CAETS
International Council of Academies of Engineering & Technological Sciences

CAETS Releases New Report

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PRESS RELEASE

Today, CAETS releases a new report, ***Towards Low-GHG Emissions from Energy Use in Selected Sectors: Looking Beyond 2040.*** The report's premise is that a sustainable long-term future requires early action. Specifically, it addresses what must be done in the near term to ensure that proven, deployable technologies are available to help achieve substantially lower greenhouse gas (GHG) emissions from energy use in important industry sectors beyond 2040.

Based on earlier work that had a shorter time horizon (see *Towards Low-GHG Emissions from Energy Use in Selected Sectors*), this "sequel project" examined seven capital-intensive critical Industry sectors:

- Forestry
- Agriculture and food
- Oil and gas
- Chemicals
- Cement
- Iron and steel
- Buildings and smart cities

GHG emissions unrelated to energy use in these sectors were considered as appropriate, and supplementary cross-cutting chapters on hydrogen, carbon capture and storage (CCS), and coupling (i.e., multi-industry integration) are included. These additions provide a more complete view of future decarbonization challenges and opportunities.

Project Methodology

The long-term future of GHG emissions relevant to these seven industry sectors is uncertain, shaped by complex interactions that include, but are not restricted to, geopolitics, demographics, policies and regulations, markets, economics and investments, public attitudes, technological advances, and environmental changes. Predicting the outcomes of these interactions with certainty is difficult, if not impossible, yet strategies are needed to prepare for a wide range of possibilities.

The sequel project employed the foresight approach with scenario creation to arrive at strategies applicable under a wide range of conditions. This work was performed by 52 experts convened from CAETS Academies, professional organizations, industry, and academia, spanning 24 countries. The report also benefitted from contributions by 16 external reviewers and official feedback from several CAETS Academies.

Main Results: Robust Strategies

The full report lists scenarios and strategies specific to each industry sector, with the strategies also stated in the Executive Summary. While the latter are numerous and differ in detail, the following six strategies (called "robust strategies") were found to be applicable to all industry sectors and therefore hold particular importance for leaders in industry, government, and academia:

- Ensuring a well-educated, knowledgeable citizenry that will support the introduction and use of policies, products, and processes aimed at meeting sustainability objectives.
- Maintaining and expanding an expert workforce capable of conceptualising and implementing new products and processes. This will require stronger and better-resourced educational institutions and research centres of excellence and heightened collaboration among industry, academia, and government.
- Implementing policies, regulations and practices, including incentives and taxation measures, that are more supportive of accelerated process and product innovation.
- Intensifying collaboration at the national and international levels to accelerate development and adoption of products and processes without prohibitive trade barriers and subsidies.
- Using digitisation and artificial intelligence to create and implement these changes.
- Accounting for regional and national characteristics and differences, levels of general and economic development and the capital-intensive nature of these industry sectors.

Intent and Future Work

The CAETS Energy Community did not develop this report with the intent of being prescriptive, but rather to engage readers in considerations and actions appropriate for their industry sectors and national realities. As the work neared completion, two additional general conclusions were reached:

- Artificial intelligence tools could be used to gain additional insights into industry characteristics, possible strategies, and potentially attainable results. Preliminary indications were promising; however, they also suggested that considerably more work is needed beyond the scope of the sequel project to harmonize AI insights with engineering fundamentals and local conditions.
- A greater understanding of energy security is needed, including energy affordability for end users. A new project to support this need has been initiated by the CAETS Energy Community under the leadership of the Indian National Academy of Engineering (INAE).

About CAETS and the CAETS Energy Community

CAETS (the International Council of Academies of Engineering and Technological Sciences) convenes engineering and technology leaders to advance solutions to global challenges. The CAETS Energy Community brings together experts from member academies and partners to identify actionable strategies for deep emissions reductions in major sectors.