Developing an Export oriented Green Methanol Project in India

Public-Private Partnership between 3E and ReNew E-Fuels Pvt Ltd, GIZ

The challenge

India has made significant strides toward becoming a global hub for green hydrogen (GH_2), supported by the launch of India's National Green Hydrogen Mission in January 2023, which has a budget of EUR 2.25 billion until 2030. This aligns with India's aspiration to reach net zero by 2070 and achieve half of its cumulative electric power capacity from non-fossil fuel sources by 2030. Additionally, low renewable energy costs, especially for solar, provide a competitive edge for GH_2 and its derivatives.

A key challenge lies in scaling up the production and utilisation of green methanol, which is expected to play a critical role in the global energy transition, including usage in chemical processes and as a sustainable marine fuel. Establishing green methanol projects in India for both local and export markets - where higher offtake prices are expected - will require significant effort to overcome market and allied barriers.

The solution

The primary challenge of uitilising green methanol (and hence production scale up) can be addressed by providing project developers with a financial certainty of off-take at appropriate prices. The International Hydrogen Ramp-up Program (H2Uppp) plays a crucial role in this regard by focusing on the Indian Power-to-X (PtX) exports to help the projects access guaranteed offtake amid limited local offtake opportunities. This alleviates the challenge of initial funding requirement among other benefits. Beyond its role in strengthening India's PtX sector, H2Uppp contributes to a wider global push for GH_2 market expansion.

H2Uppp is initiated by the German Federal Ministry for Economic Affairs and Energy (BMWE). The programme aims at enhancing the entrepreneurial drive and the necessary investment crucial to the global scaling of hydrogen markets. In line with these efforts, the Indian Ministry of New and Renewable Energy is keen on identifying bankable business cases for GH_2/ PtX projects in India and in synergising private sector commitments through appropriate business models.

To support the objectives of H2Uppp and address key challenges in this sector, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) as executing organisation of H2Uppp has formed a public-private partnership (PPP) with 3E and ReNew E-Fuels Pvt Ltd to develop a green methanol project with the aim of exporting green methanol to Europe. 3E is a leading technology and technical advisory company from Belgium providing digital solutions and expert services to optimise the performance of renewable energy assets, including storage along with GH_2. Renew is a leading decarbonisation solutions company and one of India's largest utility-scale renewable energy solutions providers. Thus, this collaboration is appropriate to leverage world-class expertise with understanding of local business for a successful venture.

How it will be done

The PPP will conduct a comprehensive feasibility study for a green methanol export project in India, ensuring alignment with European regulations like RED II, and supporting the broader hydrogen market ramp-up. The green methanol project is expected to be commissioned by the financial year 2028-29.

The geographical focus for the project development is the Malkangiri district in the eastern state of Odisha in India where the local government has enabled a supportive ecosystem.

The PPP will result in a comprehensive technical study for the production and subsequent export of green methanol from India. The following topics will be addressed:

- 3E will be responsible for the evaluation and assessment of suitable GH_2 production sites including proximity to grid and port, RE potential, water accessibility, etc.

- 3E and ReNew will coordinate the techno-economic scoping and feasibility study of a green methanol project in India
- ReNew will manage the sustainability criteria of the project in relation to greenhouse gas footprint, energy and water supply, etc.
- ReNew will oversee training and capacity building content on green methanol including emissions calculation methodology
- 3E and ReNew will together handle the regulatory and policy gap analysis for green methanol Production in India and export to EU
- 3E and ReNew will coordinate stakeholder engagement and the final workshop

An abridged version of the study will be published and shared with interested stakeholders through workshops. Based on the PPP results, a new production unit for manufacturing GH_2 and green methanol is expected to be set up. For the production of green methanol, GH_2 and captured CO_2 emissions from nearby industrial units - which use biomass for heating purposes - shall be used. A carbon capture system should also be set up at production through electrolysis.

The port of dispatch has been identified as Kakinada Port and new methanol storage shall be built there. Methanol will be transported via pipeline/road from the production unit to the port storage tanks where it will be loaded onto the vessel for delivery. The key inputs - GH_2 and captured CO_2 - shall comply with the EU Renewable Energy Directive including associated Delegated Acts.

Expected impact

The study is expected to increase the knowledge and expertise required to ramp up GH_2 and green methanol projects in India. National and international investors shall gain a highly relevant insight into the viability of green methanol exports from India and will be better placed to make future investment decisions based on this information. Once investment decisions have been made, the capital-intensive implementation phase will need a variety of suppliers and service providers (engineering consultants, contractors, equipment manufacturers, banks, etc.).

The aim of this PPP is to have the results of this joint study form an important basis for further project activities by the private sector. The focus will be on green methanol production projects catering to international and national demand as well as infrastructure projects, like terminals, for export. Additionally, the PPP will be of benefit for national regulators with regard to further development of national framework conditions for green methanol. The project being one of the first green methanol projects of the state and country, is expected to sensitise the permitting authorities about green methanol production process-related permits.

At a glance	
Duration	11/2024-05/2026
Country	India
Objective	Enable the development of a bankable green methanol export project from India to the EU by building capacities and enabling an optimised design and configuration of the project.
Partners	GIZ, 3E, ReNew E-Fuels Pvt Ltd
Expected results	• Web-based map of potential GH_2 sites in India • Whitepapers on regulatory gap analysis and emission calculations for green methanol production in India and up to destination port in EU • Scoping and feasibility study of export oriented bankable 275 kTPA green methanol project • Building of necessary capacity for green methanol uptake • Support to regulators in developing national framework conditions for green methanol

The International Hydrogen Ramp-up Programme (H2Uppp) of the German Federal Ministry for Economic Affairs and Energy (BMWE) promotes projects and market development for green hydrogen in selected developing and emerging countries as part of the National Hydrogen Strategy.

Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn, Germany

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Layout:
Peppermint Werbung Berlin GmbH, Germany

URL links:
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