

Climate Action opportunities for India's Public Sector Enterprises – a workshop by SCOPE & GIZ

On the 12th of March 2024, under the Indo-German Support Project for Climate Action in India, a workshop on 'Decarbonisation of PSEs and the Role of Green Hydrogen for Public Sector Enterprises (PSEs)' was organized by the Standing Conference of Public Sector Enterprises (SCOPE), GIZ India and the Indo-German Energy Forum. It provided a 'Multi-Level Perspective'¹ on the ongoing climate action developments in India, particularly decarbonization-related transformations at three levels, namely across the '*landscape*' (policies, regulations, finance mechanisms), in existing '*systems*' and evolving '*innovations*'. During the workshop, a comprehensive study "Decarbonising India – Potential for Electrification across India's Economy & Assessment of Electricity Needs" was released which is accessible at https://www.energyforum.in/fileadmin/user_upload/india/media_elements/publications/20240310_Decarbonising_India/Max_electrification_India.pdf

The following sections provide a brief insight into the solutions, ongoing efforts and financing

mechanisms that were discussed.

Climate action tools and solutions

Role of Climate Co-benefits in strengthening climate action

As part of the ongoing Indo-German Bilateral Cooperation, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is implementing the Indo-German Support Project for Climate Action in India (CAP). The project is supported by the German Federal Ministry of Economic Affairs and Climate Action (BMWK) and Ministry of Environment, Forest, and Climate Change (MoEFCC) is the political partner in India. One of the focus areas of the project is the development of methodologies for the accounting of climate co-benefits, measured in Green House Gas (GHG) emissions or sinks, for programmes of the Government of India and activities of the public and private sector companies that do not have a specific climate focus.

There are several development programmes and policies currently being implemented in India which do not have climate impacts as their core objective.

However, these programmes do have climate impacts-mitigation, adaptation, and biodiversity- that are currently not measured and reported.

Climate co-benefits as a metric can very effectively show how development and climate can work together. Climate co-benefits methodologies for the urban forestry scheme can contribute to accurate accounting of **mitigation effects** of the scheme and can also measure **adaptation and biodiversity impacts** of the scheme. Flagship forestry programs like the Green India Mission have accrued several adaptation benefits over the last decade and have helped forest and forest-fringe communities deal with climate impacts like heatwaves, water shortages, and crop failures. As such, these adaptation co-benefits are extremely relevant to India's overall climate action.

PSEs have been identified as important stakeholders in the project. These methodologies can also support PSEs in quantifying the climate co-benefits of the forestry measures they have been undertaking. GIZ, in collaboration with SCOPE will organize consultations with PSEs,

¹ Geels, Frank. (2011). The Multi-Level Perspective on Sustainability Transitions: Responses to Seven Criticisms. Environmental Innovation and Societal Transitions. 1. 24–40. 10.1016/j.eist.2011.02.002.

to take their inputs and support the institutionalization of these methodologies in their existing reporting mechanisms, thereby strengthening climate action.

Existing solutions for decarbonisation and the role of Green Hydrogen: key findings from the technical session² :

The **Ministry of New and Renewable Energy (MNRE)** in February, 2024 has issued the guideline for the implementation of pilot projects for the use of Green Hydrogen in both Direct Reduced and Blast Furnace ironmaking process; and the substitution of fossil fuels with Green Hydrogen in a gradual manner. This will help in establishing a Green Hydrogen demand-supply ecosystem and leverage its potential for decarbonization and energy security. **Oil and Natural Gas Corporation (ONGC)** is planning to spend \$9.6–10.2 billion in next decade on developing a Green Hydrogen ecosystem. **National Thermal Power Corporation Limited (NTPC)** has initiated blending of Green Hydrogen in their PNG Network and is also running Hydrogen based Fuel-Cell Electric Vehicle (FCEV) Buses in Leh and Greater Noida. NTPC is also setting up Integrated Green Hydrogen Hub, Ultra Mega Renewable Energy Power Parks across India, and various projects on Hydrogen derivatives. **GAIL Limited** has

started blending Hydrogen in City Gas Distribution grid. **Oil India Limited** has commissioned India's first 99.9% pure Green Hydrogen pilot plant and has also developed a 60-kW capacity hydrogen fuel cell bus. **Indian Oil** has ventured into demonstration pilot plants for production of Green Hydrogen through water electrolysis using solar power, biomass oxy steam gasification, and CBG reforming for refuelling 15 Hydrogen Fuel Cell buses. **National Hydroelectric Power Corporation (NHPC)** is setting up Kargil Green Hydrogen Mobility Stations. **Bharat Heavy Electricals Limited (BHEL)** is setting up a Centre of Excellence for Electrolysers, Type IV hydrogen storage cylinders and a national testing facility for Type IV hydrogen storage cylinders. **THDC India Limited** has recently inaugurated India's largest Electrolyser End Fuel Cell-based Green Hydrogen Pilot Project. **Cochin Shipyard Limited** has launched India's first hydrogen cell ferry. **The Cochin International Airport Ltd (CIAL) and Bharat Petroleum Corporation Limited (BPCL)**, by combining their expertise and resources, aim to create the world's first Green Hydrogen plant and fuelling station located within an airport setting.

These ongoing efforts demonstrate the manner in which landscape (policy, program) level changes are being transformed into on-ground action through systems and innovations. Apart

from these, many collaborations, pilot studies, MoUs, agreements, etc. are in the pipeline and are directed towards one goal – strengthening the green hydrogen ecosystem in India.

Limestone Calcined Clay Cement (LC³) as another solution for decarbonization³

LC³ is a blend of clinker (typically 50%), calcined clay (typically 30%), crushed limestone (typically 15%) and gypsum (typically 5%). Since the calcination of clays requires almost half the energy required for the production of clinker and the calcination process does not emit any CO₂ from the decomposition of clays, the embodied energy and carbon of LC³ is seen to be significantly lower than ordinary Portland cement.

LC³ is currently the only commercially available technology that can further reduce the clinker content in cements in the large scales that are required by the cement industry in India. LC³ provides the Indian government an opportunity to create policies for the cement industry, that can allow the reduction of emissions from the cement industry, without compromising on the performance of the cement. LC³'s production processes and benefits were showcased during the workshop.

This cement also provides PSEs the opportunity to support

² Includes inputs from: Dr. Arvind Prasad Chaphekar, Deputy Secretary, Ministry of New and Renewable Energy; Shri Abhay Bakre; Director General, Bureau of Energy Efficiency; Dr. D.M.R Panda; General Manager (Hydrogen, RE), NTPC Limited; Smt. D Padma Executive Director, IOCL (Planning and Business Development) Indian Oil Corporation Ltd.

³ Inputs by Prof. Shashank Bishnoi, Indian Institute of Technology Delhi (LC³ cement);

infrastructure growth that is aligned with climate action.

Pathways to finance these solutions⁴

Financing mechanisms are key for the realization of solutions. Hence the workshop brought together key financial institutions and banks, that provided an overview of the financing options their respective institutions have to offer and their ongoing initiatives:

- **Indian Renewable Energy Development Agency (IREDA):** provides loans covering up to 70% of the project cost at 10-11% interest rates. Line of Credit also provided by IREDA to other Non-Banking Financial Corporation (NBFC) for on-lending to Green Hydrogen projects. IREDA has already sanctioned 1,200 crore rupees till date.
- **Power to X Hub by KfW:** The objective of PtX Development Fund is to encourage the production of green hydrogen and its derivatives in developing

and emerging economies, and to provide strong financial incentives to trigger further investments. The KfW's PtX Platform provides comprehensive advice on various funding and financing options for large-scale PtX projects in non-European countries and offers an integrated financing solution from a single source. The PtX Platform bundles funding offers from the German federal government and the KfW and puts together a suitable financing package for PtX projects. Interested PSEs may reach out of KfW representatives in India.

- **European Investment Bank:** Decarbonisation is among the key focus areas of the bank and it is interested to partner with PSEs in India given the strong mandate of the Government of India to bring forward energy security and address environmental objectives. EIB can finance projects aligned with their objectives which include expansion of RE, Green hydrogen, and anything that

contributes to climate action which also includes electrolysers and other components in the green hydrogen value chain. The bank usually finances larger projects and can provide financing in the form of debt.

- **World Bank:** Recently, WB approved a loan to develop one of the world's largest solar power plants "Rewa Ultra Mega Solar Power Project" in Madhya Pradesh. In June 2023, it has approved \$1.5 billion (with another tranche of \$1.5 billion forthcoming in 2024) in financing to accelerate India's development on low-carbon energy. Other than this, the World Bank has provided technical assistance to the Government of India to establish the sovereign green bond program. ■

This article summarises key highlights of select sessions of the workshop. It is jointly developed by Ms. Jasprit Kaur (Climate Change Advisor, GIZ India) and SCOPE.

⁴ Inputs by Dr. Thomas Engelmaan Manager at PtX Hub, KfW; Smt. Nina Fenton Head of Regional Representation, European Investment Bank (EIB); Smt. Surbhi Goyal Senior Energy Specialist, World Bank

Disclaimer: All writeups are taken as received from respective organisations.