

Concept Note

Hydrogen Application in Hard-to-Abate Industries – Steelmaking

Decarbonising hard-to-abate industries calls for measures to reduce emissions from fuel combustion and process emissions. These measures can yield incremental emission savings for abating emissions at scale. As the last frontier towards the net-zero goal, hard-to-abate sectors such as steel and cement manufacturing units must look to transition to scalable solutions that can offer energy-saving opportunities and emissions reduction.

Studies indicate that hydrogen and carbon capture technologies are not silver bullet solutions to these problems. However, applicability and scale of implementation remain unexplored, especially in Indian conditions. As part of its funded project with the Department of Science and Technology (DST) Government of India, the Hydrogen group at the Center for Study of Science, Technology and Policy (CSTEP) examined the role of hydrogen in decarbonising the steel and cement sectors. Titled ***Advanced Process Simulation Modelling for Hydrogen Application in Steel and Cement – A Technical and Economic Assessment***, the study report estimates the amount of hydrogen that can be used in steel and cement manufacturing.

The report also provides a series of options that can be incorporated along with hydrogen to further amplify emissions reduction. Furthermore, it outlines proven ways of blending hydrogen with other fuels in cement manufacturing to increase the share of alternative fuel resources and reduce coal dependency.

The report launch event, '**Hydrogen Application in Hard-to-Abate Industries – Steelmaking**', scheduled for **16 December 2024 in New Delhi**, is a significant platform to discuss learnings from the study, particularly the steel sector. CSTEP researchers will present their research, which will be followed by two panel discussions. The first panel will set the context by addressing the challenges and bottlenecks for hydrogen incubation in industries, while the second panel will delve into long-term perspectives on the hydrogen economy, with a focus on the use of electrolysers and fuel cells.

We expect participation from the government (line ministries – Ministry of Steel, Ministry of New and Renewable Energy, Department of Science and Technology), industry (steel manufacturers, original equipment manufacturers, associations, industry bodies), and academia (IITs). Other stakeholders (think tanks, government agencies, and multilateral organisations) working in this area will also find the sessions useful.





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About CSTEP: CSTEP is a not-for-profit research organisation with a mission to enrich policymaking with innovative approaches using science and technology for a sustainable, secure, and inclusive society. Our interdisciplinary research encompasses diverse fields such as energy, urban development, climate, and air pollution.

About Hydrogen: Hydrogen is a sustainable fuel with diverse applications in areas including mobility, domestic sector, and industries. As a fuel, it is superior to the traditional fossil-fuel route owing to its scalability and versatility. Despite the uncertainty in terms of storage, the adoption rate is expected to drive the green hydrogen market. CSTEP's research is focussed on the application of hydrogen in decarbonising hard-to-abate industries for a sustainable and secure future.

