

2026 CTCN Learning Visit on Green Hydrogen Production and Fuel Cell

Paraguay and Green Hydrogen: Current State of Activities, National Policies, and Cooperation Prospects

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Low Carbon Technologies Laboratory

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Paraguay is in the heart of South America

Country Overview

- Land area: 406,752 km²
- Population: 6.109.644 (www.ine.gov.py)
- Languages: Spanish and Guarani
- GDP: 55,834 Mill USD (<https://www.bcp.gov.py/>)
- Export Product 2025:
 - Soybeans
 - Bovine meat
 - Electricity
 - Soybean Oil
 - Agro-industrial / Agricultural Products



Energy Situation in Paraguay

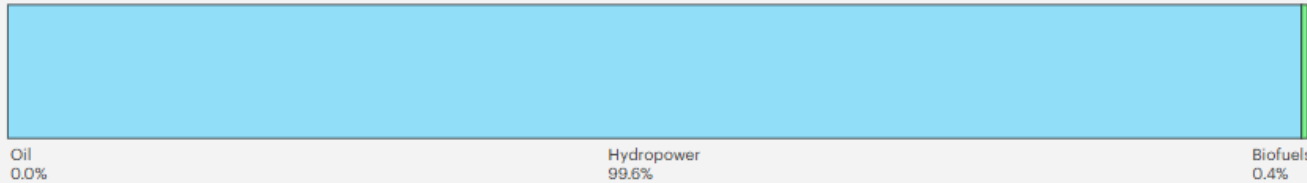
Largest source of electricity generation in Paraguay, 2023

Hydropower

100%

of total generation

Electricity generation, Paraguay, 2023



Largest sources of energy in final consumption in Paraguay, 2023

Biofuels and waste

40%

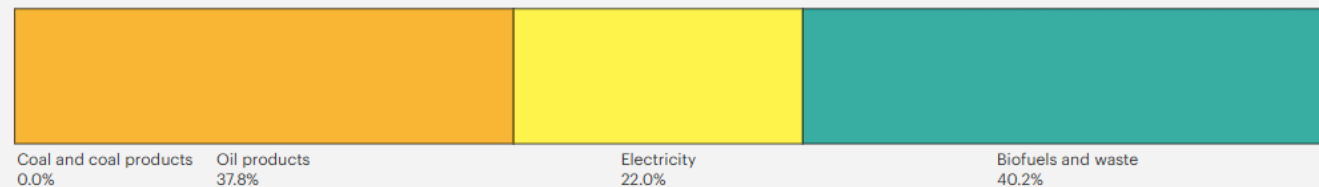
of total final consumption

Oil products

38%

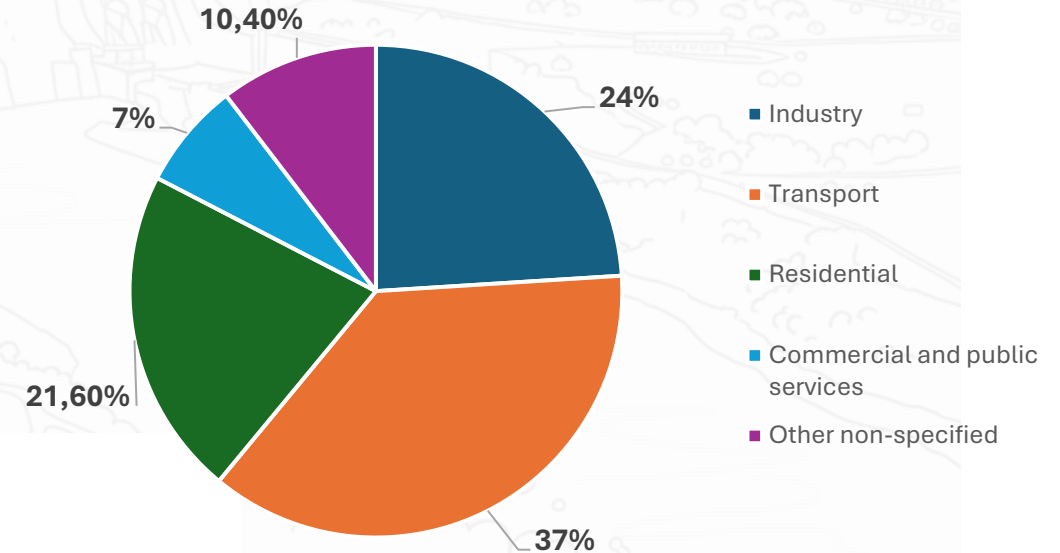
of total final consumption

Total final consumption, Paraguay, 2023



Source: International Energy Agency.

Total final consumption, Paraguay, 2024



Source: Balance Energético Nacional 2023 y 2024.

Parque Tecnológico Itaipu - Paraguay



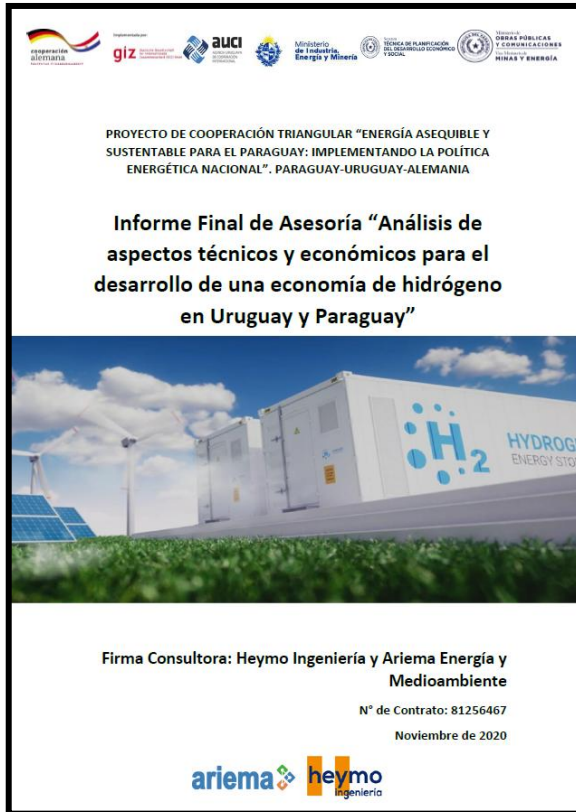
PTI
Paraguay

Main Task

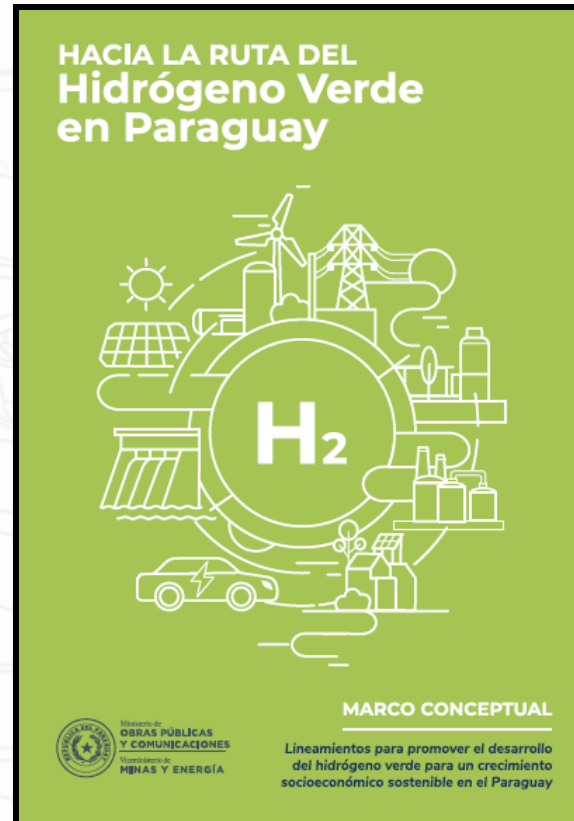
An initiative of Itaipu Binacional, PTI promotes human development through science, technology, and innovation. Our mission is to deliver applied solutions that drive digital transformation and sustainability across key sectors.

National documents developed

2020



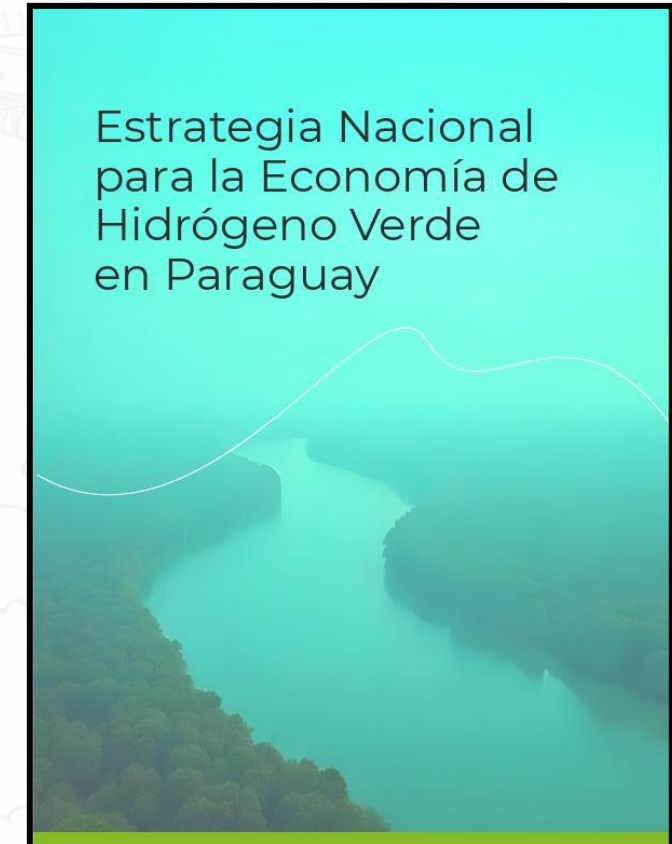
2021



2022



2024



Ministerio de
**OBRAS PÚBLICAS
Y COMUNICACIONES**
Vice Ministerio de
MINAS Y ENERGÍA



BID
Banco Interamericano
de Desarrollo

National Hydrogen Strategy

OBJECTIVES



Development of a specific regulatory framework for hydrogen.



Creation of a favorable environment for investment.



Guaranteeing orderly and sustainable growth of the hydrogen industry.



Strategic Autonomy:

- Energy system resilience.
- Sustainable economic growth.
- Industrial competitiveness.
- New jobs and capabilities.



Leveraging Paraguay's geographical situation and natural resources.



Accelerating industrial development through green hydrogen.

6 PILLARS

19 Lines of Action

55 MEASURES

Source: [Viceministerio de Minas y Energía. \(2025\). Estrategia Nacional para la Economía de Hidrógeno Verde en Paraguay. Ministerio de Obras Públicas y Comunicaciones \(MOPC\); Banco Interamericano de Desarrollo \(BID\).](#)

National Hydrogen Strategy



Medida 44: Fomentar el desarrollo de un Centro Tecnológico de Hidrógeno en Paraguay para coordinar la investigación, desarrollo y observación de tendencias globales, impulsando la innovación y la colaboración internacional.

Fomentar la creación de un único Centro Tecnológico de Hidrógeno, preferiblemente como parte del Parque Tecnológico Itaipú (PTI), que sirva de nexo entre las diferentes iniciativas y proyectos piloto desarrollados por el país, además de la coordinación transfronteriza con otros proyectos estratégicos.

Este centro coordinará y apoyará las actividades de investigación y pruebas tecnológicas en hidrógeno verde, gestionando y facilitando el desarrollo de un ecosistema de innovación sólido y coherente.

The **Measure 44** proposes the creation of a single **Hydrogen Technology Center** in Paraguay, suggesting that it should preferably be developed as part of the **Itaipu Technology Park (PTI)**

National Hydrogen Strategy

1 

Infrastructure and Energy

The development of green hydrogen requires:

- New developments in **electrical grids**.
- New **large-scale renewable projects**.

2 

Logistics Constraints

Impossibility in the medium term for the export of pure green H₂ or derivatives (due to lack of appropriate infrastructure and access to the sea).

3 

Regulation

Absence of a **specific regulatory framework**.

4 

Financing

Appropriate **financial mechanisms** are required.



- **1 GW** of installed capacity for electrolyzers.



- **1 pilot project** for e-methanol barges operating along the Waterway.



- **2 pilot projects** for public buses using fuel cells (FCEV).



- **80-100% substitution** of grey hydrogen and ammonia with green hydrogen in industrial consumption.



- **900 kton** of green fertilizers produced per year.



- **100 heavy-duty vehicles** for freight transport using fuel cells (FCEV).



- **5-10 hydrogen refueling stations** for fuel cell vehicles (FCEV).



- **+\$1,000 Million USD** in investments for green hydrogen economy projects.

National Technical Committee of H2 Standardization



Honorable
Cámara de Senadores
Congreso Nacional



MINISTERIO DE
OBRAS PÚBLICAS Y
COMUNICACIONES
VICEMINISTERIO DE
MINAS Y ENERGÍA
PARAGUAY



MINISTERIO DE
ECONOMÍA
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AGENCIA NACIONAL DE
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SEGURIDAD VIAL
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Paraguay



INSTITUTO NACIONAL DE
TECNOLOGÍA,
NORMALIZACIÓN Y
METROLOGÍA



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NACIONAL DEL ESTE

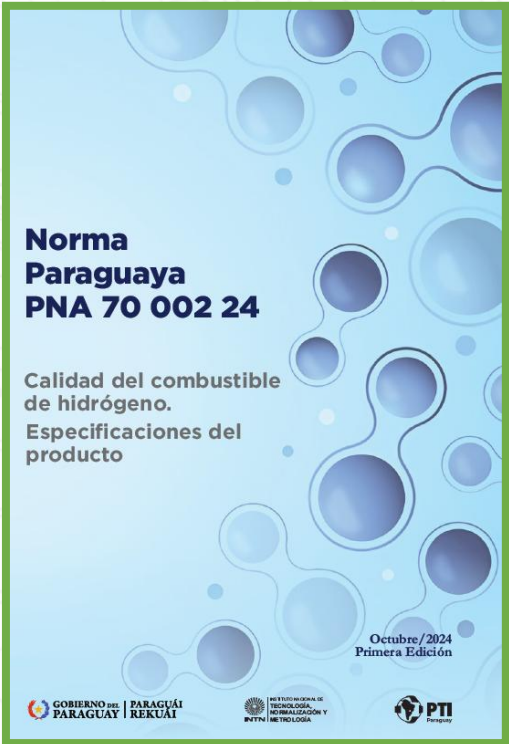


National Technical Committee of H2 Standardization

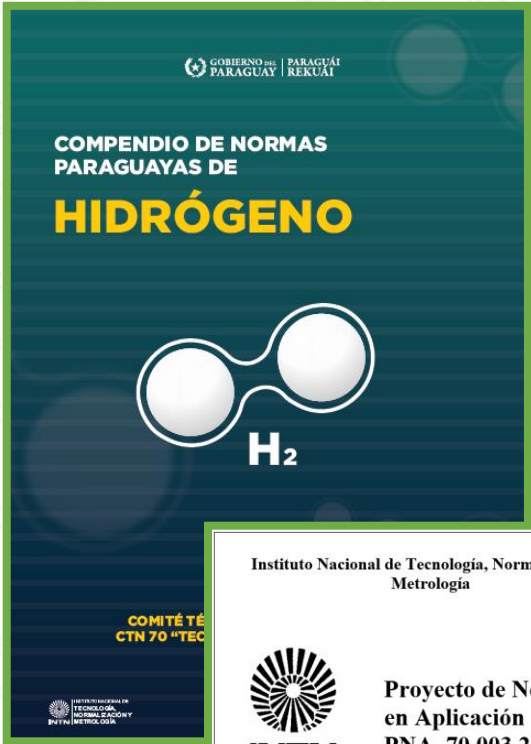
**First Paraguayan H2
standard launched in
December 2023**



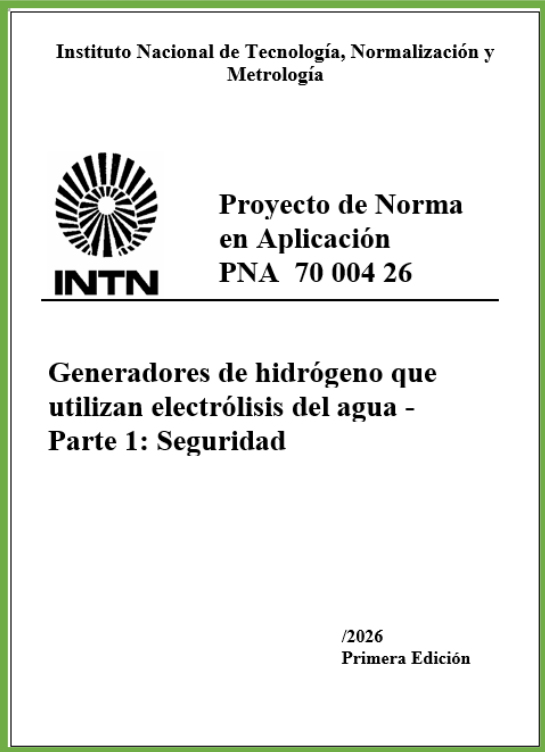
**Second Paraguayan H2
standard launched in
October 2024**



**Third Paraguayan H2
standard launched in
December 2025**



**Fourth Paraguayan H2
standard to be launched
in 2026**



First Green Hydrogen Production Plant of Paraguay



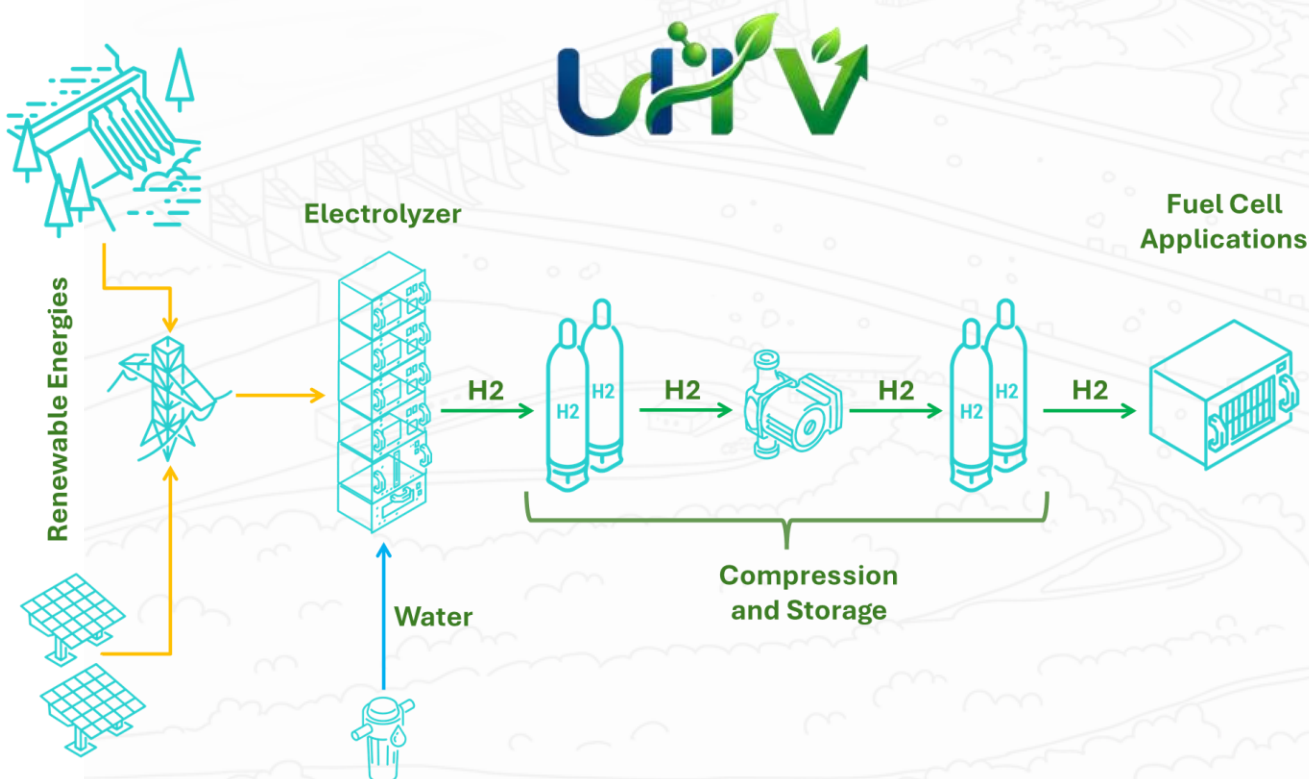
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ITAIPU
BINACIONAL

First Green Hydrogen Production Plant of Paraguay

- **Agreement:** Implement a Green Hydrogen Unit at the Itaipu Technology Park Paraguay – PTI Py.
- **Objective:** Promote the training of human resources in R&D+i and the development of new skills for the operation and maintenance of hydrogen plants.



Activities

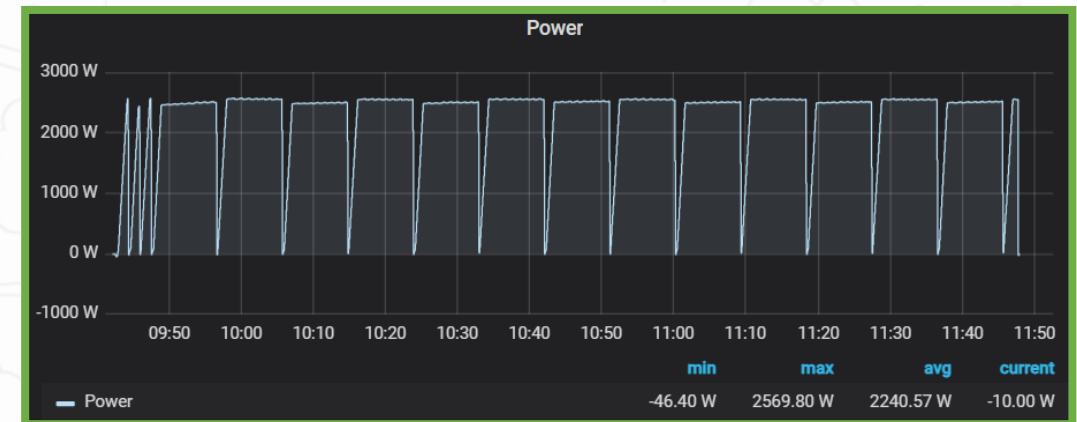
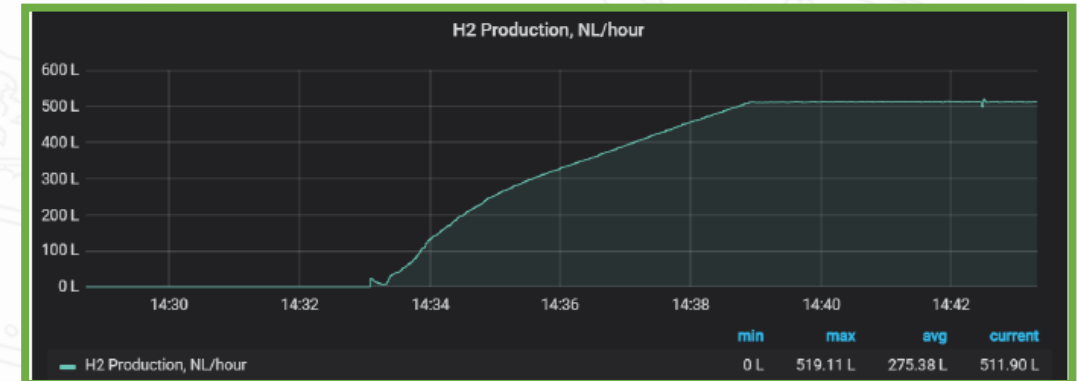
- Capacity building in hydrogen technology concepts and new skills for the operation and maintenance of plants;
- Energy transition, decarbonization, energy storage, and Power-to-X
- Production and use of low-carbon fuels in a Laboratory-scale;
- Certification of Hydrogen technologies;
- Research on stationary and mobility applications using Fuel Cells, among others scientific research.



Customer Acceptance Test in Germany



Production Data of H₂ Produced in the Electrolyzers and Power Generated in the Fuel Cell during the test.



First Green Hydrogen Production Plant of Paraguay



First Green Hydrogen Production Plant of Paraguay



RD&D ACTIVITIES

- International Network for the Decarbonization of Diesel Applications through the Integrated Use of Biofuels and Hydrogen in Multi-fuel Systems: Experimental Evaluation and Modeling.
 - Funding: 120.000 USD
 - Research institutes



- Use of green ammonia in thermoelectric power plants in Paraguay: opportunities, technical, regulatory and logistical barriers for its implementation
- Technical comparison of PEM fuel cell installed in PTI-Py (Paraguay) and TPG (Italy).



“Thank you, Gracias, Aguyje”



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UN
environment
programme



CTCN
UN Climate Technology Centre & Network

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