



GREEN HYSLAND

Webinar

Supporting 10 Islands in the Green Hydrogen Transition

25 March

15:00 - 16:30 CET

www.greenhysland.eu



15:00- 15:10	Introduction and presentation of Green Hysland (Christian Galletta - FEDARENE)
15:10- 15:25	Green Hysland Technical Support Programme and How to Apply (Katharina Bouchaar - ENERCY)
15:25- 17:00	Demonstration of the Hydrogen Territories Tool (Alberto Herranz - FHa) <ul style="list-style-type: none">- <i>Demonstration of the tool, used to develop pre-feasibility studies for hydrogen on islands</i>- <i>Practical applications, the case of H2 Chile</i>
17:00- 17:25	Q&A
17:25- 17:30	Conclusions
1h30	Total



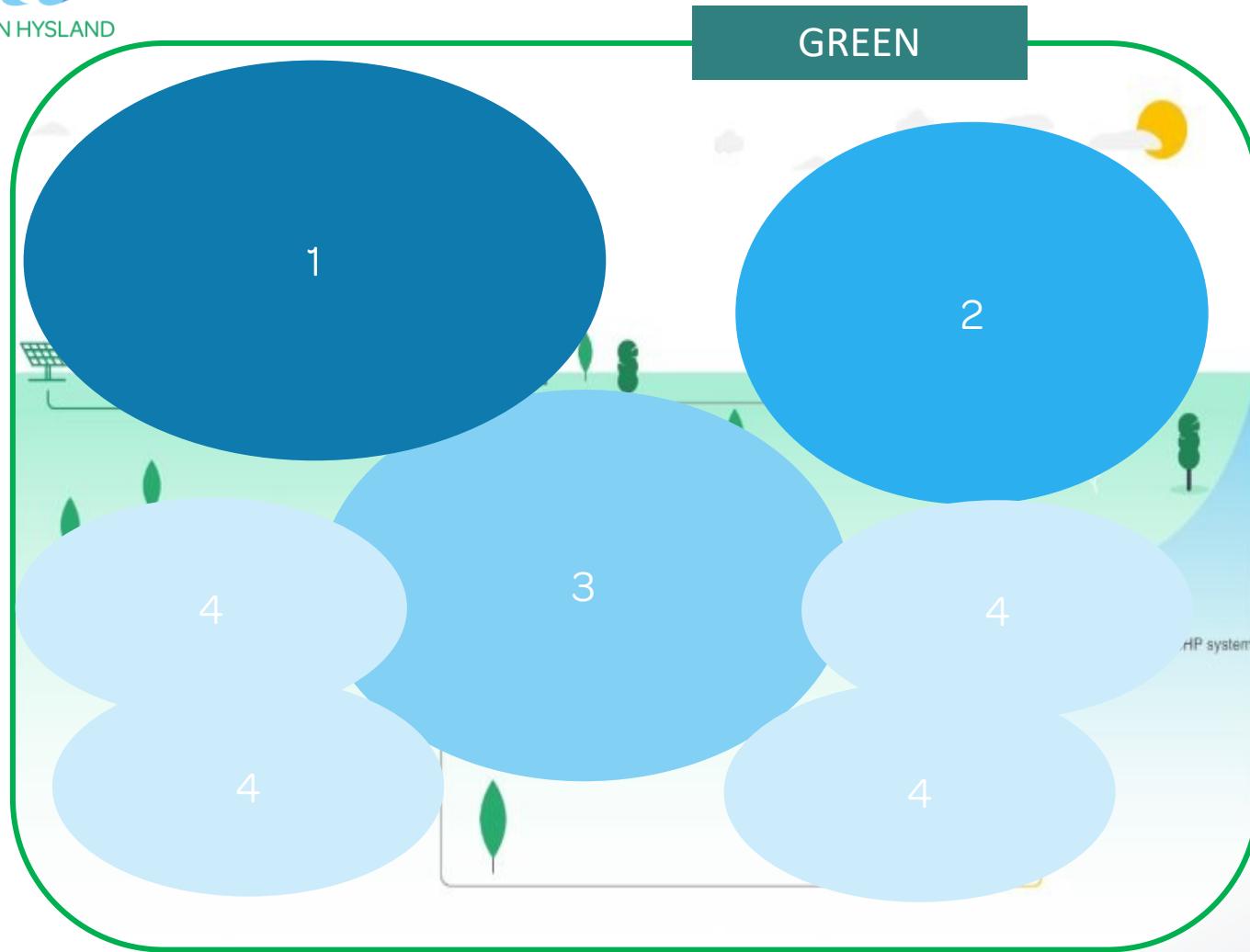
Housekeeping rules

- REMINDER: This webinar will be **recorded**
- Please **mute yourself** during the webinar (you can keep the video on or off)
- During the discussion slot, please **raise your hand** and wait for the moderator to give you the floor.
- Alternatively, please write your questions in the chat. They will be addressed towards the end of the discussion
- Slides and recordings** will be available and shared with you within two weeks

Let's get started! Who are you?



Overview of GREEN HYSLAND



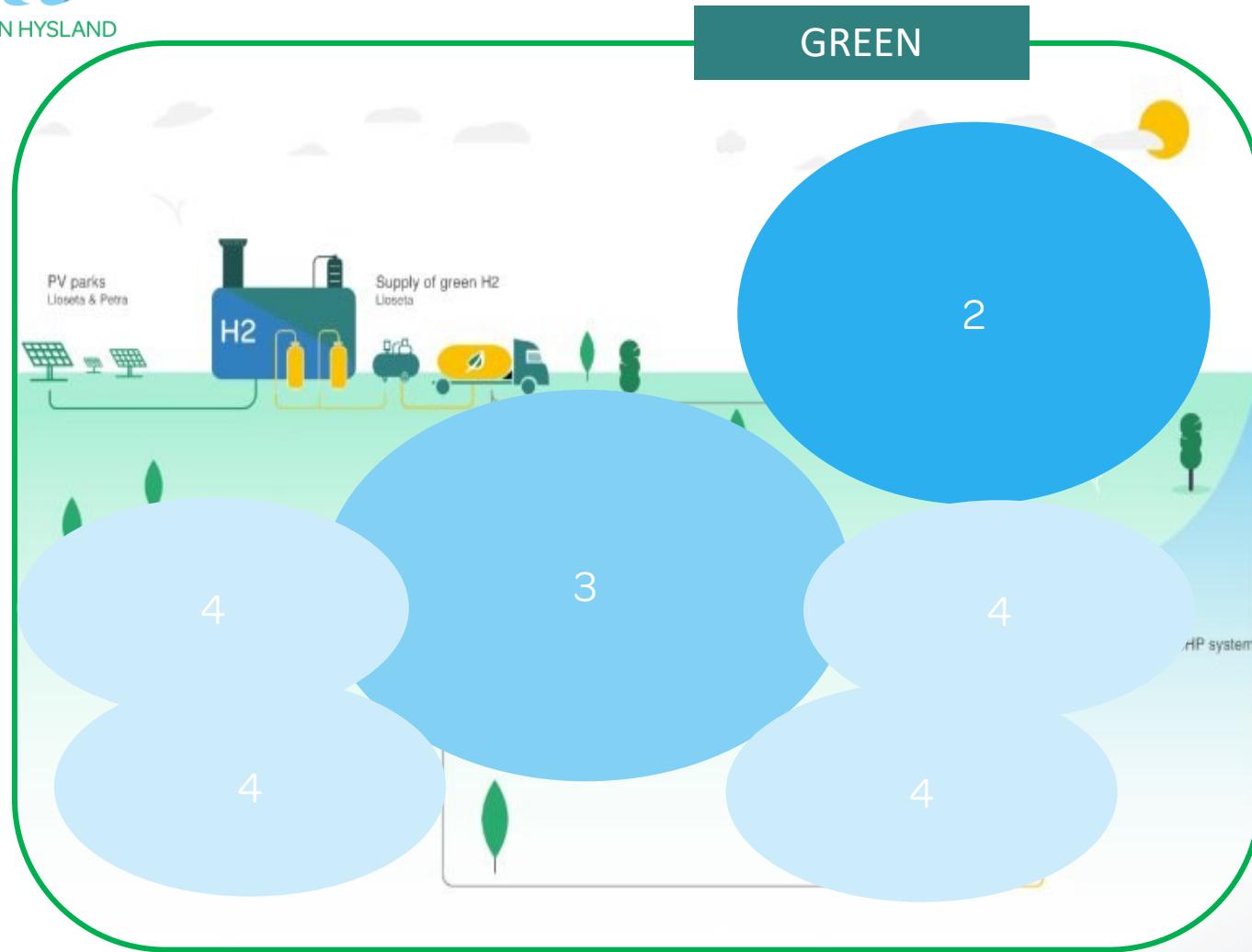
Highlights

- Beginning: 1st Jan 2021
- End: 31st Dec 2025 (extension)
- Co-funding: 10 mln Clean H2 Partnership (23 mln total)
- Coordinator: Enagas Renovable
- Partners involved: 34

The valley in pills



Overview of GREEN HYSLAND



Highlights

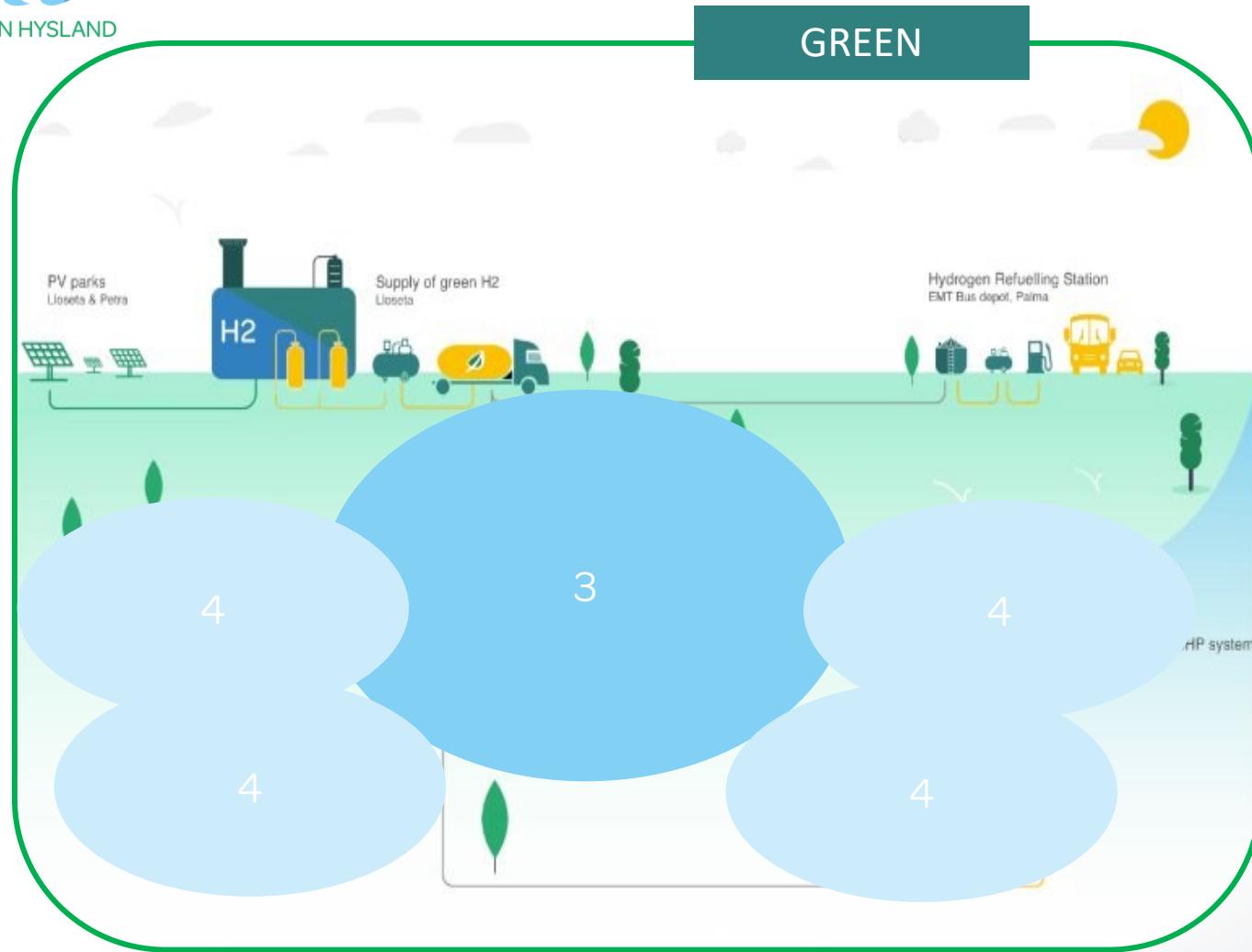
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The valley in pills

- 1 The green H2 production plant located on CEMEX land in Lloseta



Overview of GREEN HYSLAND



Highlights

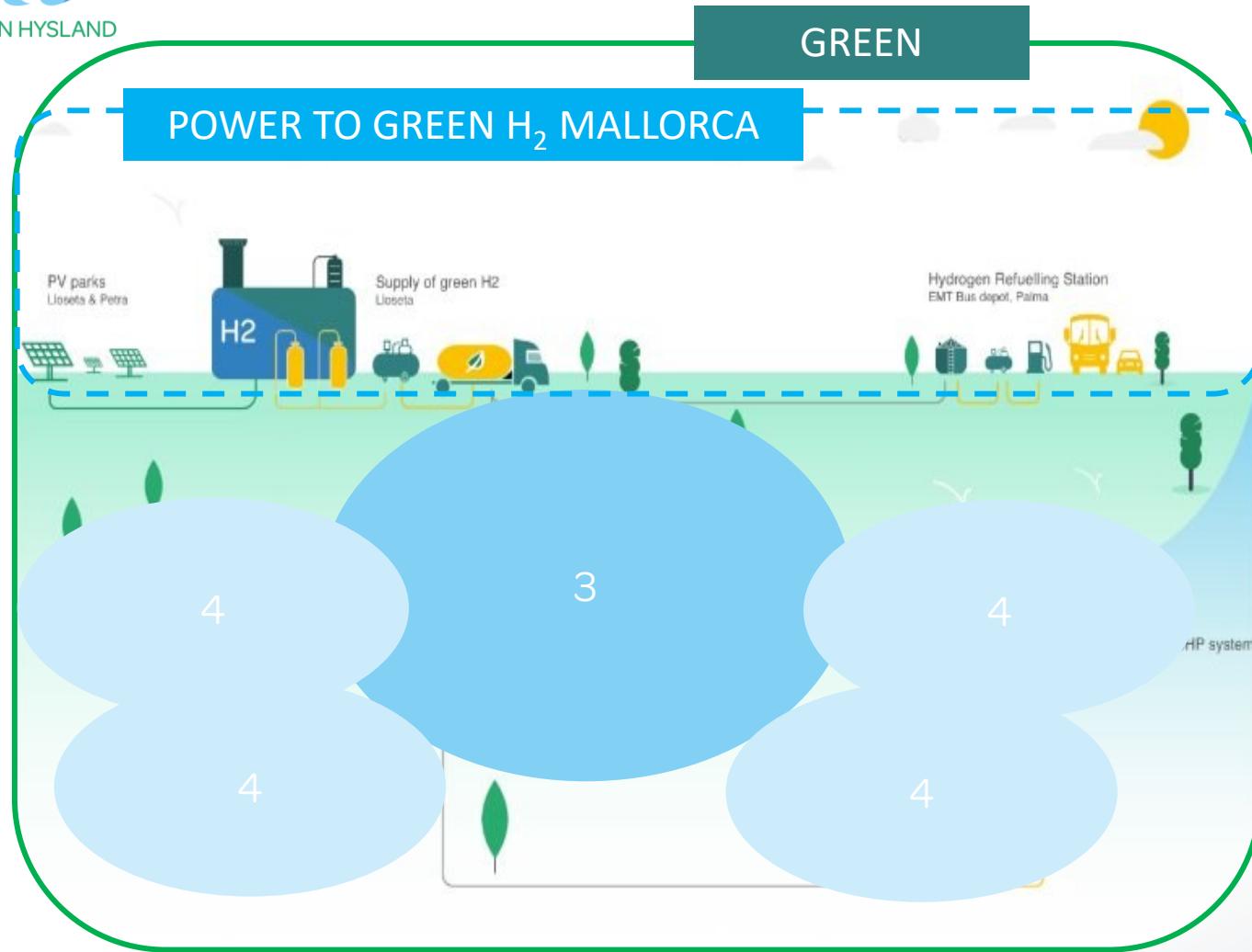
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The valley in pills

- 1 The green H2 production plant located on CEMEX land in Lloseta
- 2 Hydrogen Refueling Station (HRS) + 5 Fuel cell buses



Overview of GREEN HYSLAND



Highlights

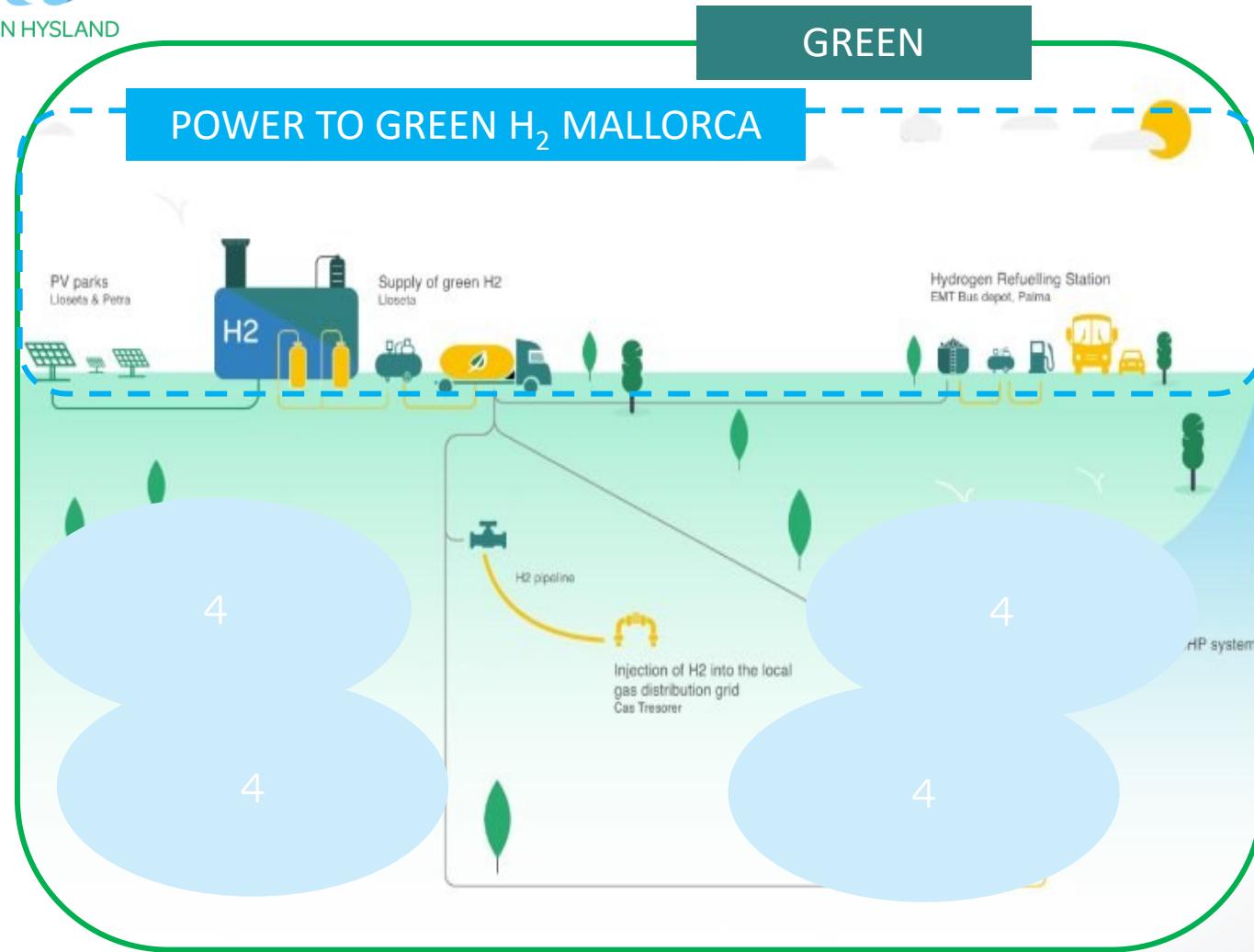
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The valley in pills

- 1 The green H₂ production plant located on CEMEX land in Lloseta
- 2 Hydrogen Refueling Station (HRS) + 5 Fuel cell buses.



Overview of GREEN HYSLAND



Highlights

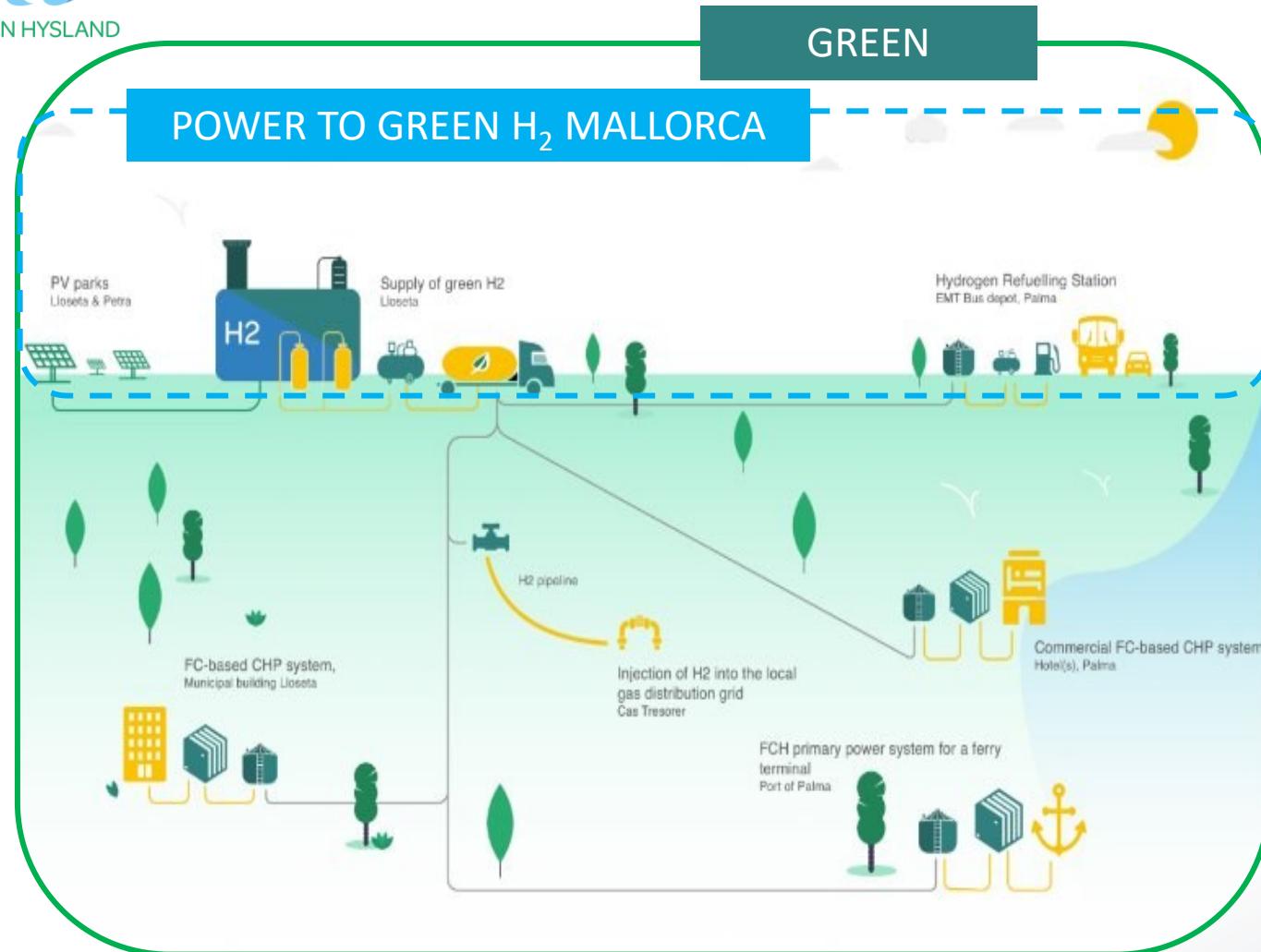
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The valley in pills

- 1 The green H₂ production plant located on CEMEX land in Lloseta
- 2 Hydrogen Refueling Station (HRS) + 5 Fuel cell buses.
- 3 The H₂ pipeline and the injection point (to blend part of the H₂ into the NG pipeline)



Overview of GREEN HYSLAND



Highlights

- Beginning: 1st Jan 2021
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The valley in pills

- 1 The green H₂ production plant located on CEMEX land in Lloseta
- 2 Hydrogen Refueling Station (HRS) + 5 Fuel cell buses.
- 3 The H₂ pipeline and the injection point (to blend part of the H₂ into the NG pipeline)
- 4 End Users (after distribution): 1 Port terminal, 1 Hotel, 1 Municipal building, multiple natural gas users (H₂ blended)



Overview of GREEN HYSLAND





Deployment of a Hydrogen Ecosystem on the Island of Mallorca

The Green Hysland Technical Support Programme & How to Apply

Katharina Bouchaar

Managing Director, ENERCY

25/3/2025



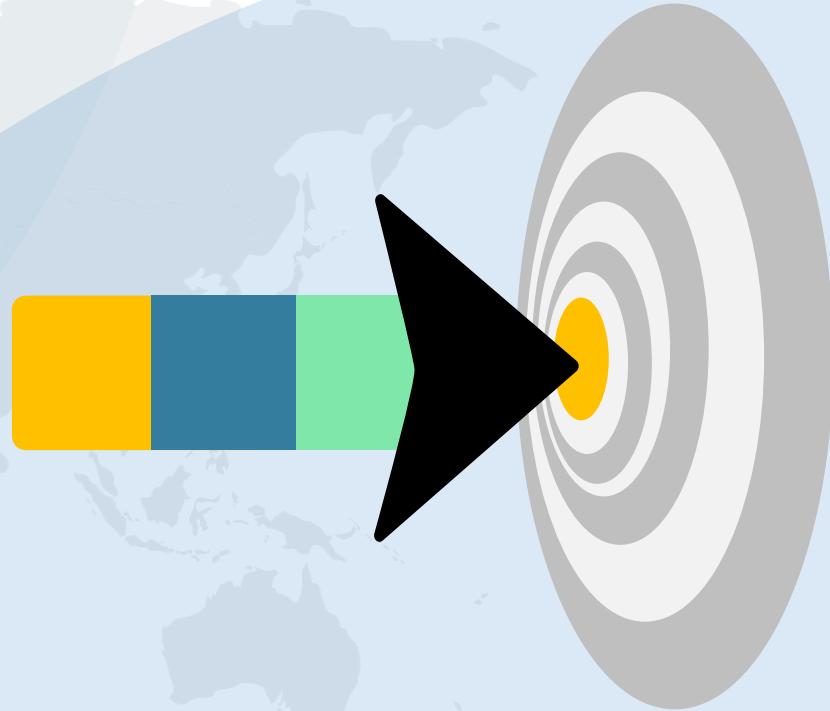


About Energy

Energy is a leader in hydrogen energy project development & implementation, specialising in integrated hydrogen systems (Hydrogen Valleys).

Energy's MISSION

Enable the Sustainable Energy Transition by contributing to the widespread adoption of renewable hydrogen technologies in the transport, industry, energy and built environment sectors



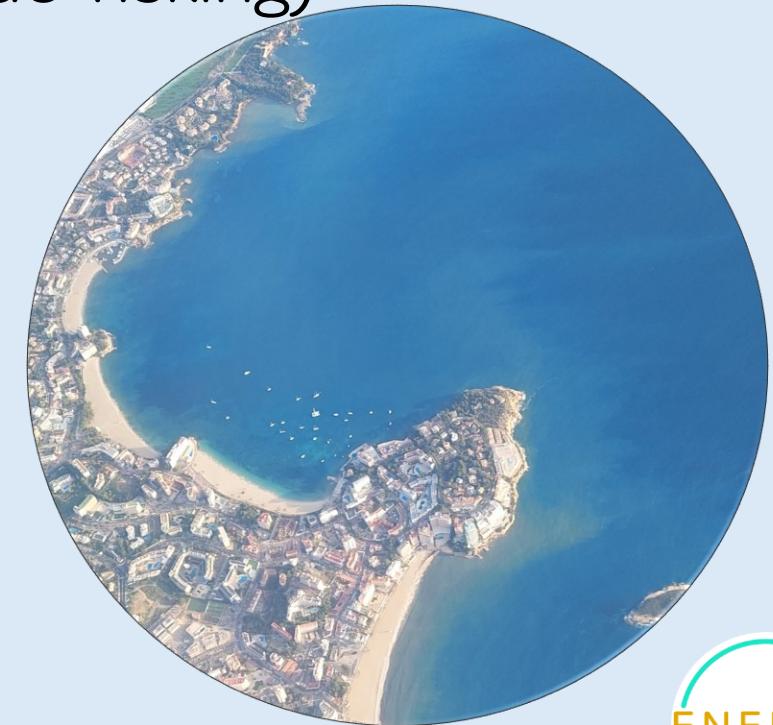
Technical Assistance Programme - Objectives

Support Islands that are not part of the Green Hysland project

- Help stakeholders develop initial pre-feasibility studies for their green hydrogen project ideas and concepts (project de-risking)

Targeted Key Applications of Green Hydrogen

- Local transport
- Maritime solutions
- Energy systems in buildings
- Industry
- Tourism



Additional Benefits of the Technical Support programme



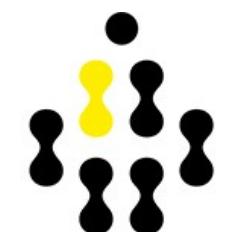
Green Hysland
Technical Support
Programme



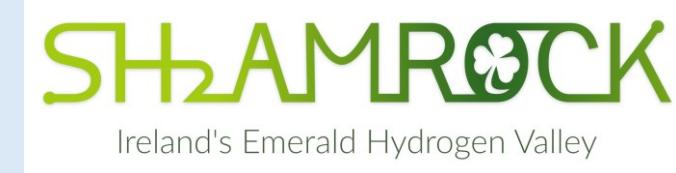
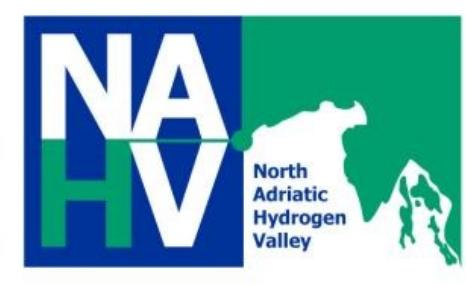


Technical Support and Mentorship delivered by Hydrogen Experts

- The Green Hysland Technical Support Programme will be led by [Enercy](#) and the [Aragon Hydrogen Foundation \(FHa\)](#)
- Both have considerable experience in developing and implementing Hydrogen Islands and Hydrogen Valleys



HEAVENN





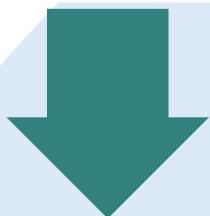
GREEN HYSLAND

How the Programme Works - Selection

Step 1: Fill in your Expression of Interest (EOI)

Submit by 16 May 2025 by filling in an online form:

<https://h2territory.eu/replicability-tool/green-hyslands-technical-assistance-programme/>



Step 2: Selection of 10 islands

The Green Hysland Technical Support team will select 10 EU islands to benefit from free tailored Technical Support



How the Programme Works – Technical Support

Step 3: Participation of Islands in Technical Support Programme

Selected Island Beneficiaries will take part in an online group workshop to discuss the technical capabilities of the HTP Tool in detail and in up to 3 bilateral mentoring sessions.



Step 4: Analysis of the project concept

The Technical Support Expert team will use the HTP Tool and the inputs provided by the Beneficiary Island to prepare a pre-feasibility assessment of the initial project concept.



Step 5: Receive Technical Recommendations and Final Report

Receive a summary analysis with recommendations for project development & implementation.



Selection criteria for the Technical Assistance Programme

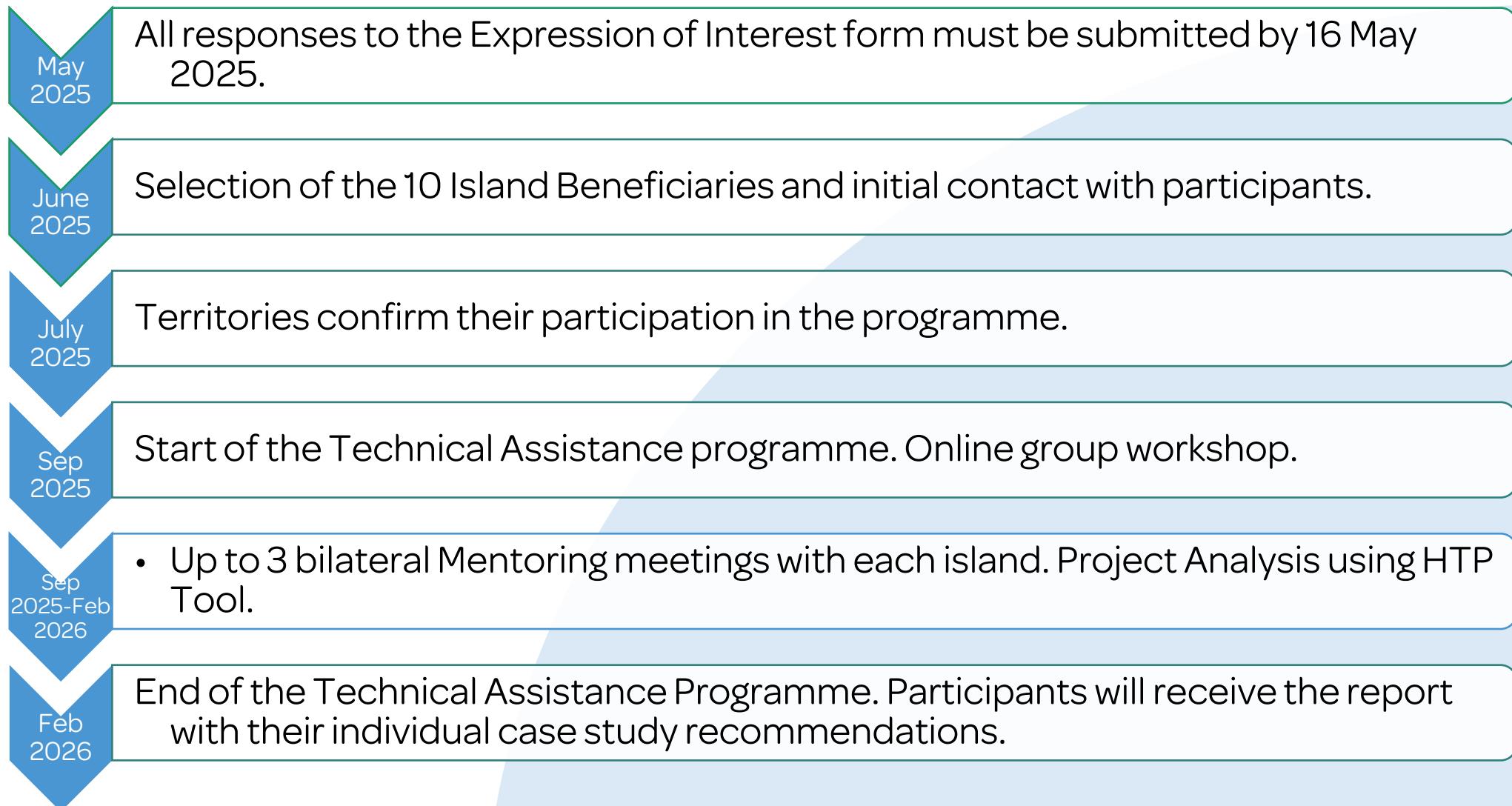
- 1 Existence of an initial hydrogen project concept on the island, demonstrated through a short description of the concept
- 2 Different types of partners involved in the H2 project concept (e.g. Local Authority, industry, community, transport providers)
- 3 Access to renewable energy resources to develop a green H2 project
- 4 Located in the EU (including Overseas Countries and Territories (OCTs) and Outermost Regions (ORs))
- 5 Membership on the Hydrogen Territories (HTP) Platform (mandatory)
- 6 Existence of a clear strategy for using green hydrogen on the territory (advantageous)





GREEN HYSLAND

Timeline



Why Participate?

Tailored Support for your Island's Sustainable Energy Project

- Focused on green hydrogen as a sustainable energy solution
- Hydrogen can contribute to the Energy Independence of your Island

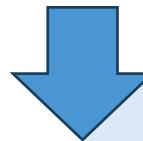
Expertise and Guidance

- Access to Energy's and the Aragon Hydrogen Foundation's deep knowledge and experience in hydrogen systems and hydrogen deployment projects





Are you interested in receiving FREE
Tailored Technical Assistance for your
green hydrogen project?



Then
[APPLY HERE](#)

Deadline: Friday, 16/5/2025





Thank you!



Any Questions?

Feel free to leave them in the chat

or

Email the Technical Assistance Team at:

h2v@hidrogenoaragon.org





Backup slides





Structure of the GREEN HYSLAND Technical Assistance programme

1. **Select 10 islands** (5 to be supported with Technical Assistance by ENER, 5 by FHa) on the basis of the submissions from the Expressions of Interest form, using the criteria previously defined in Deliverable D6.8.
2. Schedule a **group workshop** with the Beneficiaries to and to explain how the HTP tool works.
3. Organise **up to three 1-to-1 sessions per Beneficiary** to:
 - a) Gain an understanding of the project idea or concept
 - b) help the Beneficiaries define necessary technical parameters for their hydrogen project
 - c) Provide an overview of the results of the use of the HTP Tool
4. Using the results of the HTP Tool data, prepare a **short 5-10 page prefeasibility assessment report of the planned hydrogen project**. In our final reports of the Technical Assistance provided to the 10 Technical Assistance Beneficiaries: in the recommendations section, we just provide light advice regarding regulation and financial matters. Note that regulations and languages differ greatly across countries and we don't have the competences to go deeper.
5. The Final Pre-Feasibility Assessment Report will then be handed over to each Beneficiary for their further use.



The HTP Tool and Tierra del Fuego case study

Live demonstration of the HTP Tool

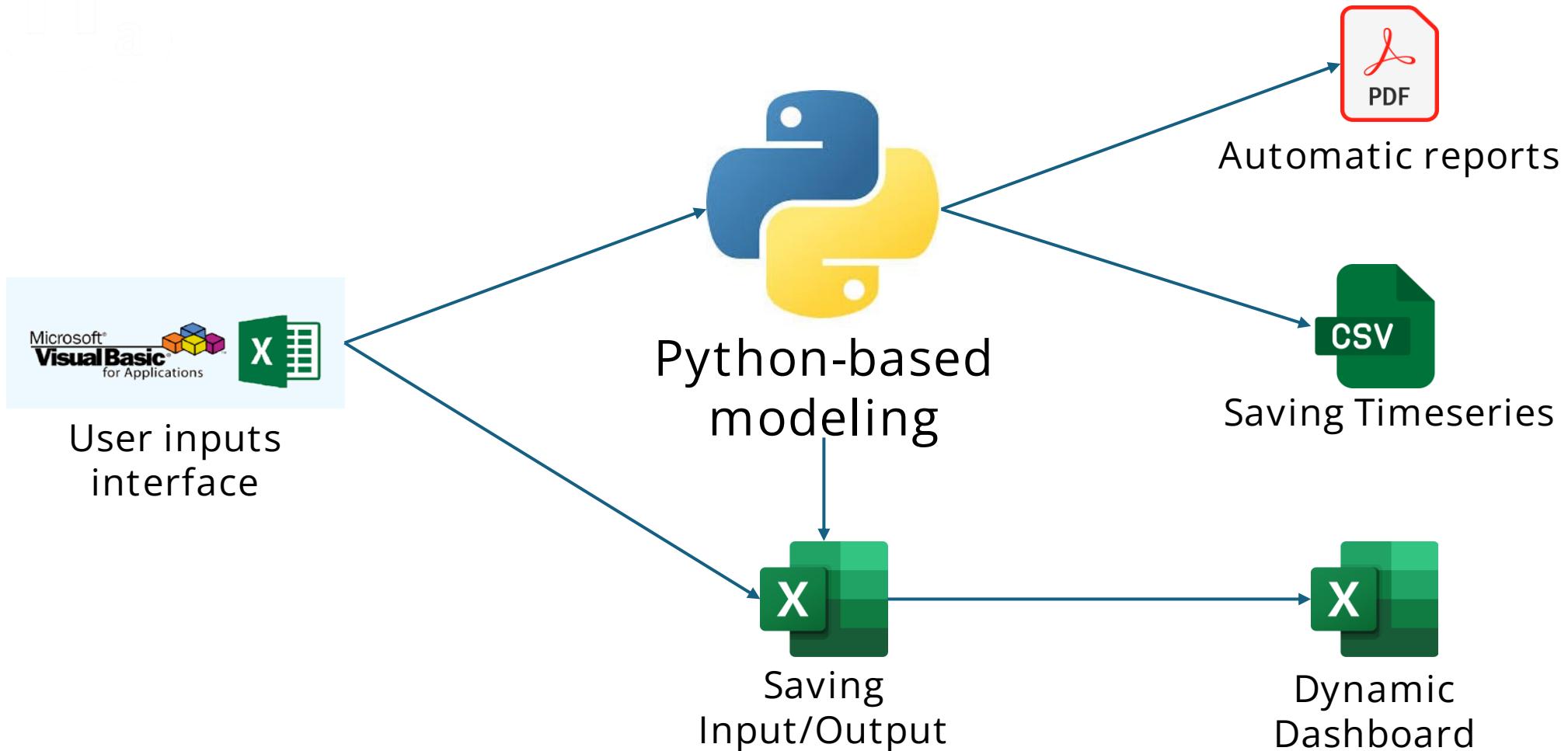
Alberto Herranz FHA - Hydrogen Valleys Engineer

Ricardo Rodríguez H2 Chile – Head of Studies



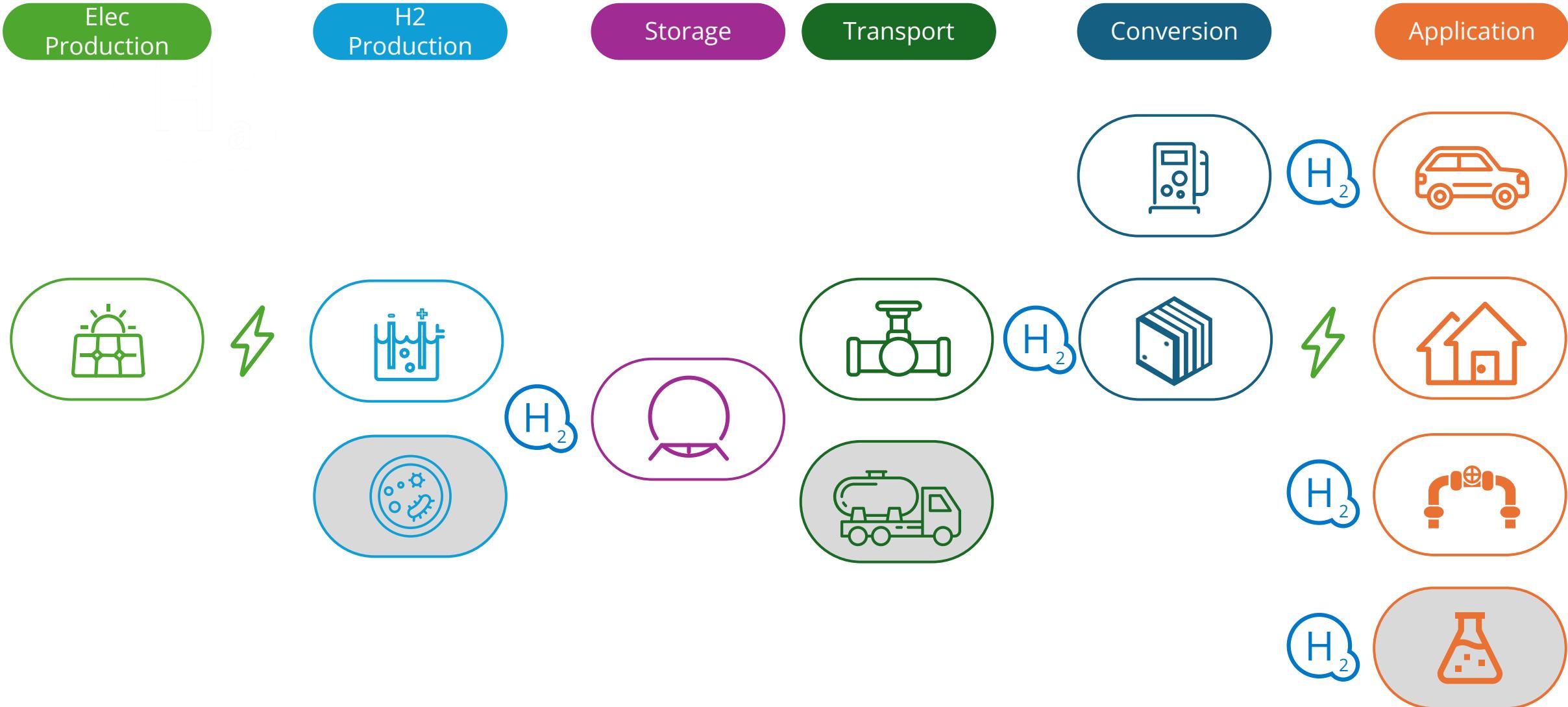
HTP Tool presentation

Platform on which the tool is based



Capabilities of HTP Tool

- Creates scenarios across the hydrogen value chain
- Enables installation sizing
- Performs financial analysis, including investment & benefits
- Assesses the feasibility of a hydrogen valley





Renewable Hydrogen Development in Chile: **Tierra del Fuego Island**

March 2025

Chilean Hydrogen Association, H2 Chile

www.h2chile.cl / comunicaciones@h2chile.com

Note: the following presentation was prepared based on studies, data collected and analysis of the administrative team of the Chilean Hydrogen Association. Any misuse or dissemination of the information provided during the meeting may be grounds for disciplinary and/or legal action as stipulated by H2Chile.H2 Chile - Chilean Hydrogen Association®, 2024.



About H2 Chile

Our vision

Be a promoter of zero emission development of Chile and the world.

Our mission

Accelerate the adoption of renewable hydrogen and its derivatives in our society, promoting public-private collaboration.

H2 Chile: 105 companies y 40 individual members



Last Update: October 2024





Replication Case Study

A wide-angle photograph of a landscape in Tierra del Fuego. In the foreground, a single, gnarled tree with orange autumn leaves leans dramatically to the left. The ground is covered in sparse, yellowish-brown vegetation. A winding river or stream cuts through a valley in the middle ground, its path curving from the center-left towards the bottom right. The background consists of a range of low, rounded mountains under a sky filled with scattered white and grey clouds.

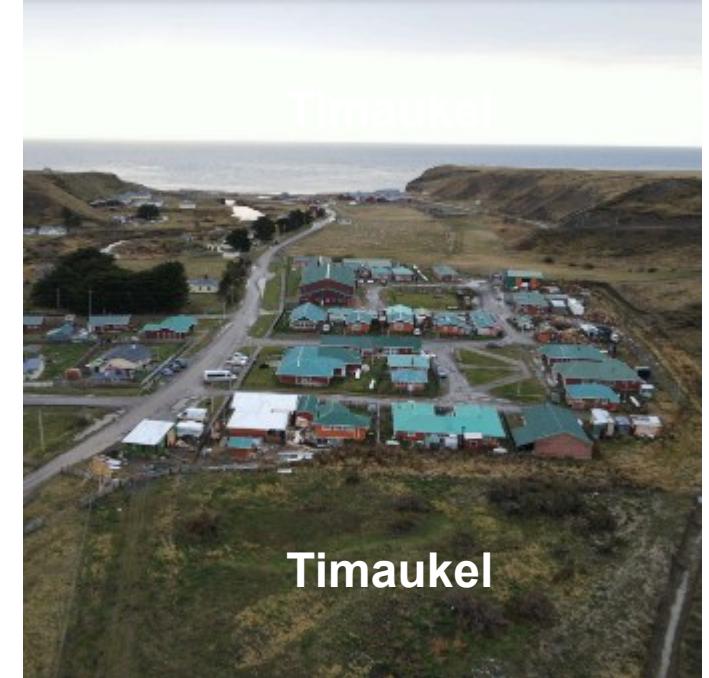
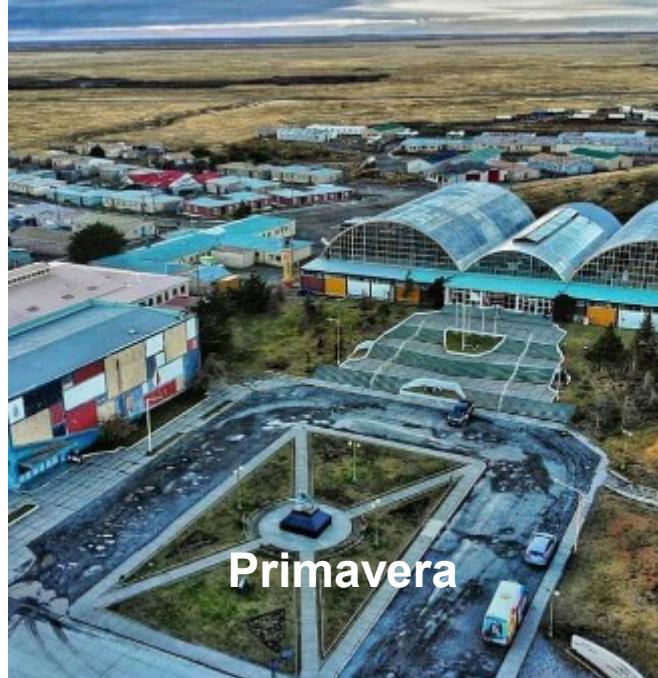
Tierra del Fuego Island

Tierra del Fuego Island

Tierra del Fuego Island is located at the southern tip of South America, separated from the continent by the Strait of Magellan. It has a total area of 47,992 km², with 61% belonging to Chile and 39% to Argentina. It is bordered by the Beagle Channel to the south, the Atlantic Ocean to the east, and the Pacific Ocean to the west. This analysis will focus on the Chilean territory of Tierra del Fuego, which is part of the Magallanes Region and Chilean Antarctica.



Demographic context



- The province of Tierra del Fuego has a low population density and rural character.
- Porvenir is the biggest and the most urbanized municipality, while Primavera and Timaukel remain rural.
- Total surface area: 24,719 km² (Balearic Islands: 4.992 km²)

Municipality	Inhabitants	Inhabitants/km ²
Porvenir:	7,570	0.75
Primavera	679	0.16
Timaukel	278	0.02
Total	8,527	0.34

Source: National Institute of Statistics of Chile. (2017).

Economic context



The main economic activities in the province of Tierra del Fuego, Chile, are:

- Sheep farming
- Fishing and salmon farming
- Oil & gas extraction

Energy context

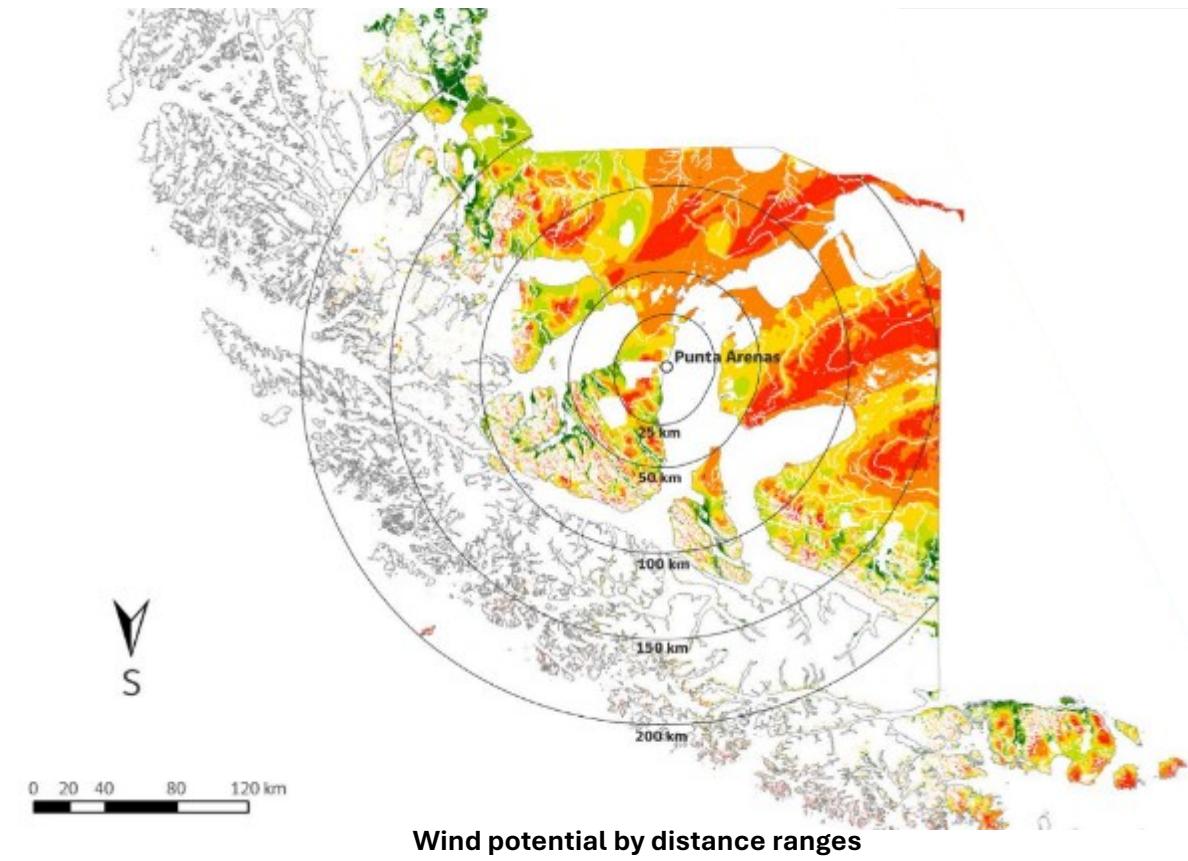
- Energy development is historically tied to oil & gas exploitation, with the National Petroleum Company (ENAP) leading production and distribution.
- Each municipality operates an independent electrical system, presenting autonomy and infrastructure challenges.
- Main fuels:
 - Natural gas (primary source for electricity and heating)
 - Diesel (backup and remote areas)
 - Firewood (rural household heating)
- A government subsidy on natural gas ensures affordable energy access, addressing the region's isolation and harsh climate.



Title: San Gregorio refinery

Energy Capacity and Potential

- Isla Grande de Tierra del Fuego has an estimated wind potential of **50,400 MW**.
- It offers exceptional wind quality, with average wind speeds exceeding **9 m/s at 100 meters** altitude and reaching over **11 m/s** in certain areas.
- The wind conditions in Tierra del Fuego are as **constant and intense as the best offshore wind farms in the North Sea**, but located **onshore**, offering lower development costs.
- It boasts an **average plant factor of 50%**, positioning the region among the most efficient wind generation zones in the world.



Wind potential by distance ranges

Capacity Factor	Power (MW)					
	0-25km	25-50km	50-100km	100-150km	150-200km	Más de 200km
30% - 35%	1	132	574	484	943	2.961
35% - 40%	207	446	1.234	1.369	1.946	2.281
40% - 45%	718	1.175	4.087	5.013	3.696	3.070
45% - 50%	1.288	3.348	9.995	11.272	2.538	2.970
50% - 55%	1.048	2.834	14.973	18.638	3.097	2.572
mayor a 55%	291	278	9.171	8.966	1.200	1.383
Total (MW)	3.553	8.214	40.033	45.742	13.419	15.237

Source: Vásquez Alarcón, A. A. (2021).

Energy Demand Overview

- The **local energy demand** for the province of Tierra del Fuego is estimated at **422.86 GWh**.
- **Transportation activities**—particularly **truck crossings and ferry operations**—represent a **significant additional energy load**, highlighting the **strategic role of logistics and mobility** in the region's overall energy consumption.



Title: Ferry crossing the Strait of Magellan

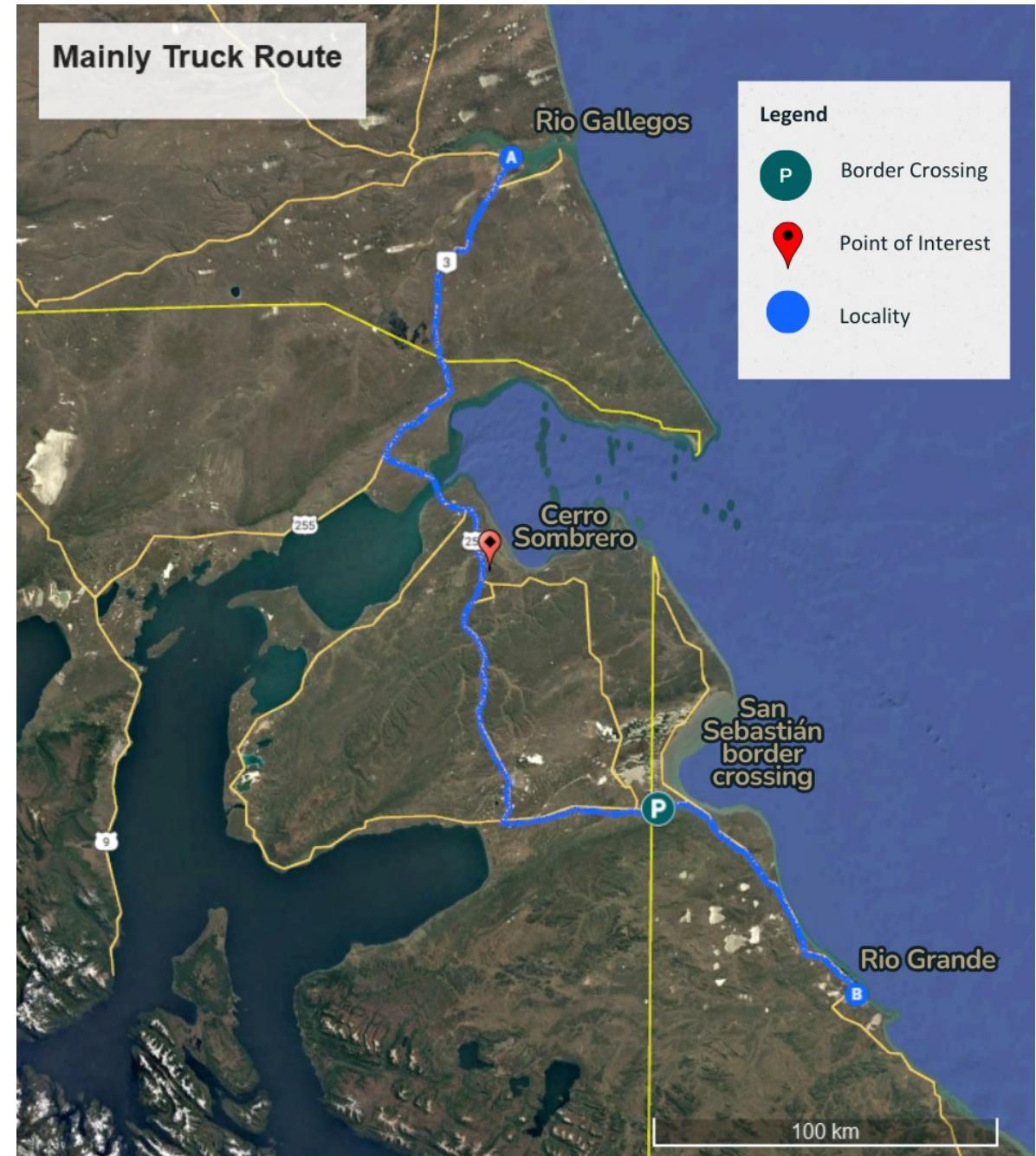
Freight transport

Freight transport

- In **2023**, a total of **38,219 trucks** crossed into Argentinian territory via the **San Sebastián border checkpoint**.
 - Average distance traveled per trip: **375 km**.
 - Estimated annual diesel consumption: **5.3 million liters**.
 - Estimated annual CO₂ emissions: **14,237 tons**.

Ferry transport

- In **2024**, a total of **14,540 ferry trips** were recorded across the Strait of Magellan.
 - Estimated annual diesel consumption:** 2.85 million liters
 - Estimated annual CO₂ emissions:** 7,633 tons



Source: Own Elaboration

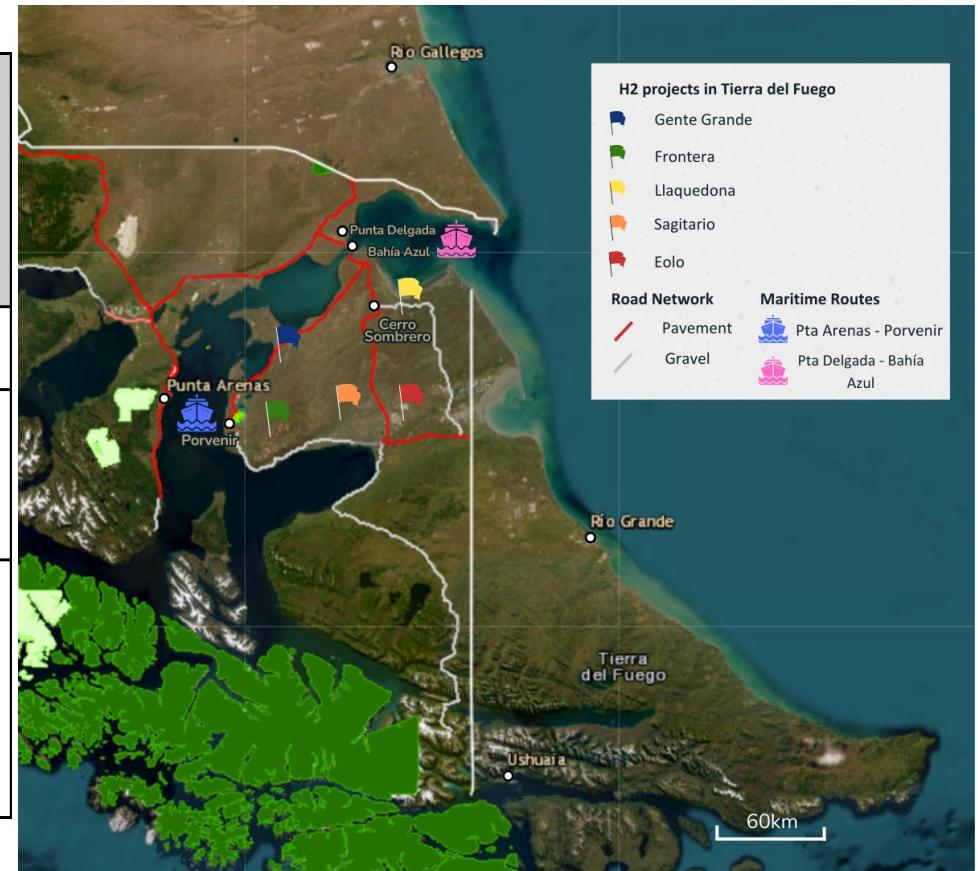
Ammonia Projects in Tierra del Fuego



Projects Developed in Tierra del Fuego

Projects	Gente Grande NH3 - EX	Llaquedona NH3 - EX	Frontera H2 - EX	Sagitario NH3 - EX	Eolo Austral NH3 - EX
	 	 			
Power Capacity	3.2 GW	1.7 GW	2.1 GW	2.5 GW	2.1 GW
Annual Production	1.4 Millions Tons of Green Ammonia	1 Million Tons of Green Ammonia	1 Million Tons of Green Ammonia	1 Million Tons of Green Ammonia	850.000 Tons of Green Ammonia

Source: H2 Chile. (2024). Projects Map.



References



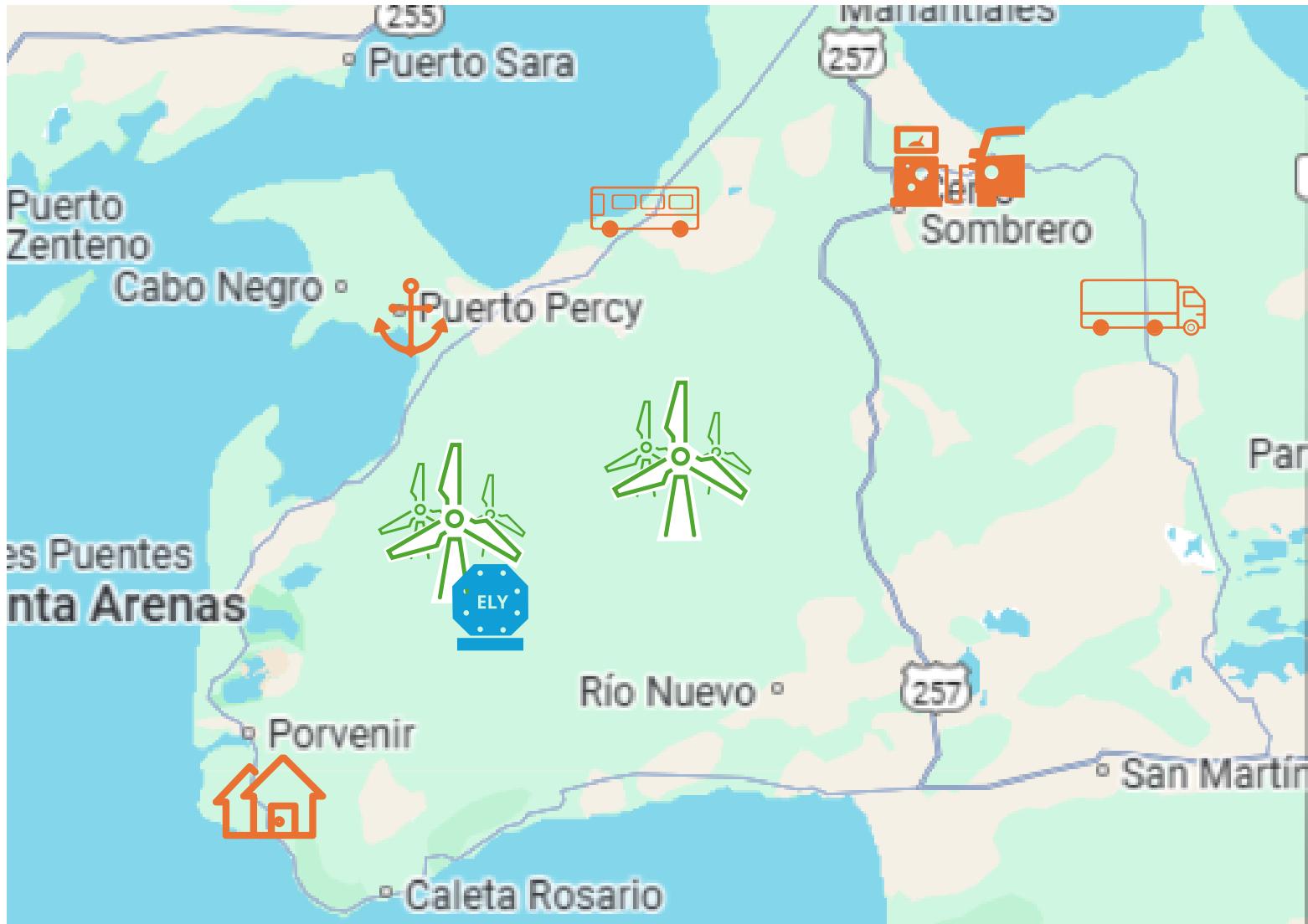


Live demonstration of the HTP Tool

Case Study



Case Study





This project has received funding from the Clean Hydrogen Partnership under Grant Agreement No 101007201. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation programme, Hydrogen Europe and Hydrogen Europe Research.

For any question or problem with the application, do not hesitate to contact htp@hidrogenoaragon.org



Green Hydrogen production





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H2PP Module

Green Hydrogen Production

HTP Hydrogen Territories Platform Tool

Power plant

Stack Power: MW

Number of Stacks:

0 PV 0 Wind
0 PPA PV 0 PPA

Electrolyser

CAPEX | OPEX

Default Values

Stack Cost (€/kW)

BoP Breakdown Costs

- Power Supply Syst. (€/kW)
- Deionised Water Syst. (€/kW)
- Hydrogen Processing (€/kW)
- Cooling Syst (€/kW)
- Miscellaneous (€/kW):
(ventilation, safety, gas detectors, nitrogen supply)

Indirect CAPEX (% of installed CAPEX):

- Site Preparation (%)
- Engineering & Design (%)
- Project Contingency (%)

Discount Rate (%)

Investment Subsidy (% of installed CAPEX)



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The screenshot shows the H2PP Module interface with the following details:

- Wind Plant Definition** window:
 - Position (Lat / Long): -53.1678 / -70.045
 - Installed capacity: 15 MW
 - LCOE (Levelized Cost Of Electricity): 40 €/MWh
 - Turbine model: Acciona AW77 1500
 - Hub height: 120 m
- Power plant** section:
 - 1 PV
 - 0 Wind
 - 0 PPA PV
 - 0 PPA
- Renewables.ninja** button
- MERRA-2** button
- HTP Hydrogen Territories Platform Tool** logo
- Information icon** (blue circle with white 'i')
- Red X** and **Green +** buttons at the bottom right



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H2PP Module

Wind Plant Definition

Position (Lat / Long): /

Installed capacity:

LCOE (Levelized Cost Of Electricity)

Turbine model :

Hub height:

Synthetic wind AC power (MW) - Timestep: 1min

1 PV 0 Wind
0 PPA PV 0 PPA
X

Renewables.ninja

MERRA-2

Information Panel

695
208
228
169
82
37

(€/kW)
(€/kW)

detectors, nitrogen supply)

Installed CAPEX:
2
8
15
6
5
30

(%)
(%)
(%)
(%)
(%)
(%) of installed



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H2PP Module

Green Hydrogen Production

HTP Hydrogen Territories Platform Tool

Power plant

Synthetic wind AC power (MW) - Timestep: 1min

Stack Cost (€/kW): 695

Stack Power: 20 MW

Number of Stacks: 1

1 PV 0 Wind

0 PPA PV 0 PPA

Electrolyser

ELY

H₂

CAPEX | OPEX

Default Values

Stack Cost (€/kW)

BoP Breakdown Costs

- Power Supply Syst. (€/kW)
- Deionised Water Syst. (€/kW)
- Hydrogen Processing (€/kW)
- Cooling Syst (€/kW)
- Miscellaneous (€/kW): (ventilation, safety, gas detectors, nitrogen supply)

208
228
169
82
37

Indirect CAPEX (% of installed CAPEX):

- Site Preparation (%)
- Engineering & Design (%)
- Project Contingency (%)

2
8
15

Discount Rate (%)

5

Investment Subsidy (% of installed

30

i

Play



This project has received funding from the Clean Hydrogen Partnership under Grant Agreement No 101007201. This Joint Undertaking receives support from the European Union's Horizon 2020



Wind Plant Definition

H2PP Module

Hydrogen Territories Platform Tool

Power plant

Synthetic wind AC power (MW) - Timestep: 10 min

1 PV 1 Wind

0 PPA PV 0 PPA Wind

Renewables.ninja

MERRA-2

Wind Plant Definition

Position (Lat / Long): /

Installed capacity: MW

LCOE (Levelized Cost Of Electricity) €/MWh

Turbine model:

Hub height: m

W

Costs

Inst. (€/kW)

Syst. (€/kW)

Assing (€/kW)

W (<€/kW)

Gas detectors, nitrogen supply)

(% of installed CAPEX):

Design (%)

Procurement (%)

Delivery (%)

Subsidy (% of installed)

X **+**



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The screenshot shows the H2PP Module interface with the following sections:

- Wind Plant Definition:**
 - Position (Lat / Long): -53.1118 / -69.7767
 - Installed capacity: 10 MW
 - LCOE (Levelized Cost Of Electricity): 40 €/MWh
 - Turbine model: Acciona AW77 1500
 - Hub height: 120 m
- Power plant:**
 - Synthetic wind AC power (MW) - Timestep: 1min: A line chart showing fluctuating power output over time.
 - 1 PV: A small icon representing a solar panel.
 - 1 Wind: A small icon representing a wind turbine.
 - 0 PPA PV: A small icon representing a power purchase agreement for solar.
 - 0 PPA Wind: A small icon representing a power purchase agreement for wind.
 - A large red X icon at the bottom left.
- Renewables.ninja**: A logo featuring a green superhero-like figure and the text "Renewables.ninja".
- MERRA-2**: A logo featuring a globe and the text "MERRA-2".
- Icons:** A row of icons including a blue circle with an info icon, a green plus sign, a red minus sign, and a green circle with a plus sign.



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H2PP Module

Green Hydrogen Production

HTP Hydrogen Territories Platform Tool

Power plant

Synthetic wind AC power (MW) - Timestep: 1min

Stack Power: 20 MW

Number of Stacks: 1

1 PV 1 Wind

0 PPA PV 0 PPA

Electrolyser

ELY

H₂

CAPEX | OPEX | **i**

Default Values

Stack Cost (€/kW) 695

BoP Breakdown Costs

- Power Supply Syst. (€/kW) 208
- Deionised Water Syst. (€/kW) 228
- Hydrogen Processing (€/kW) 169
- Cooling Syst (€/kW) 82
- Miscellaneous (€/kW): (ventilation, safety, gas detectors, nitrogen supply) 37

Indirect CAPEX (% of installed CAPEX):

- Site Preparation (%) 2
- Engineering & Design (%) 8
- Project Contingency (%) 15

Discount Rate (%) 5

Investment Subsidy (% of installed 30



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H2PP Module

Green Hydrogen Production

HTP Hydrogen Territories Platform Tool

Power plant

Synthetic wind AC power (MW) - Timestep: 1min

Stack Power: 20 MW

Number of Stacks: 1

1 PV 1 Wind

0 PPA PV 0 PPA

Electrolyser

ELY

CAPEX | OPEX

Default Values

Stack Cost (€/kW)

695

BoP Breakdown Costs

- Power Supply Syst. (€/kW)
- Deionised Water Syst. (€/kW)
- Hydrogen Processing (€/kW)
- Cooling Syst (€/kW)
- Miscellaneous (€/kW): (ventilation, safety, gas detectors, nitrogen supply)

208
228
169
82
37

Indirect CAPEX (% of installed CAPEX):

- Site Preparation (%)
- Engineering & Design (%)
- Project Contingency (%)

2
8
15

Discount Rate (%)

5

Investment Subsidy (% of installed

30

i

Play



This project has received funding from the Clean Hydrogen Partnership under Grant Agreement No 101007201. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation programme, Hydrogen Europe and Hydrogen Europe Research.

For any question or problem with the application, do not hesitate to contact htp@hidrogenoaragon.org



Green Hydrogen production



Inputs

PV Plant



0,00 plants
0,00 MW

Wind Plant



2,00 plants
25,00 MW

PV PPA



0,00 PPAs
0,00 MW

Wind PPA



0,00 PPAs
0,00 MW

Outputs



Hydrogen production

84,6

ton/year



Water consumption:

7.460 m³/year

x 3,0 olimpic pools/year

GHG Emissions (kg CO₂e/kg H₂):

0

RED III
Compliance

Is GHG Compliant ?

True

Is Renewable Compliant ?

True

Overall compliance

True



569,16 ton CO₂e
saved/year

Economic results

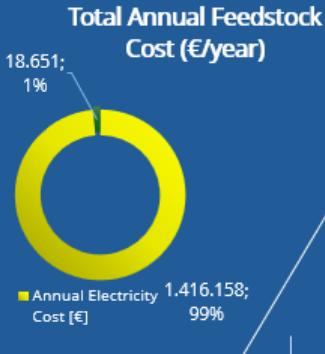
LCOH (€/kg H₂)



Hydrogen pruction cost:

9,09 €/kg

Total Annual Feedstock Cost (€/year)



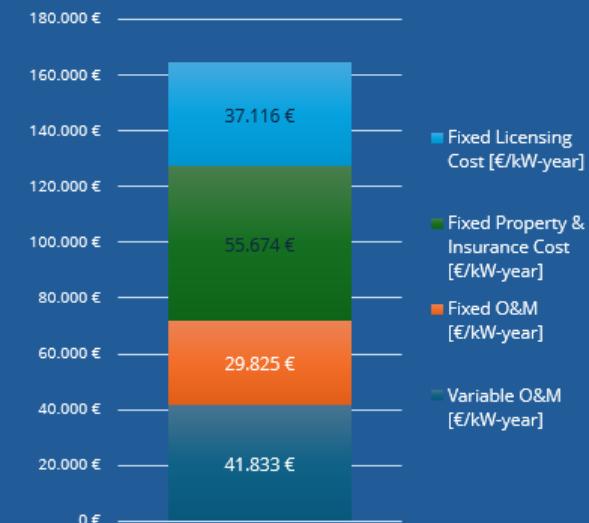
Capacity Factor (%)



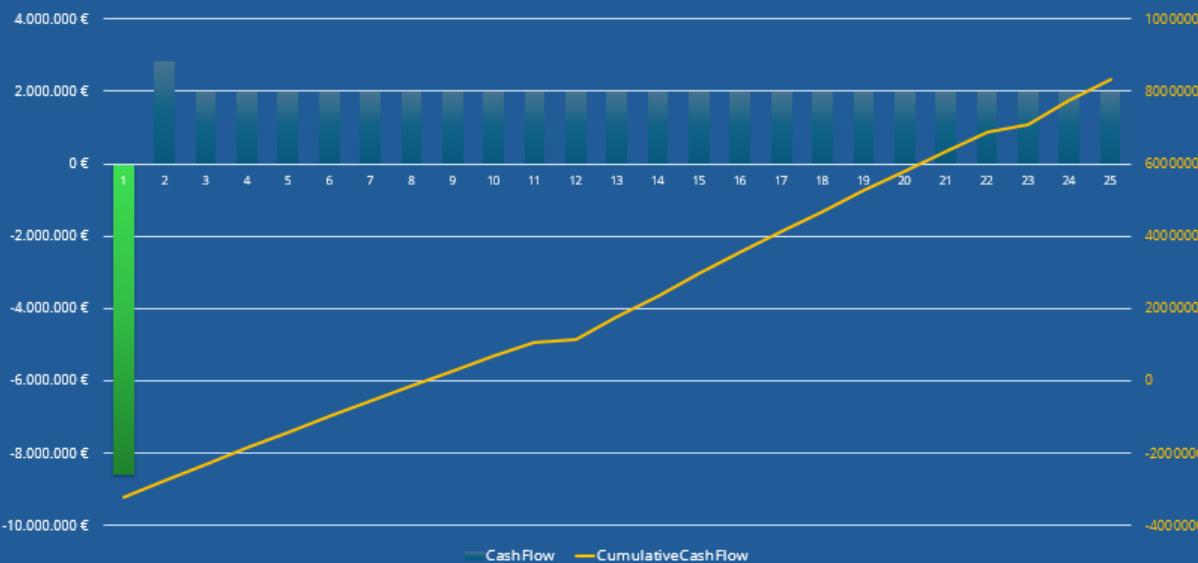
CAPEX Breakdown (€)



OPEX Breakdown (€/year)



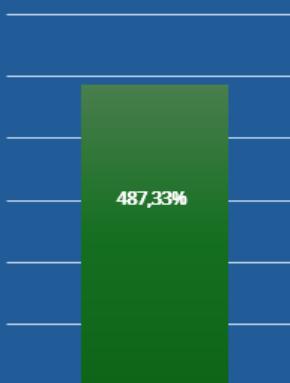
Cash Flow & H2 Production



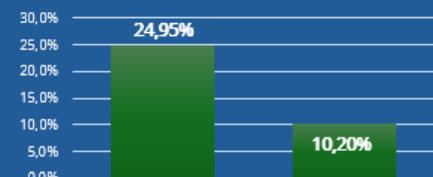
NPV



ROI



IRR



MIRR



Payback period

4 years

HRS: Hydrogen Refueling Station



Inputs

Light FCEV



15 cars
156800 km/year

Bus FCEV



20 buses
511000 km/year

Heavy-Duty FCEV



37 heavy duty
1199850 km/year

Medium-Duty FCEV



25 medium duty
1483750 km/year

content	
Vol. 900 bar:	0,050 m ³ /vessel
Vol. 500 bar:	0,053 m ³
Vol. Bulk:	4 m ³

Outputs



Annual H₂ Delivered 39.380 kg/year



nº 900 bar vessels: 14

Avg. H₂ Dispensed Per Day 108 kg/day

nº 500 bar vessels: 75

Annual Carbon Savings 354.420 kg CO₂

nº bulk storage: 6



700 bar: 1 dispenser(s)

350 bar: 2 dispenser(s)

HRS Module

Hydrogen Territories Platform Tool

Position (Lat / Long): -53.2539 / -70.3201

Optimization N° Dispensers

Light FC Vehicles

FC Electric Buses

Heavy-Duty FC Trucks

Medium-Duty FC Trucks

Hydrogen Refuelling Station

i

Inputs

Outputs

700 bar

900 bar

500 bar

350 bar

300 bar

H₂

CAPEX | OPEX | REVENUE | PROJECT | FOOTPRINT |

Default Values

900bar vessel cost (€/unit) 3500

500bar vessel cost (€/unit) 2750

Bulk storage cost (€/m3) 25000

Compressor cost (€/kW) 7500

Cooling system cost (€/kW) 1000

Installation cost percentage (%) 20

700bar dispenser (€/unit) 250000

350bar dispenser (€/unit) 80000

Land cost (€/m2) 1000

Construction cost (€/m2) 500

Hydrogen Refuelling Station

Optimization N° Dispensers

Inputs

Position (Lat / Long): -53.2539 / -70.3201

Add Heavy-Duty Truck

Technical specs. | Driving patterns | Other constraints

Bus line name: TDF_TrucksFleet

Nº of buses in the line: 2

Fuel tank capacity (kg H₂): 40

Average H₂ consumption per 100 km (kg H₂ / 100 km): 1.5

Accept | Cancel

Outputs

Light FC Vehicles

FC Electric Buses

Heavy-Duty FC Trucks

Medium-Duty FC Trucks

900 bar vessel

500bar vessel cost (€/unit) 3500

Bulk storage cost (€/m³) 25000

Compressor cost (€/kW) 7500

Cooling system cost (€/kW) 1000

Installation cost percentage (%) 20

700bar dispenser (€/unit) 250000

350bar dispenser (€/unit) 80000

Land cost (€/m²) 1000

Construction cost (€/m²) 500

Hydrogen Refuelling Station

Inputs

Position (Lat / Long): -53.2539 / -70.3201

Optimization N° Dispensers

Add Heavy-Duty Truck

Technical specs.	Driving patterns	other constraints
Refuelling threshold (% of tank)	10	
Avg. daily distance weekday (km)	516	
Avg. daily distance weekend (km)	516	
Seasonal factor summer (%)	-10	
Seasonal factor winter (%)	30	

✓ Accept ✗ Cancel

Light FC Vehicles

FC Electric Buses

Heavy-Duty FC Trucks

Medium-Duty FC Trucks

Outputs

2 travels/day
Porvenir-Cerro Sombrero

REVENUE | PROJECT | FOOTPRINT

cost (€/unit)

500bar vessel cost (€/unit)

Bulk storage cost (€/m3)

Compressor cost (€/kW)

Cooling system cost (€/kW)

Installation cost percentage (%)

700bar dispenser (€/unit)

350bar dispenser (€/unit)

Land cost (€/m2)

Construction cost (€/m2)

Hydrogen Refuelling Station

Position (Lat / Long): -53.2539 / -70.3201

Optimization N° Dispensers

Inputs

- Light FC Vehicles: + (Green) / - (Red)
- FC Electric Buses: + (Green) / - (Red)
- Heavy-Duty FC Trucks: + (Green) / - (Red)
- Medium-Duty FC Trucks: + (Green) / - (Red)

Outputs

- TDF_Busline: + (Green) / - (Red)
- TDF_Truck: + (Green) / - (Red)

CAPEX | OPEX | REVENUE | PROJECT | FOOTPRINT |

Default Values

900bar vessel cost (€/unit)	3500
500bar vessel cost (€/unit)	2750
Bulk storage cost (€/m3)	25000
Compressor cost (€/kW)	7500
Cooling system cost (€/kW)	1000
Installation cost percentage (%)	20
700bar dispenser (€/unit)	250000
350bar dispenser (€/unit)	80000
Land cost (€/m2)	1000
Construction cost (€/m2)	500

Hydrogen Refuelling Station

Position (Lat / Long): -53.2539 / -70.3201

Optimization N° Dispensers

700 bar

900 bar

Inputs

Light FC Vehicles

FC Electric Buses

Heavy-Duty FC Trucks

Medium-Duty FC Trucks

Outputs

Aggregated Hydrogen Consumption Per Minute by Fleet

Fleet Mirai

Fleet Nexo

Fleet Juan car

Hydrogen Consumption (kg)

Minutes

CAPEX | OPEX | REVENUE | PROJECT | FOOTPRINT

Default Values

900bar vessel cost (€/unit) 3500

500bar vessel cost (€/unit) 2750

Bulk storage cost (€/m3) 25000

Compressor cost (€/kW) 7500

Cooling system cost (€/kW) 1000

Installation cost percentage (%) 20

700bar dispenser (€/unit) 250000

350bar dispenser (€/unit) 80000

Land cost (€/m2) 1000

Construction cost (€/m2) 500

HRS Module

Hydrogen Refuelling Station

HTP Hydrogen Territories Platform Tool

Position (Lat / Long): -53.2539 / -70.3201

Optimization N° Dispensers

Inputs

Vehicle Type	Add (+)	Remove (-)	Play (Run Simulation)	Plot (Graph)
Light FC Vehicles				
FC Electric Buses				
Heavy-Duty FC Trucks				
Medium-Duty FC Trucks				

Outputs

CAPEX | OPEX | REVENUE | PROJECT | FOOTPRINT | Default Values

900bar vessel cost (€/unit)	3500
500bar vessel cost (€/unit)	2750
Bulk storage cost (€/m3)	25000
Compressor cost (€/kW)	7500
Cooling system cost (€/kW)	1000
Installation cost percentage (%)	20
700bar dispenser (€/unit)	250000
350bar dispenser (€/unit)	80000
Land cost (€/m2)	1000
Construction cost (€/m2)	500

HRS Module

Hydrogen Refuelling Station

HTP Hydrogen Territories Platform Tool

Position (Lat / Long): -53.2539 / -70.3201

Optimization N° Dispensers

Light FC Vehicles

FC Electric Buses

Heavy-Duty FC Trucks

Medium-Duty FC Trucks

Inputs

Outputs

CAPEX | OPEX | REVENUE | PROJECT | FOOTPRINT |

Default Values

900bar vessel cost (€/unit)	3500
500bar vessel cost (€/unit)	2750
Bulk storage cost (€/m3)	25000
Compressor cost (€/kW)	7500
Cooling system cost (€/kW)	1000
Installation cost percentage (%)	20
700bar dispenser (€/unit)	250000
350bar dispenser (€/unit)	80000
Land cost (€/m2)	1000
Construction cost (€/m2)	500

HRS: Hydrogen Refueling Station



Inputs

Light FCEV



0 cars
0 km/year

Bus FCEV



2 buses
376680 km/year

Heavy-Duty FCEV



2 heavy duty
268320 km/year

Medium-Duty FCEV



0 medium duty
0 km/year

constants

Vol. 900 bar: 0,050 m³/vessel

Vol. 500 bar: 0,053 m³

Vol. Bulk: 4 m³

Outputs



Annual H₂ Delivered: 58.382 kg/year
Avg. H₂ Dispensed Per Day: 160 kg/day
Annual Carbon Savings: 525.441 kg CO₂

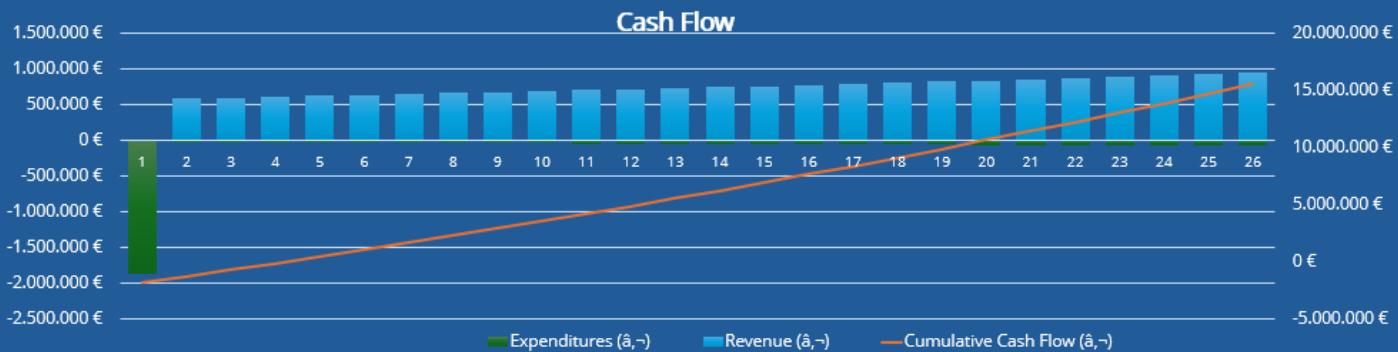
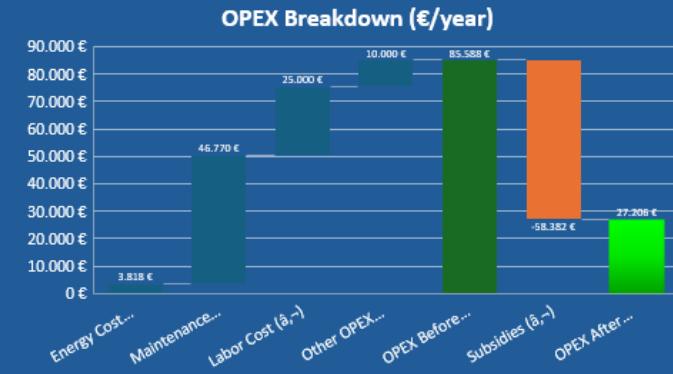
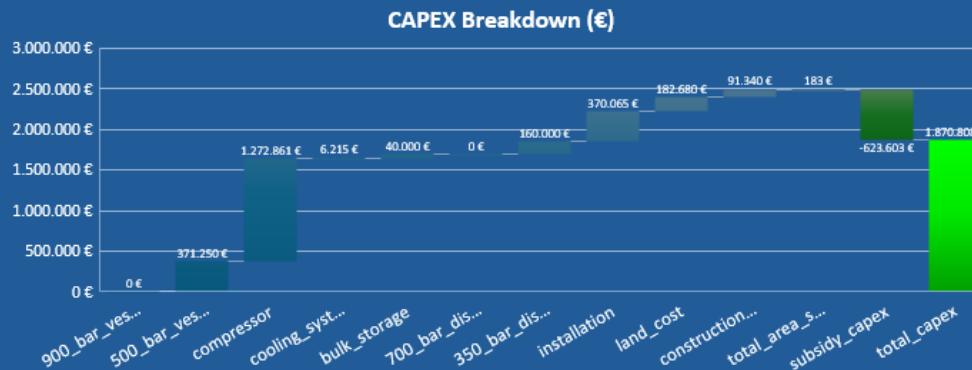
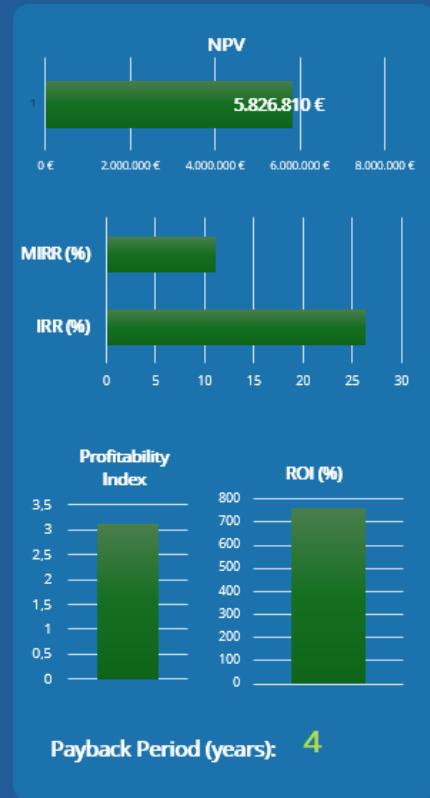


nº 900 bar vessels: 0
nº 500 bar vessels: 135
nº bulk storage: 10



700 bar: 0 dispenser(s)
350 bar: 2 dispenser(s)

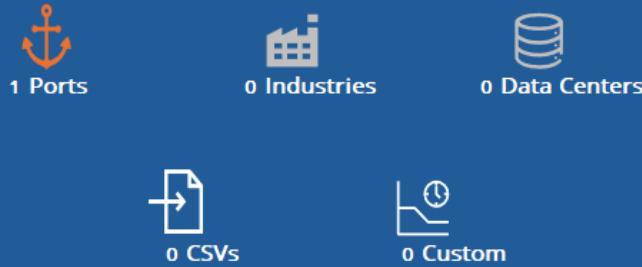
Economic results



FCH primary power system



Inputs



Annual Power Supply: **747.143 kWh/year**
Avg. Power Supply: **85,3 kWh/day**



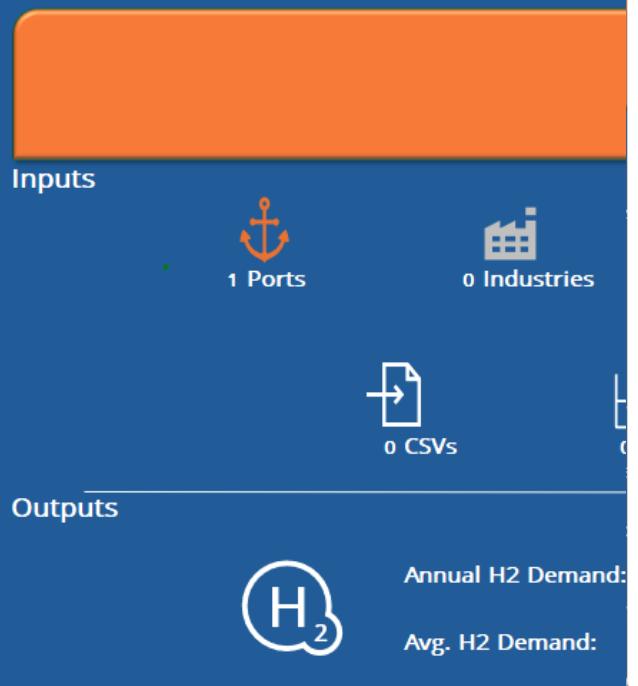
Outputs



Annual H₂ Demand: **32.468 kg/year**
Avg. H₂ Demand: **3,7 kg/day**



206 ton CO₂e saved per year



FCH Module

Power supply FC based

HTP Hydrogen Territories Platform Tool

Application

- 0 Customs
- 0 Ports
- 0 Industries
- 0 CSVs
- 0 Data centers

FuelCell

Net Power Output:	150 kW
Hydrogen consumption:	20 g/kW
Plant efficiency:	90 %

CAPEX | OPEX

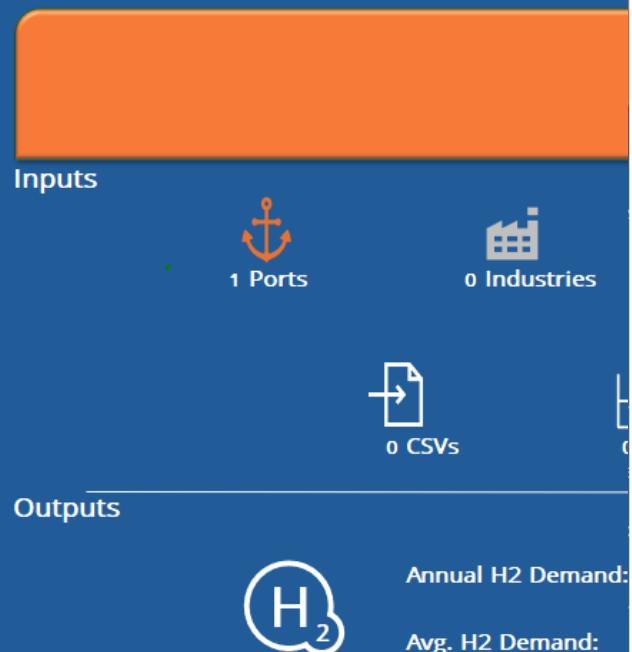
Fuel cell:	50000 €
Inverter:	2000 €
Facilities:	1200 €

Power supplied by year

206 ton CO₂e saved per year

Graph showing Power supplied by year (Tonnes CO₂e saved per year) over 12 months.

Graph showing Power supplied by year (Tonnes CO₂e saved per year) over 12 months.



FCH Module

Power supply FC based

Hydrogen Territories Platform Tool

Port definition

Application

Green Hysland

EM4 Max consumptio 30 kW

EM2 Max consumptio 0 kW

Fuel cell: 30000 €

Inverter: 2000 €

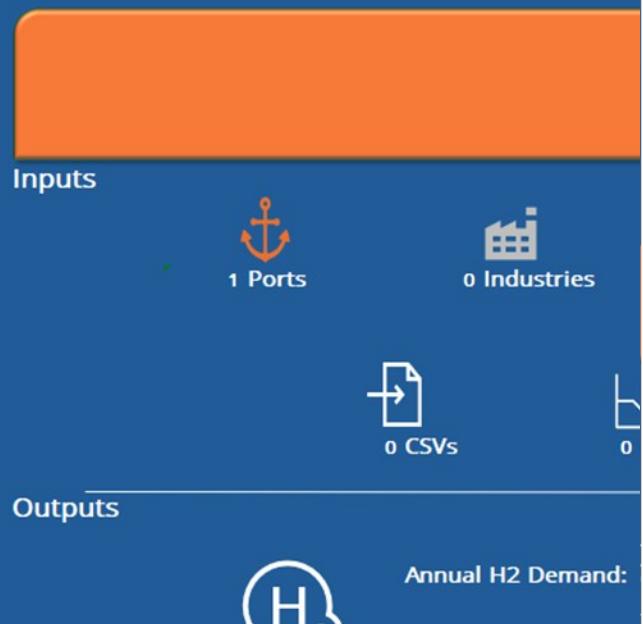
Facilities: 1200 €

Power supplied by year

1 2 3 4 5 6 7 8 9 10 11 12

206 ton CO₂e saved per year

The screenshot shows the 'Power supply FC based' module of the Hydrogen Territories Platform Tool. It displays a 'Port definition' window with two entities: EM4 and EM2. EM4 has a maximum consumption of 30 kW, while EM2 has 0 kW. Below this, there are cost inputs for a Fuel cell (30000 €), Inverter (2000 €), and Facilities (1200 €). To the right, a bar chart titled 'Power supplied by year' shows monthly data from January to December. A large orange bar at the top indicates a total of 206 ton CO₂e saved per year.



FCH Module

Hydrogen Territories Platform Tool

Power supply FC based

Application

FuelCell

- Net Power Output: 40 kW
- Hydrogen consumption: 20 g/kW
- Plant efficiency: 90 %

CAPEX | OPEX

- Fuel cell: 24000 €
- Inverter: 600 €
- Facilities: 1200 €

Power supplied by year

206 ton CO₂e saved per year

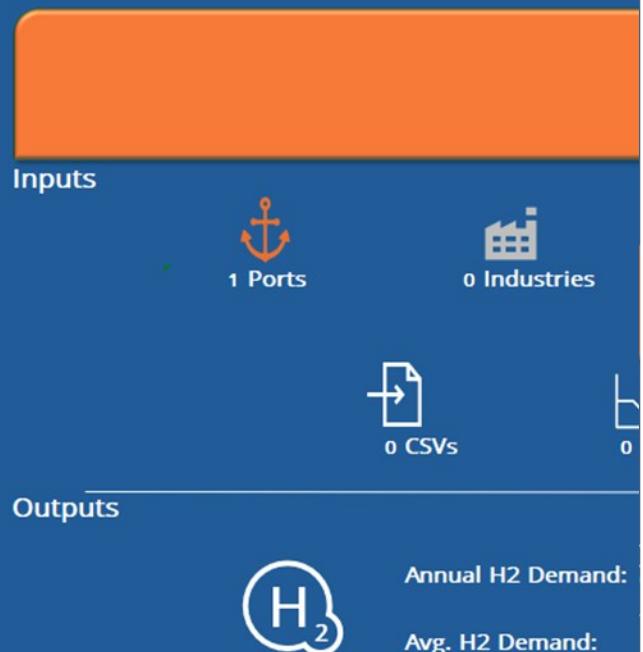
i

Supply

Power supplied by year

206 ton CO₂e saved per year





FCH Module

Hydrogen Territories Platform Tool

Power supply FC based

Application

- Net Power Output: 40 kW
- Hydrogen consumption: 20 g/kW
- Plant efficiency: 90 %

CAPEX | OPEX

- Fuel cell: 24000 €
- Inverter: 600 €
- Facilities: 1200 €

Power supplied by year

206 ton CO₂e saved per year

The FCH Module interface includes sections for Application, FuelCell, and CAPEX | OPEX. It also features a graph of power supplied by year and a summary of annual CO₂ savings.



FCH primary power system



Inputs



Annual Power Supply:

139.433 kWh/year

Avg. Power Supply:

15,9 kWh/day



Outputs

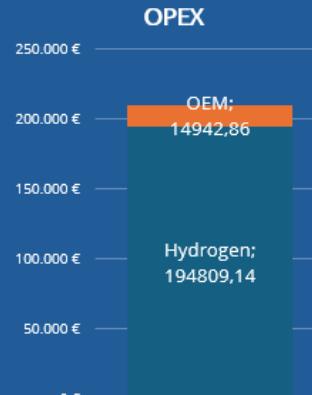
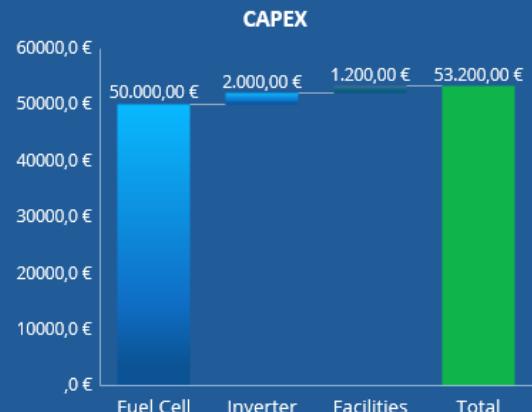


Annual H₂ Demand: 15.263 kg/year
Avg. H₂ Demand: 1,7 kg/day

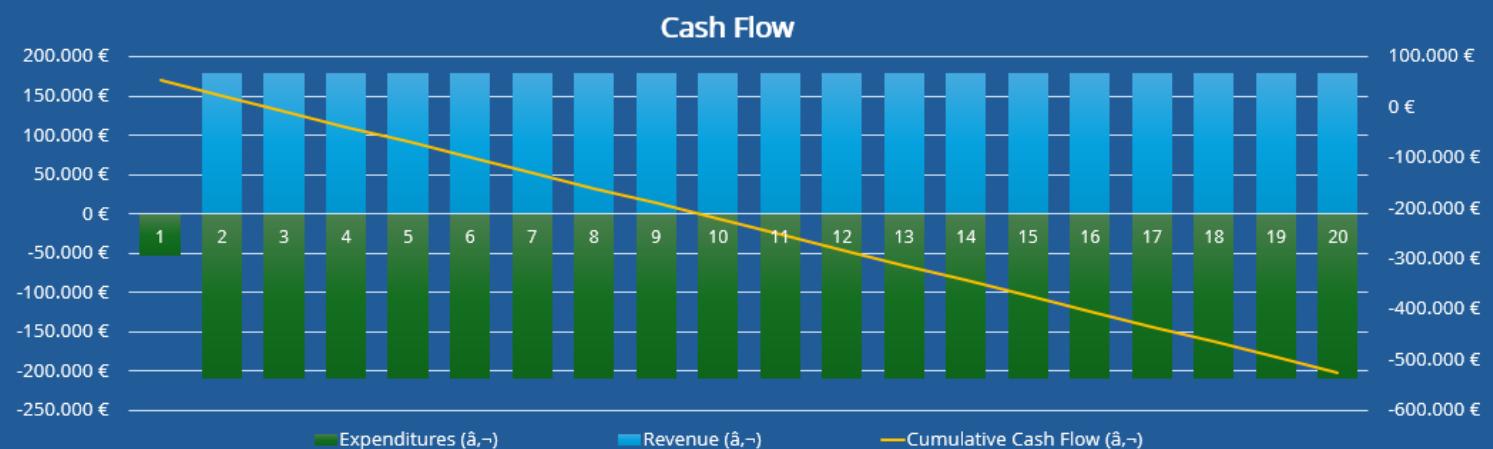


38,3 ton CO₂e saved per year

Economic results



Break-even price point of H₂
5,06 €/kg



FC-based CHP system



Inputs



1 Hotels



200 Homes



0 Universities



0 CSVs



0 Custom



Annual Power Supply

607.406 kWh/year

Avg. Power Supply:

69,3 kWh/day



Outputs



Annual H₂ Demand: 26.123 kg/year

Avg. H₂ Demand: 3,0 kg/h

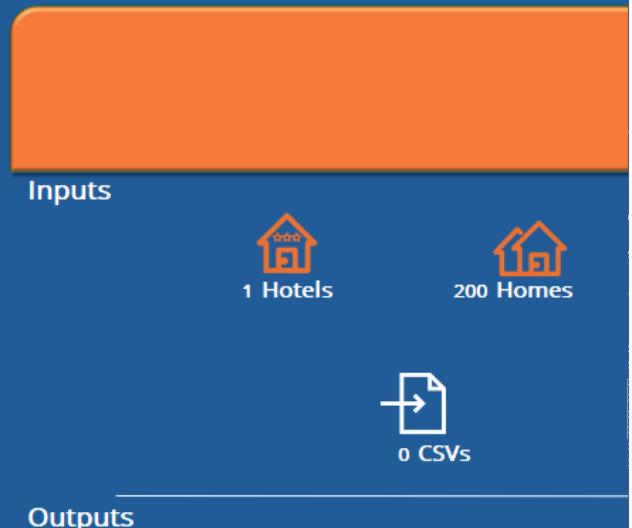


Annual Heat Demand: 662.936 kWh/year

Avg. Heat Demand: 75,7 kWh



167 ton CO₂e saved per year



CHP Module

Hydrogen Territories Platform Tool

Combine Heat & Power

Application

FuelCell

Net Power Output: 150 kW
Hydrogen consumption: 20 g/kg
Plant efficiency: 90 %

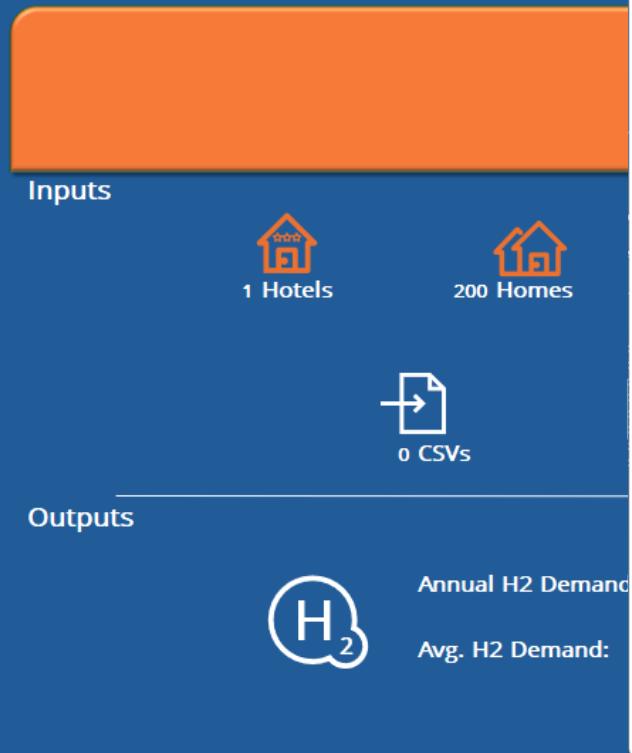
CAPEX **OPEX**

Hydrogen: 5.4 €/kg
Electricity: 0.24 €/kW
Natural gas: 0.043 €/kW
O&M: 0.02 €/kW

Power supplied by year

167 ton CO₂e saved per year

The CHP Module interface includes sections for Application, FuelCell, and OPEX. It displays power output, hydrogen consumption, plant efficiency, and cost details for hydrogen, electricity, natural gas, and O&M. A bar chart shows annual power supply, and a large orange bar at the top indicates CO₂e savings.



CHP Module

Combine Heat & Power

Hydrogen Territories Platform Tool

Home Definition

HTP Hydrogen Territories Platform Tool

Application

Home definition

Daily consumption: 4 kWh/hom

Number of homes: 100

+

Customs: 0 CSVs: 0 Universities: 0

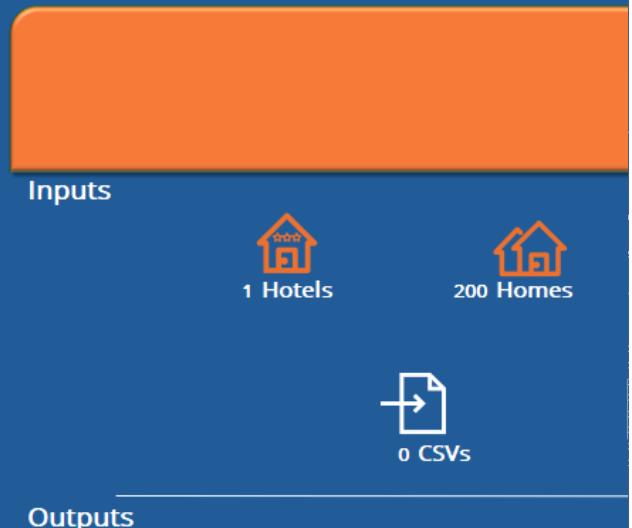
Electricity: 0.24 €/kW

Natural gas: 0.043 €/kW

O&M: 0.02 €/kW

Play button





CHP Module

Hydrogen Territories Platform Tool

Combine Heat & Power

Application

Net Power Output: 150 kW

Hydrogen consumption: 20 g/kW

Plant efficiency: 90 %

FuelCell

CAPEX | OPEX

Fuel cell: 50000 €

Inverter: 2000 €

Facilities: 1200 €

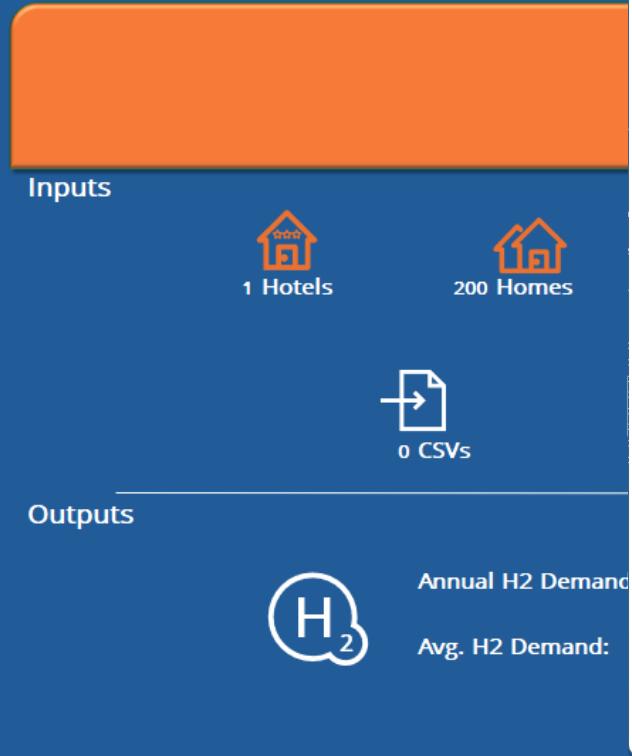
i

H₂

Play



167 ton CO₂e saved per year



CHP Module

HTP Hydrogen Territories Platform Tool

Combine Heat & Power

FuelCell

- Net Power Output: 150 kW
- Hydrogen consumption: 20 g/kW
- Plant efficiency: 90 %

CAPEX | OPEX

- Fuel cell: 50000 €
- Inverter: 2000 €
- Facilities: 1200 €

Application

0 Customs, 1 Hotel, 200 Homes, 0 CSVs, 0 Universities

H₂

Power supplied by year

167 ton CO₂e saved per year



FC-based CHP system



Inputs



0 Hotels



100 Homes



0 Universities



0 CSVs



0 Custom



Annual Power Supply:

146.140 kWh/year

Avg. Power Supply:

16,7 kWh/day



Power supplied by year



Outputs



Annual H₂ Demand:

6.951 kg/year

Avg. H₂ Demand:

0,8 kg/h



Annual Heat Demand:

186.371 kWh/year

Avg. Heat Demand:

21,3 kWh



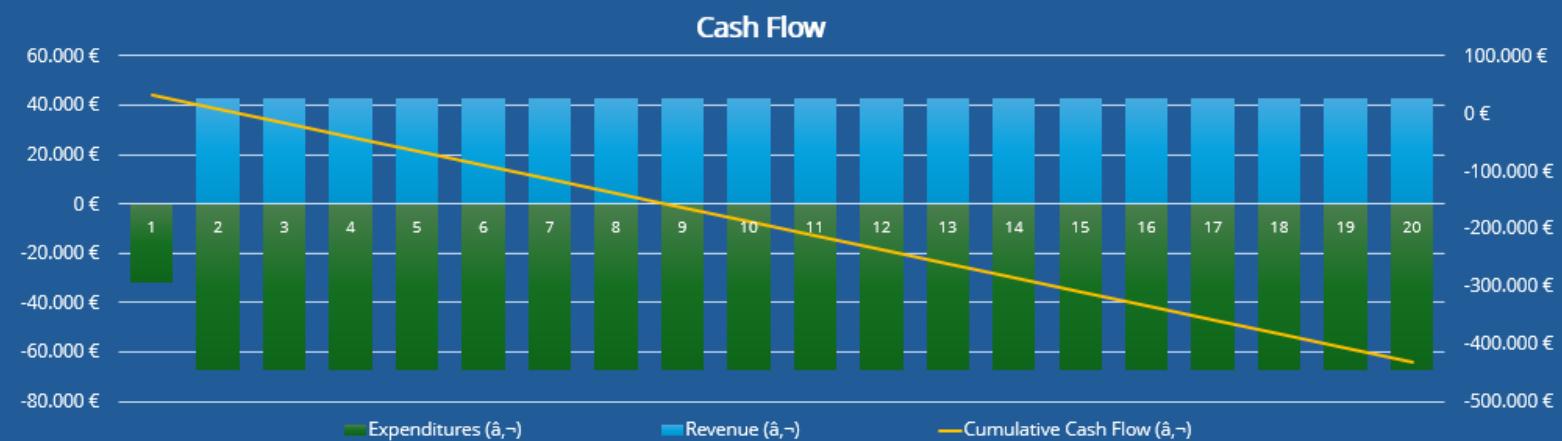
40,2

ton CO₂e saved
per year

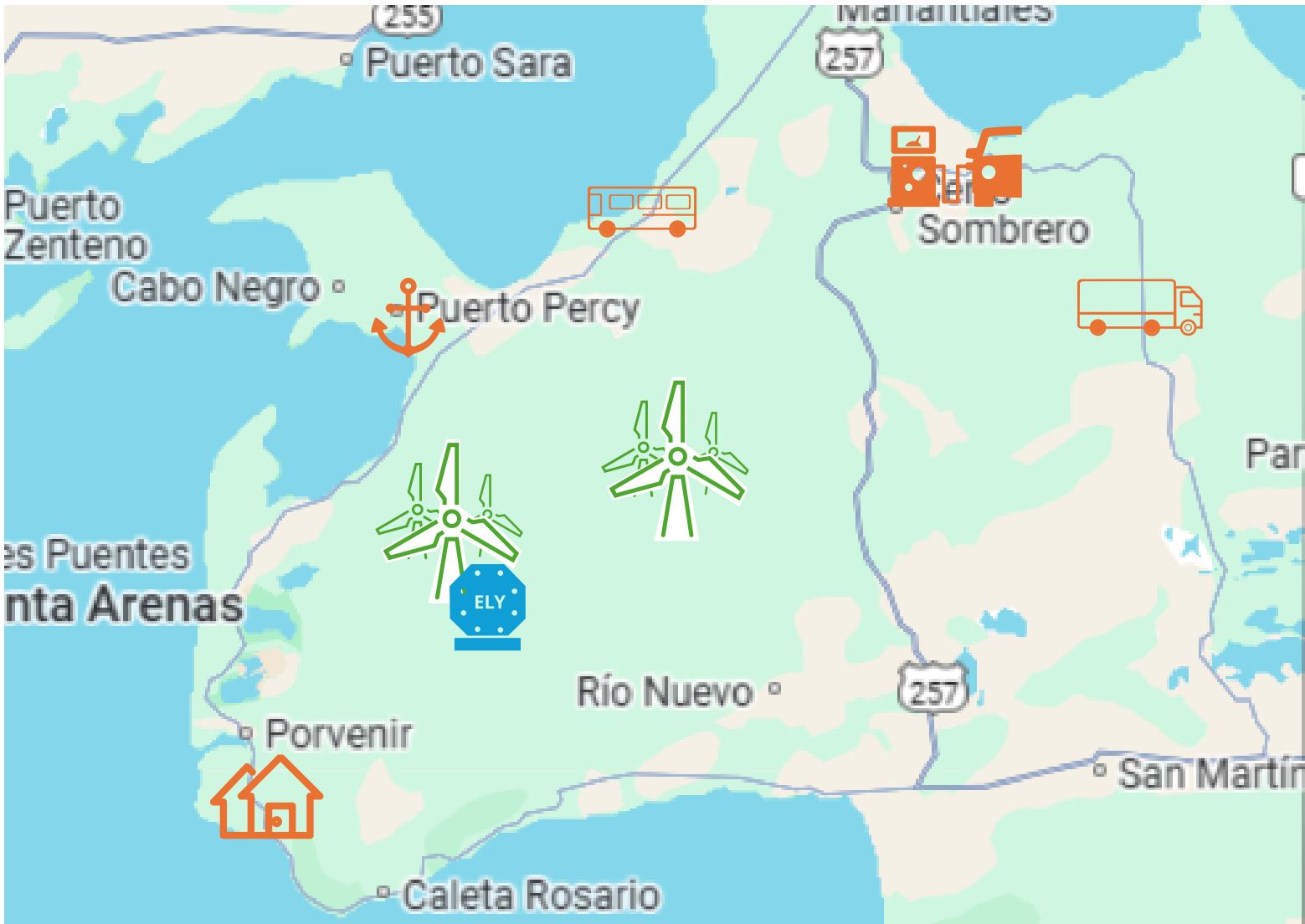
Economic results



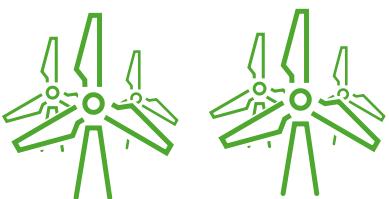
Break-even price point of H2
5,78 €/kg



Case Study



Case Study



2 wind power plants
25 MW peak power



1 stack
6 MW electrolyzer

9,09 €/kg



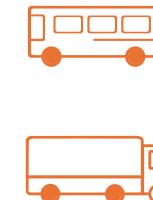
84,6 tons H₂/year



80,4 tons H₂/year



58,3 tons H₂/year



2 buses
376 680 km/year
2 trucks
268 320 km/year



15,2 tons H₂/year



30 kW maritim station
40 KW fuelcell



6,9 tons H₂/year



100 homes
30 KW CHP





Thank you

h2v@hidrogenoaragon.org

FUNDACIÓN HIDRÓGENO ARAGÓN