

Steel in the Circular Economy

Edwin Basson, Director General, 18 May 2015



Disclaimer text

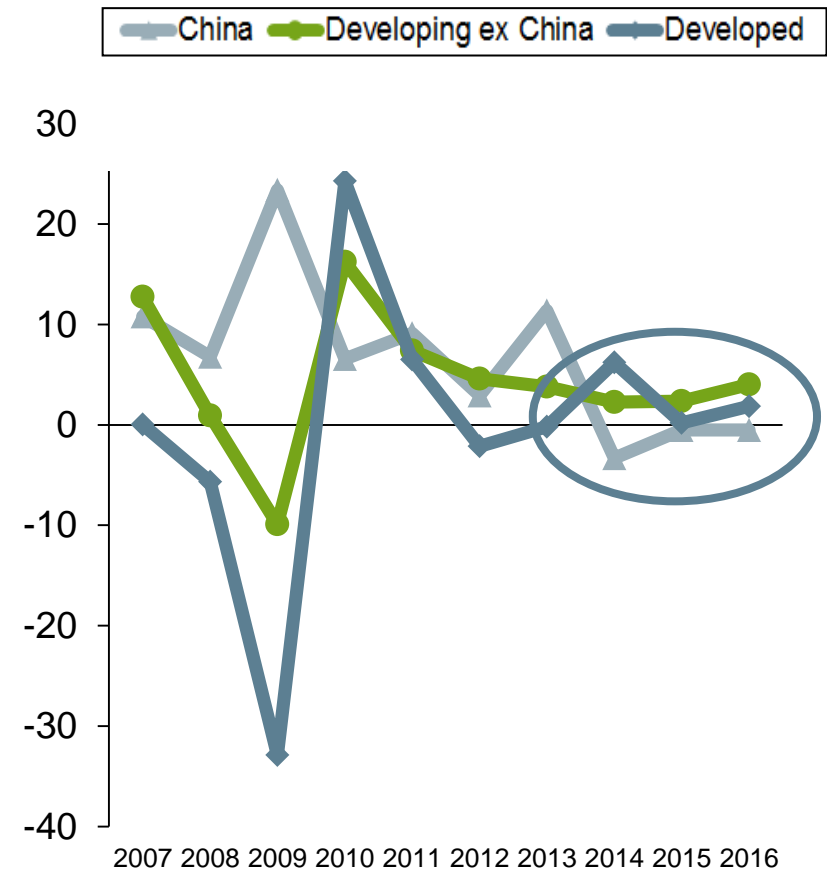
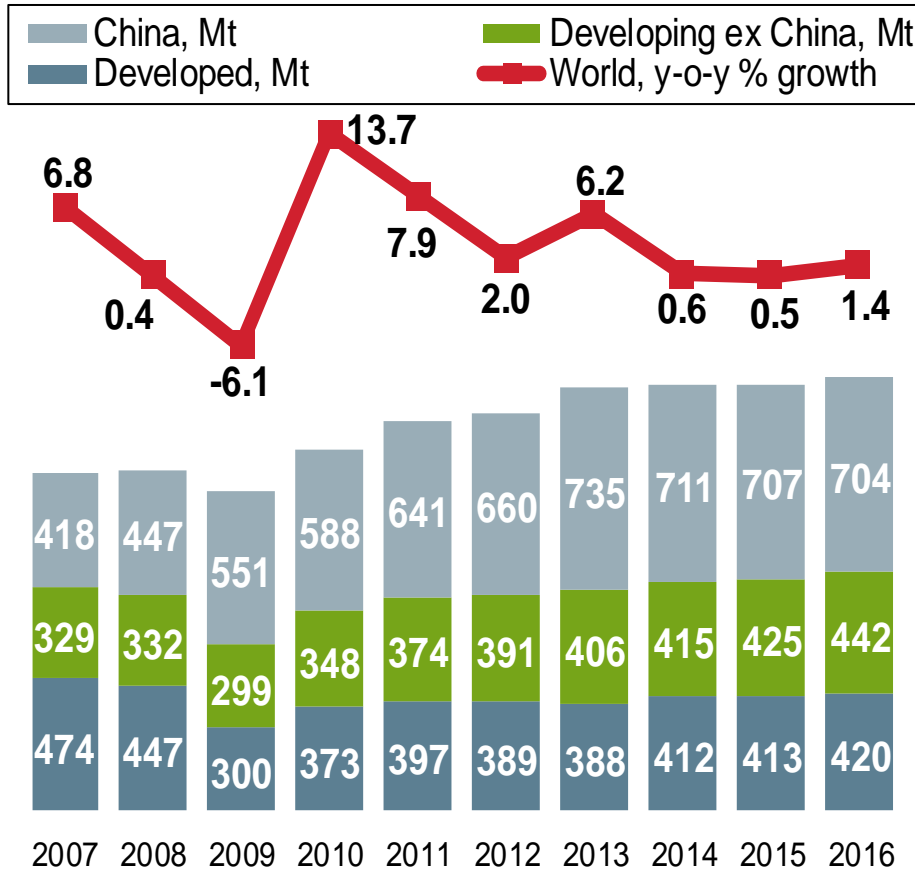
This document is protected by copyright. Distribution to third parties or reproduction in any format is not permitted without written permission from worldsteel. worldsteel operates under the strictest antitrust guidelines. Visit [worldsteel.org/About us](http://worldsteel.org/About-us) for detailed antitrust guidelines.

Expected demand for steel



China deceleration drives the outlook

Apparent Steel Use, finished steel (SRO April 2015)



Source: worldsteel SRO

SRO 2015-16: Global overview

Apparent Steel Use, finished steel (SRO April 2015)

2014

1 537.3 million tonnes, 0.6% growth

2015 (forecasts)

1 544.4 million tonnes, 0.5% growth

2016 (forecasts)

1 565.5 million tonnes, 1.4% growth

SRO submissions cover **91%** of the ASU world total (based on 2016 data)

Regional summary

Apparent Steel Use, finished steel (SRO April 2015)

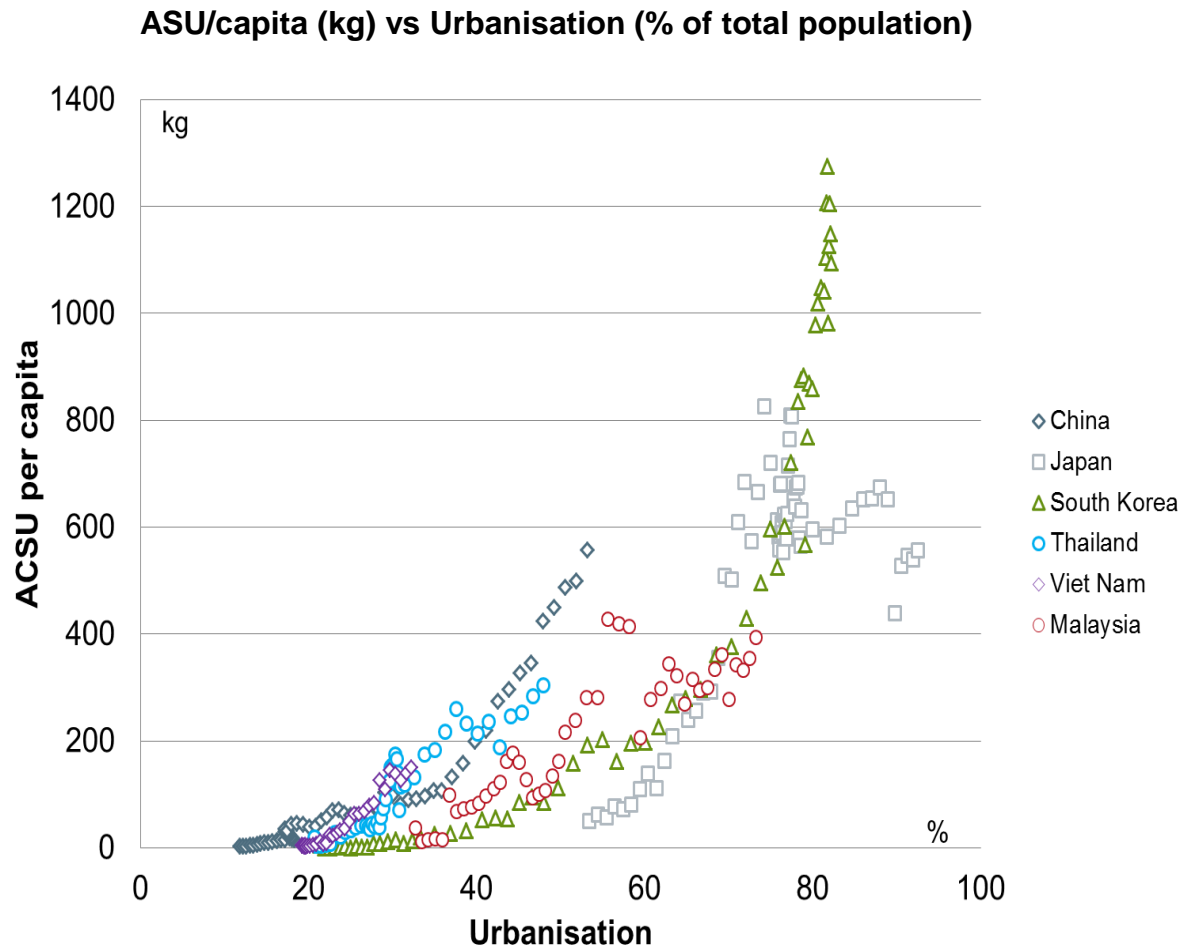
	million tonnes (Mt)			%			2016 as % of 2007
	2014	2015	2016	14/13	15/14	16/15	
World	1 537.3	1 544.4	1 565.5	0.6	0.5	1.4	128.2
European Union (28)	146.8	149.9	154.1	4.5	2.1	2.8	76.9
Other Europe	37.0	38.0	38.5	0.2	2.8	1.4	126.6
CIS	56.5	52.4	52.2	-4.9	-7.3	-0.3	92.7
NAFTA	144.6	143.3	145.1	11.3	-0.9	1.3	103.0
Central & South America	48.1	46.5	48.1	-3.9	-3.4	3.4	116.4
Africa	36.9	39.6	41.5	4.2	7.4	4.9	182.4
Middle East	51.9	53.3	55.6	3.7	2.8	4.2	126.7
Asia & Oceania	1 015.6	1 021.5	1 030.4	-1.0	0.6	0.9	150.3
China	710.8	707.2	703.7	-3.3	-0.5	-0.5	168.2

Megatrend factors affecting long-term steel demand

Global	Regional
<p>New technology in the energy sector</p> <ul style="list-style-type: none"> • Energy prices • Renewables 	<p>Population growth and middle class expansion, urbanisation</p>
<p>Technological changes in steel using sectors</p> <ul style="list-style-type: none"> • Steel intensity trends and inter-material substitution 	<p>Government reform agenda</p>
<p>Regulation</p> <ul style="list-style-type: none"> • Trade protectionism • Environmental: strengthening and aligning among regions 	<p>Changes in regional competitive positions of manufacturing and steel industry</p> <ul style="list-style-type: none"> • Evolution of manufacturing value chains

- **Base projection incorporate IHS Global Insight view on key variables for 2015-30**
 - Global population growth of 0.95% (advanced 0.4%, emerging and developing 1%)
 - Global GDP growth of 3.2% (advanced 2.0%, emerging and developing 4.7%)
- No significant changes in technology of steel using and energy sectors
- Changes in regulation and competitiveness will significantly depend on government reforms

Urbanisation and population growth



Sources: worldsteel, UN

Medium and long term steel demand forecast

Finished steel	Tonnage, Mt			ASU/cap, kg		
	2014	2020	2040	2014	2020	2040
World	1537	1663	2101	212	215	232
NAFTA	145	158	195	300	312	337
L.America	48	53	64	101	105	111
EU28	147	161	168	288	313	325
Other Europe	37	41	46	340	359	367
CIS	57	58	82	217	223	335
Middle East	52	62	87	225	243	267
AFRICA	37	50	107	33	39	54
Asia	1008	1072	1343	261	264	303
Developed Asia	146	148	120	706	716	606
Developing Asia	862	923	1223	236	240	289

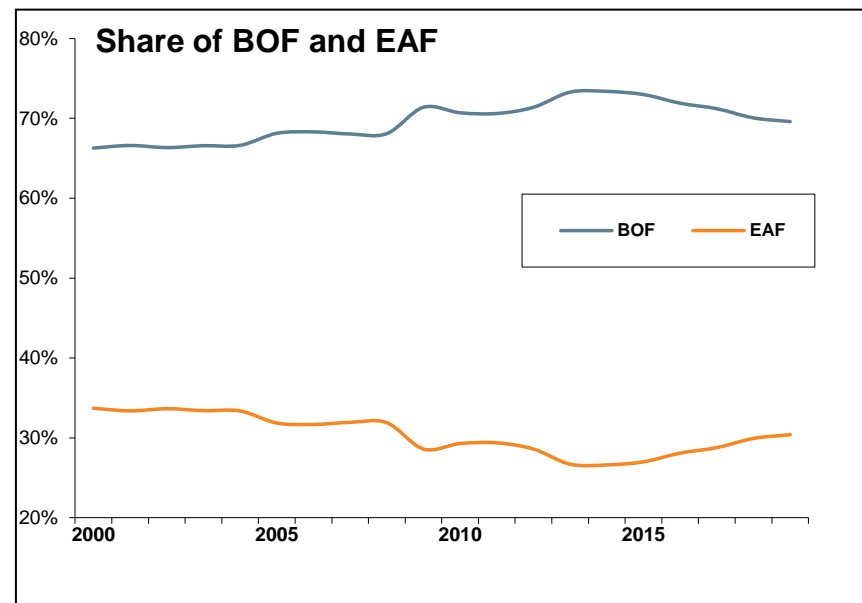
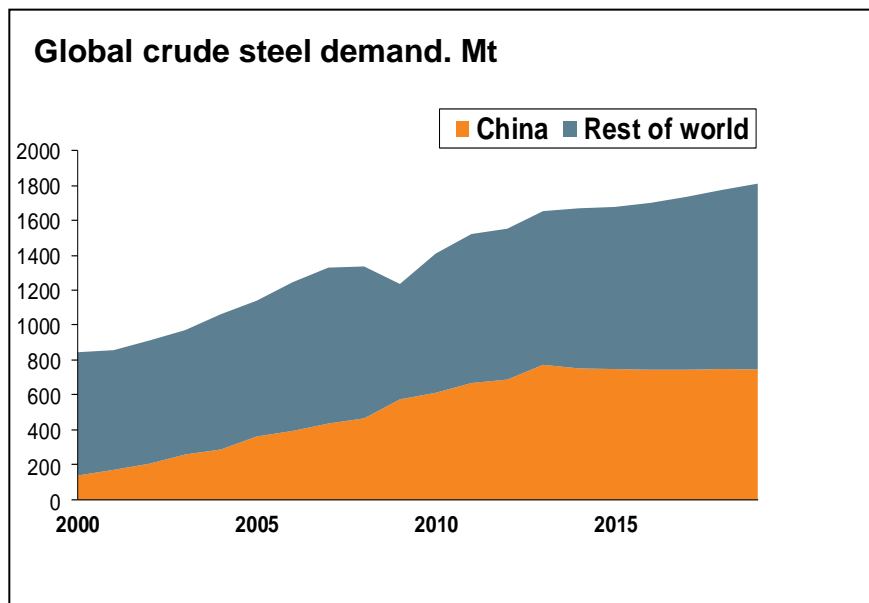
Sources: worldsteel, UN

- The global population expected to reach 9 billion in 2040. This means that steel demand will increase to 2.1 billion tonnes.

Steelmaking raw materials

Global steel production outlook, 2014-19:

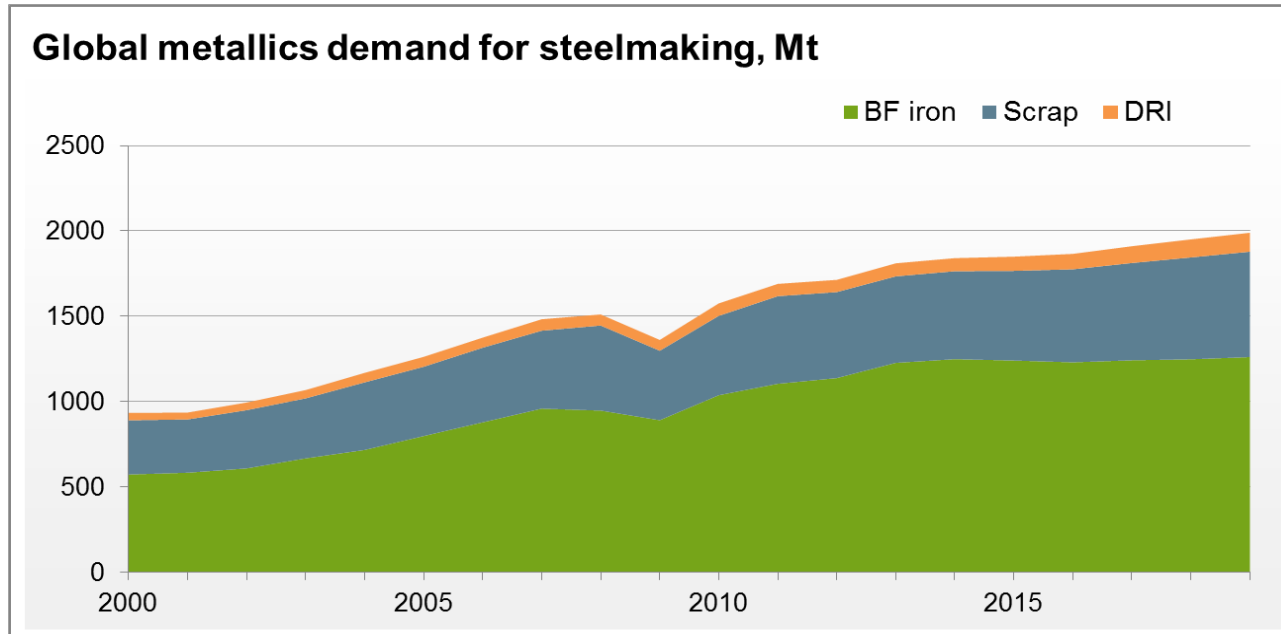
- Global EAF share expected to increase



	CAGR 2014-2019
China	-0.2%
Rest of world	3.0%
Total	1.6%

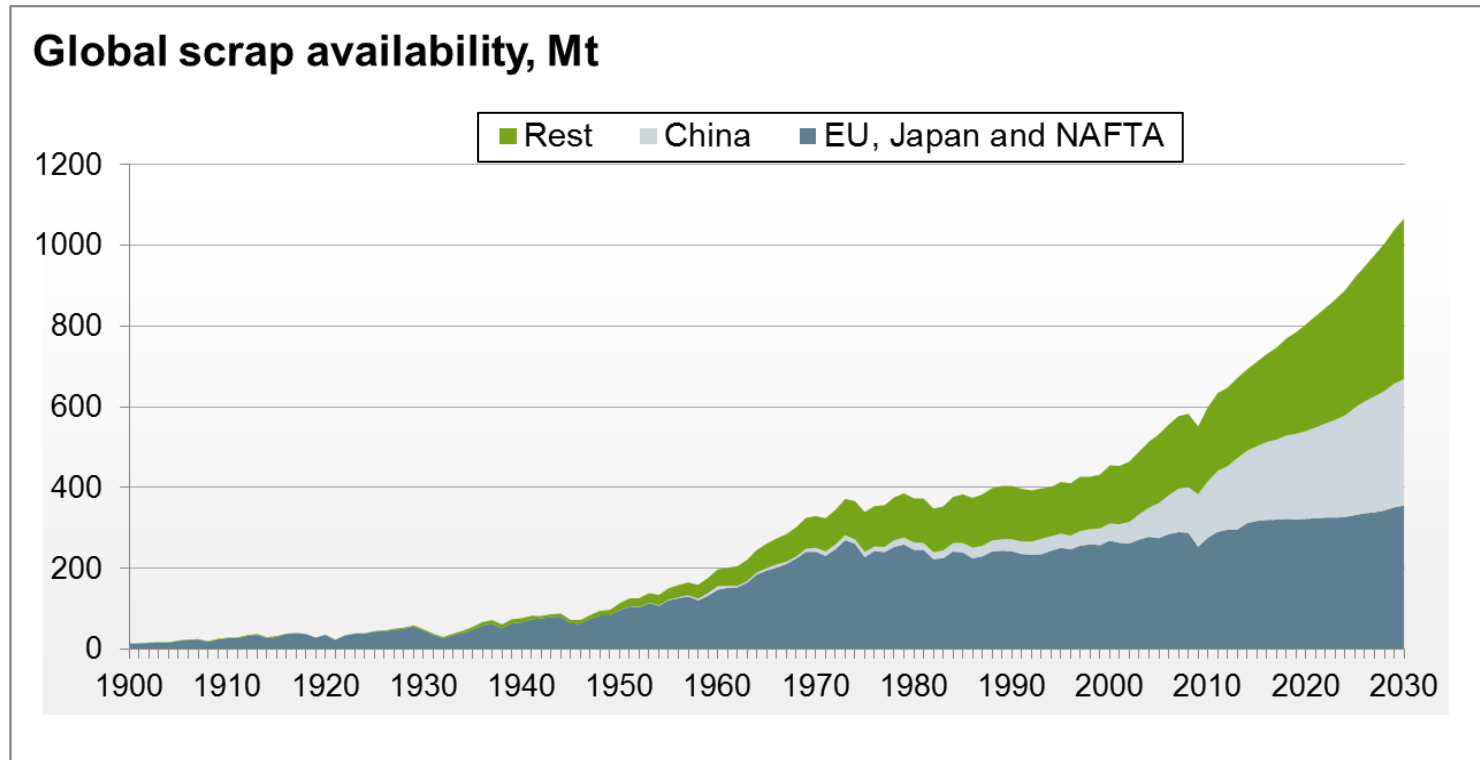
	Share 2014	Share 2019
BOF	73%	70%
EAF	27%	30%

Demand for scrap and DRI to grow, while demand for BF iron to stagnate by 2019



- Global BF iron demand for steelmaking to stagnate at around 1250 Mt
- Global demand for ferrous scrap for steelmaking to increase by about 110 Mt in 2014-19
 - China, Turkey, ASEAN, NAFTA to drive the growth in demand for scrap
- Global DRI demand to grow by about 35 Mt to 110 Mt, mainly in MENA, NAFTA and India

Global scrap availability to hit 1 billion tonnes in late 2020s

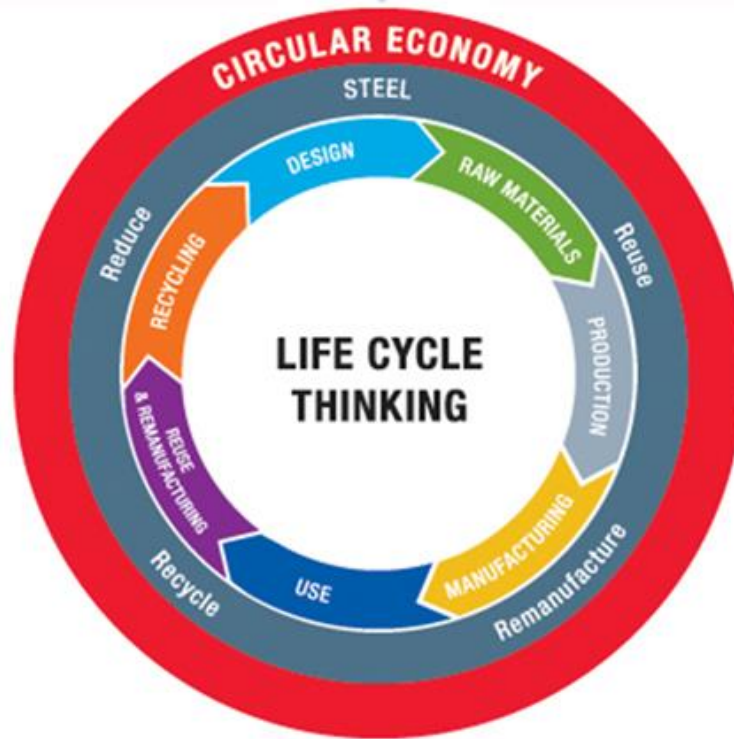


Source: worldsteel Scrap Availability Model

- The global ferrous scrap availability estimated to hit a billion tonnes in late 2020s (about 700 Mt in 2014)
- Regional distribution of scrap availability to change

Steel in the circular economy





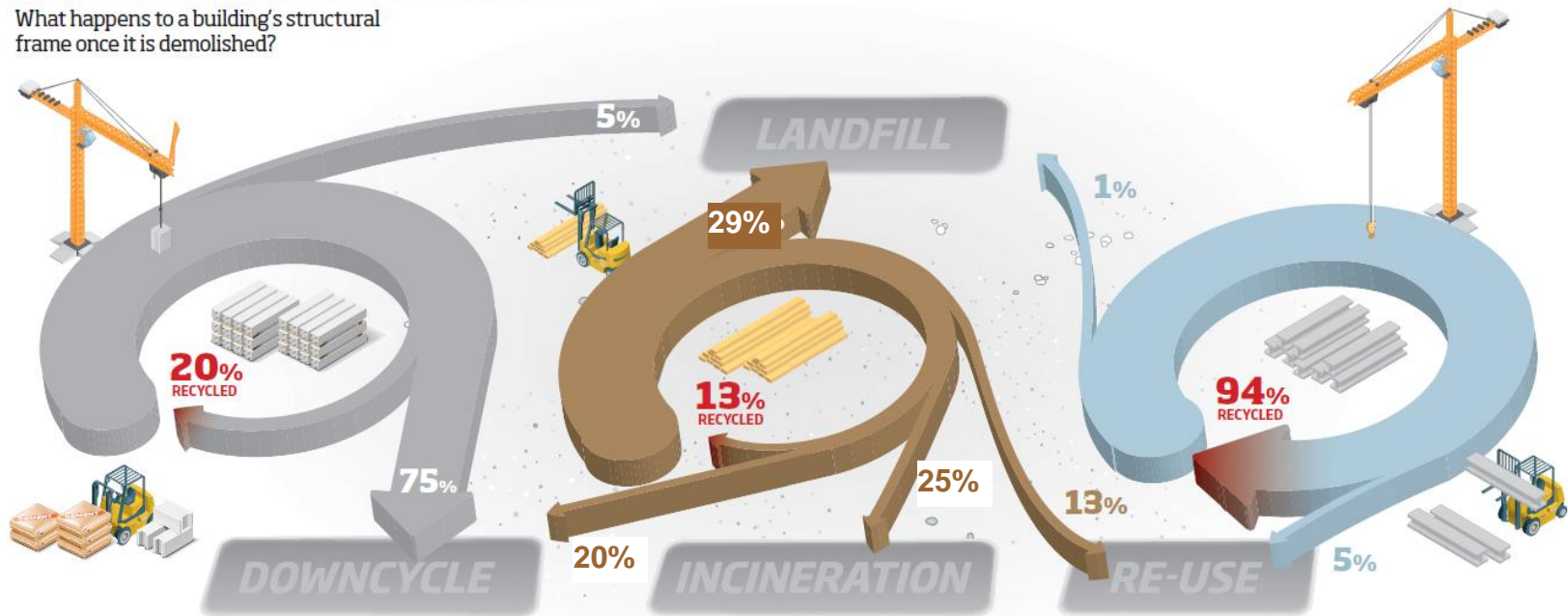
Importance of 'end of life' of materials

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.

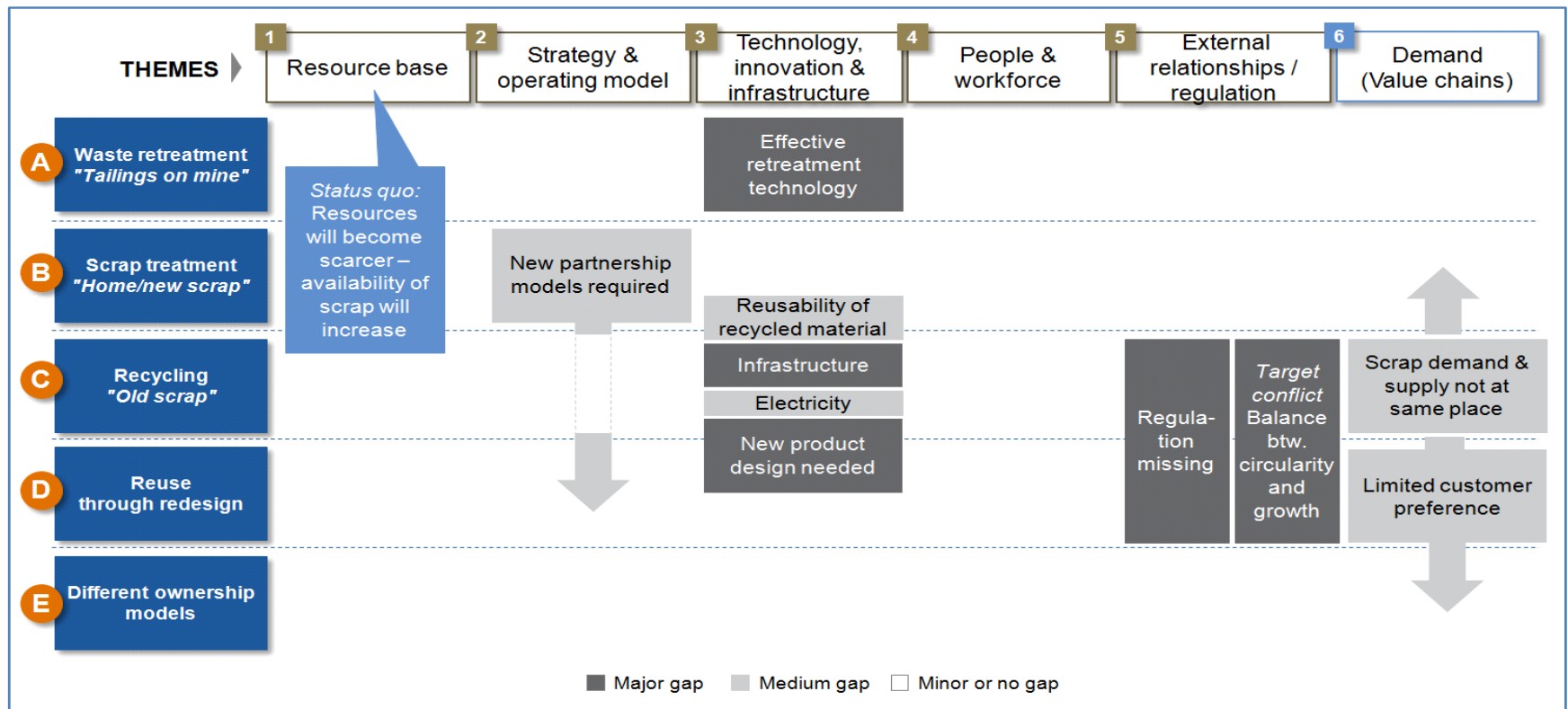
STEEL

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 99%.

These rates can be found in Material flow analysis of the UK steel construction sector, J. Ley, 2001.

Global gaps to address towards 2050



Source: WEF MMSW50 Final report

- Progress towards true circular economic systems require a value chain approach
 - Metric for success will be LCA

Thank you for your attention.

For further information contact:

Edwin Basson | Director General
World Steel Association
www.worldsteel.org

worldsteel

A S S O C I A T I O N

worldsteel.org