United Nations Framework Convention on Climate Change

Agenda item: 4 (c) iii Transformative industry

Draft policy brief on integrating hard-to-abate industries in updated NDCs

TEC/2024/29/13

Technology Executive Committee, 29th meeting and TEC-CTCN AB Joint session

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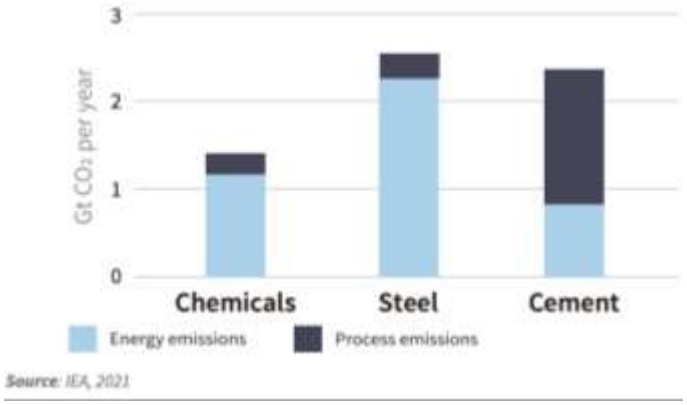
BACKGROUND

- **Key Sector Impact**: Industry is responsible for 34% of 2019 emissions, with hard-to-abate industries (HAI) contributing significantly. Transitioning these sectors towards zero-emission pathways is crucial for reducing GHG emissions and staying on course to meet the 1.5-degrees target.
- **Rising Emissions Concern**: Without action, emissions from HAI expected to rise.
- **Focus on NDC Updates**: Critical need to integrate low and net-zero emission technologies, particularly in HAI, into Nationally Determined Contributions (NDCs) for 2025-2035.



OBJECTIVES AND SCOPE OF THE POLICY BRIEF

Provide guidance to countries on integrating industrial emission reduction strategies into their updated NDCs, focusing on hard-to-abate industries (HAI) like steel, cement, and chemicals.

- **Technology & Policy Options**: Highlight the latest decarbonization technologies and policy strategies to help countries reduce emissions in key industrial sectors, with a focus on urgent, actionable solutions.
- **Practical Policy Recommendations**: Offer specific, implementable policies for different countries to adapt, accelerating progress towards achieving net-zero industrial emissions by mid-century.
- **Finance & Investment Mobilization**: Recommend clear policy signals and highlight investable low-carbon technologies to attract finance and mobilize sustainable investments in industrial decarbonization.

TECHNOLOGIES FOR DECARBONIZING HARD-TO-ABATE INDUSTRY (HAI)

Cross-Sectoral Technologies:

- **Electrification of industrial processes**: Transition to renewable electricity and low-GHG energy carriers for industrial heat and power.
- **Energy efficiency**: Process optimization, equipment upgrades, and digitalization to reduce energy consumption.
- **Material efficiency**: Reduce use of GHG-intensive materials through eco-design and switching to alternatives like wood and cementitious substitutes.
- **Circularity**: Close material and energy loops by enhancing recycling and minimizing waste in high-GHG industries.
- **Decarbonizing production processes**: Invest in emerging technologies like hydrogen-based production, carbon capture, and bio-based chemicals.

Electrification | Energy efficiency | Material efficiency | Circularity | Decarbonizing production processes

TECHNOLOGIES FOR DECARBONIZING HARD-TO-ABATE INDUSTRY (HAI)

Sectoral Technologies:

- **Steel**: Green hydrogen-based steelmaking, Electric Arc Furnaces (EAF)[1], and carbon capture use and storage (CCUS) for emissions reduction.
- **Cement**: Use alternative clinker materials, improve energy efficiency in kilns, and apply carbon capture solutions.
- **Chemicals & Pulp/Paper**: Biomass feedstocks, electrification, and advanced catalysts to reduce emissions in chemical production and bio-based energy for pulp and paper.

[1] Electric Arc Furnances (EAF) use electricity to melt scrap metal, direct reduced iron, or hot briquetted iron, offering high efficiency by minimizing energy loss through rapid on-off capabilities, while also reducing greenhouse gas emissions compared to blast furnaces.

IMPLEMENTATION BARRIERS

- **Technological Maturity**: Many technologies, like hydrogen and advanced catalysts, need further development to become scalable.
- **High Capital Costs**: Significant upfront investments hinder adoption, especially in regions with limited financing.
- **Infrastructure Challenges**: Building infrastructure for hydrogen distribution, CO2 storage, and renewable energy grids is complex and requires heavy investment.
- **Regulatory Uncertainty**: Inconsistent policies and carbon pricing lead to industry relocation and slow adoption.
- **Lack of Transparency**: Weak monitoring systems hinder accurate tracking of emissions and progress.
- **Market Volatility**: Fluctuations in carbon credit and energy prices impact investment stability.
- **Public Perception & Engagement**: Effective decarbonization requires not only community support but also the rethinking of industrial norms.
- **Just Transitions**: Ensuring a fair, equitable shift from carbon-intensive industries is vital.

POLICIES TO ENABLE LOW EMISSION AND NET-ZERO TECHNOLOGIES

Economic and Regulatory Incentive Policies

- Introduce carbon pricing mechanisms (carbon taxes or cap-and-trade systems) to incentivize emission reductions.
- Provide subsidies, tax breaks, and regulatory support for low-carbon technologies like CCUS and renewable energy.

Electrification and Decarbonization Policies

- Establish policies that promote the electrification of industrial processes and transition to renewable energy sources.
- Support the development of green hydrogen infrastructure and incentivize its adoption through government programs.

Policies for Research, Development & Demonstration (RD&D)

- Create policy frameworks that fund RD&D for decarbonization technologies, focusing on industry-specific innovations.
- Offer enhanced incentives for collaborative R&D between public and private sectors in hard-to-abate industries.

Green Public Procurement Policies

- Implement preferential purchasing policies for low-carbon industrial products to create market demand.
- Develop procurement standards that prioritize products with lower embodied carbon.

Policies for Definitions and Standards

- Set clear regulatory standards and carbon labelling schemes to ensure transparency in the carbon footprint of industrial products.
- Encourage adoption of life cycle assessments (LCA) and carbon footprint labelling to support low-emission materials.

Capacity Building

- Implement policies that enhance governmental and institutional capacity to support low-carbon technology adoption.
- Encourage international cooperation and voluntary agreements to build the necessary frameworks for sustainable industrial practices.

STEPS FOR IMPLEMENTING DECARBONIZATION POLICIES IN HARD-TO-ABATE INDUSTRIES (HAI)

Develop Roadmaps and Milestones:

- Align with 1.5°C and net-zero targets.
- Set clear sector-specific goals, timelines, and regular progress monitoring.

Define Roles and Responsibilities:

- Governments: Create regulatory frameworks and provide incentives.
- Industry: Invest in and adopt decarbonization technologies.
- Financial Institutions: Offer funding and de-risking solutions.
- International Organizations: Support capacity-building and global cooperation.

Create Investment Plans:

- Align public and private financing to support industrial decarbonization.
- Issue green bonds and establish financial mechanisms for renewable energy and technology deployment.

Leverage Blended Finance:

- Combine public funds with private capital to scale up investment in low-carbon technologies.

Promote International Cooperation:

- Foster collaboration and knowledge sharing through joint research, demonstration projects, and multilateral agreements.

Integrate Industry in NDC Updates:

- Ensure industrial decarbonization strategies are included in updated NDCs and long-term low-emission development strategies (LT-LEDS).

KEY MESSAGES

- Industry contributes 34% of all GHG emissions, making the transformation of key industrial sectors essential to meet the 1.5-degree target.
- Low and near-zero emission technologies—such as electrification, renewable energy, energy efficiency, circularity, hydrogen-based steelmaking, carbon capture and storage (CCS), electric boilers, and high-efficiency electric kilns—are vital to reducing industrial emissions.
- Progress tracking through roadmaps and milestones ensures emission reduction targets are met.
- Collaboration between industries, research institutions, financial institutions, and governments can accelerate the development and deployment of low and net-zero emission technologies.
- International cooperation and knowledge sharing drive innovation, technology transfer, capacity-building, and gender equality, with several roadmaps and initiatives already underway.

POLICY RECOMMENDATIONS ADDRESSED TO POLICY-MAKERS

- ✓ Consider the approaches and technologies, the enabling policies and the actions for implementation **described in this brief** to enhance industrial decarbonization, particularly in HAI.
- ✓ Set clear targets and policies to **phase out unabated coal** in key sectors like steel, cement, and chemicals, ensuring a just transition for workers and communities.
- ✓ Prioritize **tripling renewable energy capacity** globally by 2030, with policies to incentivize direct electrification of industrial processes through renewable sources.
- ✓ Double the global rate of **energy efficiency improvements** by 2030 through energy audits, best practice sharing, and adopting energy-efficient technologies in industrial processes.

The policy brief also includes policy recommendations addressed to international development organizations.

Thank you!

Merci!

¡Gracias!

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Спасибо!

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