AkuaippaHy Project: Development of sustainable hydrogen and methanol in La Guajira, Colombia

The Challenge

Colombia has significant potential to become a leader in green hydrogen production in South America due to its abundant renewable energy resources. The La Guajira region has some of the best capacity factors, with an average and maximum solar factor of 19% and 21%, respectively, and wind energy factors of 46% and 63%, respectively. La Guajira has an estimated renewable energy potential of at least 25 GW of onshore wind and 45 GW of solar power, positioning it as a key location for green hydrogen production.

Despite these advantages, Colombia remains dependent on fossil fuels in its industrial and transportation sectors. Additionally, regions such as La Guajira face socioeconomic challenges and limited access to basic services, which can be addressed through initiatives that promote economic development and improve quality of life.
In 2021, the Colombian government launched its **Hydrogen Roadmap**, identifying hydrogen as a strategic energy vector. The roadmap highlights the country's strong potential for solar (45 GW) and wind energy (20 GW onshore and 50 GW offshore), in addition to its abundant natural resources, port infrastructure, and favorable export position.

To develop a robust and competitive hydrogen ecosystem, Colombia faces key challenges:

- Accelerating regulatory frameworks, including defining the low-emission threshold for hydrogen and its derivatives.
- Establishing tax and tariff incentives.
- Strengthening local capacities for exporting to the European Union.
- Developing technical capabilities.
- Providing financial support for hydrogen project developers.
- Advancing environmental and social regulatory development.

Both public and private sectors are actively working to address these challenges. In this context, the AkuaippaHy Project emerges as an innovative energy transition solution, focusing on the production of green methanol from renewable hydrogen and CO2 capture.

The Solution

The **AkuaippaHy Project**, led by the German company **VIRIDI RE** with support from the **International Hydrogen Ramp-up Program (H2Uppp) of BMWK**, aims to establish an integrated facility in La Guajira. This region, with one of the highest renewable energy potentials in Latin America, will combine solar and wind energy for the production of low-emission hydrogen and a biogenic CO2 plant for **e-methanol production** intended for export to Europe.

Image 1. Potential areas

The planned facility will include:

- 540 MWp of solar energy
- 460 MW of wind energy
- 413 MW in electrolysis capacity
- 40.000 t/year of H2 production
- 210.900 t/year of e-methanol

The project is expected to **reduce 6 millions of CO_2eq** within its first 10 years of operation.

Our Services

Through public-private cooperation, the project seeks to accelerate the development of low-emission hydrogen and e-methanol initiatives by building technical capacity and expertise for **off-grid production**. VIRIDI RE will focus on:

- **Market analysis** to assess Colombia's potential for developing a local hydrogen and methanol market.
- **Carbon resource analysis**, ensuring compliance with European Union regulations for export viability.
- **Technical feasibility study**, including a conceptual design for green methanol production integrating renewable energy and necessary infrastructure.
- **Environmental and regulatory assessment**, ensuring compliance with applicable laws.
- **Financial assessment**, including cost analysis, profitability evaluation, and financing models to secure project sustainability.
- **Capacity-building and communication strategy**, training local stakeholders and disseminating key information to foster acceptance and participation.

These efforts will help mitigate **regulatory, financial, environmental, and market risks**, ensuring feasibility and scalability of the project across Colombia.

Expected outcome

This collaboration is expected to:

- **Enhance local capacities and skilled labor development for large-scale hydrogen and derivative projects.**
- **Leverage La Guajira's strategic location and natural resources to facilitate project replicability in the Caribbean and other regions.**
- **Advance the necessary regulatory framework to enable similar projects to reach Final Investment Decision (FID).**

At a Glance	
Duration	October 2024 – September 2027
Location	Caribe región -La Guajira Colombia
Objective	Accelerate the development of green hydrogen and e-methanol projects in Colombia by strengthening technical capabilities and knowledge for off-grid production, contributing to the country's hydrogen economy.
Partners	GIZ and VIRIDI RE
Expected results	Comprehensive **technical, regulatory, financial, social, and environmental feasibility analysis** for project implementation in the Colombian La Guajira region.

Image 2. signing of the AkuaippaHy Project PPP

The International Hydrogen Ramp-up Programme (H2Uppp) of the German Federal Ministry for EconomicAffairs and Climate Action (BMWK) 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

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Bonn and Eschborn, Germany

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Location and year of publication

Author/Responsible/Editor, etc.:
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Design/layout, etc.:
Wendy Alarcón, Colombia

Photo credits/sources:
Photographer, photo agency or GIZ staff member
(GIZ/Cristián Fuentes)

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