

DEUTERIUM

COMPANY DESCRIPTION

OPEX

The first zero-emission hydrogen producer in Colombia, leading the upstream LATAM hydrogen value chain.

Company description

Developer since 2011
Project developer and sponsor of Deuterium

Hevolución
Green hydrogen, ammonia and fertilizers from small hydropower

Protium
Colombia's first industrial green ammonia plant: 1,800 t/year

15
years
Experience as an energy transition solutions provider in Colombia

+55
Companies
Leading Colombian companies served across clean energy projects

+6
years
Leading Colombia's green hydrogen value chain

OPEX key Projects



1st hydrogen refueling station in Colombia



1st zero-emission H_2 vehicle in LATAM, 30,000+ km



Hydrogen-blended cargo truck: 22% less CO_2



1st industrial green ammonia plant: 1,800 t/year

THE ROAD AHEAD

BUILT ON PROVED EXPERIENCE

Protium
(Demonstrative plant)

NH_3

1800 ton/yr

Key Highlights

- **Current state**: Commissioned
- **Product:** Ammonia and e-fertilizers
- **Location:** Medellín
- **Offtake:** Long-term agreement signed
- **Know how:** Expertise in developing PtX projects in Colombia.

Deuterium
(Under development)

60000 ton/yr

31 MW

Key Highlights

- **Current status:** FEED studies
- **Product:** E-fertilizers (CAN 21)
- **Energy:** Own SHPP
- **Location:** La Virginia, Risaralda
- **Offtake:** Under negotiation
- **FID: Q3 2027 – Q1 2028**

Tritium
(Future expansion)

235 kton/yr

174 MW

Key Highlights

- **Current status:** Feasibility
- **Product:** E-fertilizers (CAN 21)
- **Scale:** Industrial, export-oriented
- **Offtake:** Under negotiation
- **FID: 2028**

DESCRIPTION OF THE PROJECT

MAIN COMPETITIVE ADVANTAGE



Raw material: (Renewable Energy, water and Air)

Products: Low carbon chemicals for fertilizer industry, and fertilizers for farming and food.

Cheap, captive energy

Own SHPP supply low-cost energy, up to 50% below grid PPAs. Energy is a core asset, not a variable cost.

Proximity to customer

Less logistics, fewer intermediaries, products tailored to specific soils and crops — impossible for competitors in Russia or the Gulf.

Agricultural value uplift

Green fertilizers enable farmers to certify lower-carbon crops — unlocking premium prices in European and US specialty markets where buyers pay for verified sustainability.

Carbon regulation shield

Green process opens premium export markets and protects against carbon border taxes already raising costs for conventional competitors.

Source: international PtXhub

DESCRIPTION OF THE PROJECT

PROOF OF CONCEPT OF THE BUSINESS MODEL



Key metrics

1st
industrial-scale plant in LATAM

150 tons
of fertilizers for direct proofs on coffee crops

360 tons/year
green hydrogen

1.800 tons/year
of **ammonia** for industrial applications

The model works. Here is the evidence:

Protium is the first industrial-scale green hydrogen and ammonia plant powered by small hydropower in LATAM, built, commissioned, and operating in Medellín. It de-risks Deuterium on every dimension that matters to investors. Building on this track record, and with non-reimbursable funding from a German development bank, Deuterium is running a 3-year field trial on coffee plots with a coffee cooperative, applying 150 tons of the specific CAN 21 fertilizer formulation to validate agronomic performance directly with an anchor customer ahead of commercial scale-up.

WHAT PROTIUM IS VALIDATING

Technical model proven

SHPP + electrolyzer + Haber-Bosch integration operating at industrial scale in Colombia.

Fertilizer trials in crops

With Protium capacity the proofs of concept for the CAN 21 fertilizer are being developed. This allow to get real information of its performance and facilitates the access to regulatory permissions for its commercialization.

De-Risked by Design

Protium proves that Deuterium's core technology stack (SHPP, electrolysis, and Haber-Bosch integration) already runs successfully at industrial scale in Colombia, having also navigated the country's full regulatory and permitting pathway for a first-of-its-kind green hydrogen and ammonia plant.

DESCRIPTION OF THE PROJECT

FARMERS LOYALTY STRATEGY

A closed value loop

Fertilizer and technical support flow to farmers through SKN Caribecafé, premium coffee sales flow back as higher income, renewing the relationship season after season.

Partnering with:

SKN Caribecafé

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Farmers Involved

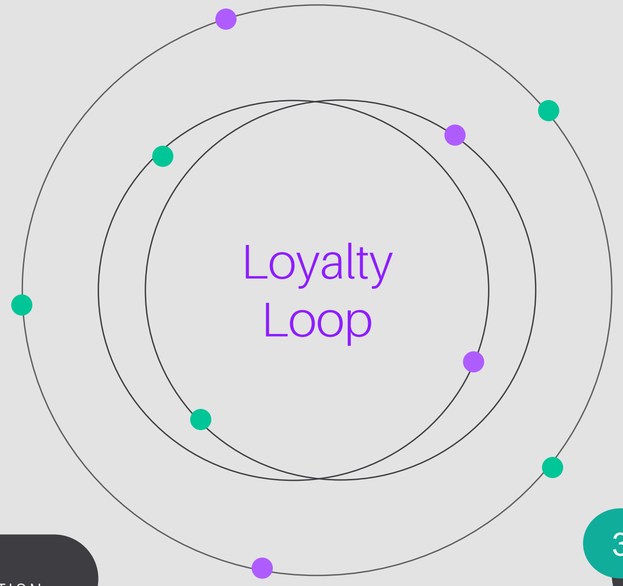
6.000

Coffee farmers families
Impacted as part of the pilot in development

Total fertilizer

150

Tonnes of fertilizer
Directly delivered to farmers in 3 years.



1 FERTILIZERS DELIVERY

CAN 21 Fertilizer is delivered to farmers through SKN Caribecafé.

2 TECHNICAL ASSISTANCE

Farmers receive technical assistance to develop better production practices.

3 COFFEE DELIVERY

Farmers deliver their coffee harvest to SKN.

4 PREMIUM COMMERCIALIZATION

SKN Commercializes the coffee in premium markets with better pay

5 HIGHER FARMER INCOME

Farmers receive better pay, as their coffee sells at a higher price.

THE JOURNEY

1. WATER BORN IN THE MOUNTAINS
2. GENERATES CLEAN POWER
3. BECOMES LOCAL E-FERTILIZER
4. NOURISHES OUR COFFEE

THE IMPACT

CLIMATE RESILIENCE
Non-acidifying, weather-ready crops

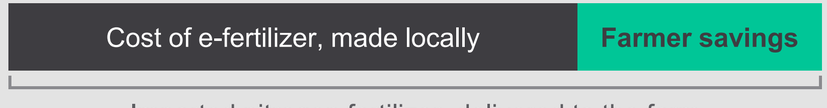
LOWER EMISSIONS
A lower footprint in every cup

HIGHER YIELDS
Boosts crop productivity

FARMER PROSPERITY
Made nearby, fewer middlemen

30%

Saved on every ton of fertilizer delivered to the farm
by cutting shipping, ports and intermediaries

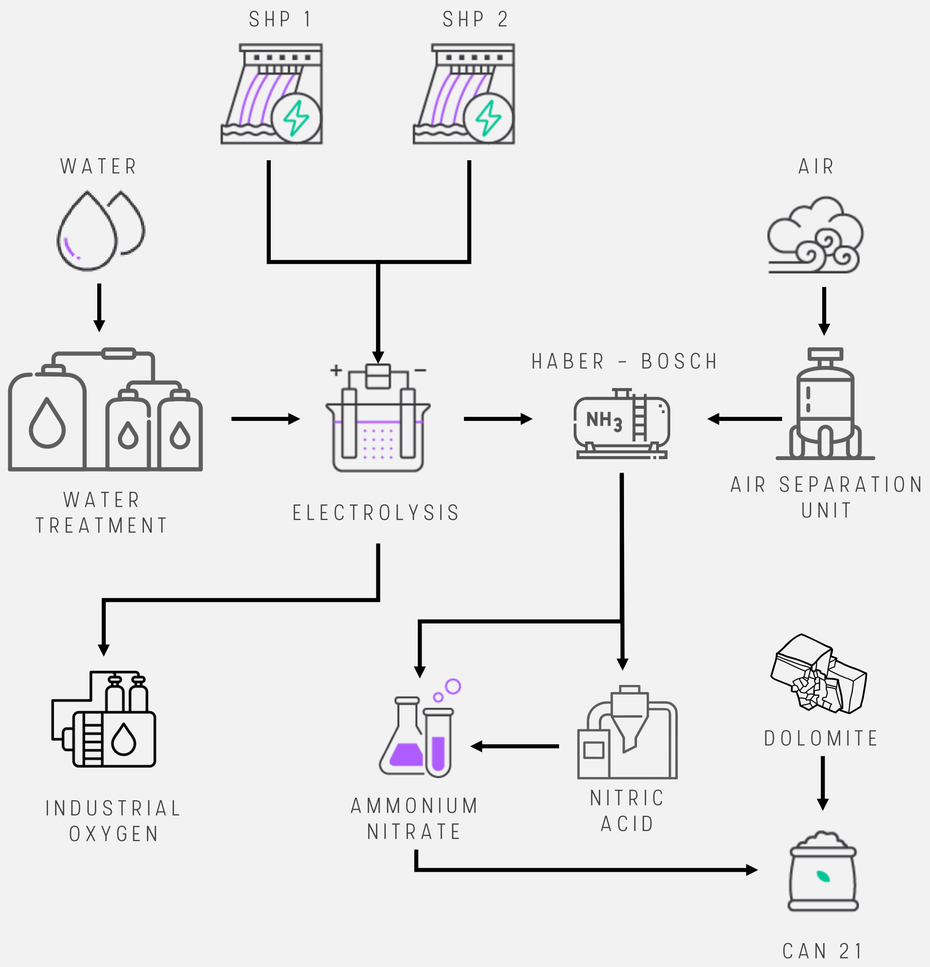




PROJECT DESCRIPTION

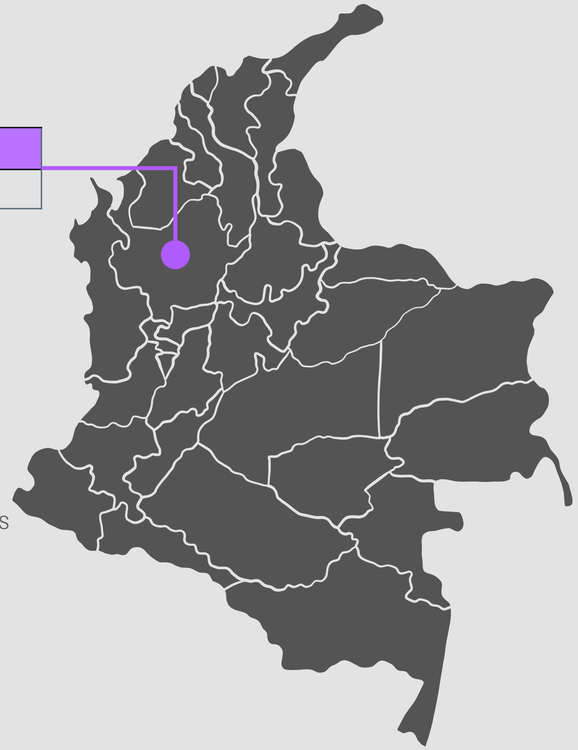
DEUTERIUM

Deuterium project description



Location of the Project

Region: Coffee Axis



Why this location

- Water security: Direct access to the river provides process water for the plant, avoiding dependency on grid power or trucked-in water.
- Logistics corridor: sits on a strategic road corridor connecting the coffee axis to the country's central agricultural markets.
- Proximity to demand: Located within reach of the crop regions anchoring Deuterium's demand tesis, coffee, sugarcane, and others export crops, shortening the distribution chain from plant to farmer.

Key project facts

Integrated

CAPEX for the development of the fertilizers plant (including SHPPs).

60 KTons/year of CAN21[1]

Primarily intended for the provision of the local market.

Competitive

(AN) CAN 21 selling price in a medium-scale plant.

Proven Model

Backed by a replicable model and proven technology, this return reflects a low-risk profile for early movers in the green ammonia market.

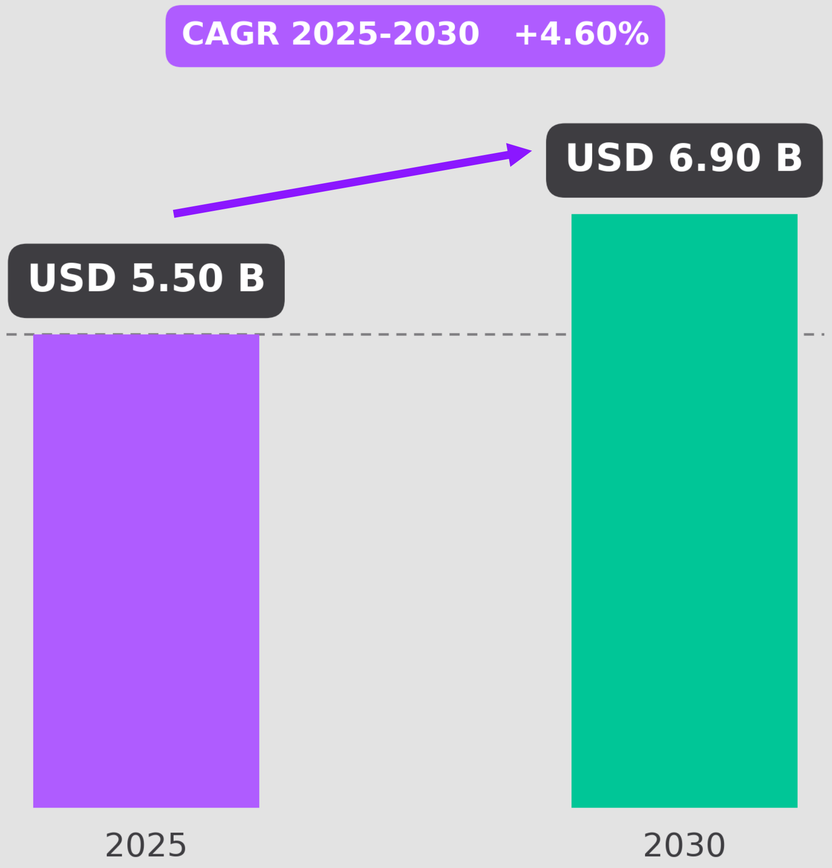
CAN21[1]: Calcium Ammonium Nitrate (21% of nitrogen)

MARKET POTENTIAL

GLOBAL MARKET CONTEXT

CAN demand is growing with low-carbon rules in Europe, chloride-free horticulture and fertigation in water-scarce regions.

Global CAN Market Size



Source: Mordor Intelligence — Calcium Ammonium Nitrate Market (Global)

2x

Conventional fertilizer price rise in one years. Deuterium runs on electrolysis, not gas.

CBAM

EU carbon border tax creates a price premium for low-carbon fertilizer.

0% chloride

Preferred for premium crops: coffee, cocoa and avocado.

DEUTERIUM · DEVELOPMENT PROCESS

COMPLETED · IN PROGRESS · UPCOMING

2024 DECISION POINT	2025 DECISION POINT	2026 DECISION POINT	2027–2028 INVESTMENT DECISION	2030 OPERATIONS START
CONCEPT	PRE-FEASIBILITY	FEASIBILITY	FRONT END ENGINEERING DESIGN	ENGINEERING, PROCUREMENT & CONSTRUCTION	OPERATIONS & MAINTENANCE
• Market and regulation analysis • Costs and benefits estimate	• Site and design options • First techno-economic study • Early offtaker engagement	• Site secured • Initial plant design • Permitting started	• Technology selection • Detailed engineering • Financing and offtake	• Plant construction • Commissioning	• Plant operations • Performance monitoring


opex