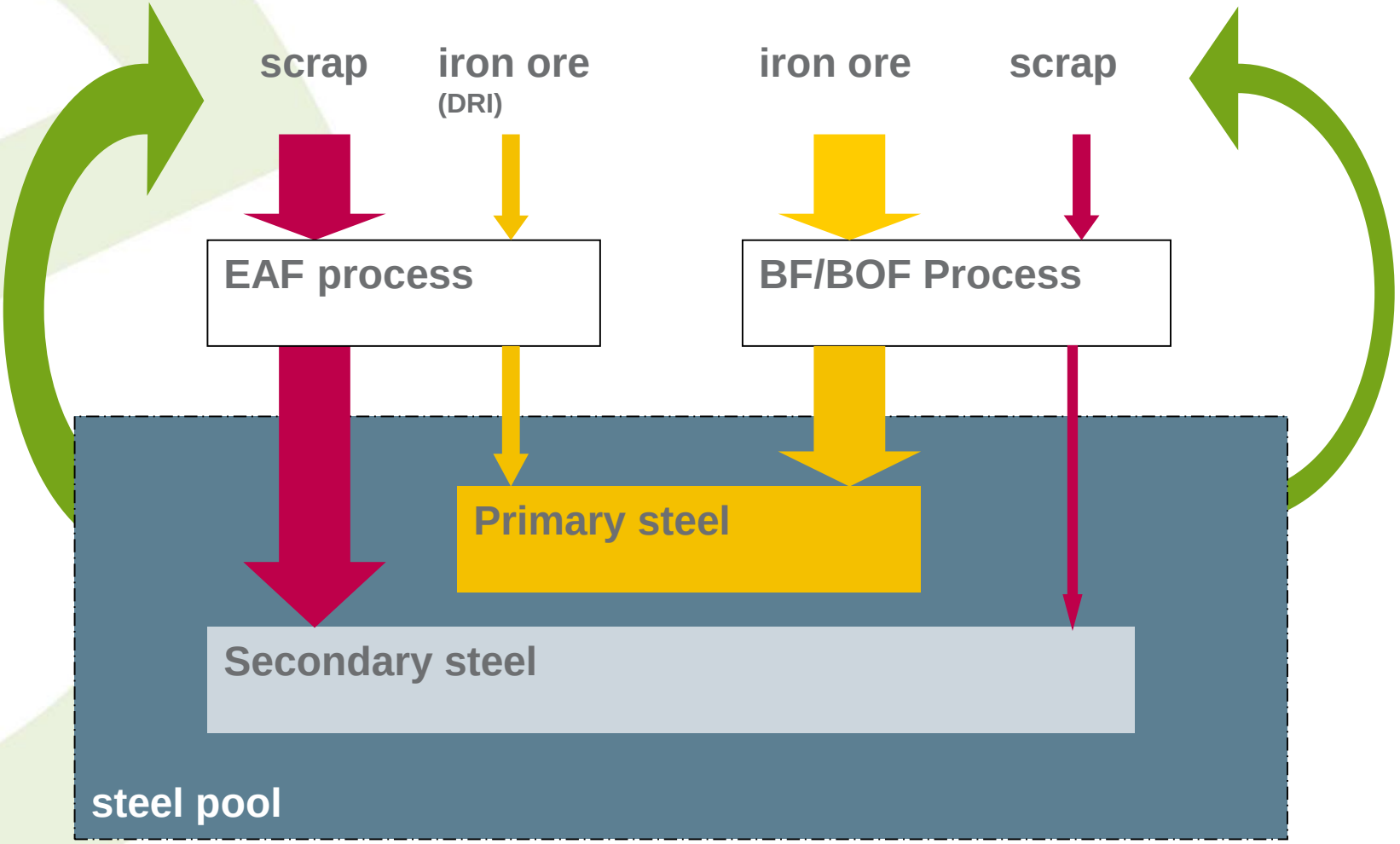
Steel use by sector

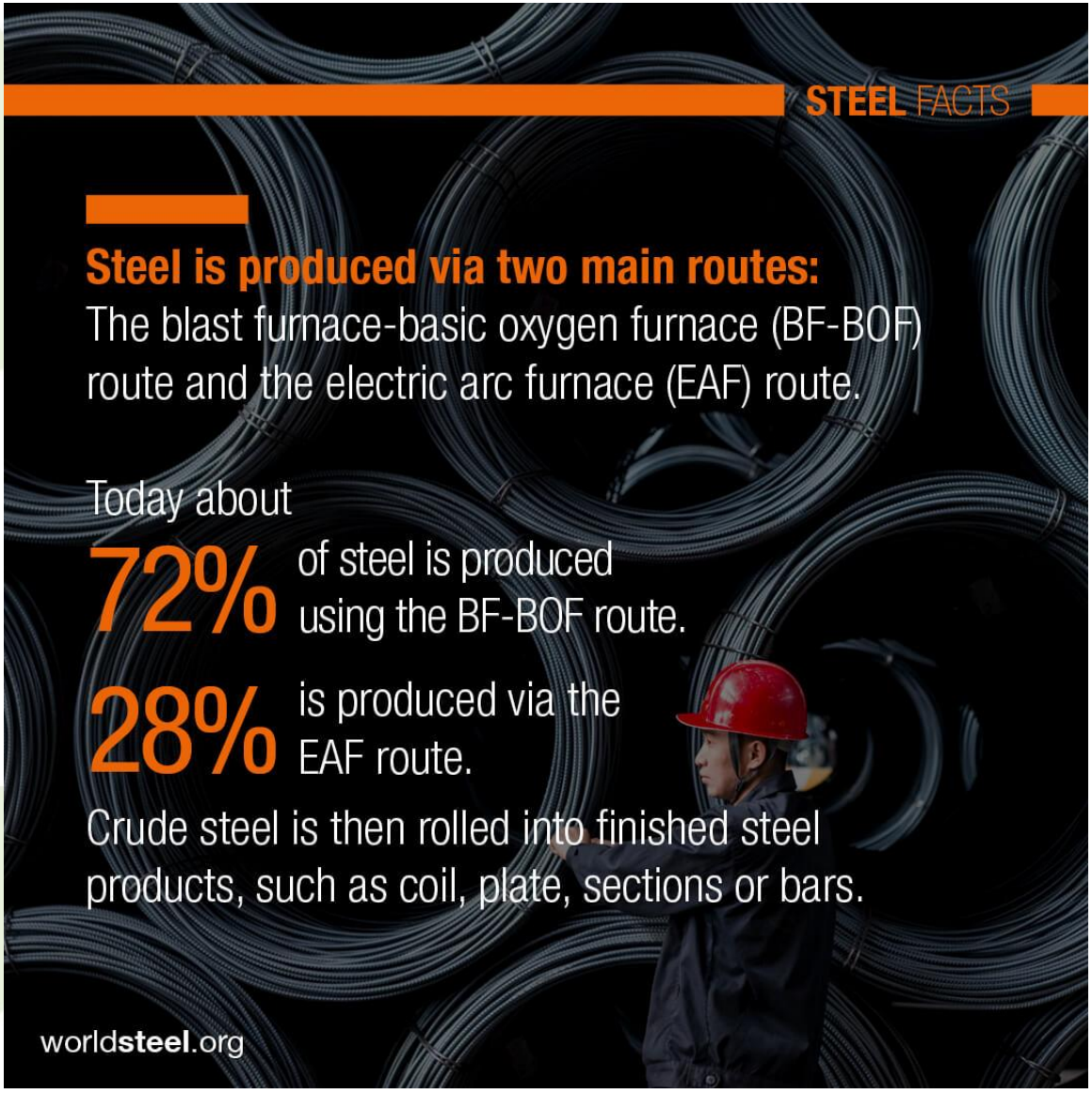


How steel is made

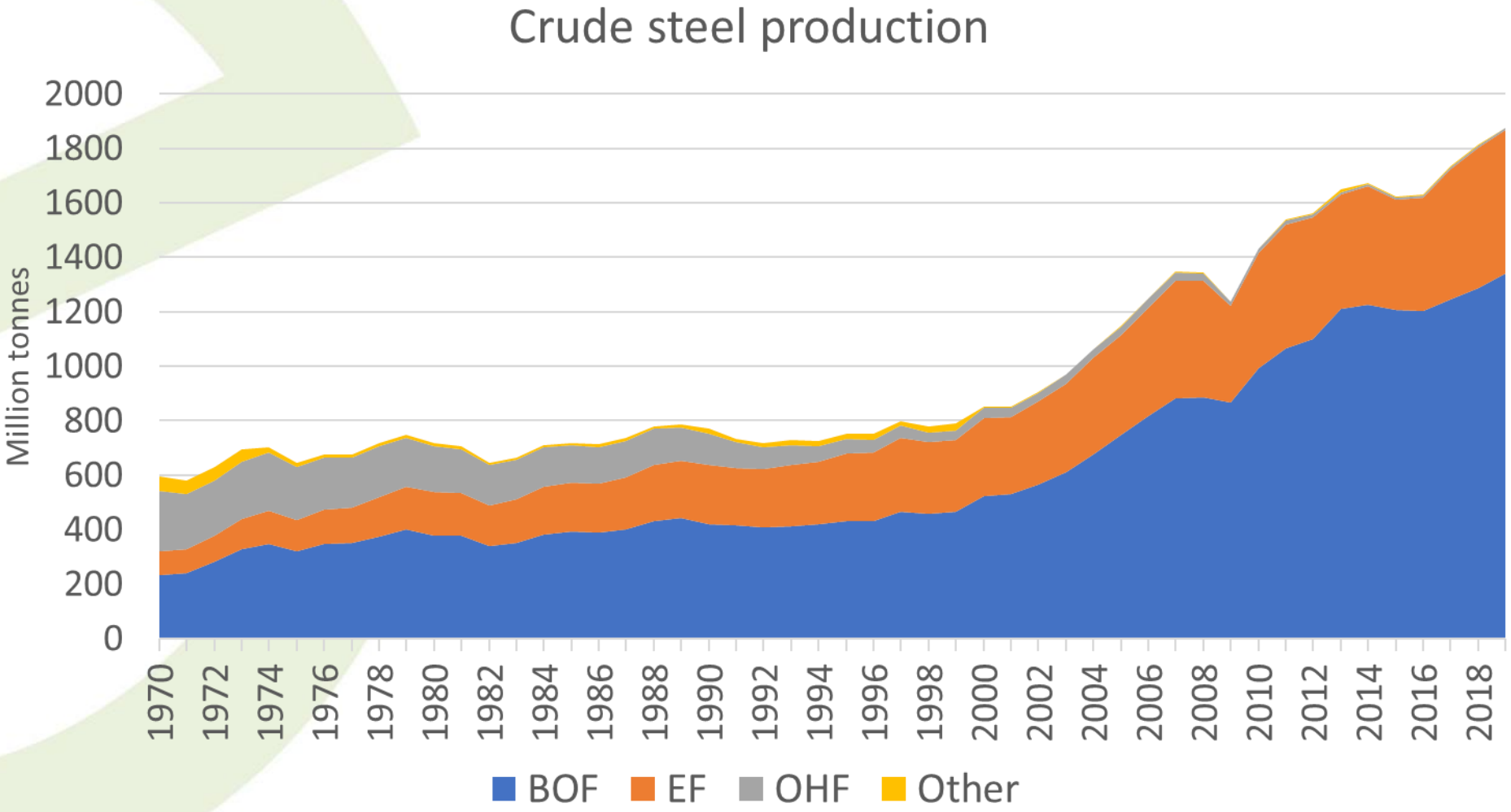


Put more simply:

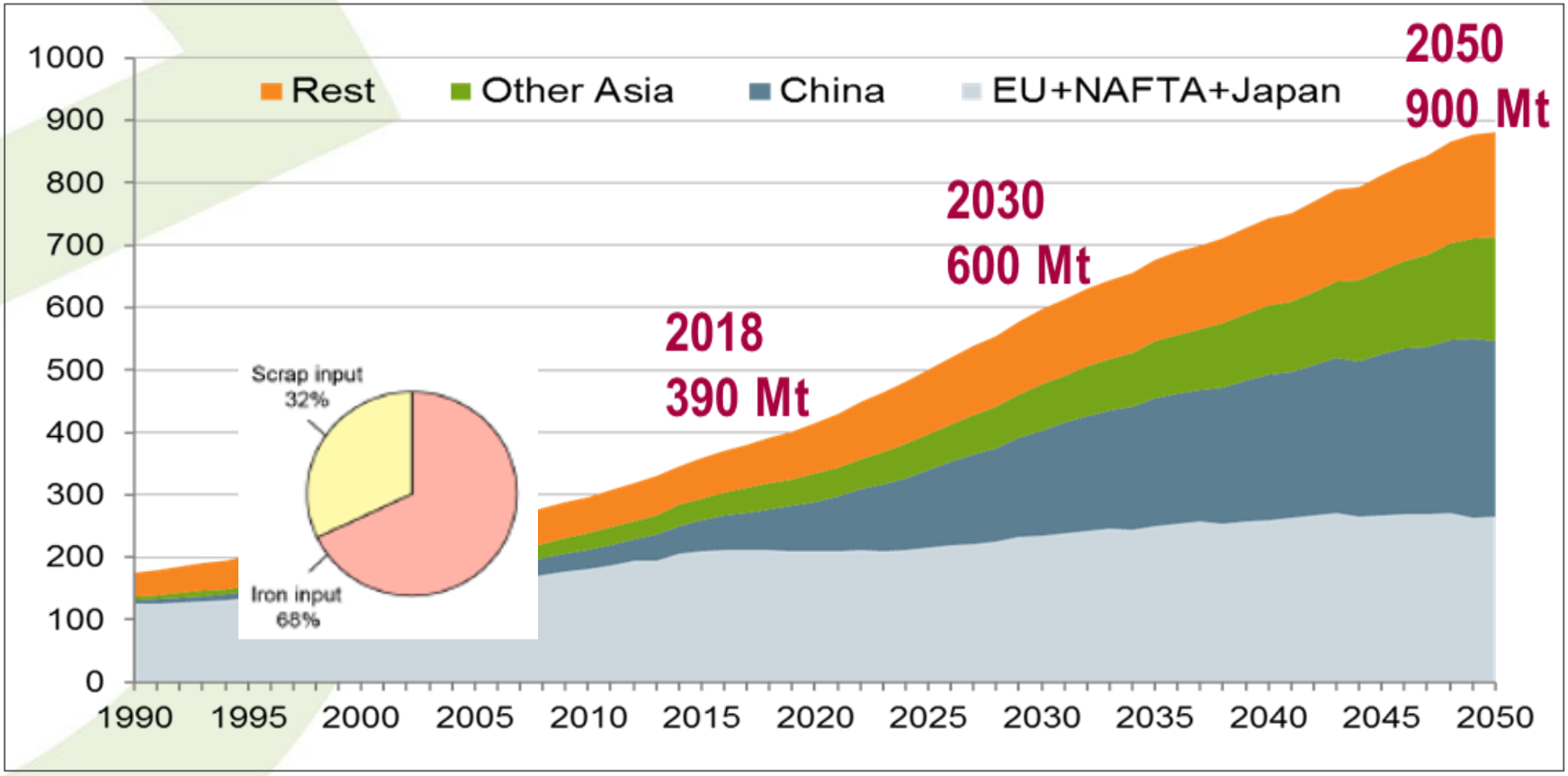



STEEL FACTS
Steel is produced via two main routes:
The blast furnace-basic oxygen furnace (BF-BOF) route and the electric arc furnace (EAF) route.
Today about
72% of steel is produced using the BF-BOF route.
28% is produced via the EAF route.
Crude steel is then rolled into finished steel products, such as coil, plate, sections or bars.
worldsteel.org

Steel production per process route



End-of-life scrap availability



Increased scrap use in either EAF or BF route will lower specific CO_2 emissions of the industry as a whole

Steel is the most recycled material in the world

All steel needs scrap

BOF process: up to 30% scrap

EAF process: up to 100% scrap

All products therefore contain scrap

Quality

Steel scrap can be converted into higher value steels.

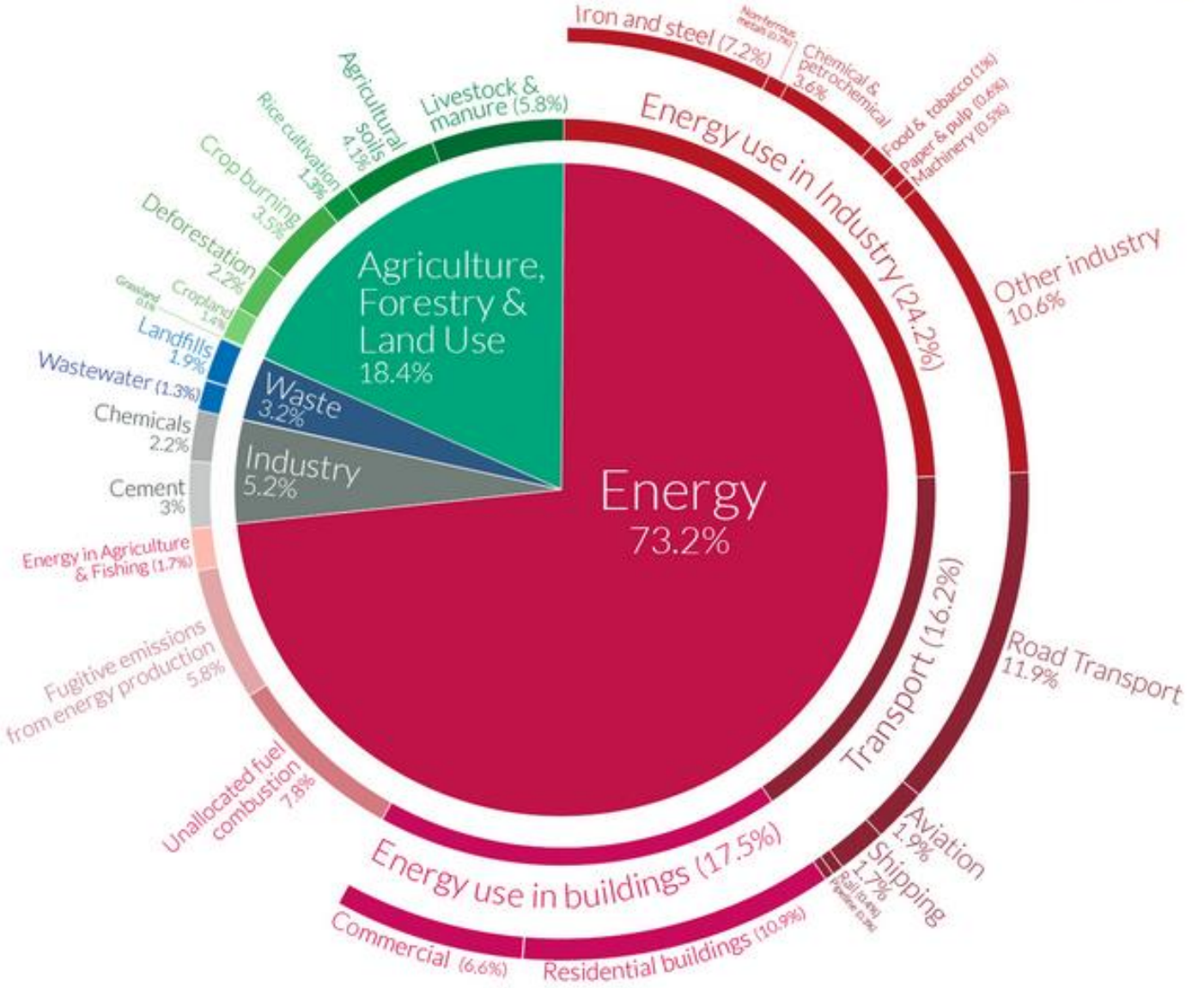
Scrap recycling

- Waste products: often shredded or incinerated
- Steel is magnetic – easiest material to separate from the waste stream
- Scrap is selected based on a ‘recipe’
- Coated and Galvanised steel scrap
  - Pre-consumer scrap from our customers is ‘cleanest’
  - Scrap is melted
  - De-zincing / de-tinning processes
  - Zinc in EAF dust
  - Emissions from coatings are captured in the flue gases

Global greenhouse gas emissions by sector

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO_2eq.

Our World in Data



OurWorldinData.org – Research and data to make progress against the world's largest problems.

Source: Climate Watch, the World Resources Institute (2020).

Who is interested in steel's business?

ecca prepaintedmetal.eu

THE CLIMATE GROUP

iea

OECD

UN environment

Climate Bonds Initiative

Responsible Steel standards & certification

ipcc intergovernmental panel on climate change

ACT ASSESSING LOW CARBON TRANSITION

WORLD GREEN BUILDING COUNCIL

ENERGY TRANSITIONS COMMISSION

International Resource Panel

UNFCCC

GPP FURNITURE

ROCKY MOUNTAIN INSTITUTE

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

ISO

ICC

Buying green!
A handbook on green public procurement
3rd Edition

Steel for Europe

World Business Council for Sustainable Development

CDP
DISCLOSURE INSIGHT ACTION

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

COMET Coalition On Materials Emissions Transparency

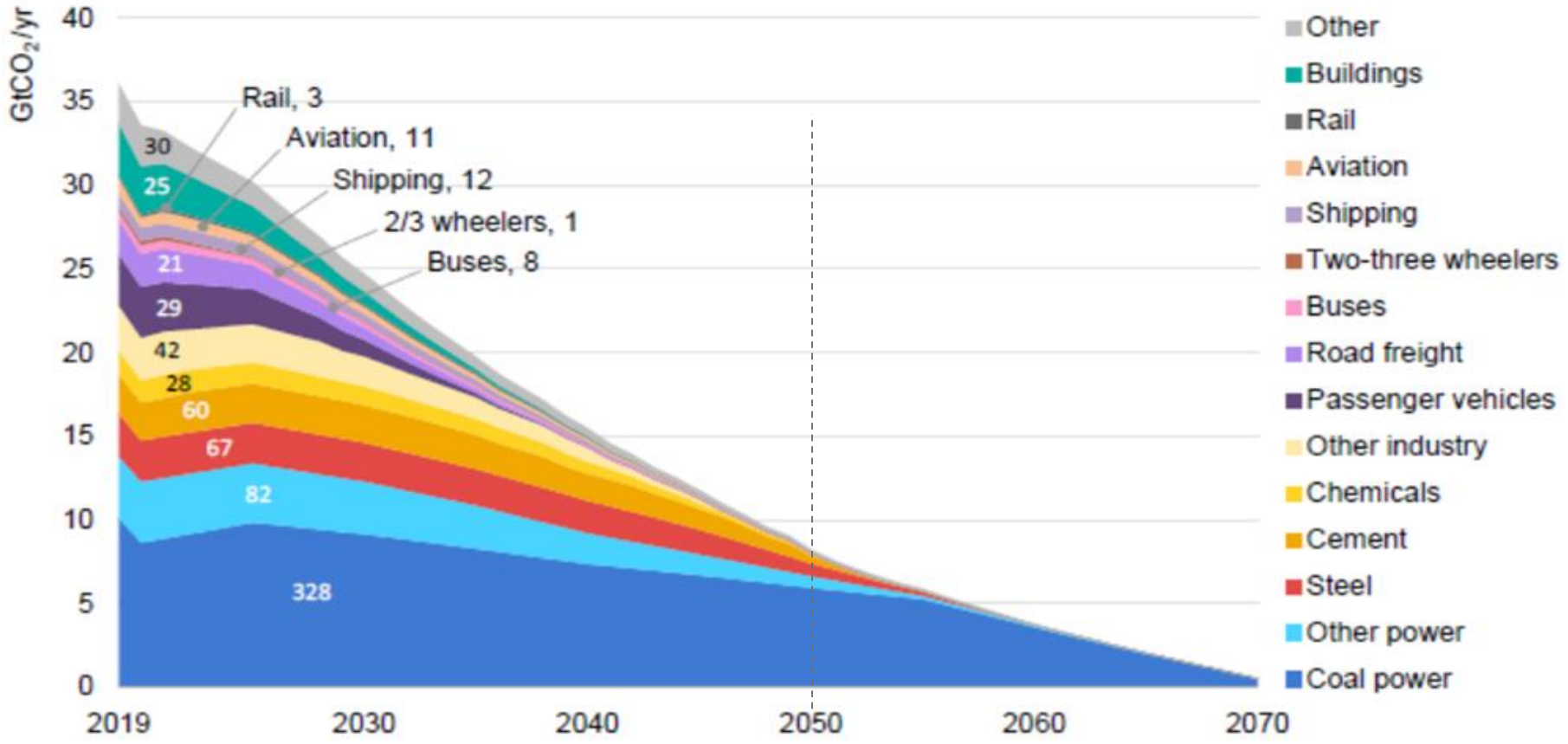
IFC International Finance Corporation WORLD BANK GROUP
Creating Markets, Creating Opportunities

HSBC

CIRCULAR ECONOMY
Closing the loop
AN AMBITIOUS EU CIRCULAR ECONOMY PACKAGE

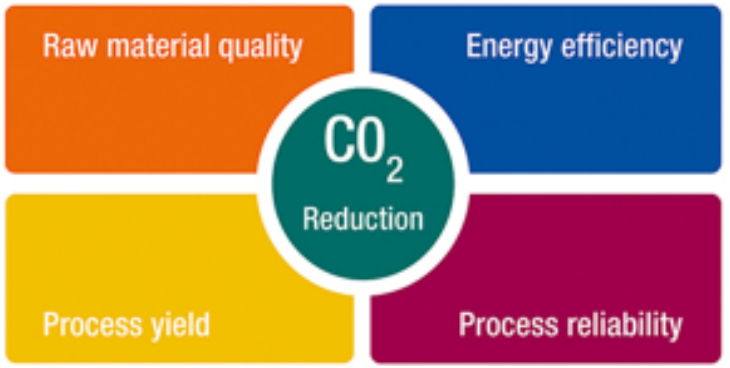
IEA: industry CO_2 emissions

Figure 1.11 Global CO_2 emissions from existing energy infrastructure by sub-sector, 2019-70



worldsteel step up programme

step up



Efficiency improvement – the step up programme

Efficiency review process that supports improvements in plant operations to efficiency levels corresponding with the steel industry's top performers

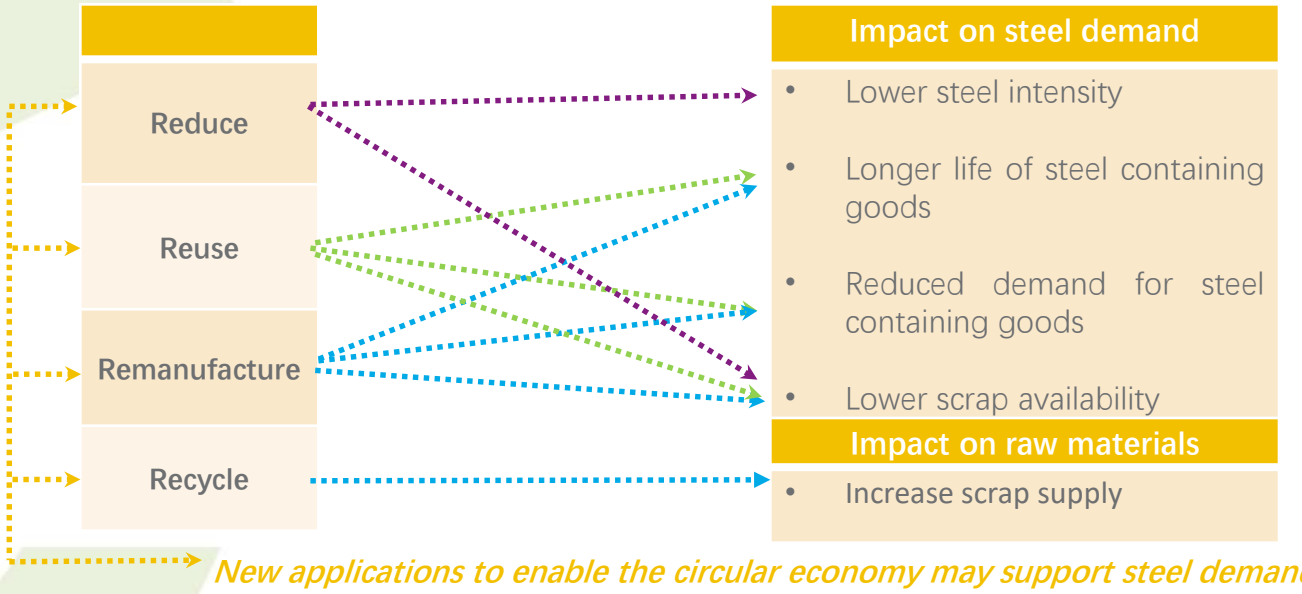
4 key levers: raw material quality, energy efficiency, process reliability and process yield

Optimised operations leads to lower CO2 intensity in steelmaking

Raw materials and Energy are the two most important cost factors in steelmaking

Circular economy

Circular economy concept will have impact on steel demand via multiple channels



Reuse and remanufacturing extend a service life of steel applications

The road to decarbonisation

- Move to a more circular economy
  - While recycling is key for steel, this is the 'last resort' for a circular economy
  - Design for reduced consumption, waste
  - Design for dismantling, reuse and remanufacture
  - Recover more scrap for recycling
- Recycling steel scrap saves 1.6 tonnes CO_2e (GHG emissions) per tonne scrap

Recycling


STEEL FACTS
By sector, global steel recovery rates for the following areas are estimated to be at least:
85%
Construction
90%
Automotive
90%
Machinery
50%
Electrical and domestic appliances
worldsteel.org

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 one
740 kg coal
120 kg limestone

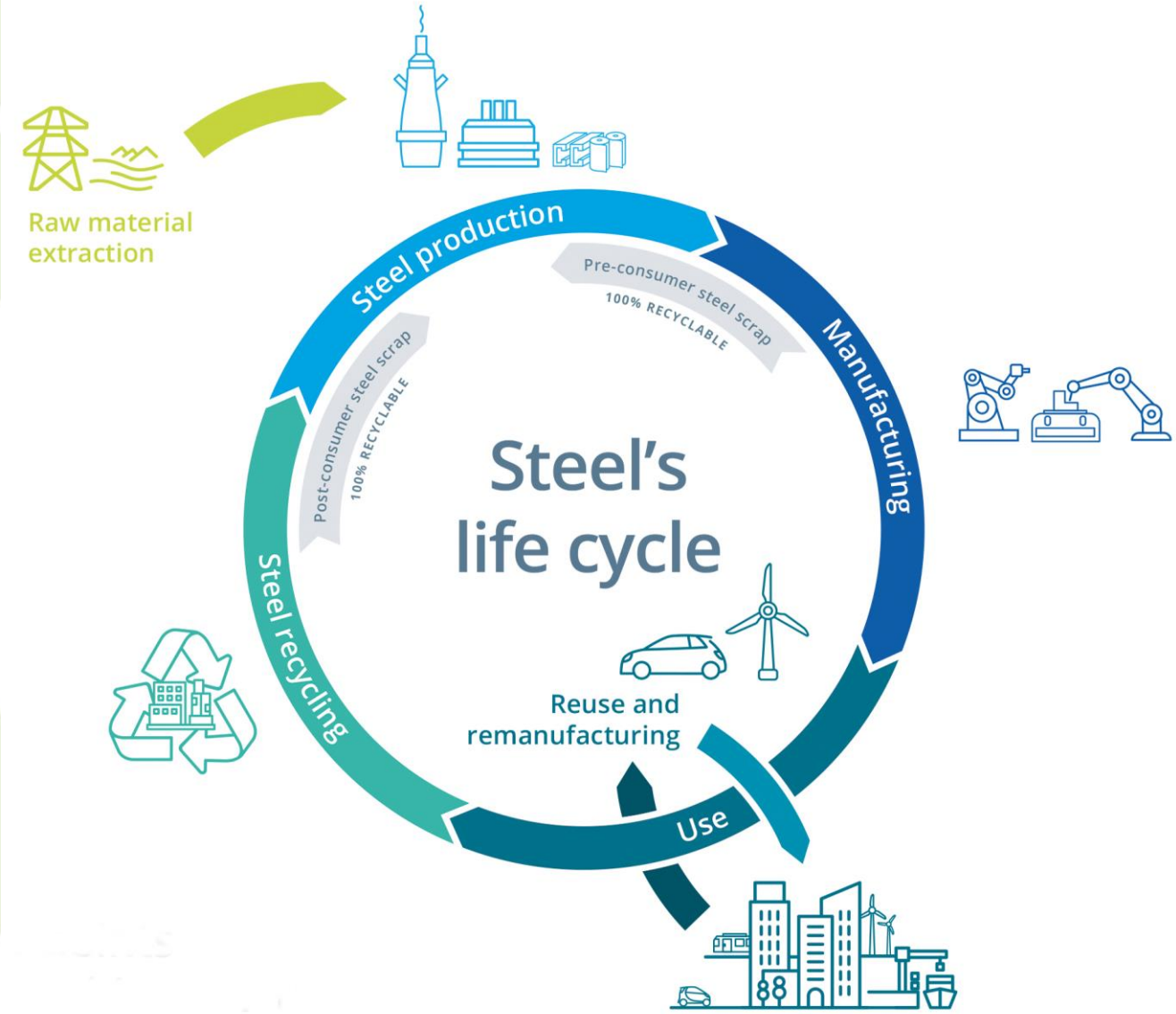
70% Energy saving

Recycling a single steel can saves :
1 laundry load, or
1 hour TV, or
24 hours of a 10 watt LED bulb

Job creation

Jobs required for scrap collection, separation and recycling

The life cycle of steel



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The LCI data quantifies 'cradle to gate' inputs (resources, energy) and outputs (environmental emissions) of steel production from:

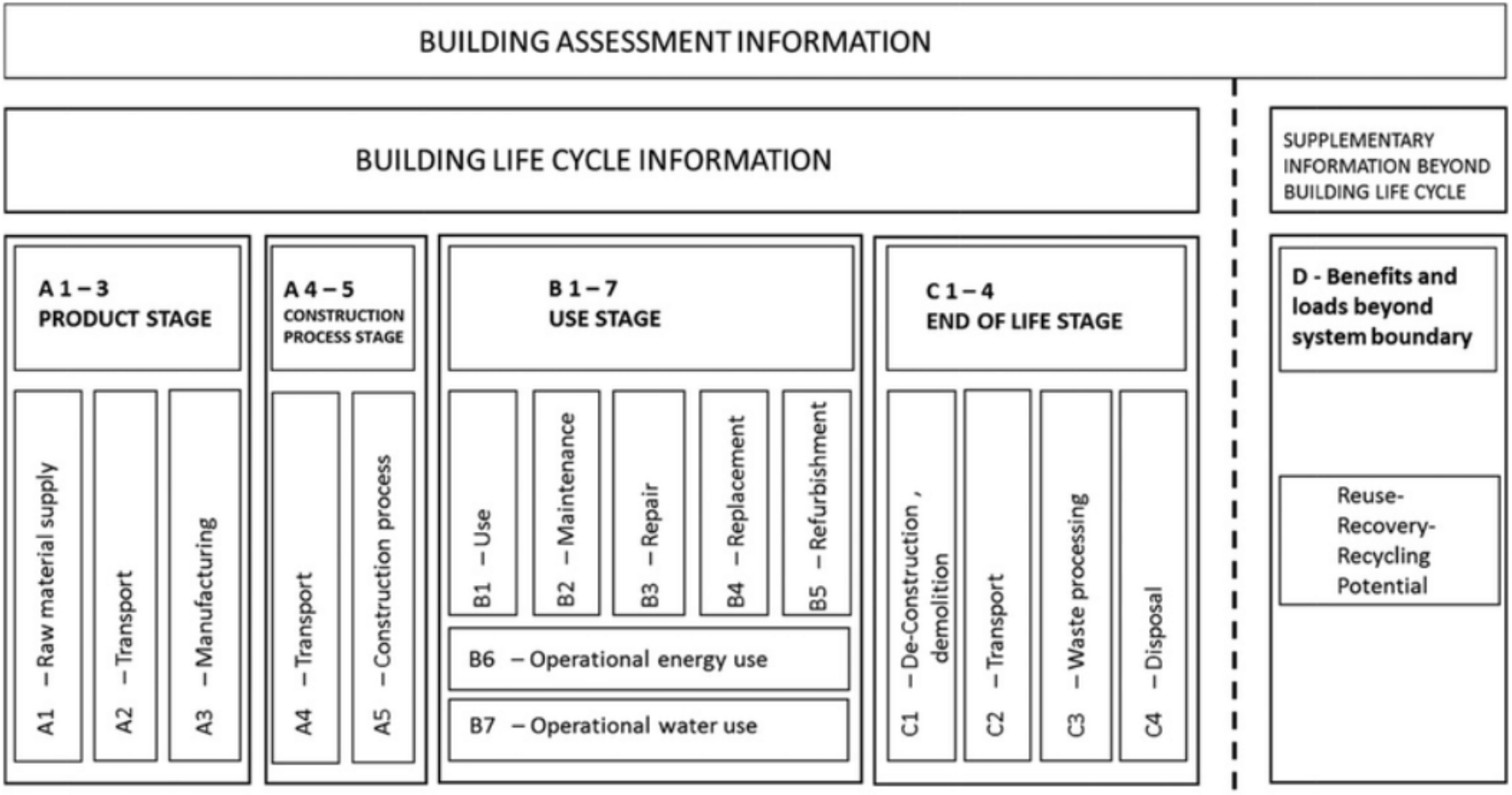
the extraction of resources and use of recycled materials,

production of steel products to the steelworks' gate,

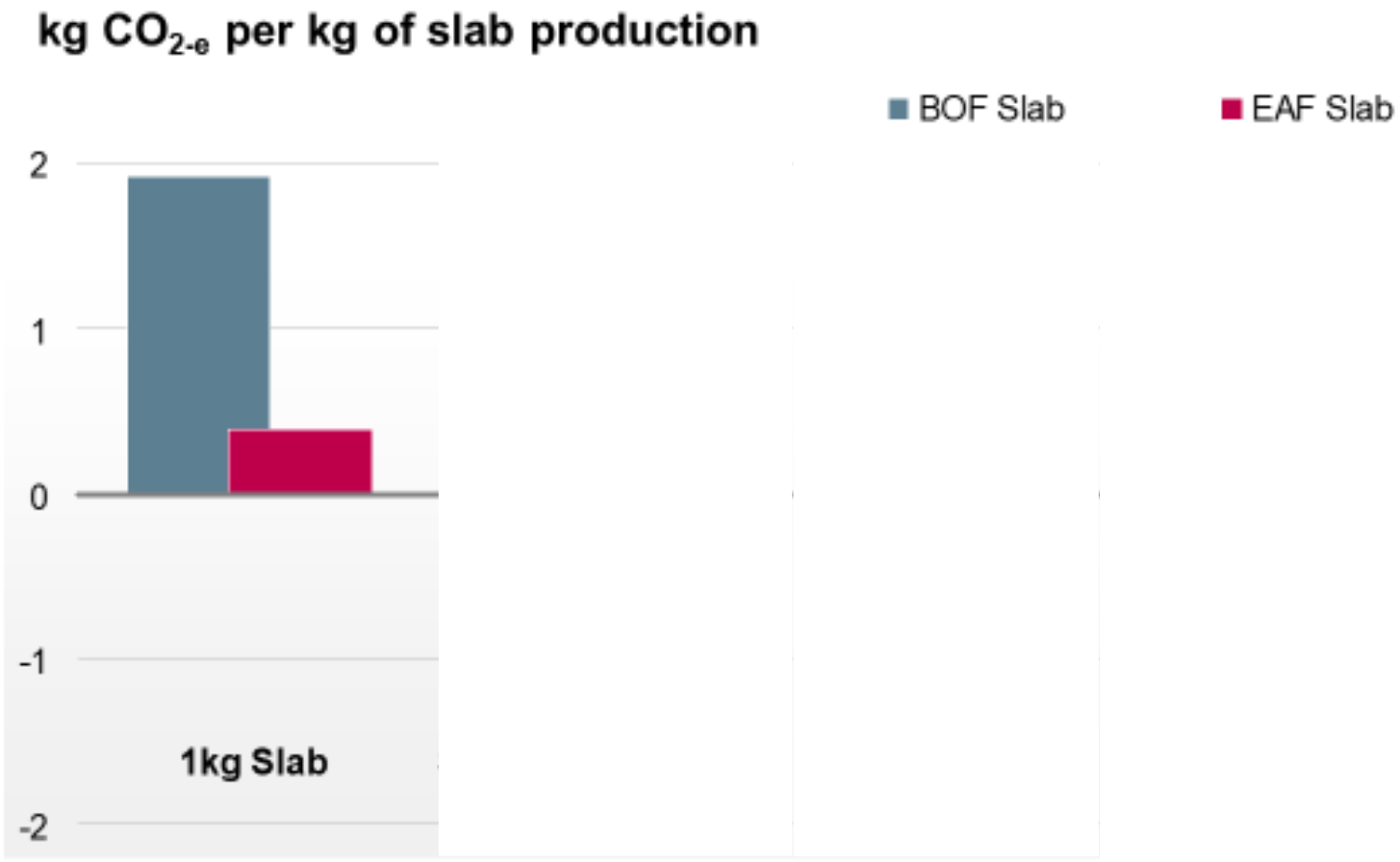
reuse and remanufacturing, and

end-of-life recovery and recycling of steel.

Reporting of impacts



GWP for slab production



For a product's life cycle, recycled content is irrelevant in terms of environmental impact

Thank you for your attention. Any questions?

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worldsteel ASSOCIATION