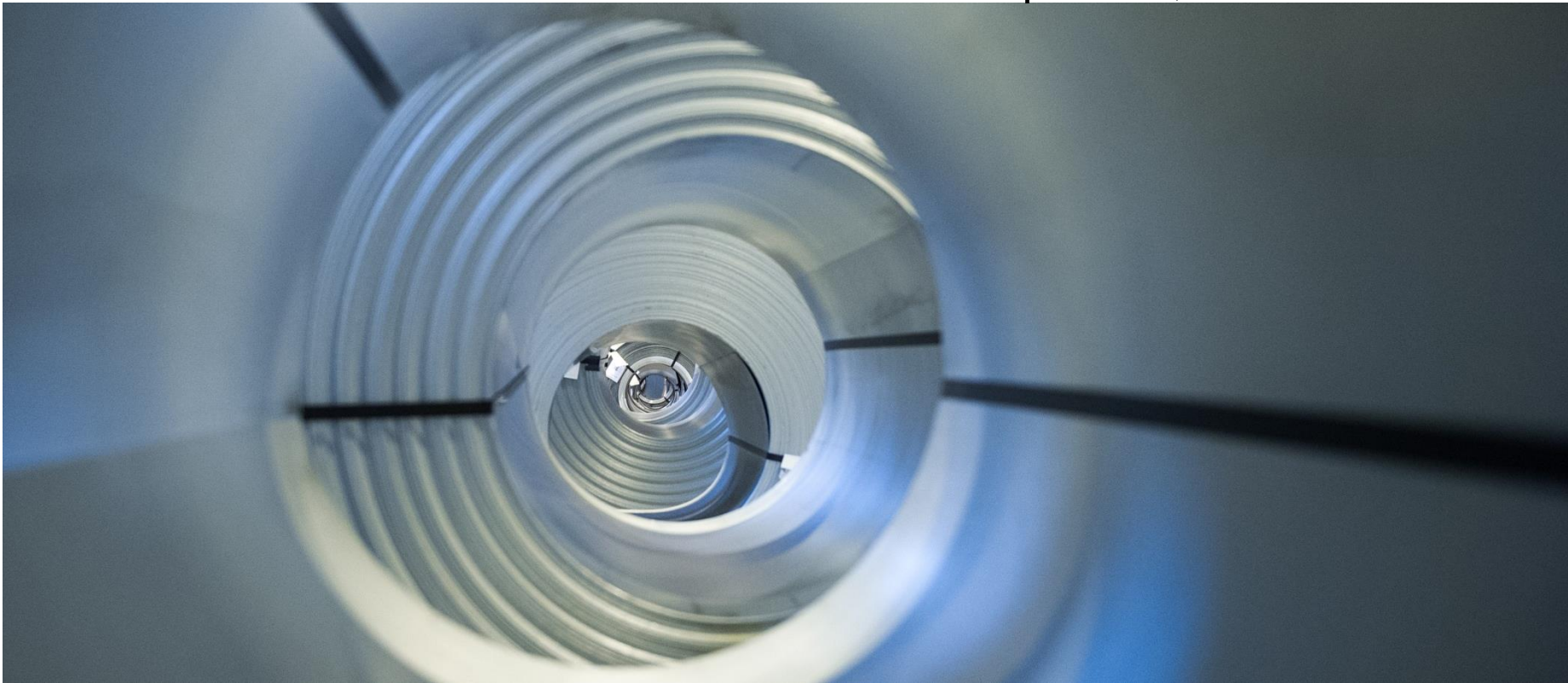


Global steel industry: outlook, challenges and opportunities

5th International Steel Industry & Sector Relations Conference

April 20th, 2017 - Istanbul



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Agenda

- World Steel Association
- Steel demand prospects
- Global steelmaking structure and steelmaking materials markets
- Environmental challenges and opportunities
- Conclusions

World Steel Association



Key facts - worldsteel today

- Headquarters in Brussels, second office in Beijing
- Over 160 Members:
 - 73 Regular (production > 1.8 Mt)
 - 35 Associate (production < 1.8 Mt)
 - 53 Affiliated (Regional and National Associations and Steel Research Institutes)
- Membership HQs are located in over 50 countries
- 9 out of 10 of the world's largest steel companies are members
- Members represent around 85% of global steel production

What is our role?

- worldsteel acts as the focal point for the steel industry.
- worldsteel provides global leadership on all major strategic issues affecting the industry, particularly focusing on economic, environmental and social sustainability.
- worldsteel promotes steel and the steel industry to customers, the industry, media, financial markets and the general public.
- worldsteel assists its members to develop the market for steel, managing major projects in a range of industry sectors.

What are our key goals?

- Steel is the most important, innovative, recyclable and sustainable material for the 21st century.
- Members will be profitable rewarding shareholders and re-investing in new products and processes.
- The safety goal is “zero”: an injury free, illness free and healthy workplace.
- The industry will minimise its environmental footprint and conduct its operations in a sustainable way.
- The steel industry should be free of government involvement which distorts the market and prevents fair competition.

Key facts – Benefits of membership

- Access to the latest technical and economic data on industry trends and performance affecting the steel industry through the member-only extranet.
- worldsteel regularly produces member-only data, reports, publications and authoritative works on specialist subjects.
- Become involved at an international level in common market development programmes and initiatives.
- Networking with other steel industry professionals from around the world at meetings, events and the annual conference.
- Join major industry wide working parties, forums and committees.

Steel demand prospects

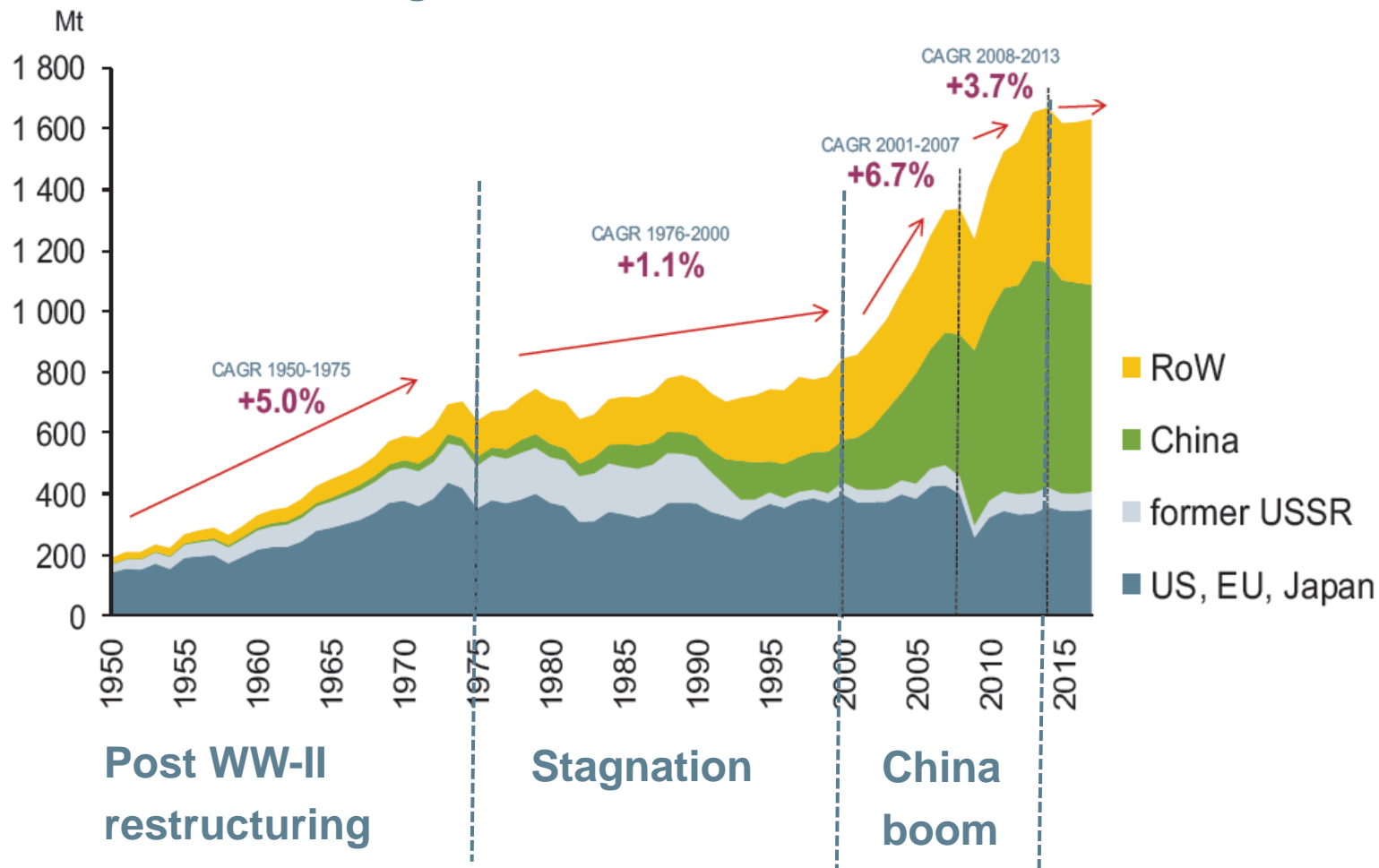


Steel demand prospects

- Steel demand growth will be slow
 - China's steel demand to decline in the medium-term
 - Pockets of growth with particularly strong fundamentals in emerging world
 - Circular economy concept
 - Slower growing and ageing population

Global steel industry at another inflection point

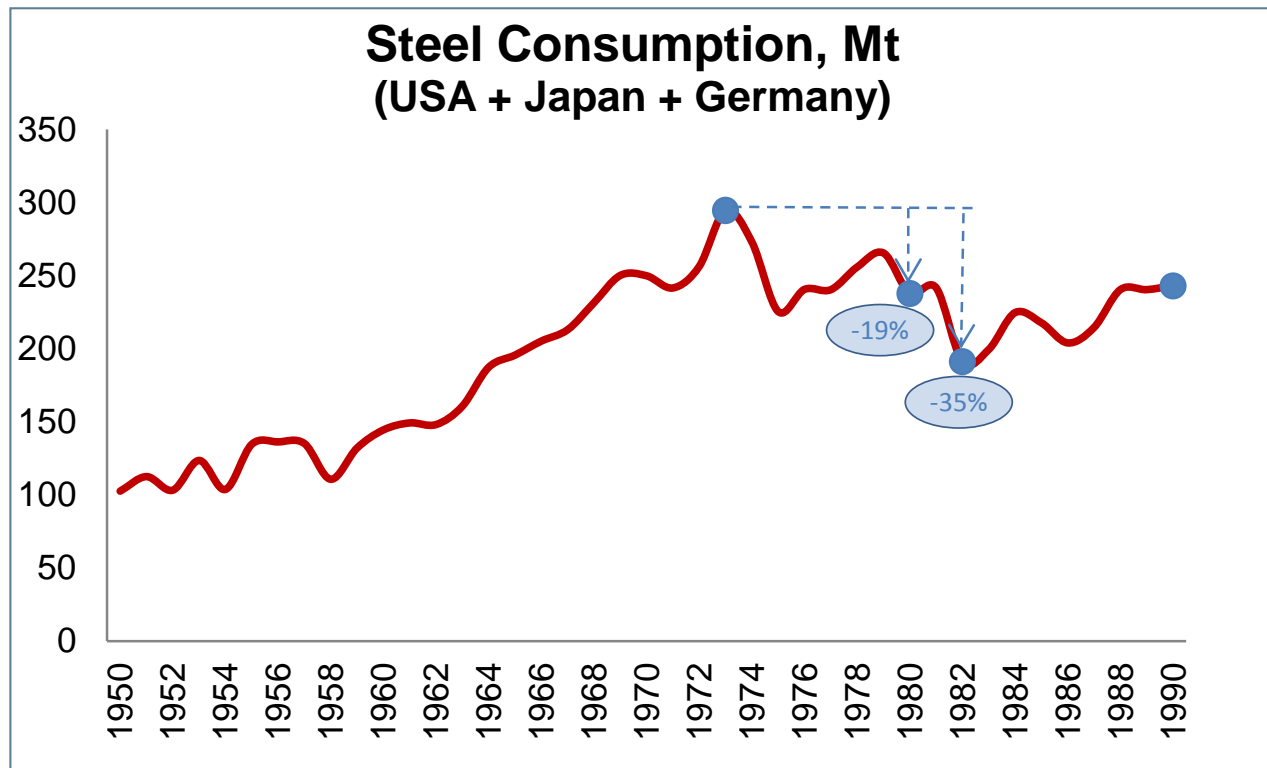
Evolution of global steel demand, 1950 - 2016



Source: worldsteel, steel demand in crude steel equivalent terms

Chinese steel demand peaked in 2014 and might be expected to decline further: historical trend in the developed world

- Steel demand in US+Japan+Germany peaked in 1973, followed by sharp decline for 2 years, and pick-up for 4 years



Source: worldsteel

Circular economy concept is spreading with increasing impact on global steel demand

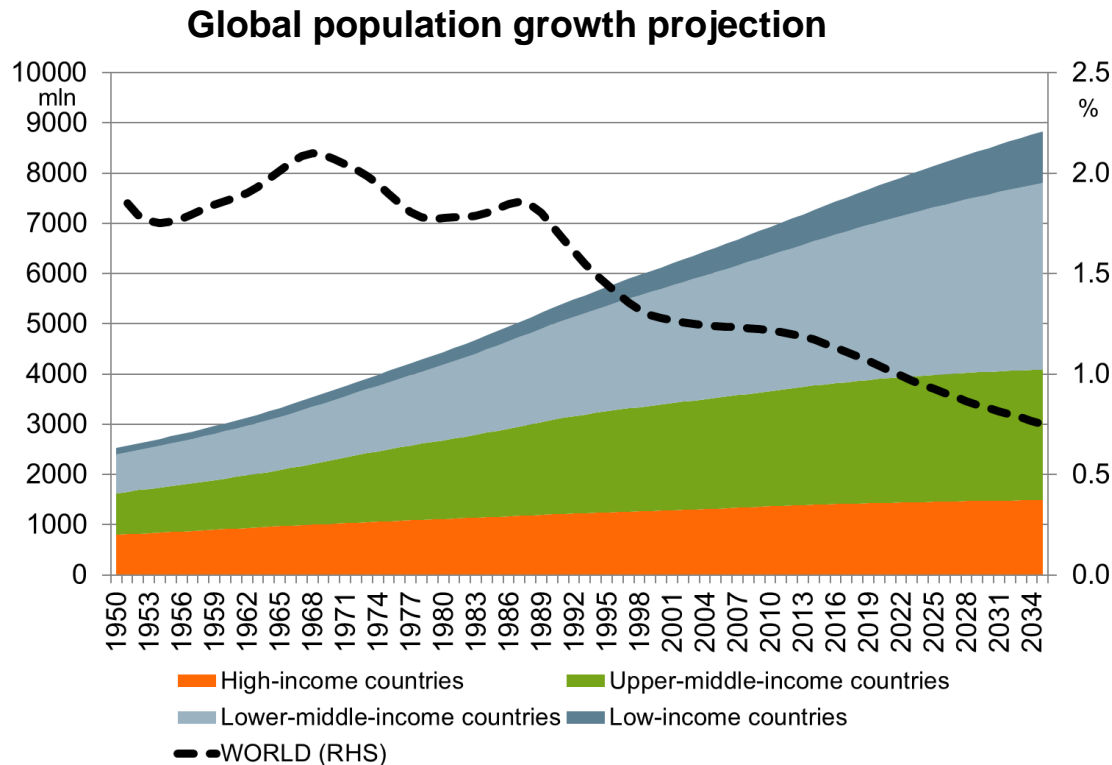
- With varying degrees, circular economy concept is spreading
- Impact on steel demand visible and likely to accelerate over time

Circular economy processes

	Process
Reduce	<ul style="list-style-type: none">• Reduce use of resources• Optimise use of products, Improved yields <i>Ex: car sharing</i>
Reuse	<ul style="list-style-type: none">• Reuse a product again in another function. <i>Ex: washing machine drums, car parts, construction beams</i>
Remanufacture	<ul style="list-style-type: none">• Restoring of products to as-new condition. <i>Ex: reconditioning of machines and equipment</i>
Recycle	<ul style="list-style-type: none">• Creation of new products from the recycled materials.• Already applied

Slower growing and aging population to dampen future steel demand growth

- Global population growth is decelerating
- Ageing is a global phenomenon and Asia leads the next ageing wave

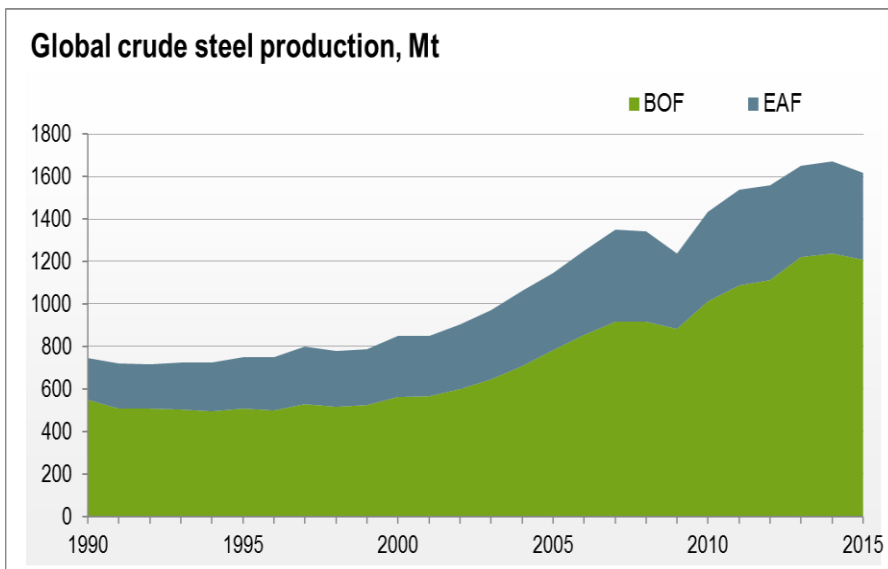


Source: UN, World Bank

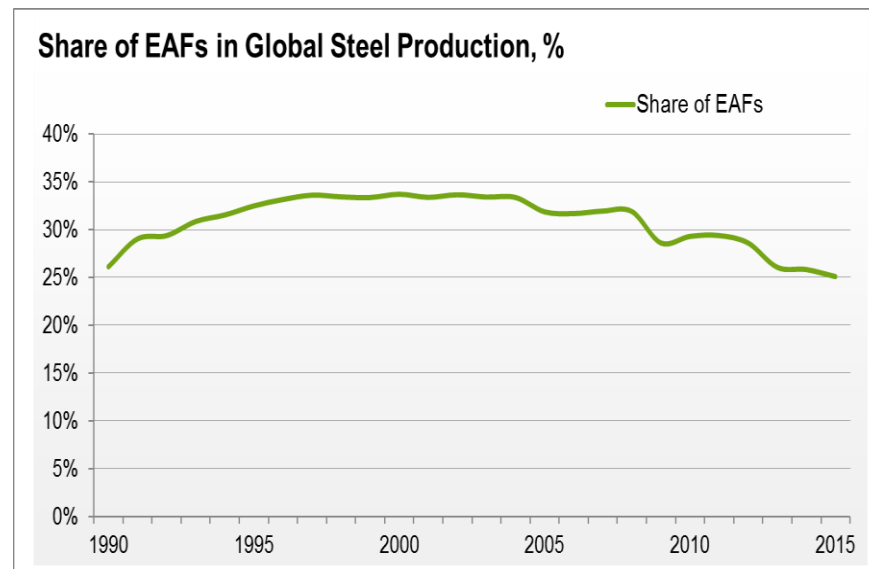
Steel production structure and raw materials markets



Global steel production

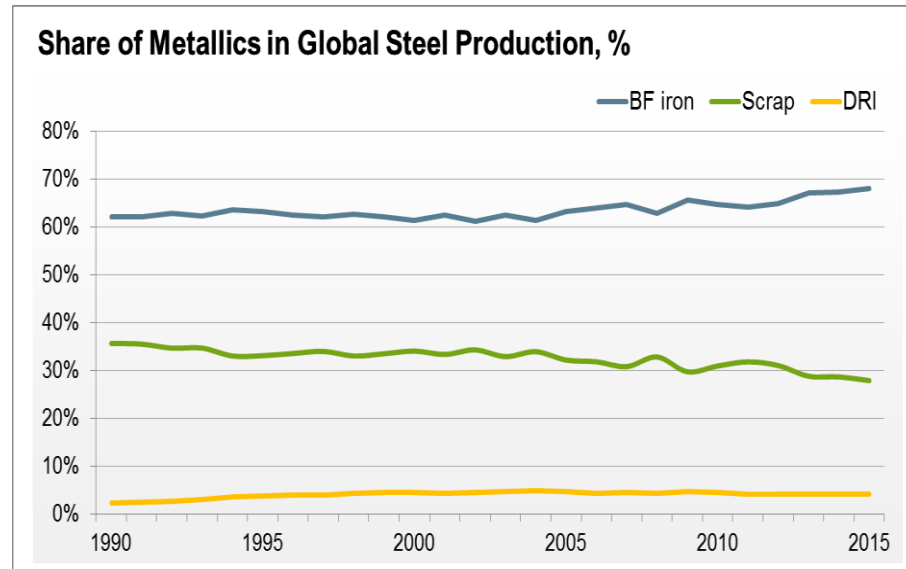
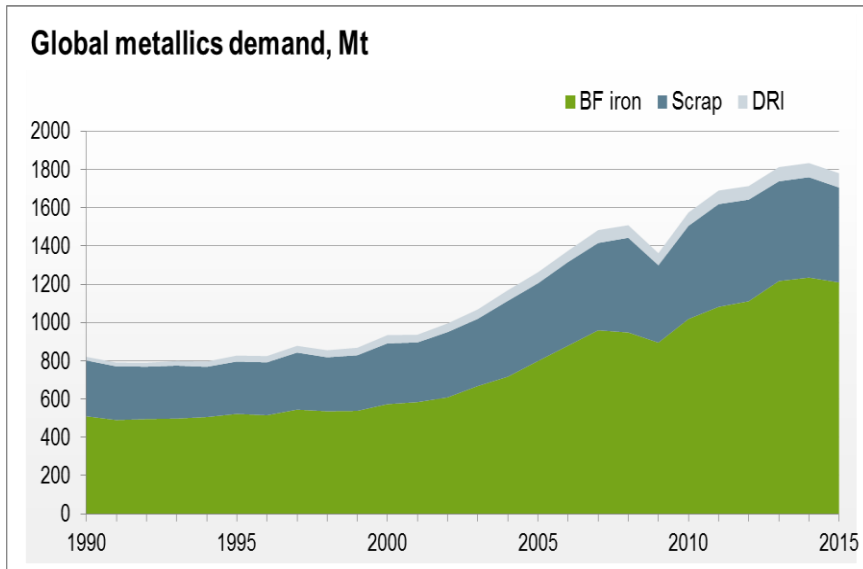


- BOF: 1.2 Gt
- EAF: 405 Mt



- Share of EAFs in the total global steel production declining

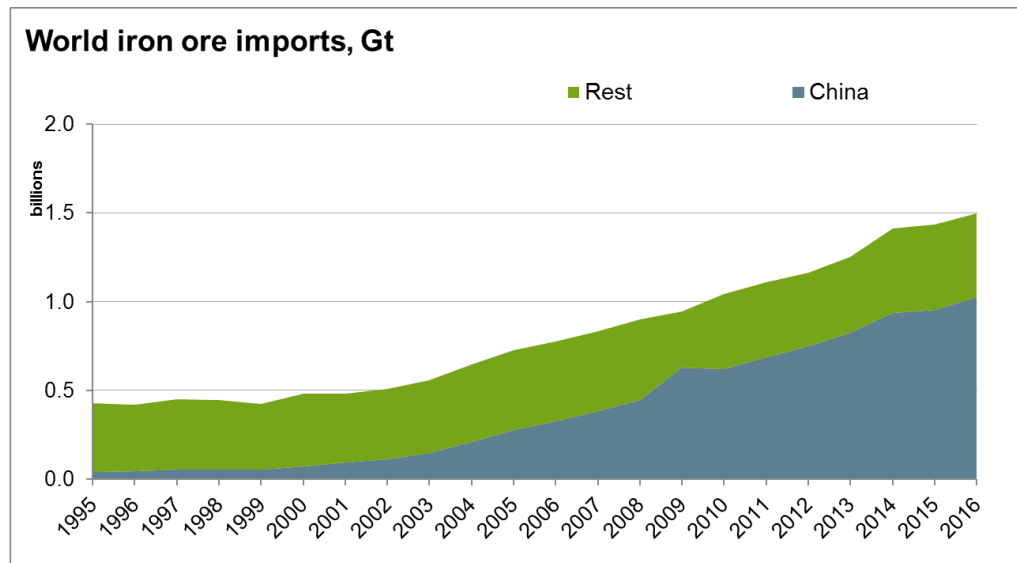
Global metallics demand



- BF-iron: 1.2 Gt
- Scrap: 550-600 Mt
- DRI: 75 Mt

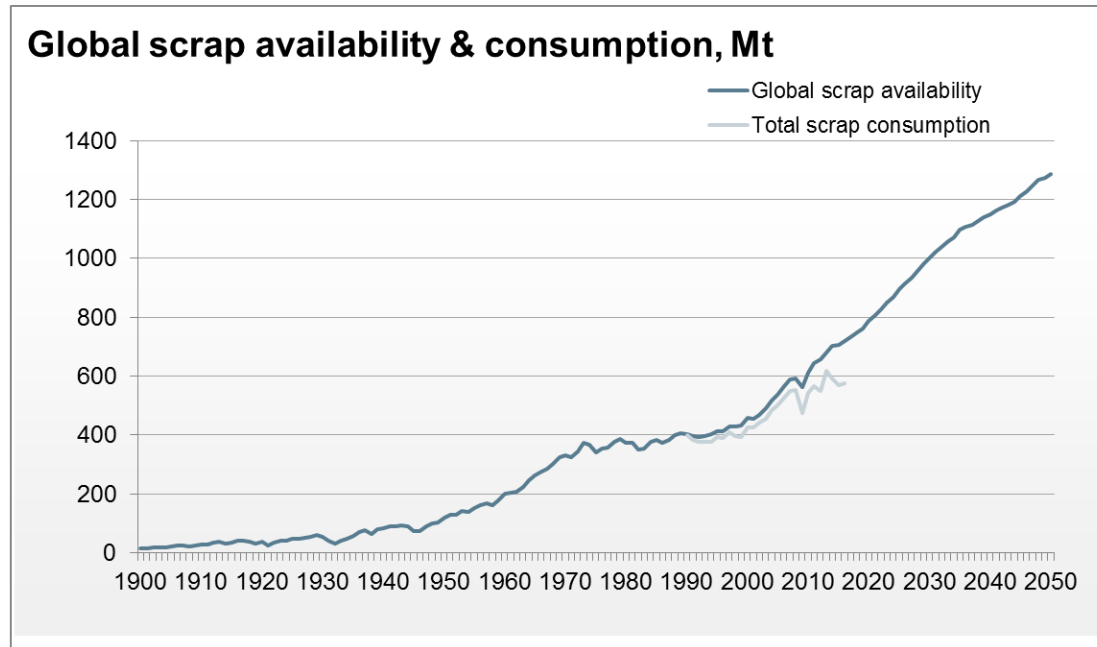
- Share of ferrous scrap in the total metallics consumption of global steel sector declining

Iron ore and metallurgical coal – growth, restructuring and stability



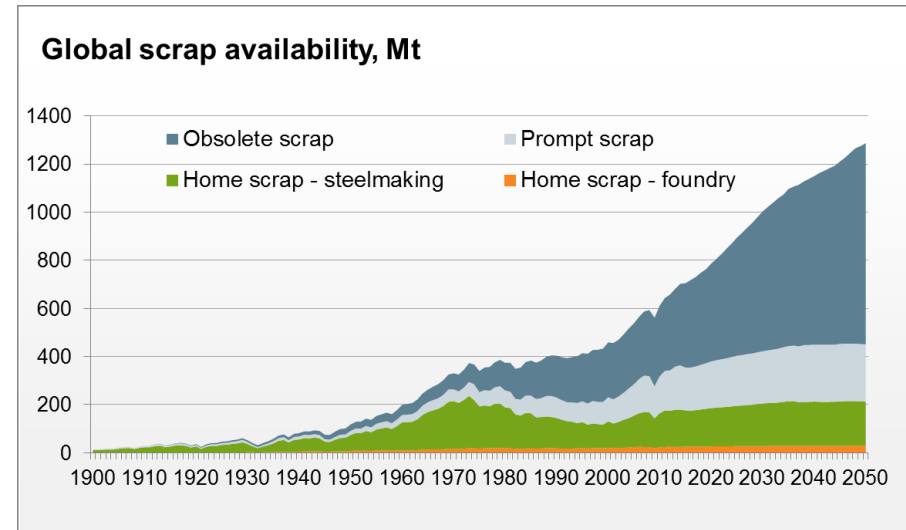
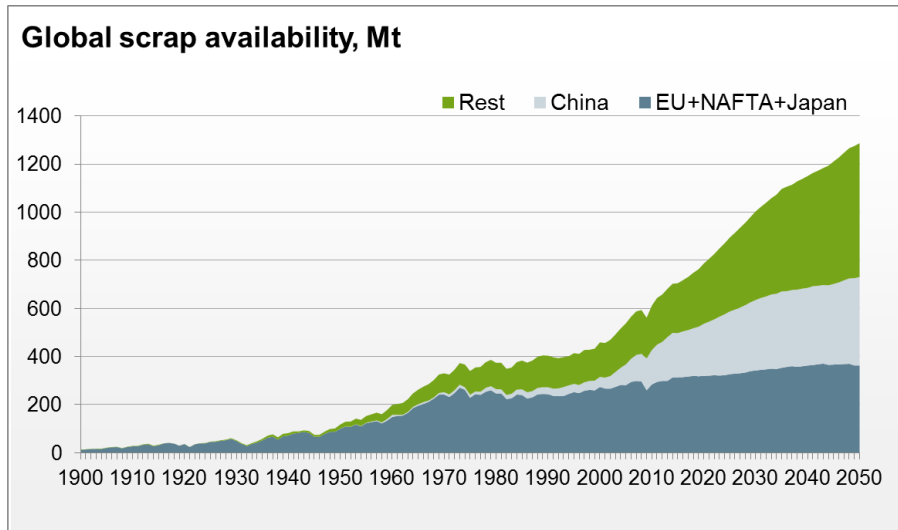
- Seaborne iron ore and metcoal markets are moving into a stability phase from a growth phase, which has been driven by China's surging raw materials demand
- We expect continued tightness for higher quality material
- Quality deterioration a growing concern
- High exposure to disruptions such as adverse weather conditions and accidents due to the concentrated supply structure
- Markets are exposed to unexpected changes in domestic iron ore and metcoal availability in China

worldsteel's global scrap availability and consumption estimates



- Global ferrous scrap availability expected to increase to 1 bn tonnes in 2030 and 1.3 bn tonnes in 2050 from about 720 Mt in 2016
- Global ferrous scrap demand increased strongly during 1990 – 2008 and hit about 600 Mt
- Interestingly, global ferrous scrap demand has stagnated for the last couple of years, and the share of ferrous scrap in the total metallics demand declined

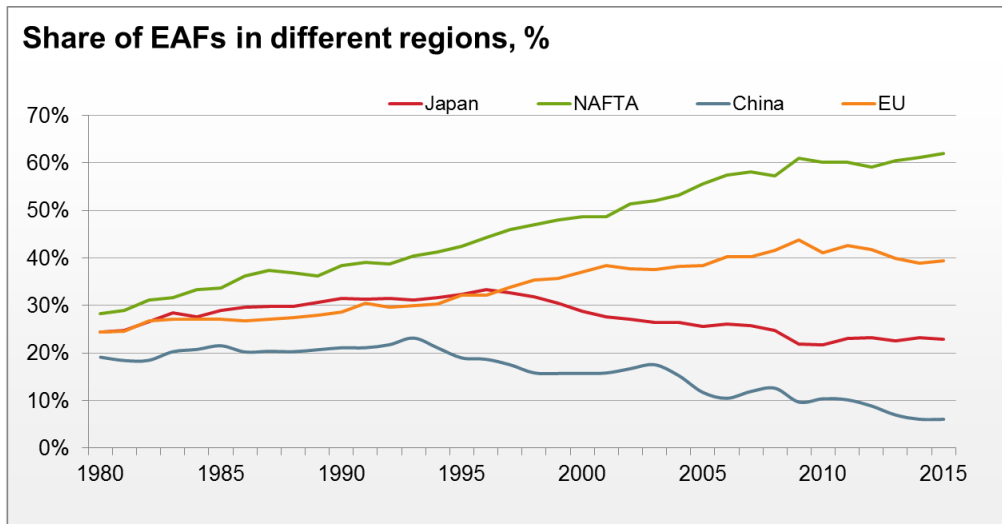
Scrap availability to surge in developing world; increase to come mainly from obsolete scrap availability



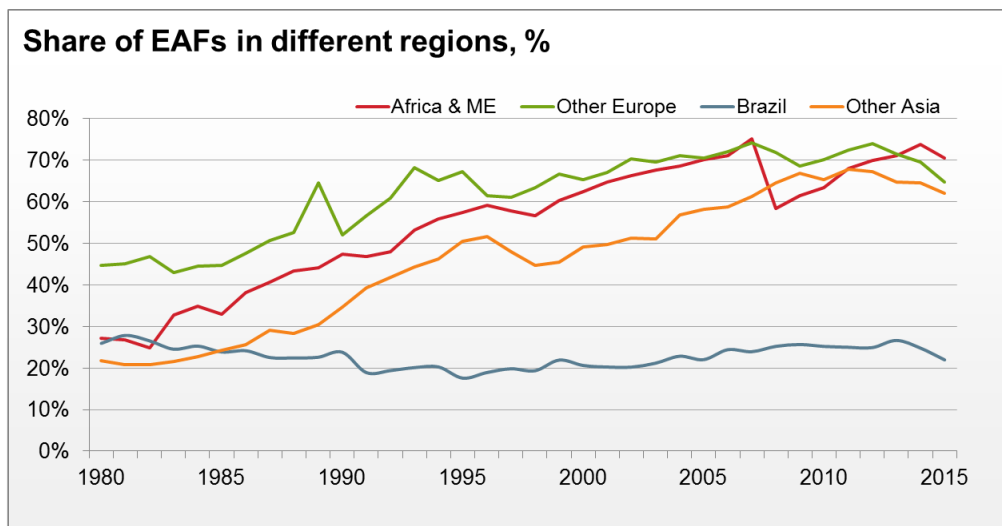
- Scrap availability to grow in the developing world, particularly in China

- Increase in scrap availability to mainly come from obsolete scrap

Steel production shows different characteristics at different regions



	Scrap charge ratio for BOFs, kg/t cs
EU28	180
NAFTA	220
Brazil	70
China	110
Japan	110

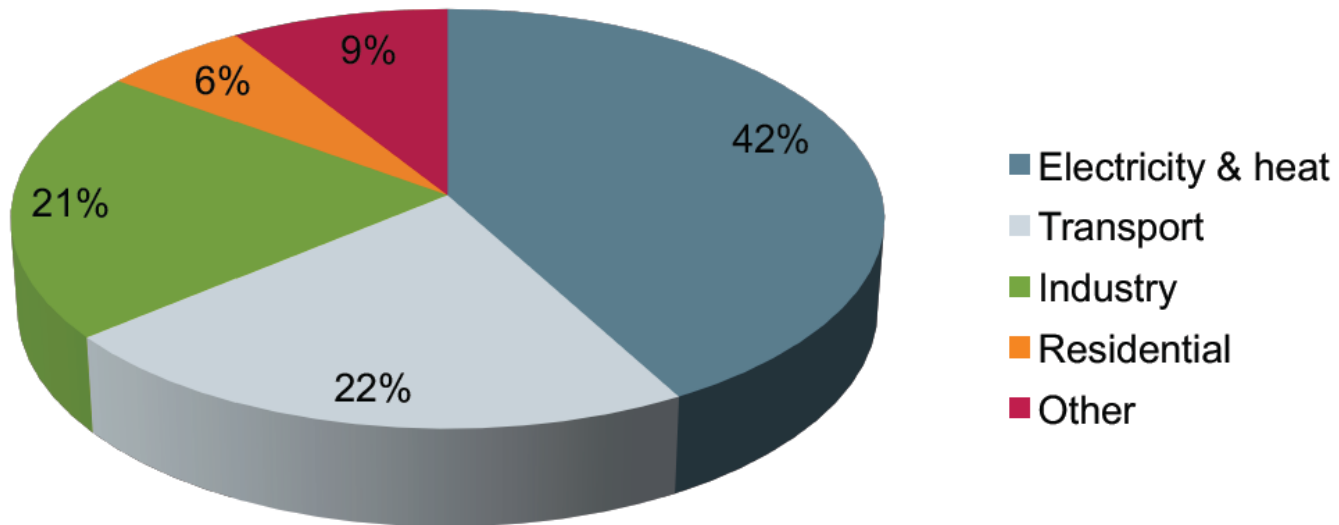


Environmental challenges and opportunities



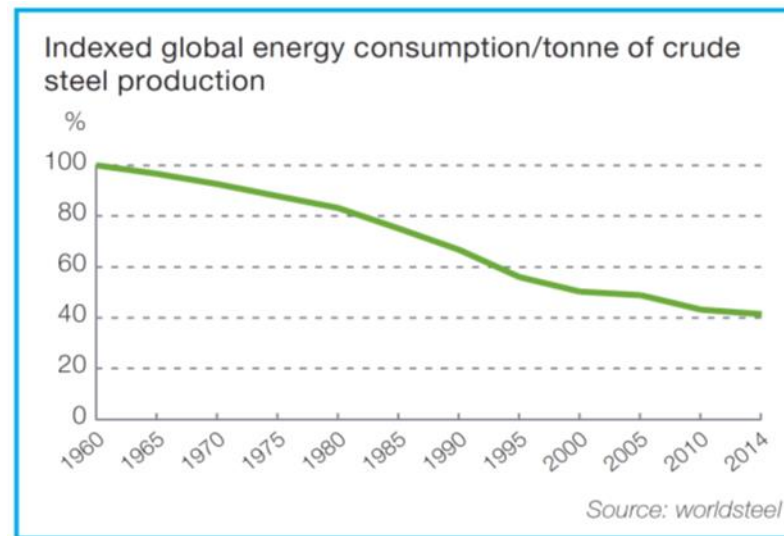
CO2 emissions by sector

- Share of iron & steel in global CO2 emissions is about 7%



Source: IEA 2011 CO2 emissions from fuel combustion

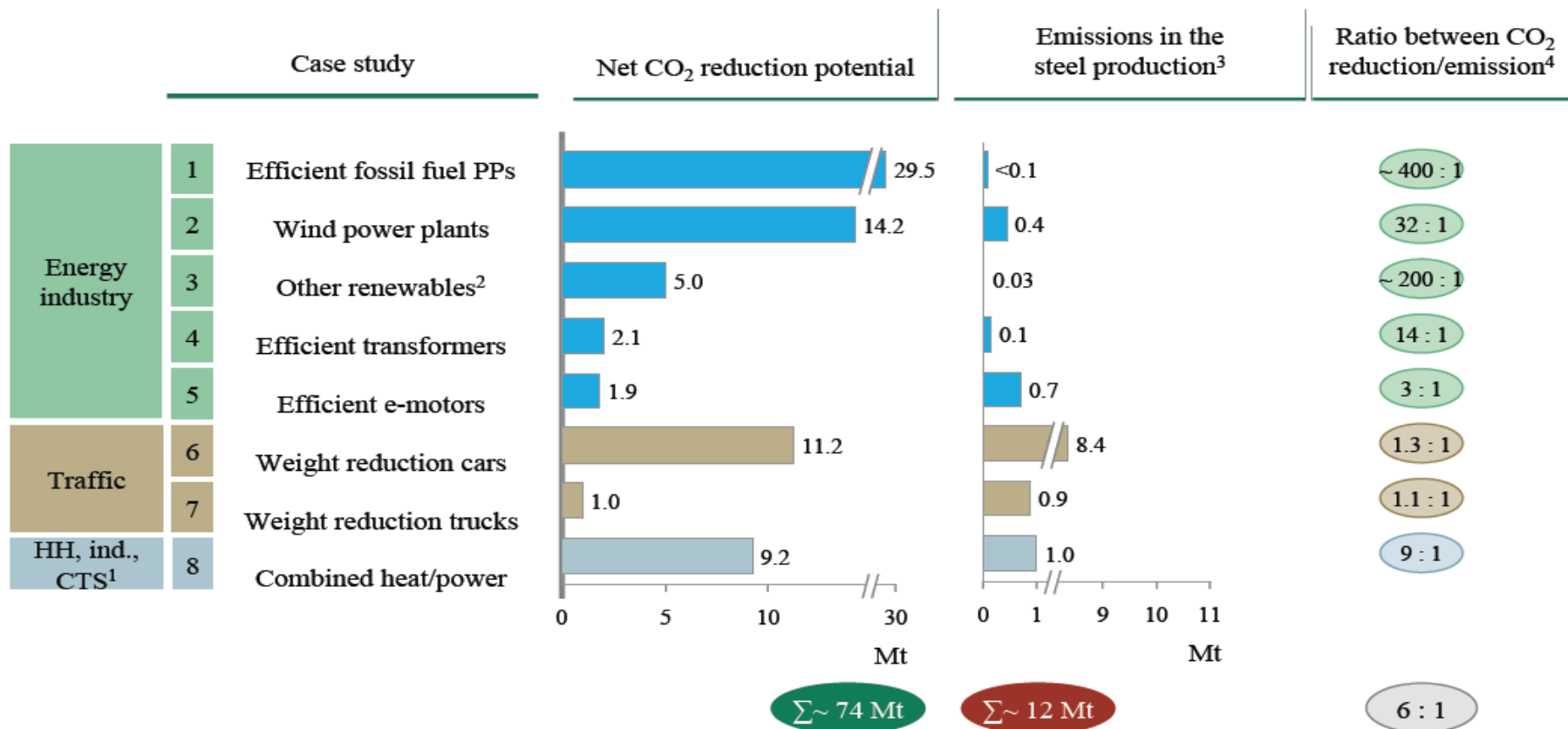
Steel industry has and will continue to provide the basis for sustainability of the modern society



- Considerable improvement in productivity and environmental footprint
- Further improvement:
 - Modernisation & usage of best available techniques
 - Innovative Technologies / changes in steel production structure
 - Directly avoiding CO₂ emissions: hydrogen, electricity
 - Process integration: eliminating need for coke making, IO agglomeration
 - Carbon capture and storage, and utilisation

Steel has superior environmental characteristics

- **Innovative use** of steel saves six times as much CO₂ as is caused by the production of the steel



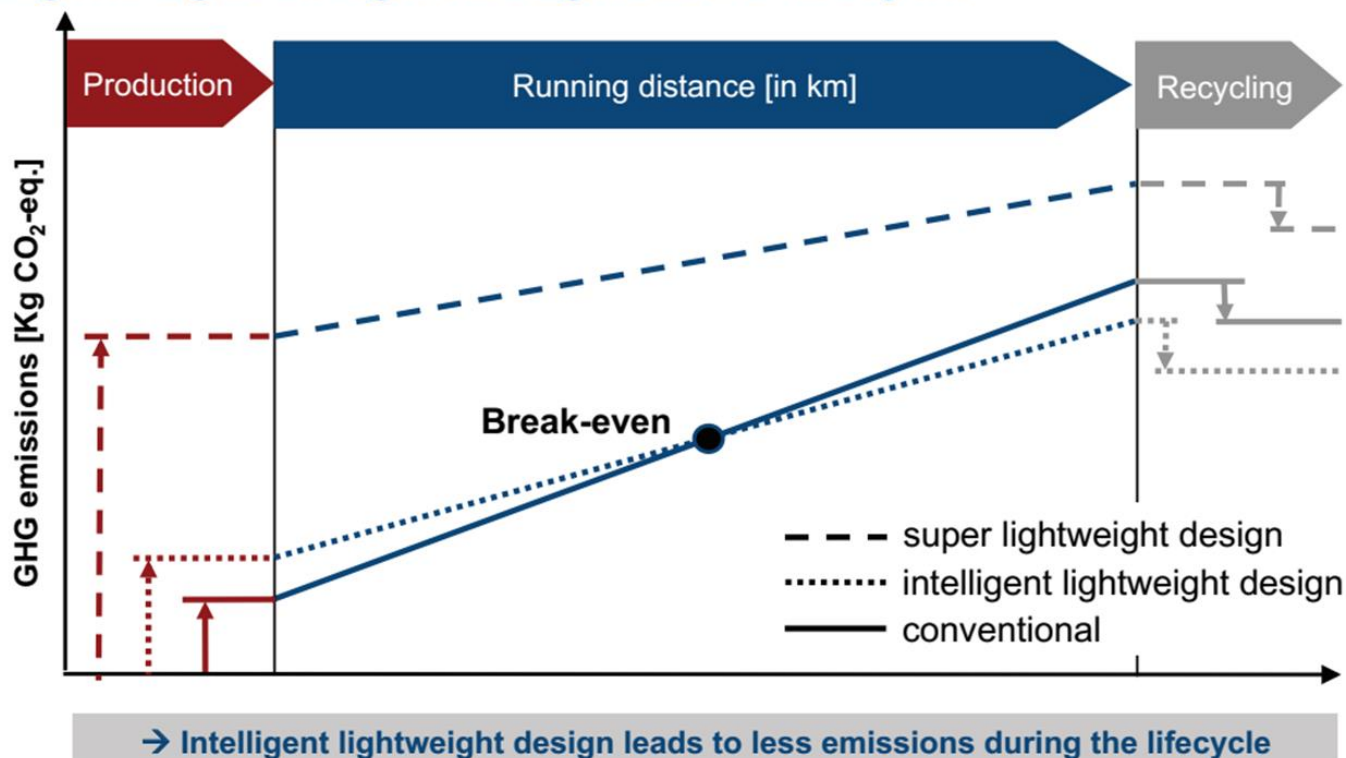
1.HH = households; CTS = commerce, trade, and service 2. Geothermal, biomass, hydro 3. CO₂ expenditure for other materials not examined; values are rounded 4. Ratio relates exclusively to the emissions

Source: BCG analysis

Steel has superior environmental characteristics

- Life cycle thinking reveals the advantages of steel

Lightweight design throughout the lifecycle



- Source: Volkswagen

Steel has superior environmental characteristics

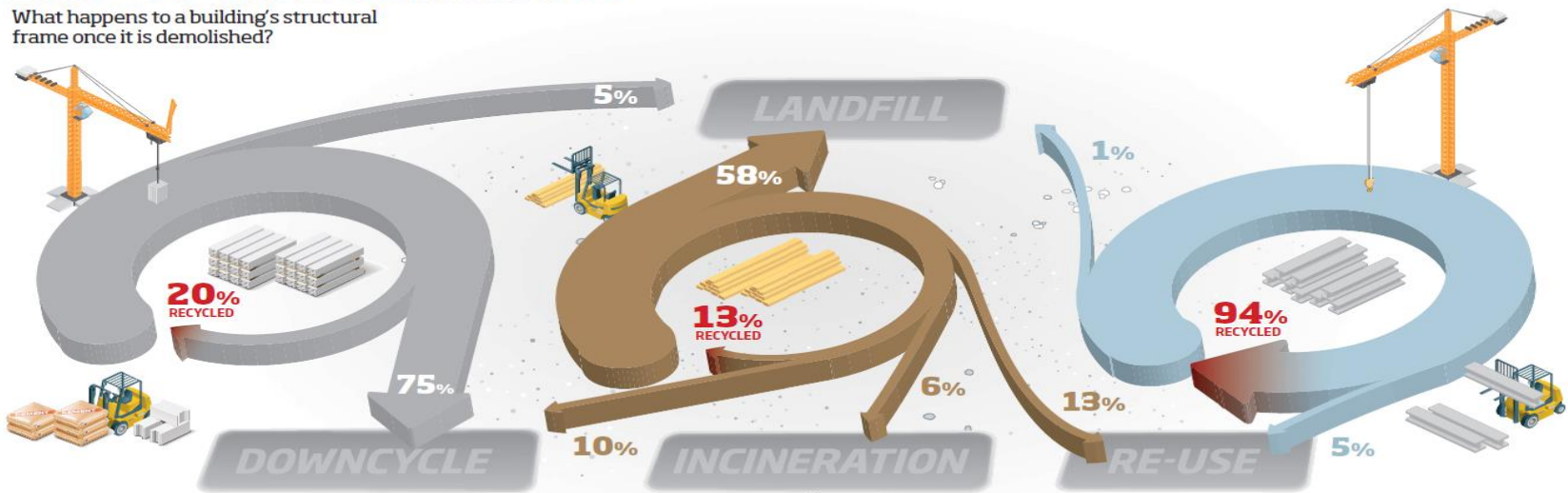
- Steel has superior **recyclability**, when compared with competing materials

THE FACTS

THE FACTS

END-OF-LIFE SCENARIOS

What happens to a building's structural frame once it is demolished?



CONCRETE

The great majority of concrete from demolition sites is crushed and used as sub-base or fill. This is downcycling rather than recycling, i.e. a secondary use which is not of the same value as the first. Aggregates from demolition may be re-used in concrete production but its use is restricted both by rules governing maximum percentages allowed and

also by supply, since the amount of aggregate that can be recovered for this purpose is limited. Where aggregates are re-used in concrete, new cement, the source of most of the CO₂ emitted in concrete production, is still needed. The Concrete Centre is the source of the downcycling figure, with the other figures estimated using various sources.

TIMBER

Definitive information on what happens to timber waste following building demolition is difficult to find. Recent publications from TRADA indicate that up to 80% of timber waste in the UK goes to landfill. The information presented here is from the BRE Green Guide.

The downcycling figure is an estimate based on published information on how much timber is diverted from the waste stream for the manufacture of chipboard. Problems with contamination in the waste stream in particular restrict opportunities to divert waste for re-use and recycling.

STEEL

Steel benefits from having a high intrinsic value supported by a well developed and efficient scrap collection infrastructure. It can be recycled at end of life to form products that are of the same, or higher, standard and quality as the original material and most steel components are large and easily captured.

Capture rates vary depending on the ease of extraction from the demolition site but are always above 90% and average 94% for all steel components. For sections, it is 90%. These rates can be found in Material flow analysis of the UK steel construction sector, J. Ley, 2001.

Source: BCSA, updated June 2014

Conclusions



Conclusions

- Steel demand prospects: global steel industry at the end of a rare cycle as China completes its rapid economic growth phase
- Share of EAFs in the total global steel production and the share of ferrous scrap in total metallics demand recently declining
- However, global scrap availability is expected to grow strongly, suggesting that steel industry can increase its use of ferrous scrap considerably in the medium and long-term
- Steel industry has shown considerable improvement in productivity and environmental footprint
- Steel has superior environmental characteristics

Thank you for your attention.

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