Towards a net-zero emissions steel industry
Åsa Ekdahl, World Steel Association, October 2019
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Outline

- Where are we and where do we need to go?
- How do we get there?
  - Efficiency improvement
  - Increased scrap availability
  - Breakthrough technologies
- How can we make it happen?
  - Resources required
  - Policy needs
  - Market conditions
- Conclusions
Steel demand is expected to keep growing for decades to come

Direct CO₂ intensity of crude steel production and steel demand

Source: IEA
Efficiency improvement – the step up programme

- Raw materials and Energy are the two most important cost factors in steelmaking.
- Worldsteel has identified 4 key levers which can help optimise these as well as lead to lower CO2 intensity in steelmaking:
  - Raw material quality
  - Energy intensity
  - Process Reliability
  - Process Yield
- These four levers are covered by a recently initiated industry wide programme to drive efficiency in production called step up.
- Step up is a 4-stage efficiency review process, based on leading practise, to support improvements in plant operations to efficiency levels corresponding with the steel industry’s top performers.
- The programme is being tested across 5 plants in 2019 and then rolled out much more widely through 2020-2025.
Increased scrap availability will improve specific CO2 emissions

- Increased scrap use in either EAF or BF route will lower specific CO2 emissions of the industry as a whole
Increased Scrap Availability
Breakthrough Technology

Direct CO₂ intensity of crude steel production and steel demand

Index: 2000 = 100

Demand increase

step up

Increased Scrap Availability

Breakthrough Technology

SDS ambition
Availability of resources vary around the world

- The resources needed for breakthrough technologies are unevenly spread globally.
- Availability and cost will determine which technologies will be implemented where.
- Industrial symbiosis could also play an important role as by-products from one industry becomes input material for another.

Source: IEA

Long-term hydrogen production costs from solar & wind systems

Source: IPCC

Storage potential by showing the distribution of sedimentary rock around the world

Source: IPCC
Policy requirements

- Policies that ensure availability of affordable and low carbon resources (H2, electricity, biomass, CO2 storage etc.)
- Policies that prevent carbon leakage and do not hinder international trade
- Policies that provide support and partnerships for breakthrough technology development and implementation
- Policies that reduce the first mover disadvantage – during a period traditional and low carbon production will coexist
How to create a market for low carbon steel products?

- There is currently a low demand for low carbon steel.
- Low carbon steel will be more expensive, irrespectively of the choice of breakthrough technology.
- Additional costs for production are expected to vary a lot between regions depending on available resources.

Possible ways forward:
- Responsible Steel – First standard in Q4 2019
- Public Procurement – Requirements to buy x% carbon free steel
- Byers’ clubs – Commitments by customers e.g. RE100
Conclusions

- The IEA is developing a Global Iron and Steel Roadmap to analyse sustainable transition pathways for steelmaking. Planned release is Q1 2020.
- In the short term, production efficiency and the worldsteel initiative Step Up will be important. While increased scrap availability will play an important role in the medium term, breakthrough technologies are absolutely crucial for the industry to reach net-zero emissions.
- There is not one technical solution for the industry but a portfolio of innovative technologies will be required. Their implementation will depend on resources available and policies in place.
- Stable policy support to unlock investment in RD&D, technology diffusion and the creation of a market for low carbon steel is a pre-requisite to accelerating the transition.
Thank you for your attention.

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