



Long term winners and losers in the steel value chain

Tokyo Iron Ore, Coal and Steel Briefing

Matthew Poole

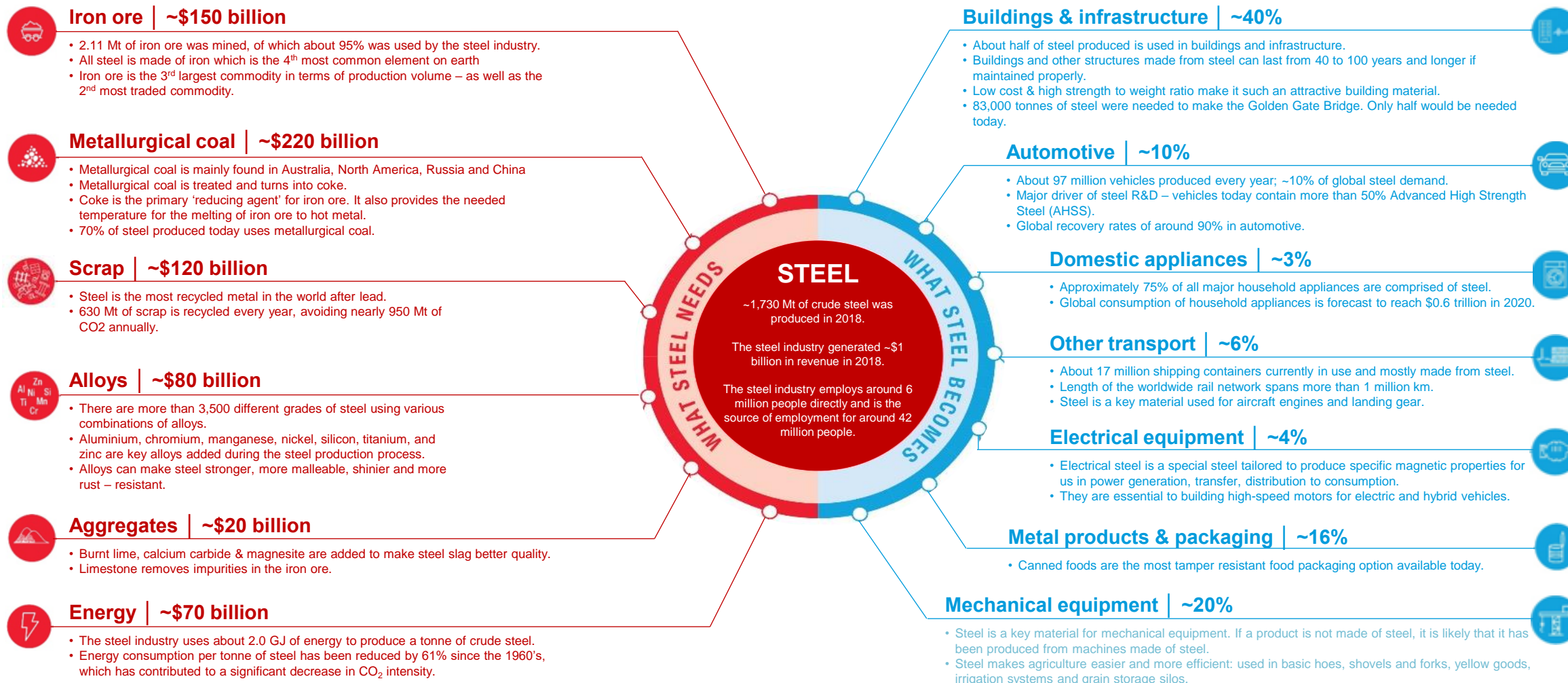
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27 November 2019

The steel value chain: a \$1 trillion industry accounting for ~ 1.3% of GDP



Source: CRU, World Steel Association, other public sources

* Market size based on current demand and average real prices over 2017-2018

How do you go about assessing long term winners and losers?

What are the long term prospects for iron ore and coal. How will increased scrap impact demand ?

What are the long term demand prospects for steel?

Long term winners and losers in steel?

What are the prospects for ferro alloys used in steelmaking?

What are the substitutes for steel that threaten long term demand outlook?

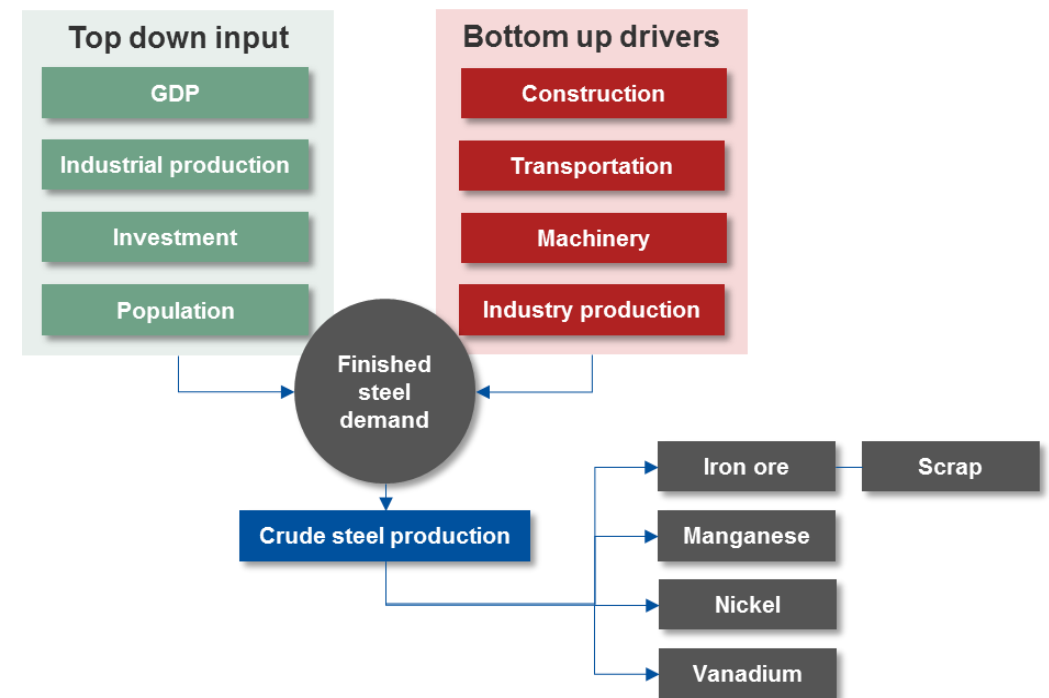
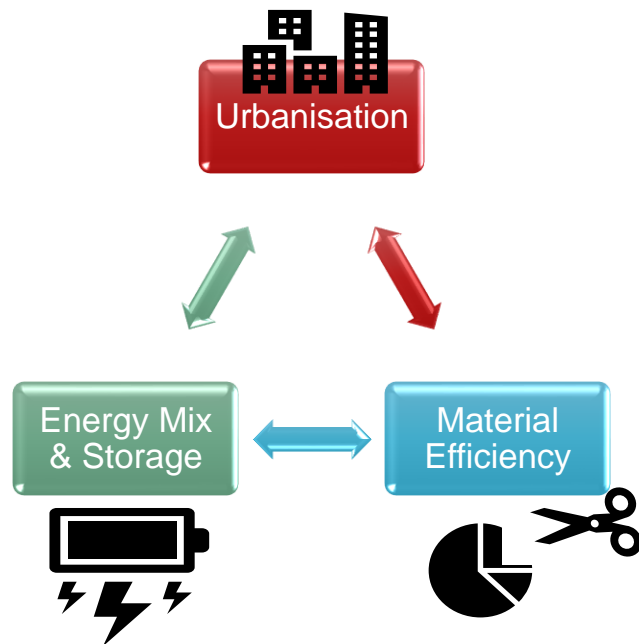
How does climate change impact on steel and the other commodities used in steelmaking?

...to answer one question you have to be prepared to ask many more questions...

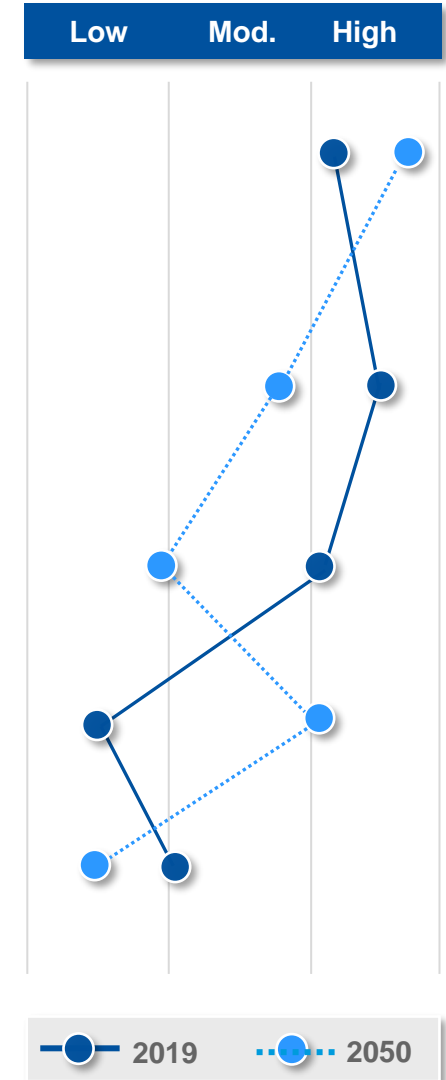
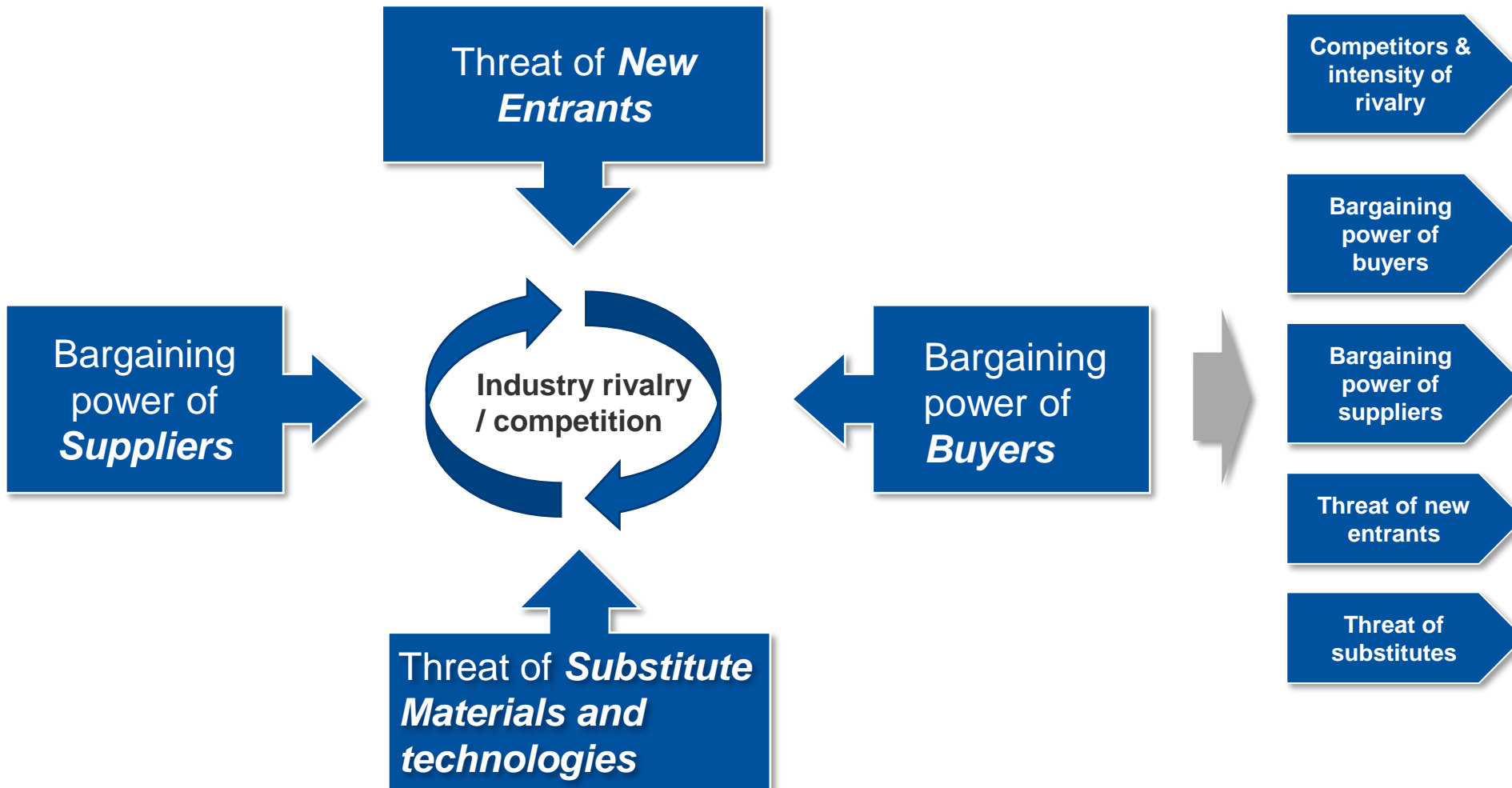
A combination of 'top down' and 'bottom up' approaches can be used, leveraging CRU data and insights throughout...

Megatrends that will shape the world's future

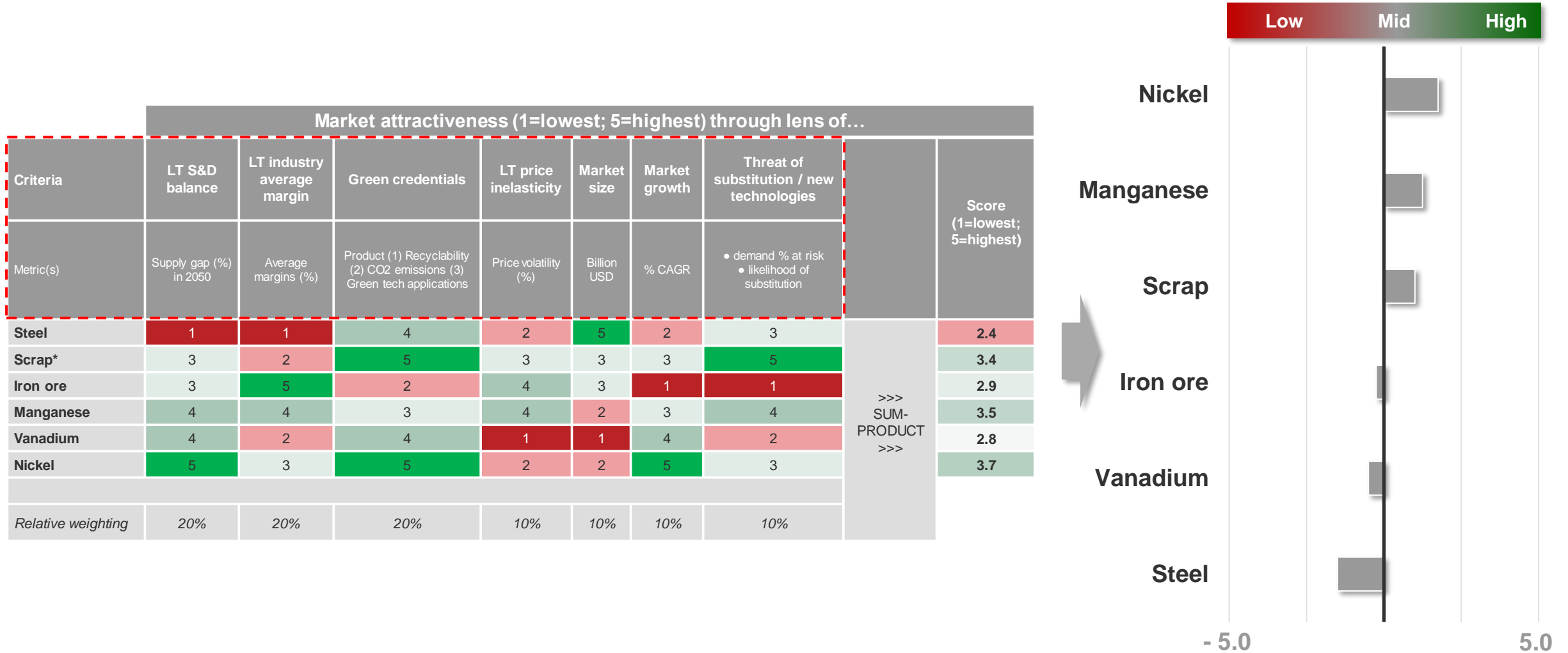
Long term market impact for steel & related commodities



Porter's Five Forces analysis was used to evaluate bargaining power across the value chain...



This enabled a long term market attractiveness index to be developed...



Scoring: Each commodity is ranked from 1 (lowest) to 5 (highest) based on a quantitative and / or qualitative assessment of the relevant metric.

An evidence based approach is used throughout to ensure robust and consistent scoring vs criteria...

Example: Modelling the impact of the 'Circular Economy' on steel demand

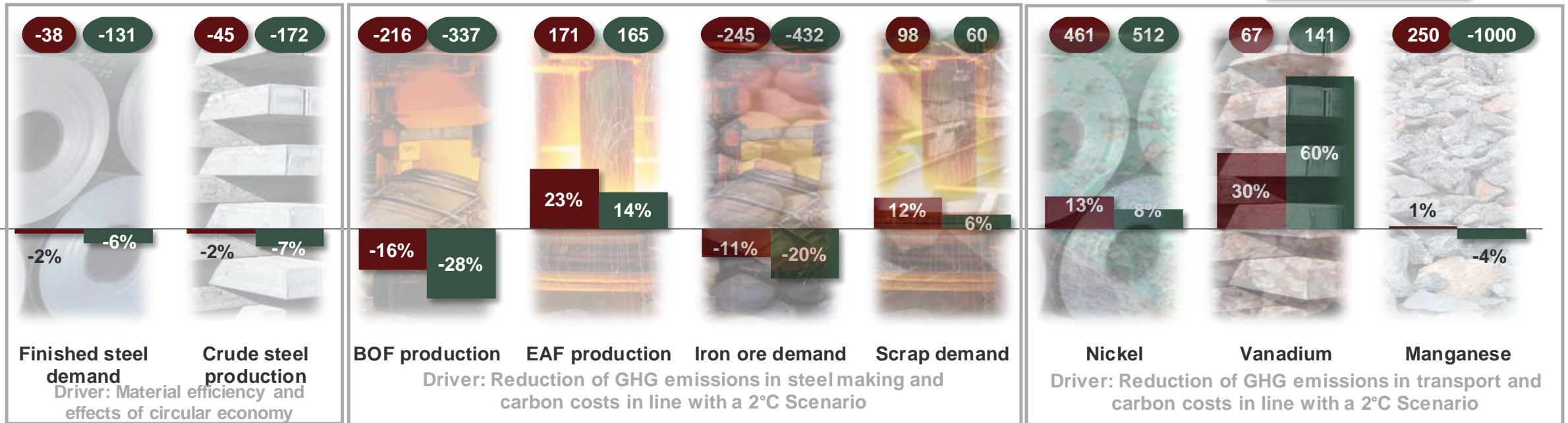
Steel end use sector >	Construction	Transportation	Machinery	Power and energy	Packaging	Electrical equipment	Defence and aerospace	Domestic appliance
Share of demand (%)								
Circular economy effects	<p>↓ Higher quality steel and better building design</p> <p>↑ More steel framed buildings</p>	<p>↓ Steel substitution and higher quality, lighter steel</p> <p>↓ Improved manufacturing yields</p>	<p>↓ Improved manufacturing yields</p>	<p>↑ More renewable energy (more steel intensive than fossil fuel power generation)</p>	<p>↓ Reducing weight of packing</p>	<p>↑ Larger power infrastructure</p> <p>↑ More electric motors</p>	<p>↓ Steel substitution</p> <p>↓ Novel manufacturing processes (e.g. 3D printing)</p>	<p>↓ Reducing weight of appliance</p> <p>↓ Improved manufacturing yields</p>
2030 steel demand change	-2%	-5%	-2%	+2%	-2%	+2%	-7%	-2%
2050 steel demand change	-5%	-15%	-5%	+5%	-5%	+5%	-20%	-5%
Steel demand change (Mt)	<p>-16</p> <p>-55</p>	<p>-14</p> <p>-50</p>	<p>-5</p> <p>-17</p>	<p>2</p> <p>6</p>	<p>-2</p> <p>-6</p>	<p>0.5</p> <p>2.0</p>	<p>-1</p> <p>-2</p>	<p>-3</p> <p>-9</p>
								<p>■ 2030 ■ 2050</p>

An evidence based approach is used throughout to ensure robust and consistent scoring vs criteria...

Example: Assessing the impact of a 'Green World' scenario on steel and steelmaking raw materials demand

Scenario impact (change in demand Green Scenario vs Base Case), Mt & %

■ 2030 ■ 2050



Some conclusions...

Steel has a long term growth story – even in a ‘Green World’ scenario.

Steel is, and will remain, a less attractive commodity than the raw materials used to produce it. Supplying the industry will remain a more attractive proposition than producing steel.

Nickel, Manganese and scrap are ranked at the top of the commodity index as having the best long-term fundamentals within the steel value chain.

The long-term attractiveness of Nickel and Manganese is influenced by the development of the EV / batteries sector.

Not all low carbon steelmaking demand can be met by scrap based EAF. There will still be a need for iron ore in 2050.



Thank you for your attention!



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