Iron and Steel Technology Roadmap
Towards more sustainable steelmaking
Launch webinar, 08 October 2020
What do net-zero ambitions mean for energy technology?

• A growing number of governments and companies are making ambitious pledges to reach net-zero emissions in the coming decades.

• Major progress has been made: the rise of solar PV, wind and batteries has significantly reduced the costs of renewable electricity and electric cars.

• But an energy system transition to net-zero emissions requires broader technology efforts in three critical areas:
  • Existing assets in power generation and industry
  • Clean energy innovation
  • Infrastructure that enables rapid technology deployment
Focusing on the power sector is not enough to reach climate goals. About half of all CO$_2$ emissions today are from industry, transport and buildings.
Emissions from heavy industry sectors are ‘hard to abate’

Fossil fuels account for around 85% of the final energy used in heavy industries, which, combined, account for just under a fifth of total energy system CO₂ emissions.
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Heavy industry final energy demand and direct CO\textsubscript{2} emissions, 2019

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Existing capacity is the starting point for the transition

Geographic distribution and average age of key ironmaking assets

- Around 50% of the existing stock of ironmaking equipment is based in China, with India contributing a further 5%.
- The current stock is quite young, with a global average age of 13 to 14 years for blast furnaces and DRI furnaces.
Steel continues to play a pivotal role across multiple end-use sectors.

Global demand for steel is projected to increase by more than a third through to 2050 in our baseline projection. In the Sustainable Development Scenario, demand is reduced through material efficiency strategies.
There is great potential for a more efficient use of steel. Material efficiency strategies pursued across the supply chain deliver savings of around 20% in global steel production in the Sustainable Development Scenario, relative to our baseline projection.
A portfolio of mitigation strategies is required

Technology performance improvements and material efficiency deliver 90% of annual emission reductions in 2030. In the longer term, innovative technologies such as CCUS-equipped and hydrogen-based production are required.
A diverse portfolio of energy carriers and processes

Unabated use of coal drops by more than 50% in the Sustainable Development Scenario by 2050, facilitated by widespread deployment of innovative technologies.
Sustainable steel requires a major push for clean energy infrastructure.

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Innovation is key to delivering deep emissions reductions

In the Faster Innovation Case, demonstration and prototype stage technologies contribute nearly three times as much emissions reductions in 2050 as in the Sustainable Development Scenario.
Governments have a critical role to play in accelerating the transition

- **Driving force: stakeholder collaboration**
  - Governments, steel producers & other actors

- **Framework fundamentals**
  - Planning and policy for long-term CO₂ emission reductions

- **Targeted actions for specific technologies and strategies**
  - Steelmaking technologies
  - Scrap use & steel demand
  - Managing existing assets & near-term investment
  - Creating a market for near-zero emission steel
  - Developing earlier-stage technologies
  - Accelerating material efficiency

- **Necessary enabling conditions**
  - International co-operation & a level playing field
  - Infrastructure planning & development
  - Tracking progress & improved data