

Net Zero by 2050: Focus on Industry

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The IEA's Roadmap series

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The IEA's roadmap series have covered numerous topics over the past decade, spanning three dimensions: technology roadmaps, energy system roadmaps and country roadmaps.

Set near-term milestones to get on track for long-term targets



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Prepare for the next phase of the transition by boosting innovation



Unlocking the next generation of low-carbon technologies requires more clean energy R&D and \$90 billion in demonstrations by 2030; without greater international co-operation, global CO₂ will not fall to net-zero by 2050.

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Dramatic reductions in industrial CO₂ emissions are required



The majority of residual emissions in industry in 2050 come from heavy industries in emerging market and developing economies

Where do we start in industry? Examining existing assets



Around 60% of the existing stock of ironmaking equipment is based in China.

The current stock is quite young, with a global average age of 13 to 14 years for blast furnaces and DRI furnaces.

Addressing CO₂ emissions from heavy industry



Intervening at the end of the next 25-year investment cycle could help unlock 60 Gt CO₂, around 40% of projected emissions from existing heavy industry assets

Addressing CO₂ emissions from heavy industry

Global CO₂ emissions reductions in heavy industry by mitigation measure and technology maturity category in the NZE



An array of measures reduces emissions in heavy industry, with innovative technologies like CCUS and hydrogen playing a critical role

Innovative technology deployment in heavy industry



Near-zero emissions routes dominate cement, primary steel and chemicals production by 2050, with key roles for CCUS and hydrogen-based technologies

Heating technologies in light industries

Share of heating technologies in light industries in the NZE



Technology

- Fossil fuel heater
- Biomass heater
- Electric heater
- Hydrogen heater
- Heat pump
- Other heat sources

Sub-sectors

- Mining and construction
- Food and tobacco
- Machinery
- Textile and leather
- Transport equipment
- Wood and wood products

The share of electricity in satisfying heat demand for light industries rises from less than 20% today to around 40% in 2030 and about 65% in 2050

Governments have a critical role to play in accelerating the transition

Driving force: stakeholder collaboration

Governments, industrial producers, consumers, financial institutions and other actors





