



Production of Green Hydrogen and Synthetic Fuels in Sugarcane-Based Ethanol Plants

PROJECT FACTS

Duration:

February/2026 to
December/2026

Country:

Brazil

Partners:

Siemens, Cocal and GIZ

Outputs:

- Pre-feasibility study for green fuels incl. GHG analysis and CO₂ supply options
- LCA, certification requirements, and risk assessment
- CO₂ source mapping and feasibility impact
- Dissemination, stakeholder engagement, and capacity building



Figure 1 - The image shows Cocal's production site in Paraguaçu Paulista- SP, featuring biogas facilities and CO₂ capture technology. Photo: GIZ



PROJECT OVERVIEW

Brazil consumes around 1.5 million tonnes of methanol per year, but depends on imports, with no industrial production facilities, whether fossil or renewable. The implementation of an e-methanol plant represents a technological and regulatory challenge, requiring the integration of renewable energy, CO₂ capture and industrial scale.

The project envisages the use of biogenic CO₂ with a purity of over 99%, generated in ethanol fermentation to produce e-methanol at a plant of Cocal – a Brazilian company with over 40 years of experience in the sugar and energy sector. The CO₂ will react with green hydrogen produced by electrolysis, creating a route for renewable carbon recovery and emissions reduction. The e-methanol can also be converted into sustainable aviation fuel (SAF) via the Methanol-to-Jet (MtJ) route.

The project includes studies on the integration of ethanol, green hydrogen, e-methanol and SAF plants, including technical and economic pre-feasibility analysis. In line with the circular economy, the solution integrates CO₂ from fermentation and biogas, considering the seasonality of the harvest to ensure operational stability and strengthen negotiations with offtakers.

OBJECTIVES AND EXPECTED RESULTS

- Assess the economic, technical and environmental feasibility of producing and distributing green hydrogen, e-methanol and SAF at a sugarcane ethanol facility using the MtJ route.
- Technical development of alternative routes for sustainable fuels
- Training in synthetic fuel production technologies.

ABOUT H2UPPP

H2Uppp paves the way for companies to develop the global green hydrogen market through project identification and development, technical support, and trade.

Published by:

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Dag-Hammarskjöld-Weg 1-5, 65760 Eschborn, Germany. On behalf of the German Federal Ministry for Economic Affairs and Energy.

Responsible: Regine Dietz

Contact: h2uppp@giz.de, +49 61 96 79-0
Photo credits: © GIZ, if not stated otherwise
Brasília, March 2026

The International Hydrogen Ramp-up Programme is supporting entrepreneurial engagement in the ramp-up of hydrogen in the Global South and is a programme of the:

Implemented by: