GREEN HYSLAND

Webinar

Supporting 10 Islands in the Green Hydrogen Transition

25 March

15:00 - 16:30 CET

www.greenhysland.eu

GREEN HYSLAND

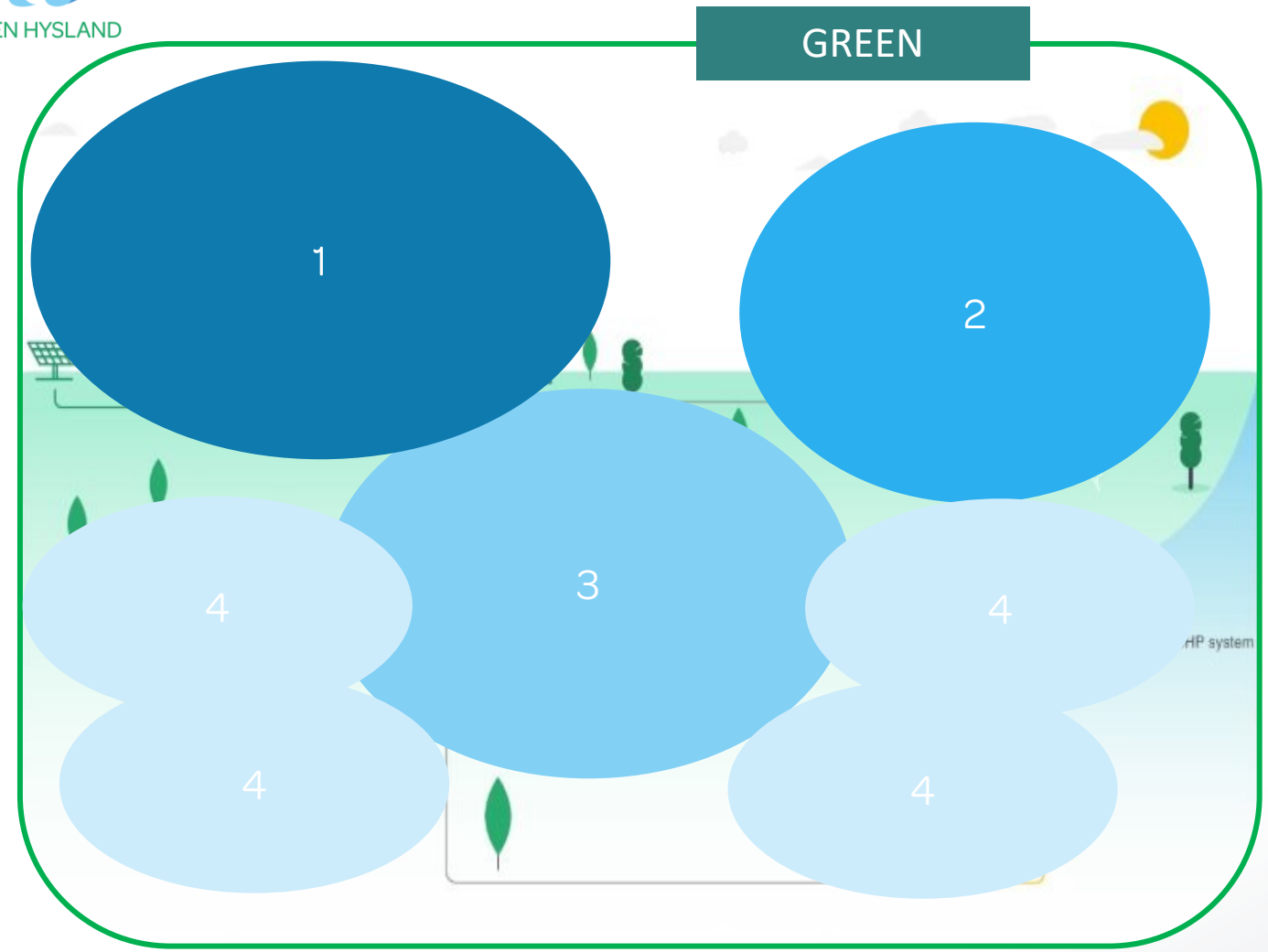
15:00-15:10	**Introduction and presentation of Green Hysland** (Christian Galletta - *FEDARENE)*
15:10-15:25	**Green Hysland Technical Support Programme and How to Apply** *(Katharina Bouchaar - ENERCY)*
15:25-17:00	**Demonstration of the Hydrogen Territories Tool** *(Alberto Herranz - FHa)* - *Demonstration of the tool, used to develop pre-feasibility studies for hydrogen on islands* - *Practical applications, the case of H2 Chile*
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



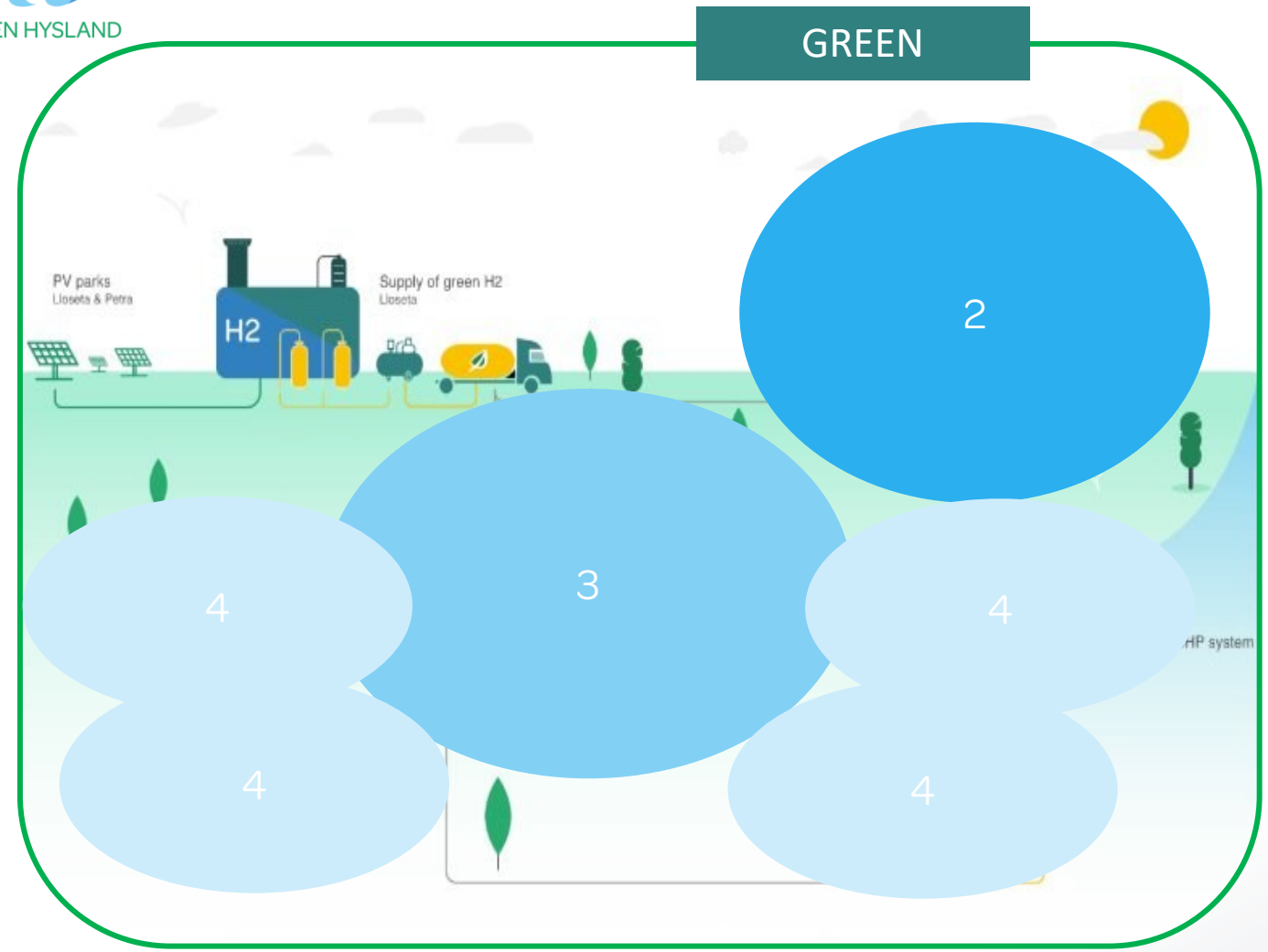
Highlights

- 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



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

Overview of GREEN HYSLAND

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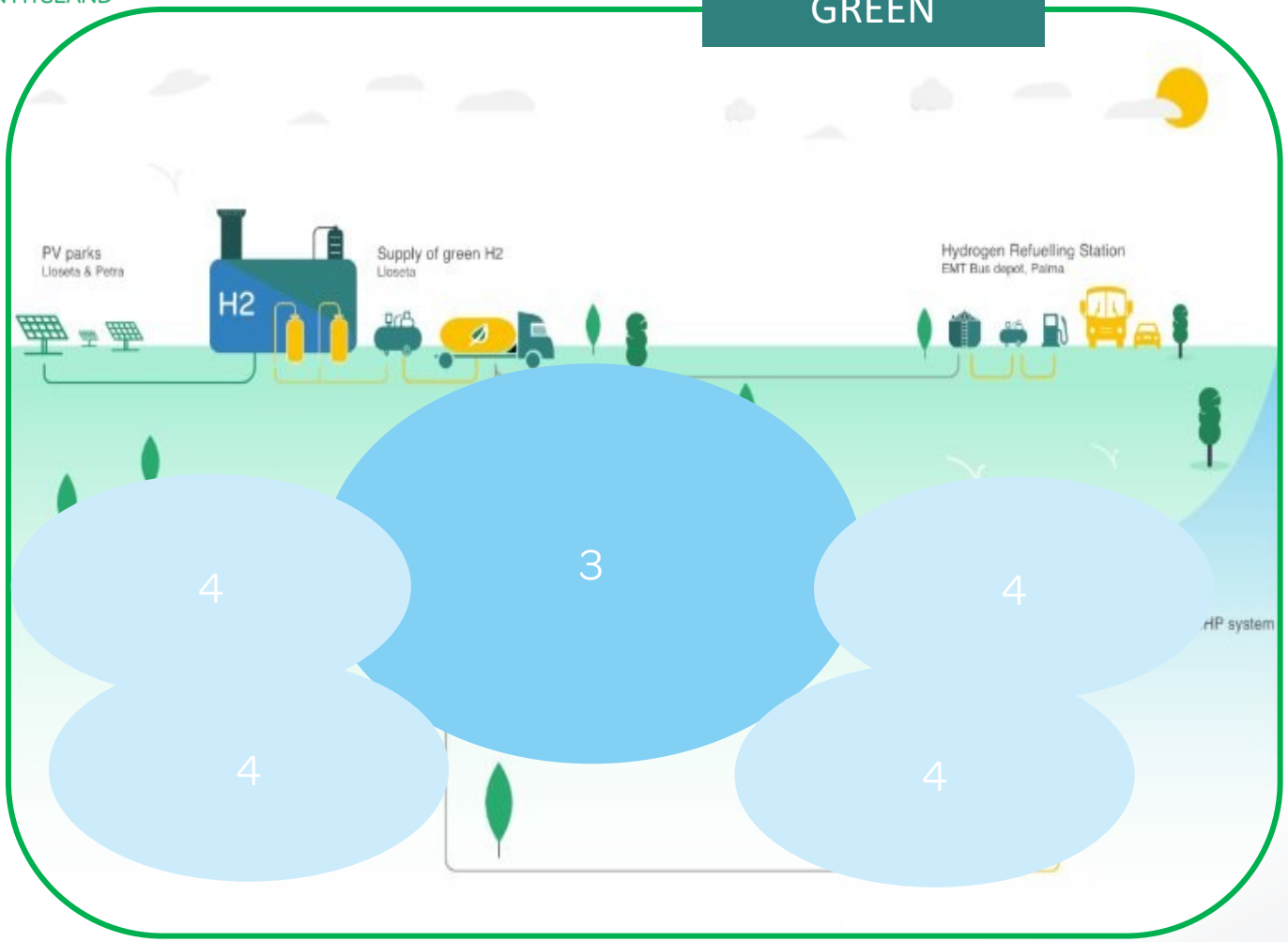

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1. The green H2 production plant located on CEMEX land in Lloseta
2. Hydrogen Refueling Station (HRS) + 5 Fuel cell buses

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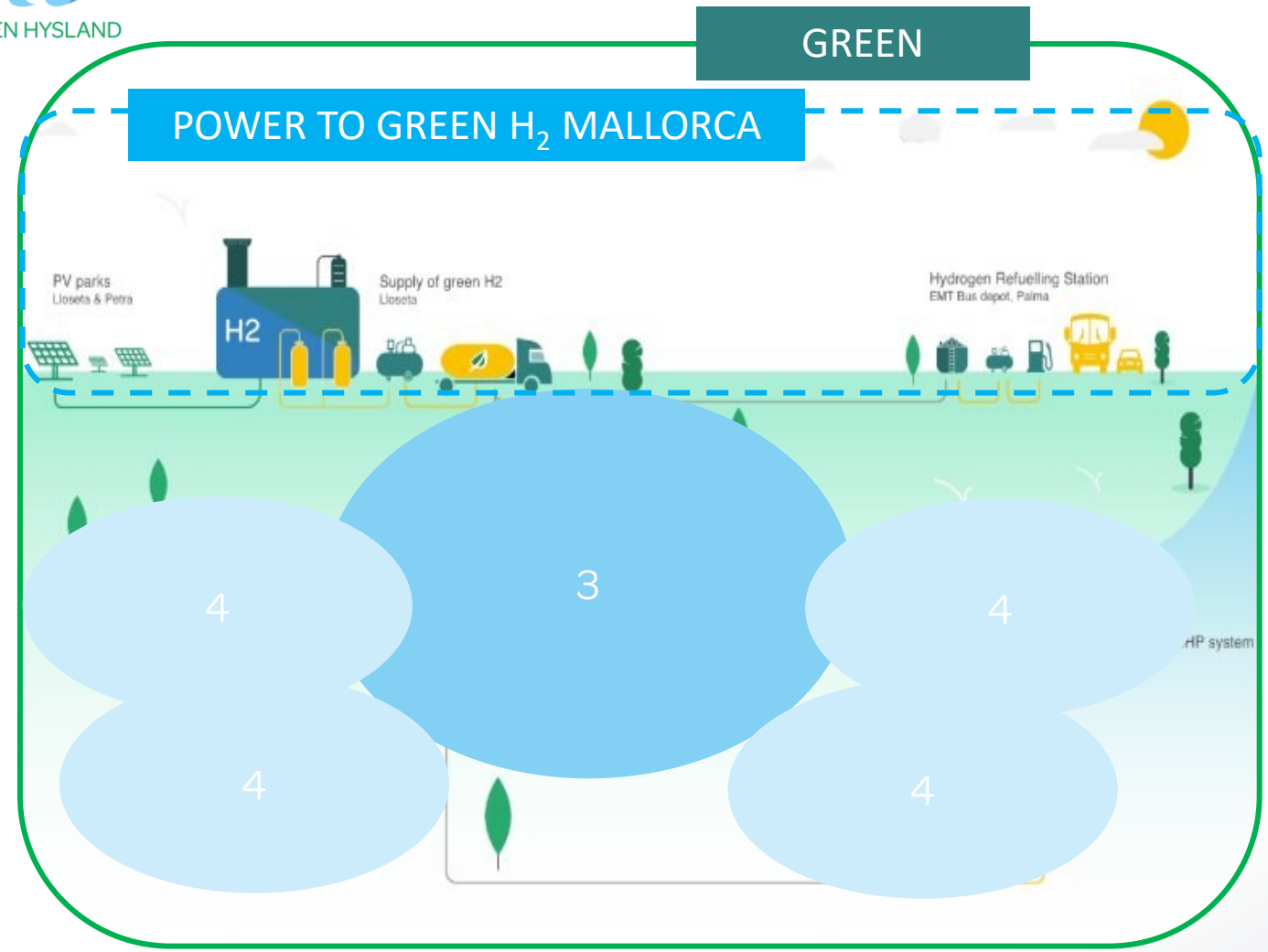

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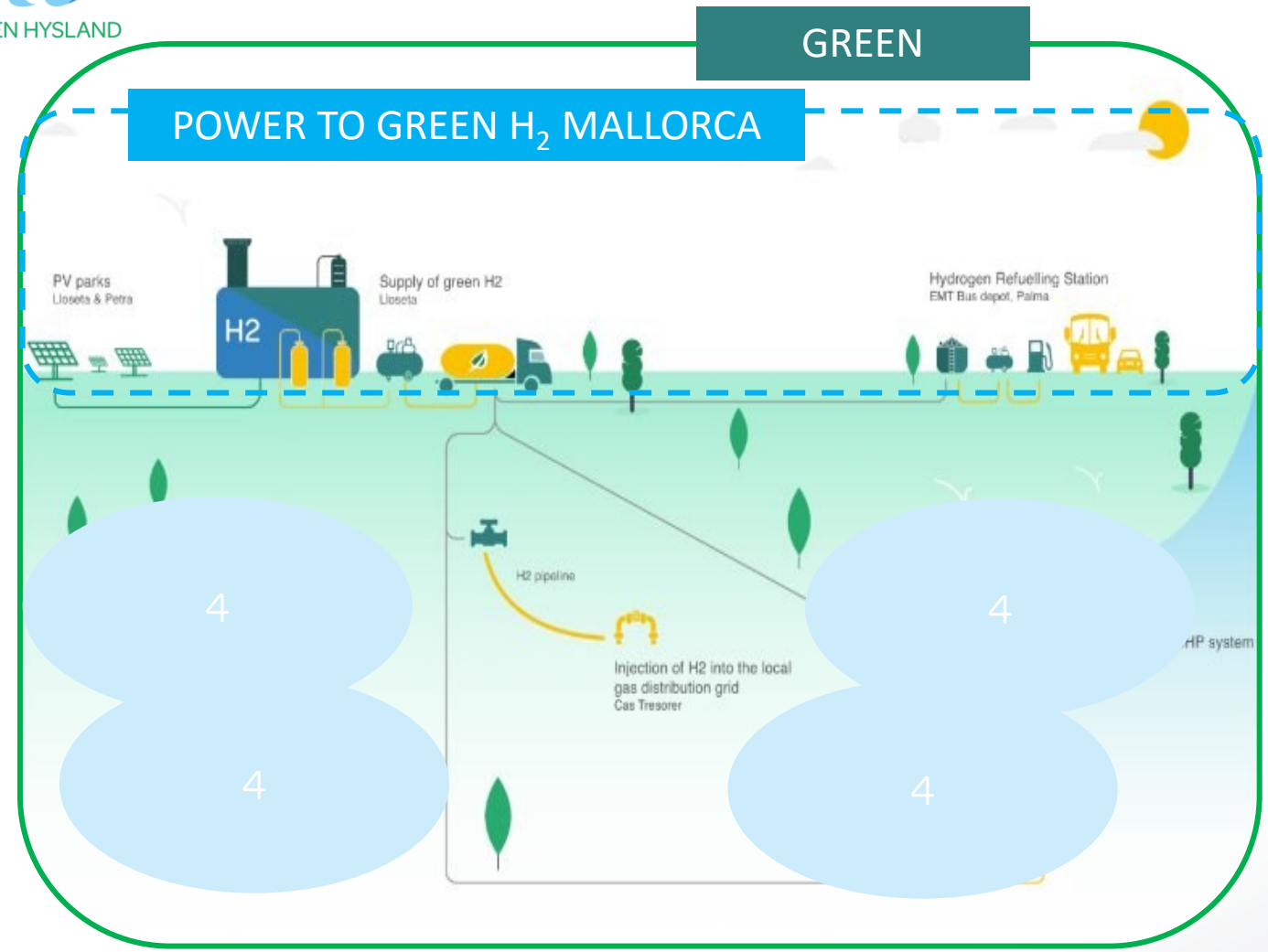

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1. The green H2 production plant located on CEMEX land in Lloseta
2. Hydrogen Refueling Station (HRS) + 5 Fuel cell buses.
3. The H2 pipeline and the injection point (to blend part of the H2 into the NG pipeline)

Overview of GREEN HYSLAND

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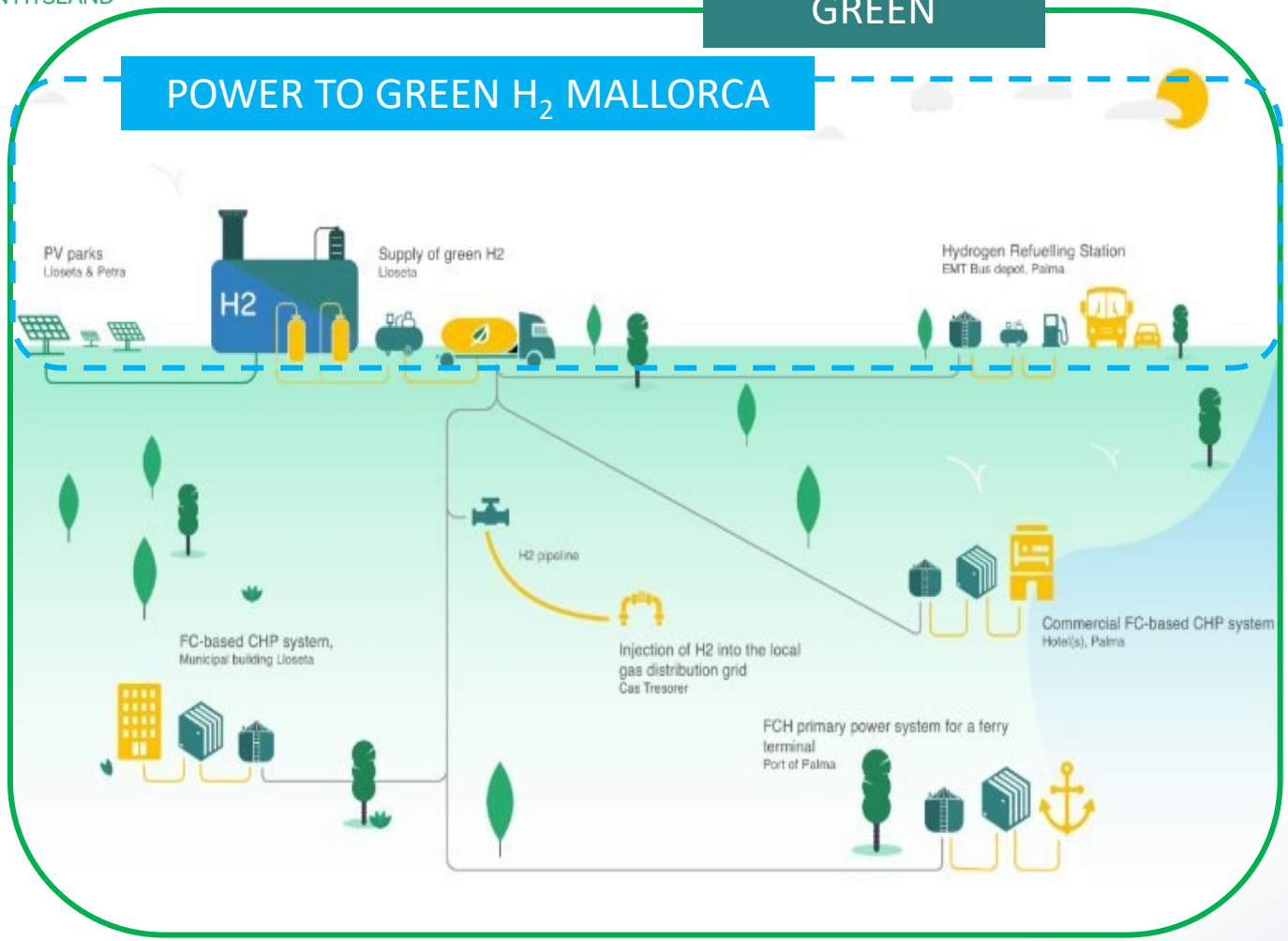
POWER TO GREEN H_2 MALLORCA



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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. 4 End Users (after distribution): 1 Port terminal, 1 Hotel, 1 Municipal building, multiple natural gas users (H2 blended)

Overview of GREEN HYSLAND

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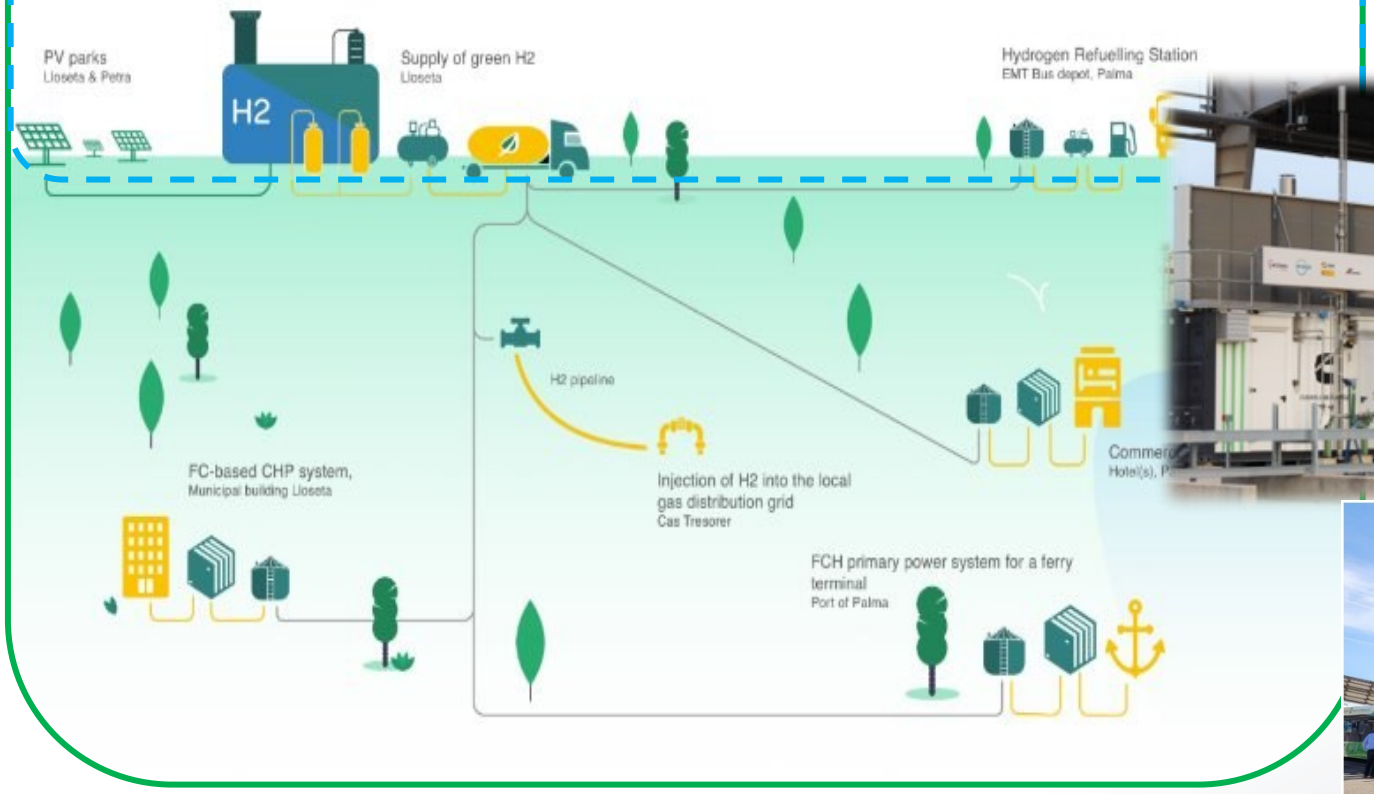
POWER TO GREEN H_2 MALLORCA



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

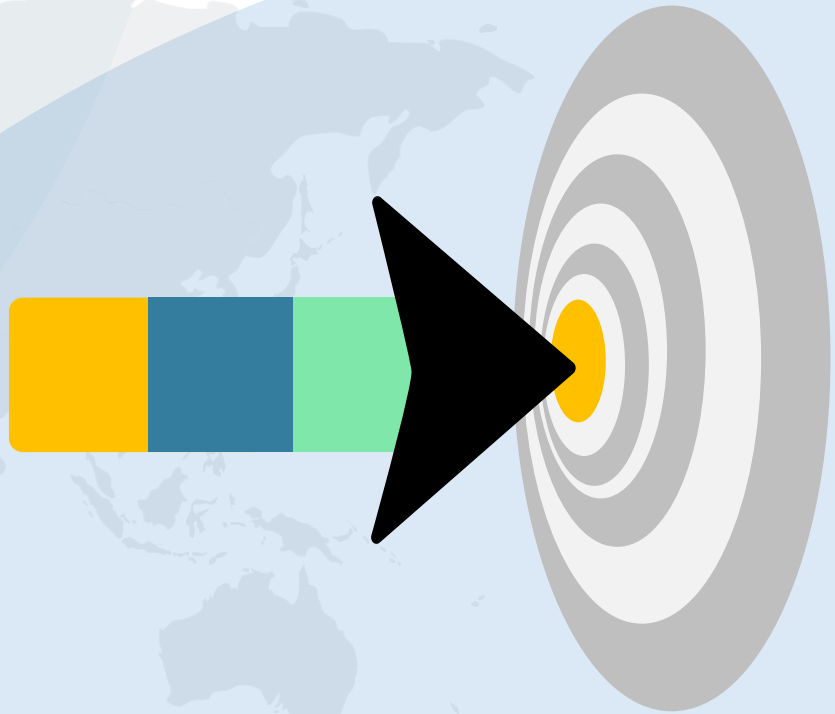
25/3/2025

ENERCY

Clean Hydrogen Partnership

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

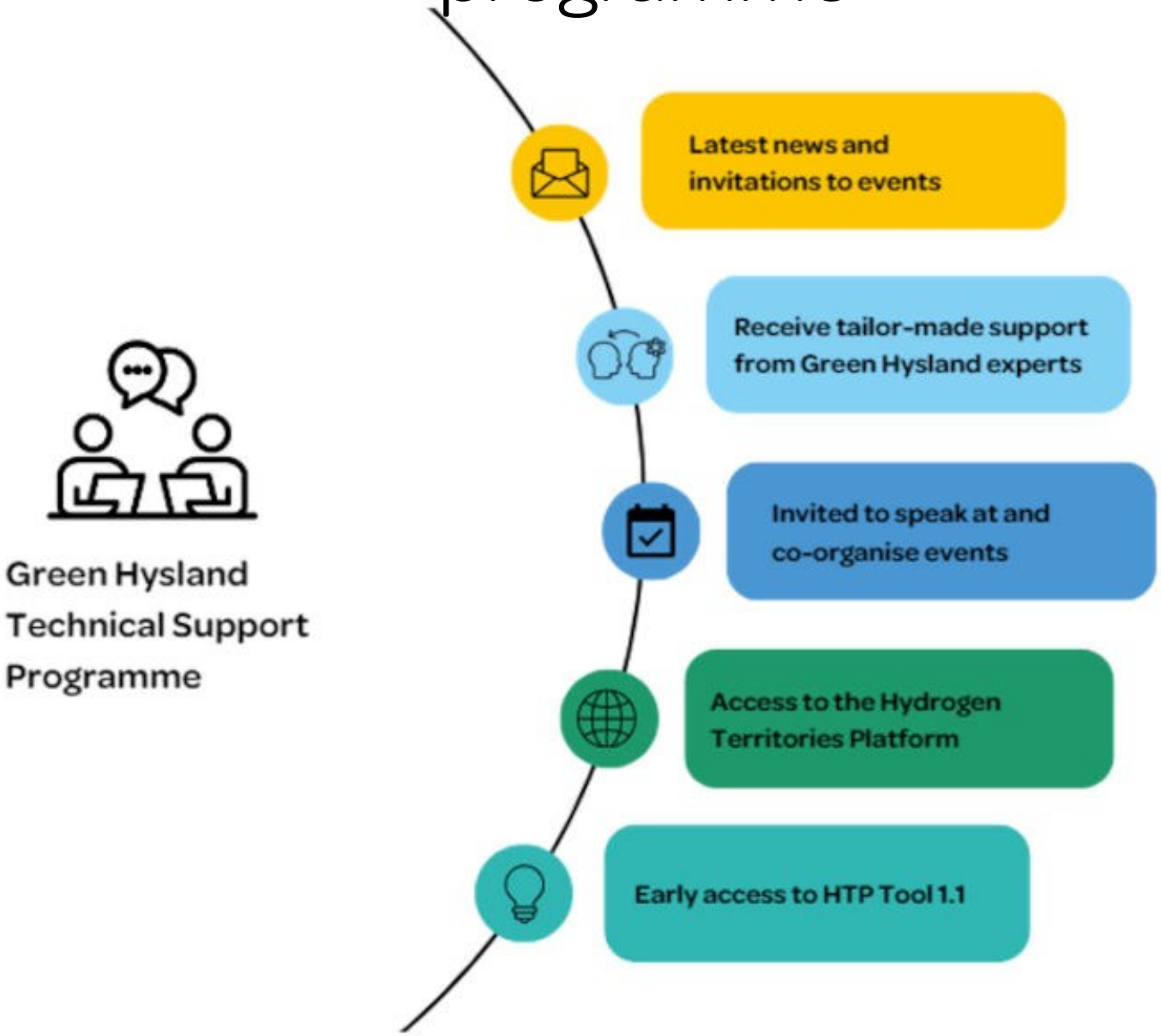
Support Islands that are not part of the Green Hysland project

- 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



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

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)

Timeline

May 2025	All responses to the Expression of Interest form must be submitted by 16 May 2025.
June 2025	Selection of the 10 Island Beneficiaries and initial contact with participants.
July 2025	Territories confirm their participation in the programme.
Sep 2025	Start of the Technical Assistance programme. Online group workshop.
Sep 2025-Feb 2026	• Up to 3 bilateral Mentoring meetings with each island. Project Analysis using HTP Tool.
Feb 2026	End of the Technical Assistance Programme. Participants will receive the report with their individual case study recommendations.

GREEN HYSLAND

Why Participate?

Tailored Support for your Island's Sustainable Energy Project

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

Expertise and Guidance

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

ENERCY

GREEN HYSLAND

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

Then
APPLY HERE

Deadline: Friday, 16/5/2025

ENERCY

GREEN HYSLAND

Thank you!

☺

Any Questions?

Feel free to leave them in the chat

or

Email the Technical Assistance Team at:

h2v@hidrogenoaragon.org

ENERCY

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

FUNDACIÓNHIDRÓGENOARAGÓN

HTP Tool presentation

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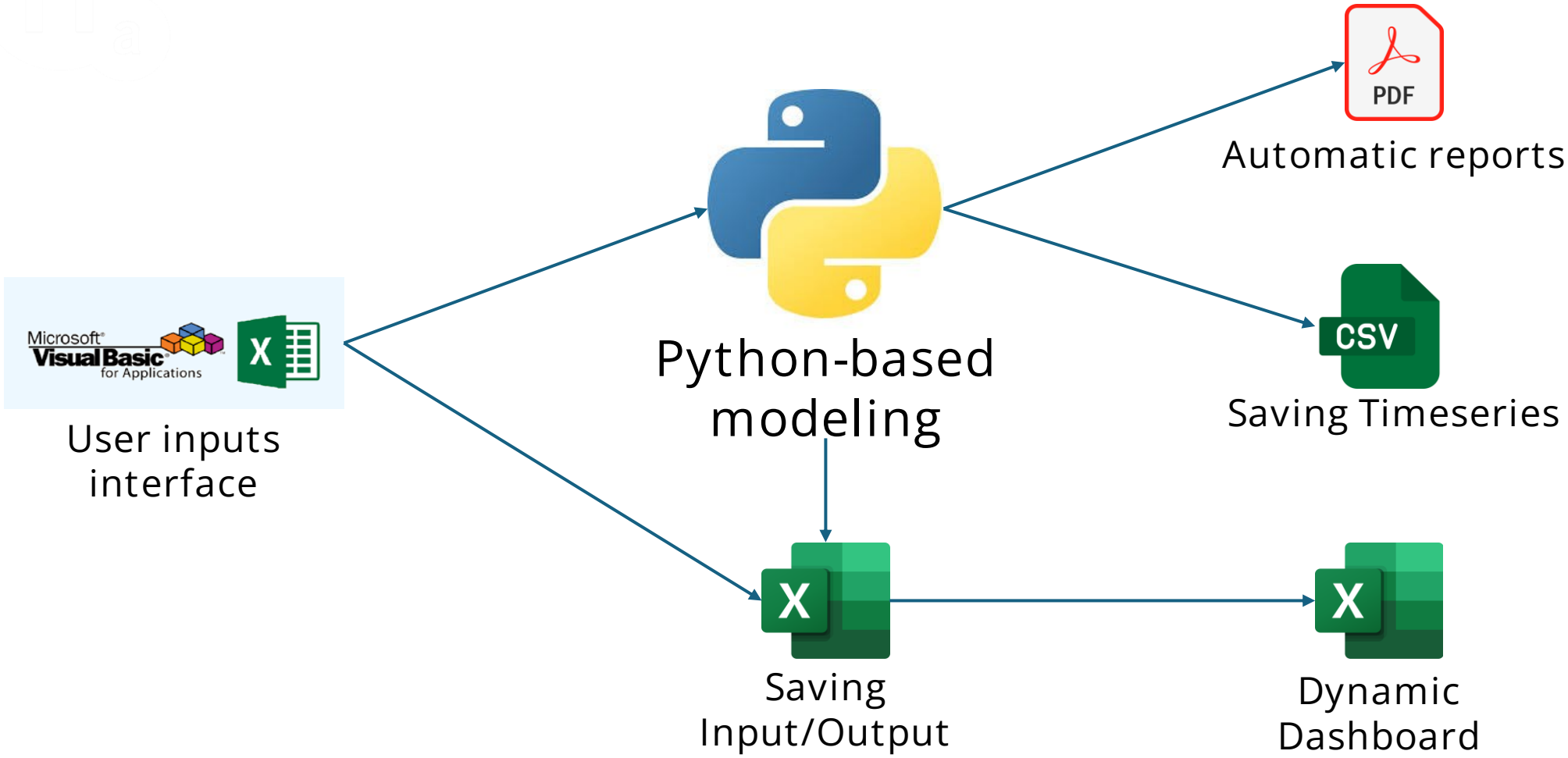
Platform on which the tool is based



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

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Elec Production

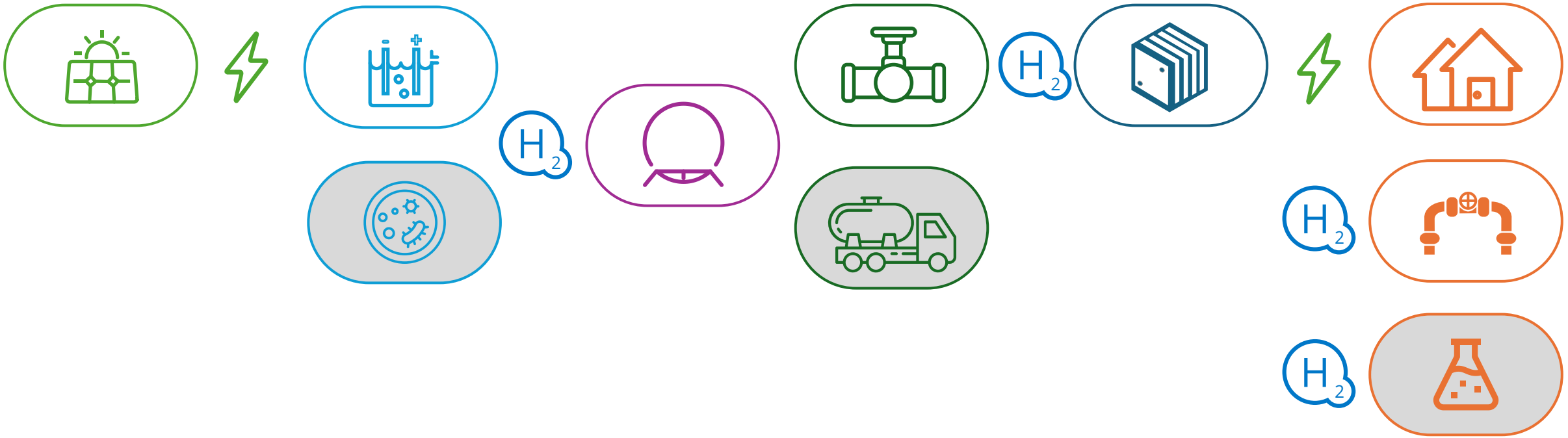
H2 Production

Storage

Transport

Conversion

Application



Renewable Hydrogen Development in Chile:

Tierra del Fuego Island

March 2025

Chilean Hydrogen Association, H2 Chile

www.h2chile.cl / comunicaciones@h2chile.com

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

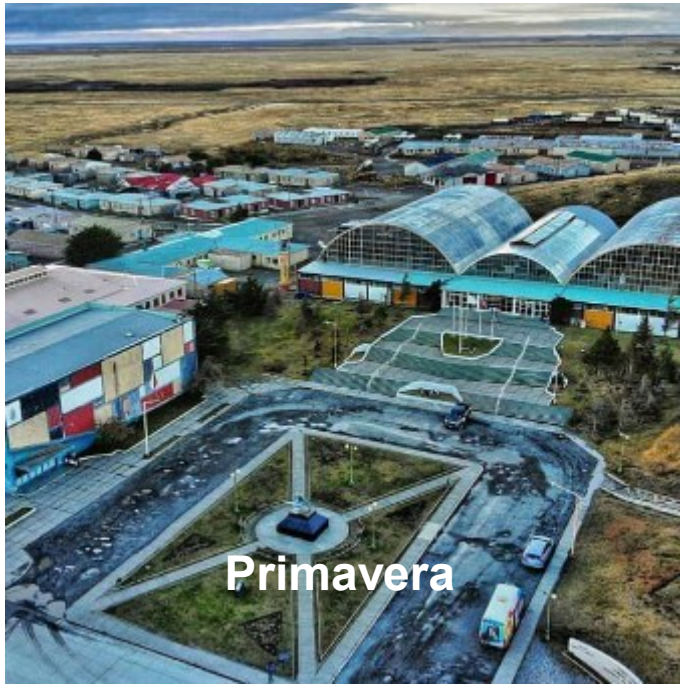
Replication Case Study

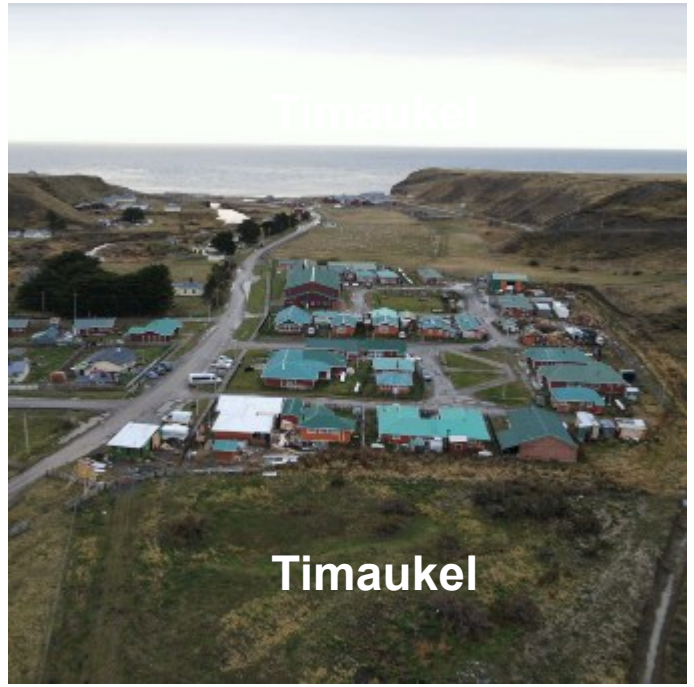

Tierra del Fuego
Island

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/km²
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

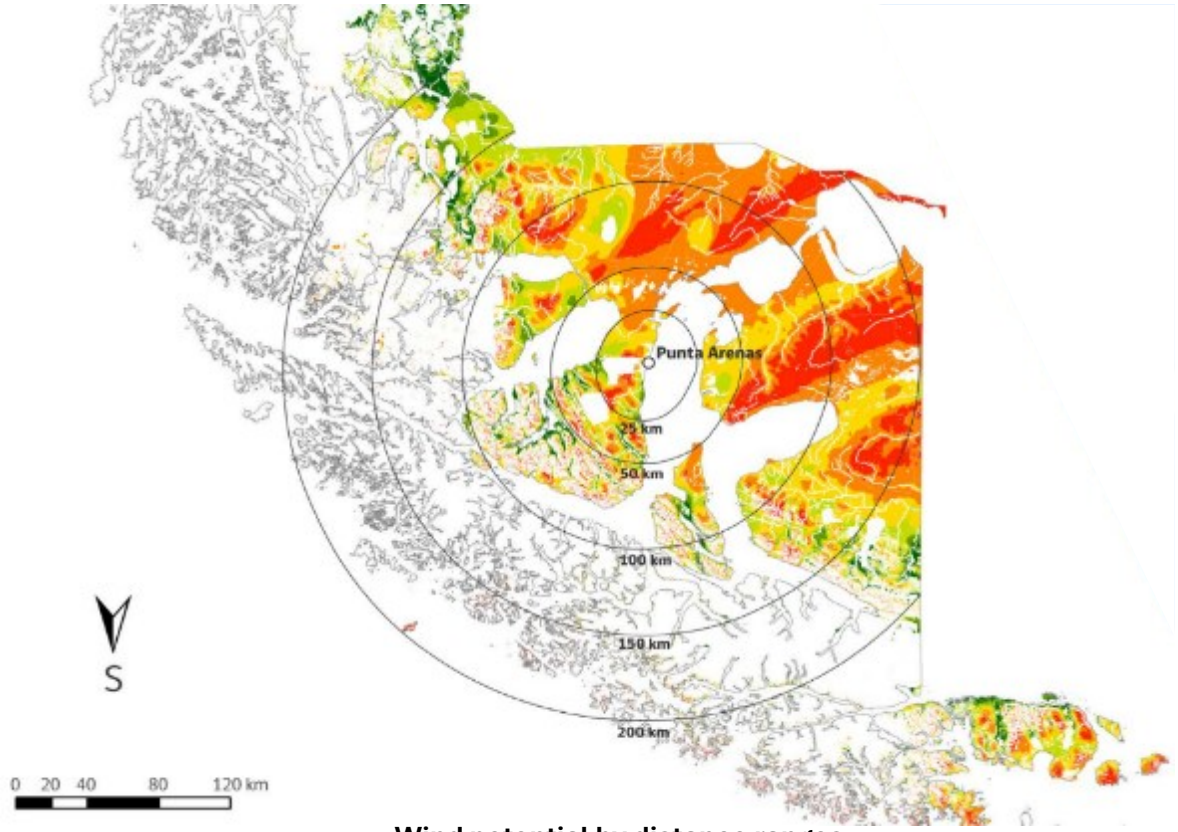
Energy context

- 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 CO_2 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 CO_2 emissions**: 7,633 tons

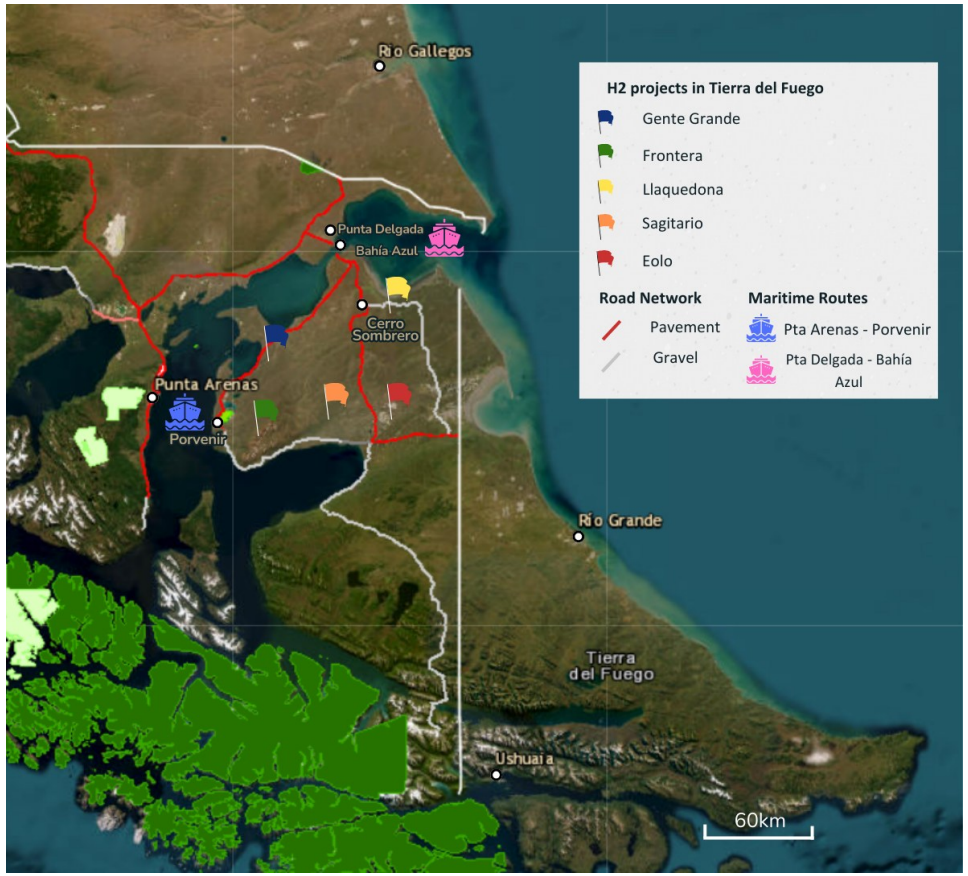
Source: Own Elaboration

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
Stage	Preparation of Enviromental Impact Assesment (EIA)	Project Feasibility	Project Pre - Feasibility	Project Pre - Feasibility	Project Pre - Feasibility

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



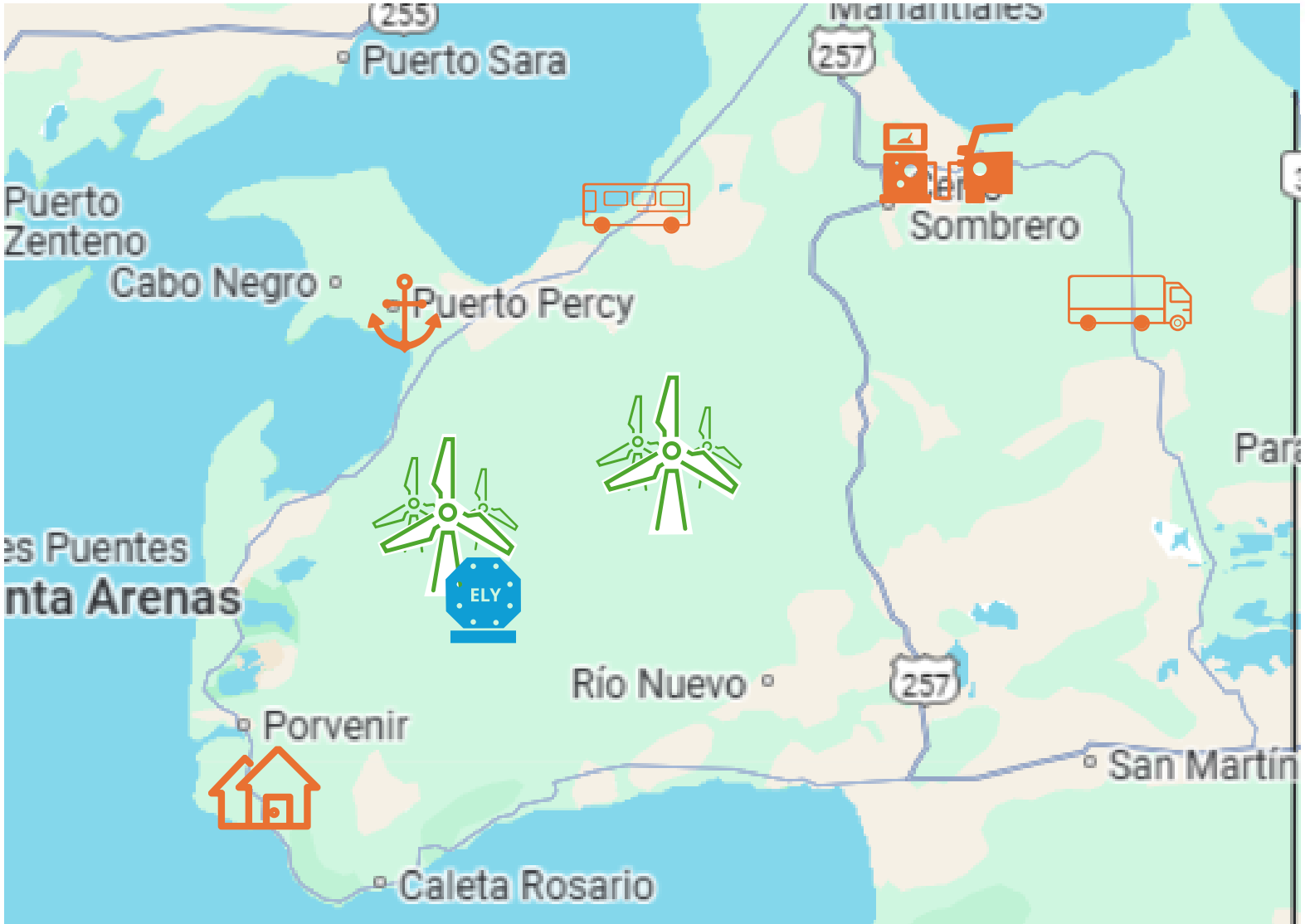
References

Live demonstration of the HTP Tool

Case Study


Puerto Sara
Puerto Zenteno
Cabo Negro
Puerto Percy
Cerro Sombrero
Río Nuevo
Porvenir
Caleta Rosario
Camerón
Munizaga
Puerto Harris
257
255

Case Study


255
Puerto Sara
257
Puerto
Zenteno
Cabo Negro
Puerto Percy
Sombrero
ELY
Río Nuevo
257
Porvenir
San Martín
Caleta Rosario

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HTP Hydrogen Territories Platform

Green Hydrogen production

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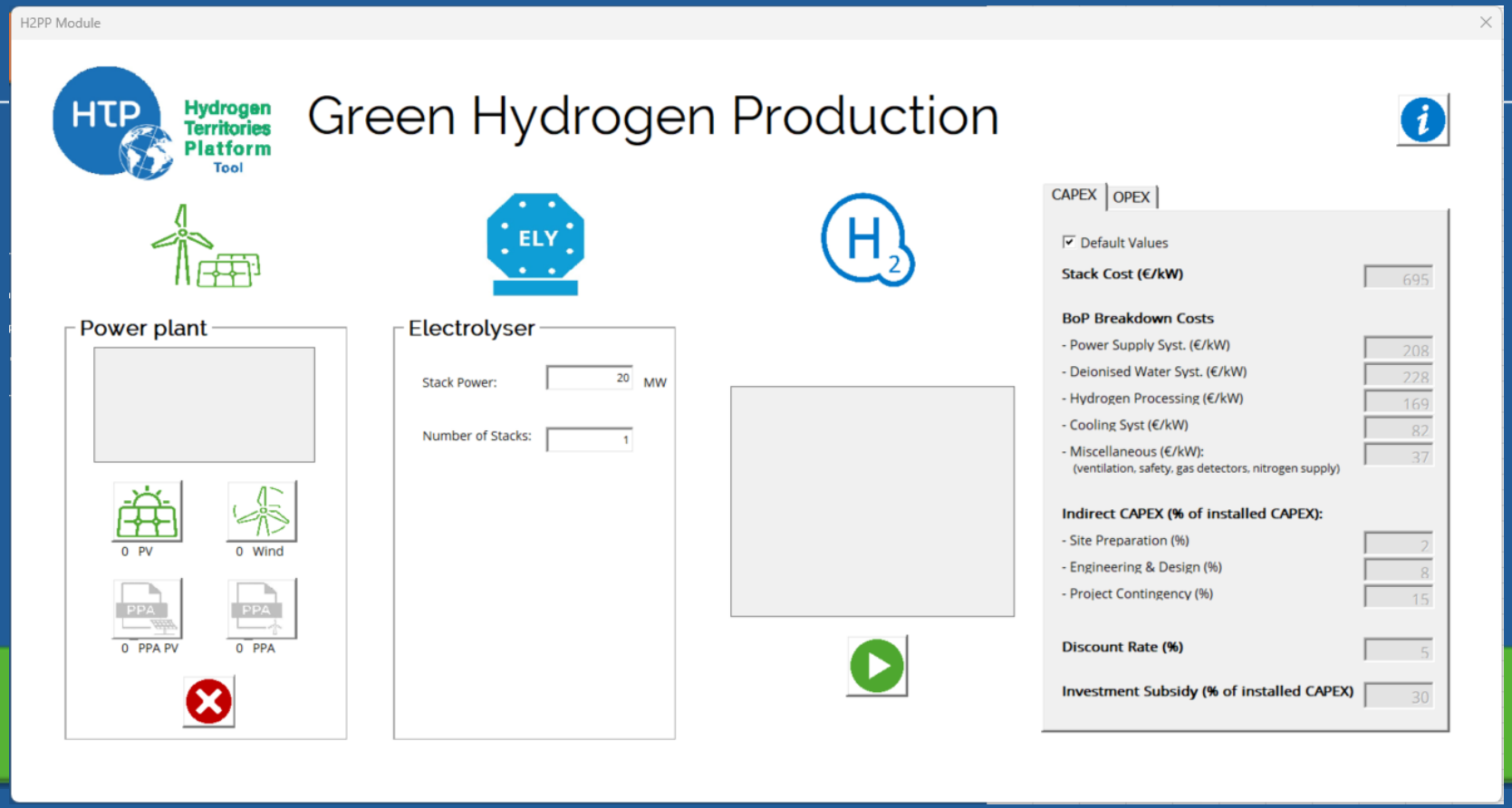

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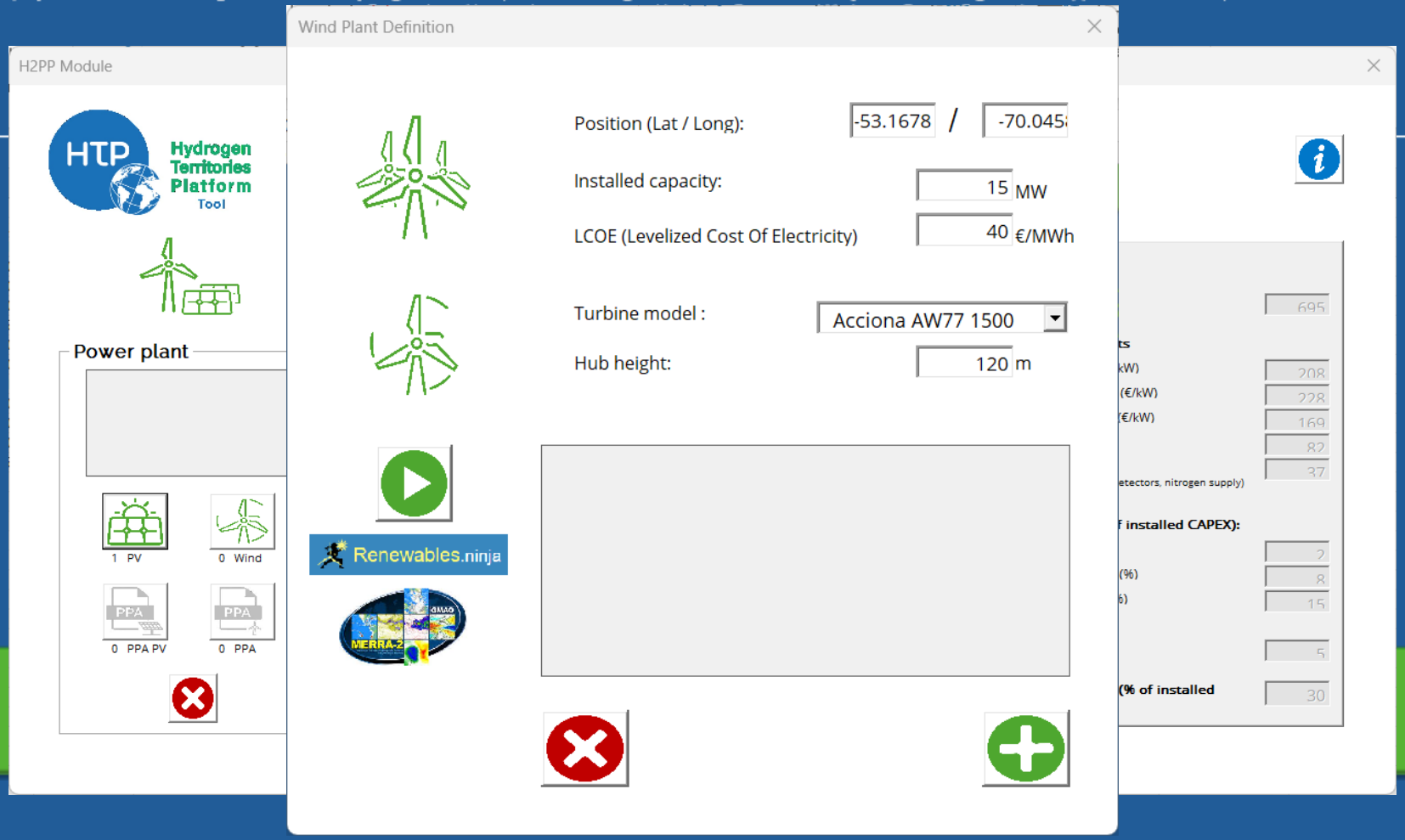

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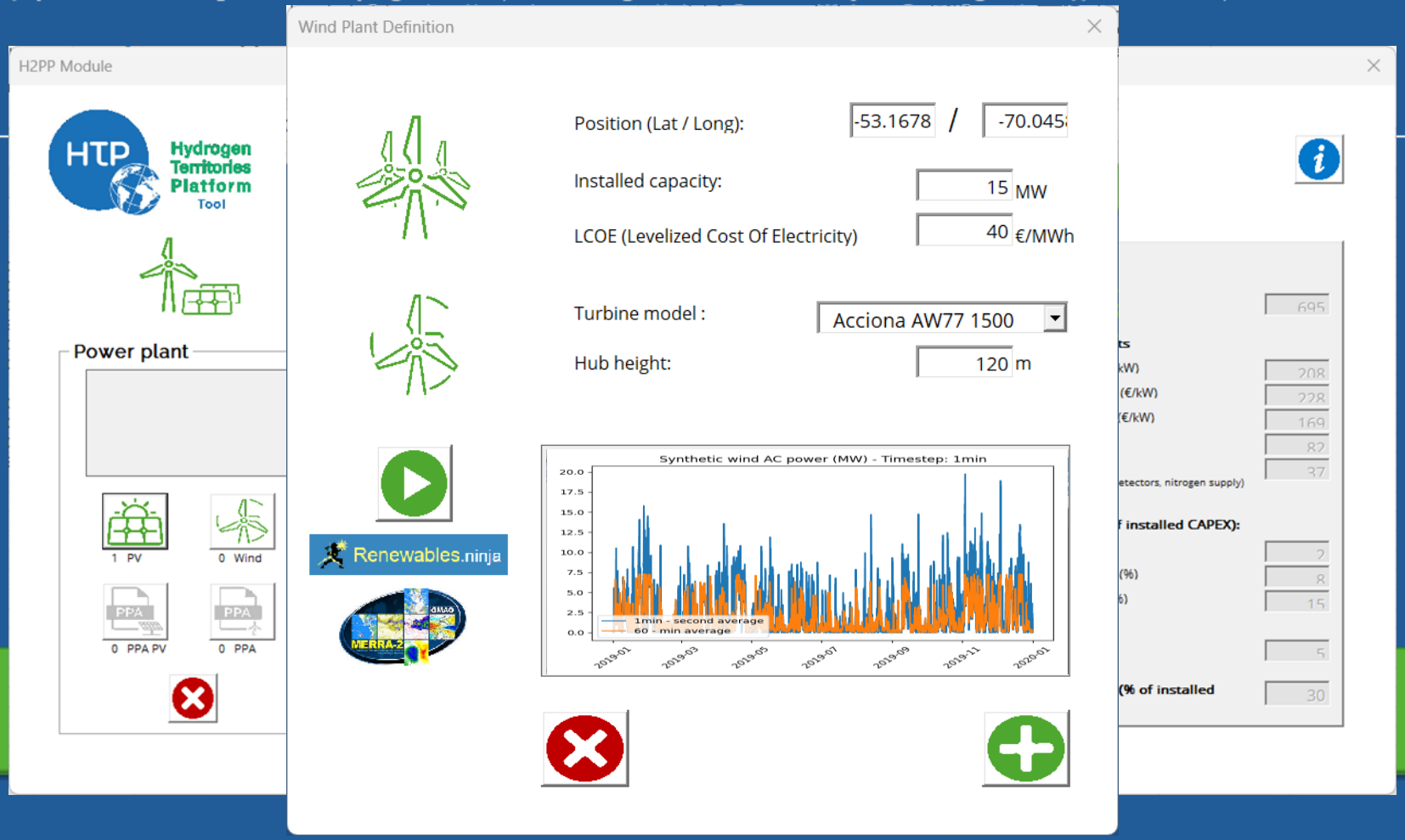

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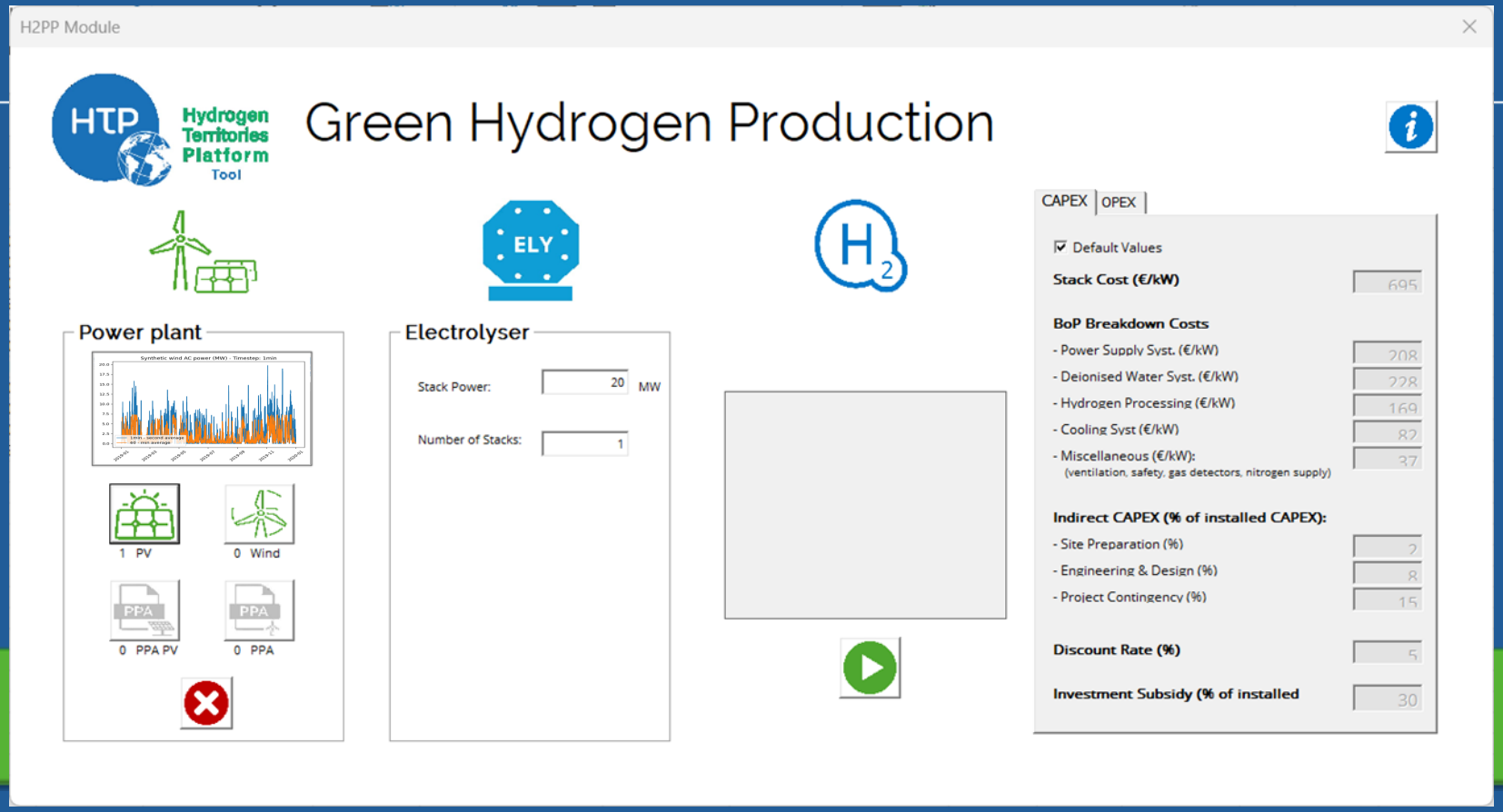

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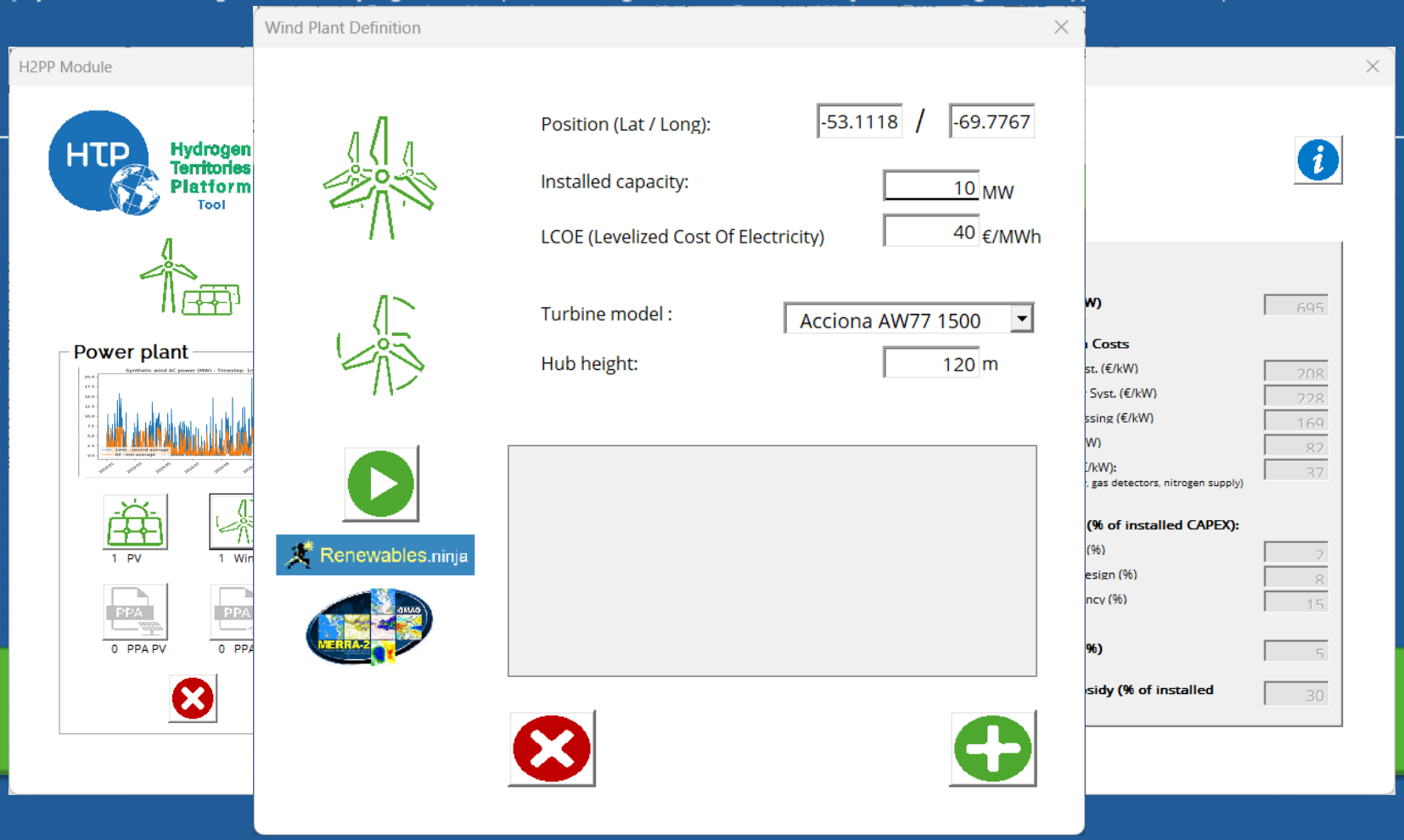

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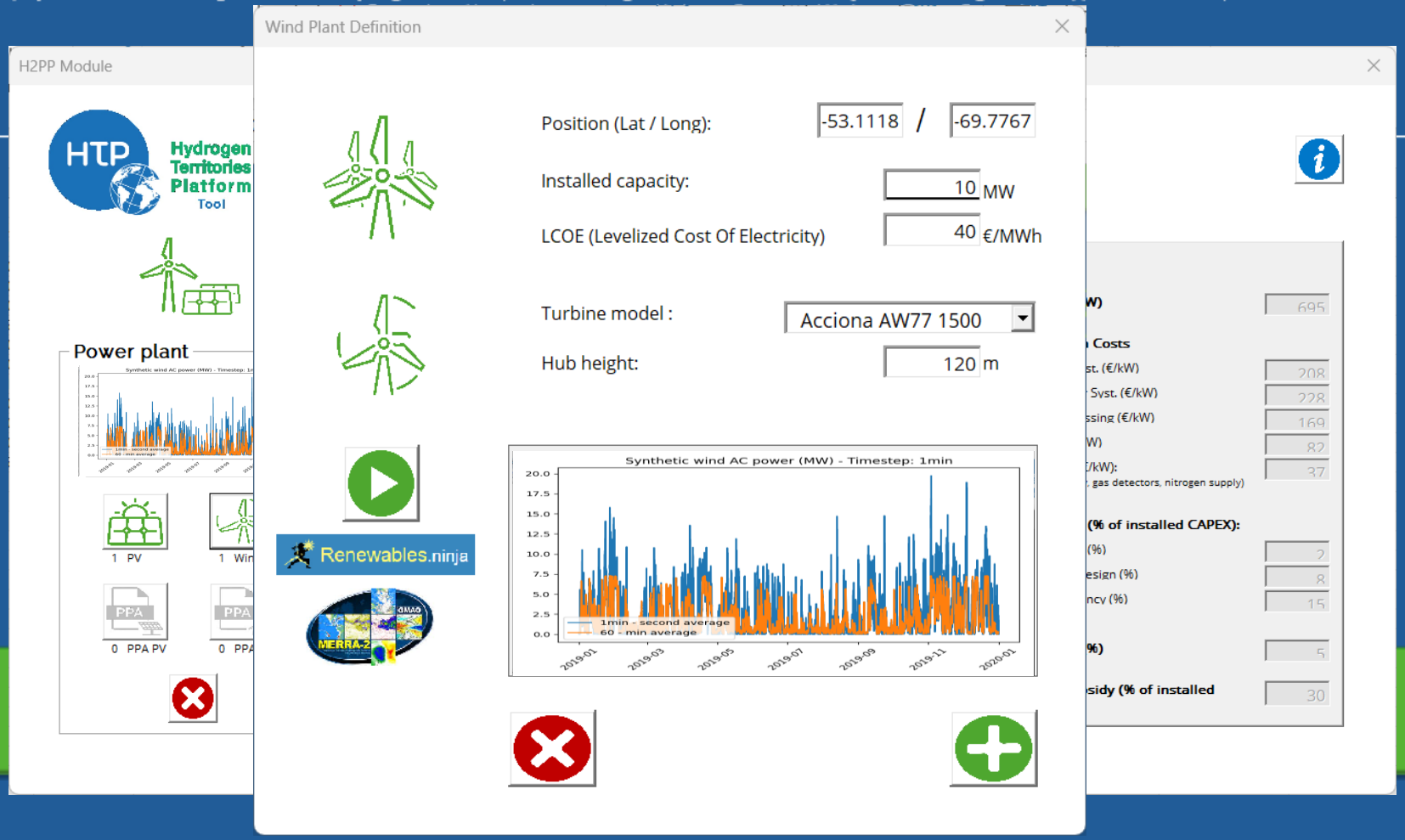

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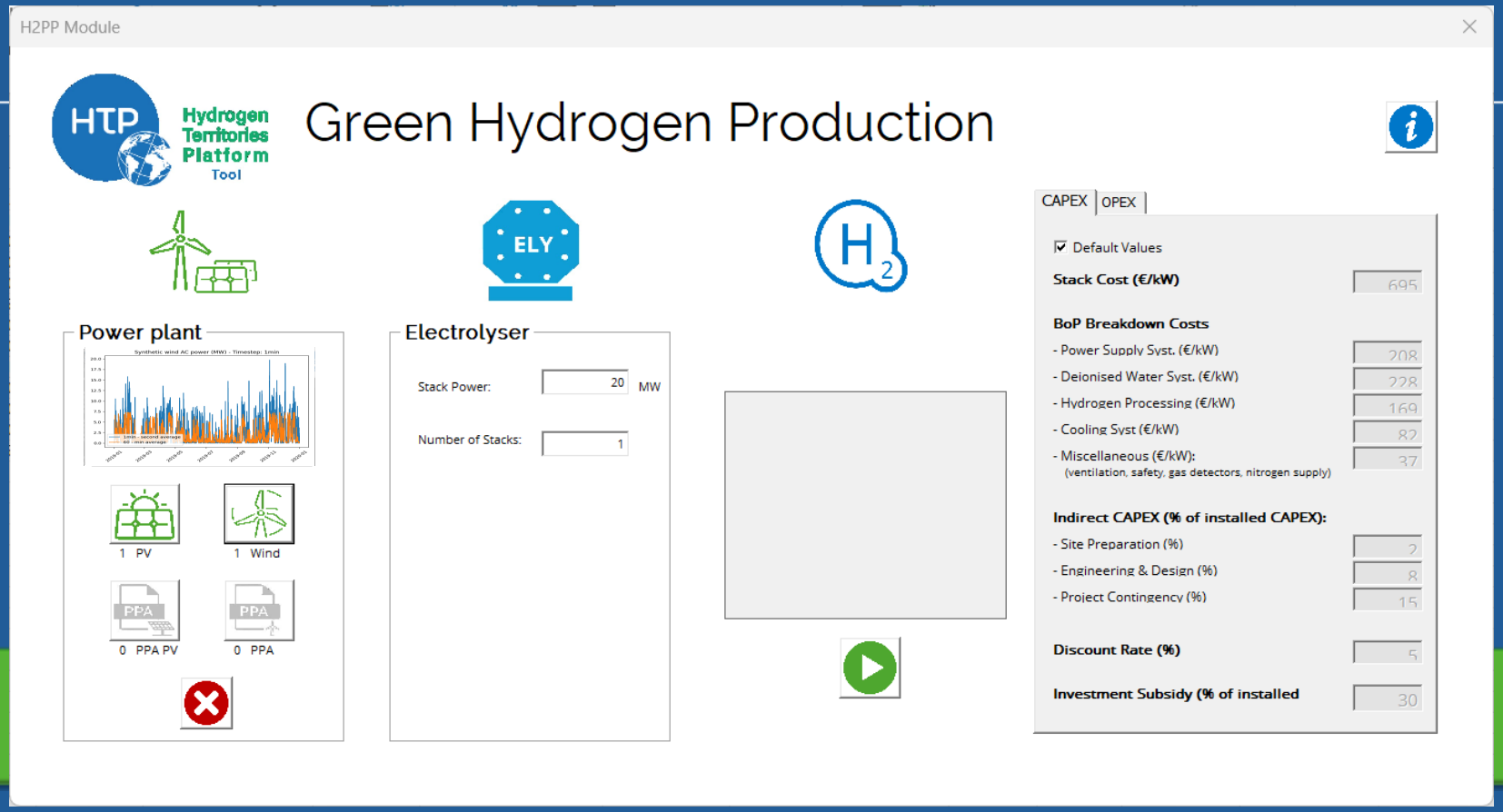

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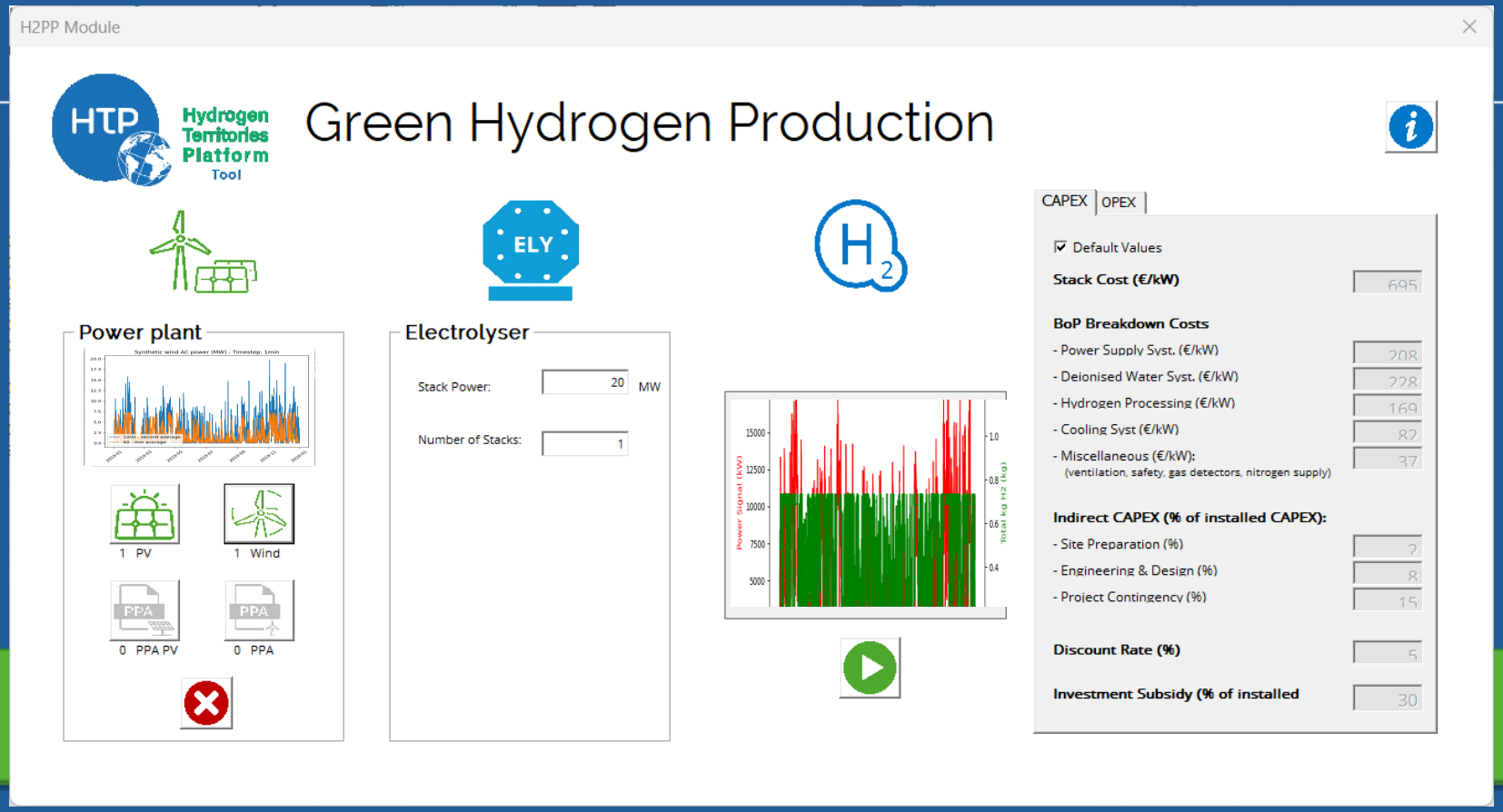

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HTP Hydrogen Territories Platform

Green Hydrogen production

Inputs

PV Plant	Wind Plant	PV PPA	Wind PPA
0,00 plants	2,00 plants	0,00 PPAs	0,00 PPAs
0,00 MW	25,00 MW	0,00 MW	0,00 MW

Outputs

Hydrogen production 84,6 ton/year

Water consumption: 7.460 m3/year

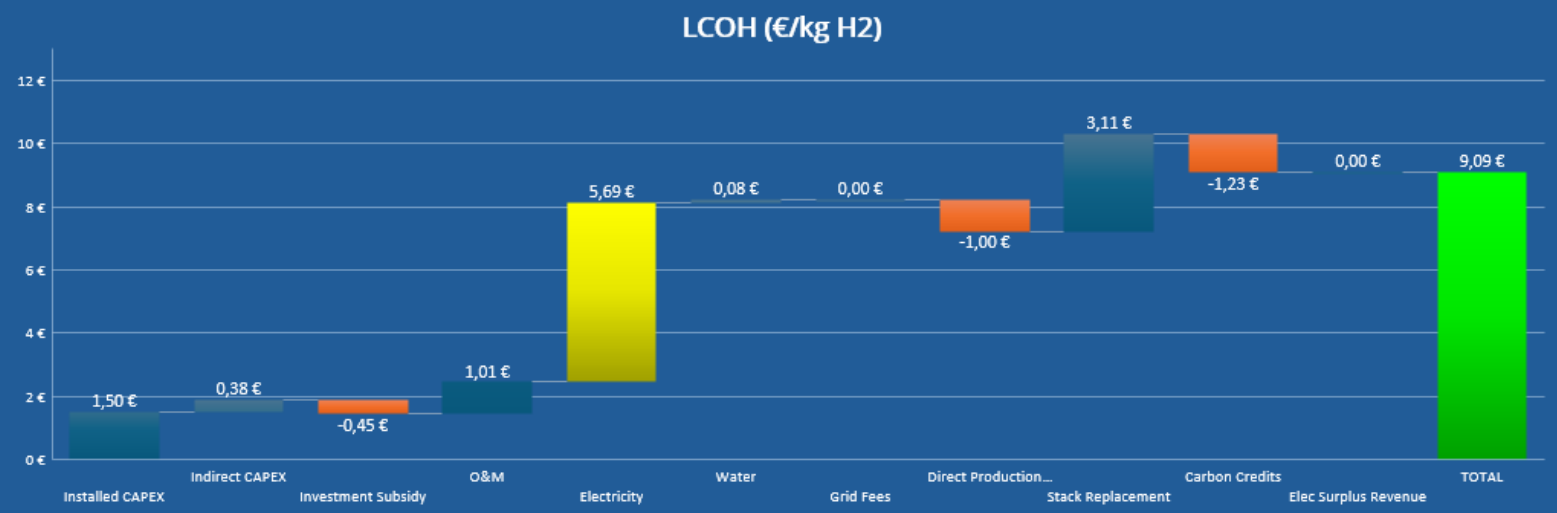
x 3,0 olimpic pools/year

RED III Compliance

GHG Emissions (kg CO2e/kg H2):	0
Is GHG Compliant ?	True
Is Renewable Compliant ?	True
Overall compliance	True

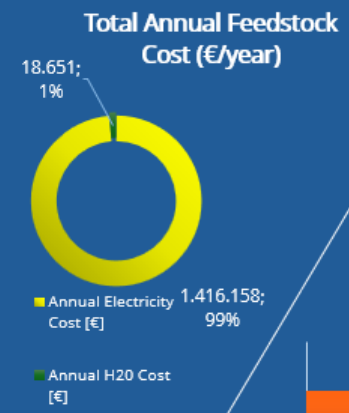
569,16 ton CO2e saved/year

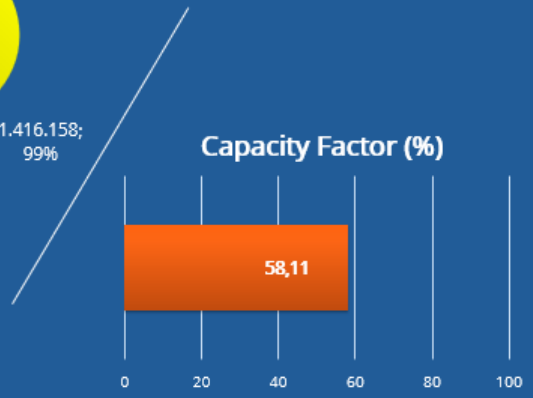
Economic results

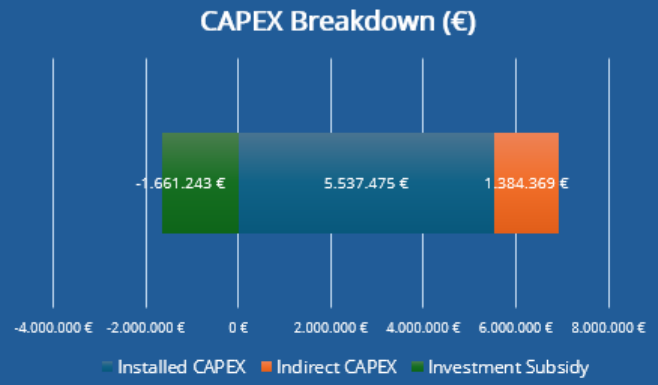


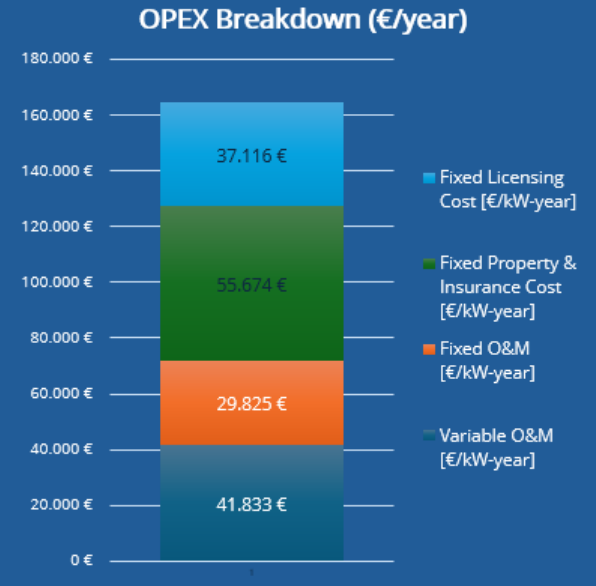
Hydrogen pruction cost:

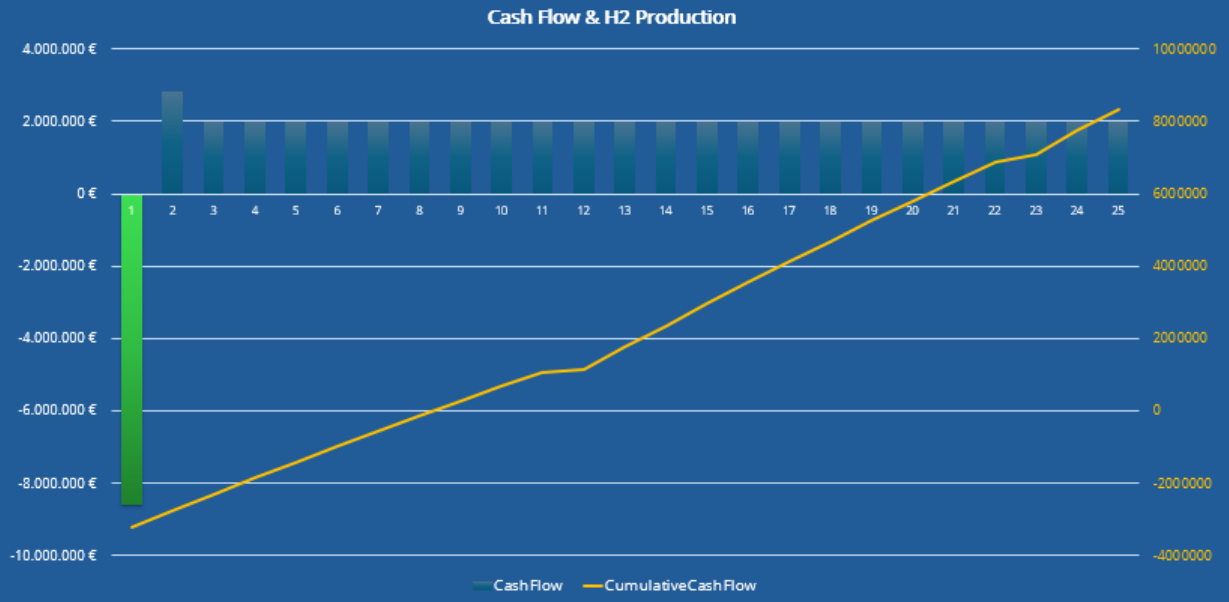
9,09 €/kg

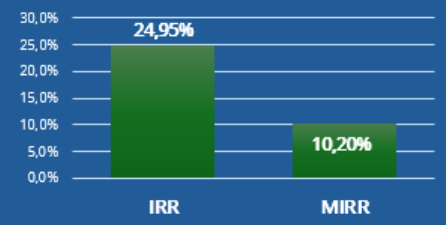


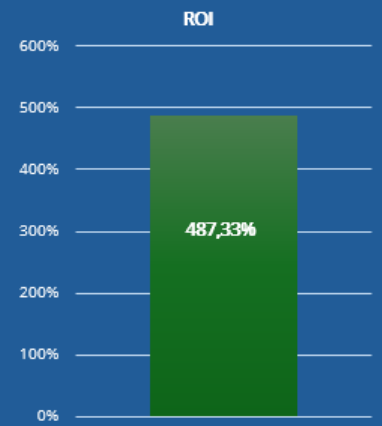












Payback period 4 years

HRS: Hydrogen Refueling Station

Inputs

Light FCEV	Bus FCEV	Heavy-Duty FCEV	Medium-Duty FCEV
15 cars	20 buses	37 heavy duty	25 medium duty
156800 km/year	511000 km/year	1199850 km/year	1483750 km/year

contents		
Vol. 900 bar:	0,050	m³/vessel
Vol. 500 bar:	0,053	m³
Vol. Bulk:	4	m³

Outputs

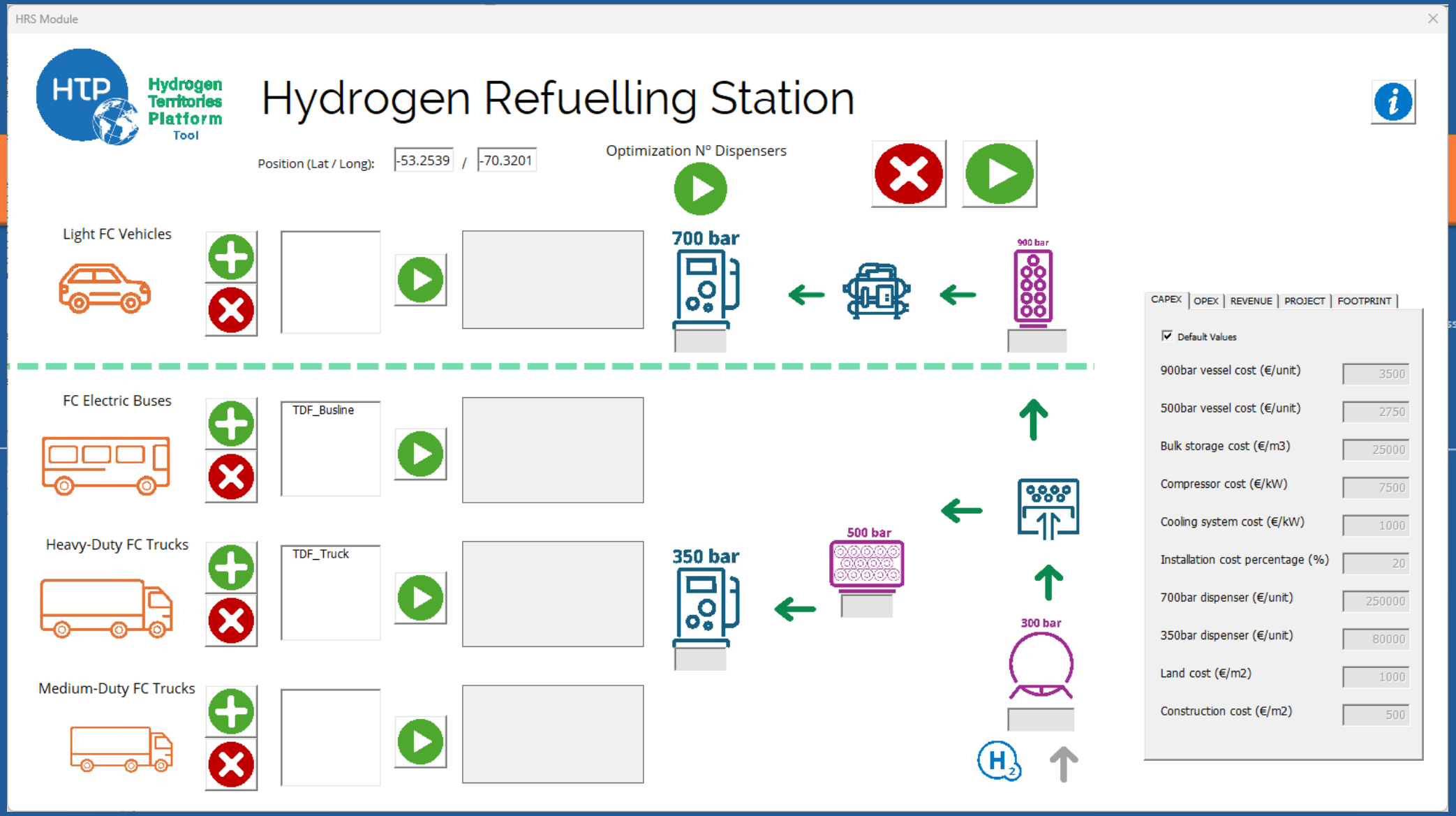
Annual H2 Delivered	39.380	kg/year
Avg. H2 Dispensed Per Day	108	kg/day
Annual Carbon Savi	354.420	kg CO2

n° 900 bar vessels:	14
n° 500 bar vessels:	75
n° bulk storage:	6

700 bar:	1	dispenser(s)
350 bar:	2	dispenser(s)

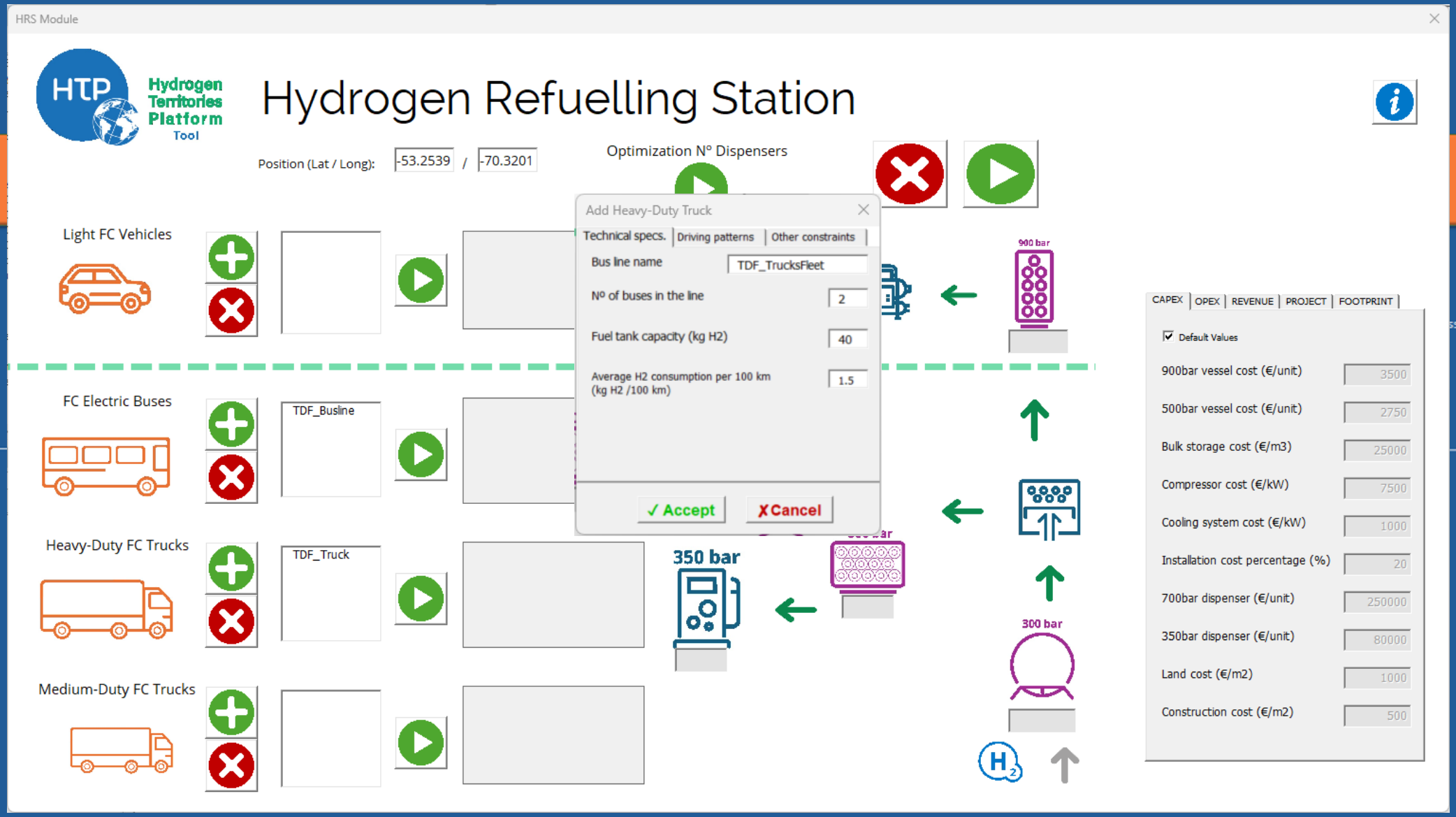
Inputs

Outputs



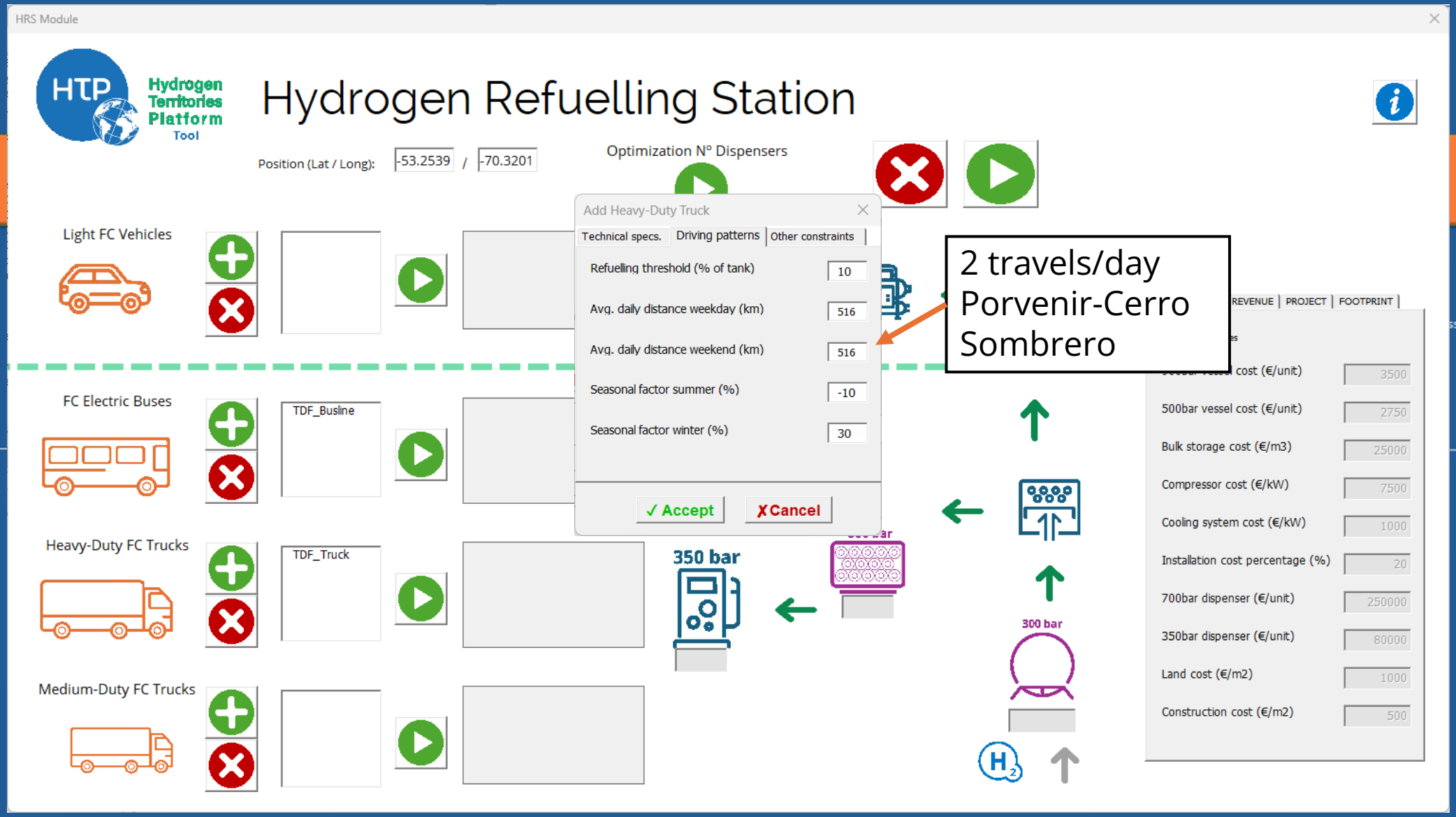
Inputs

Outputs



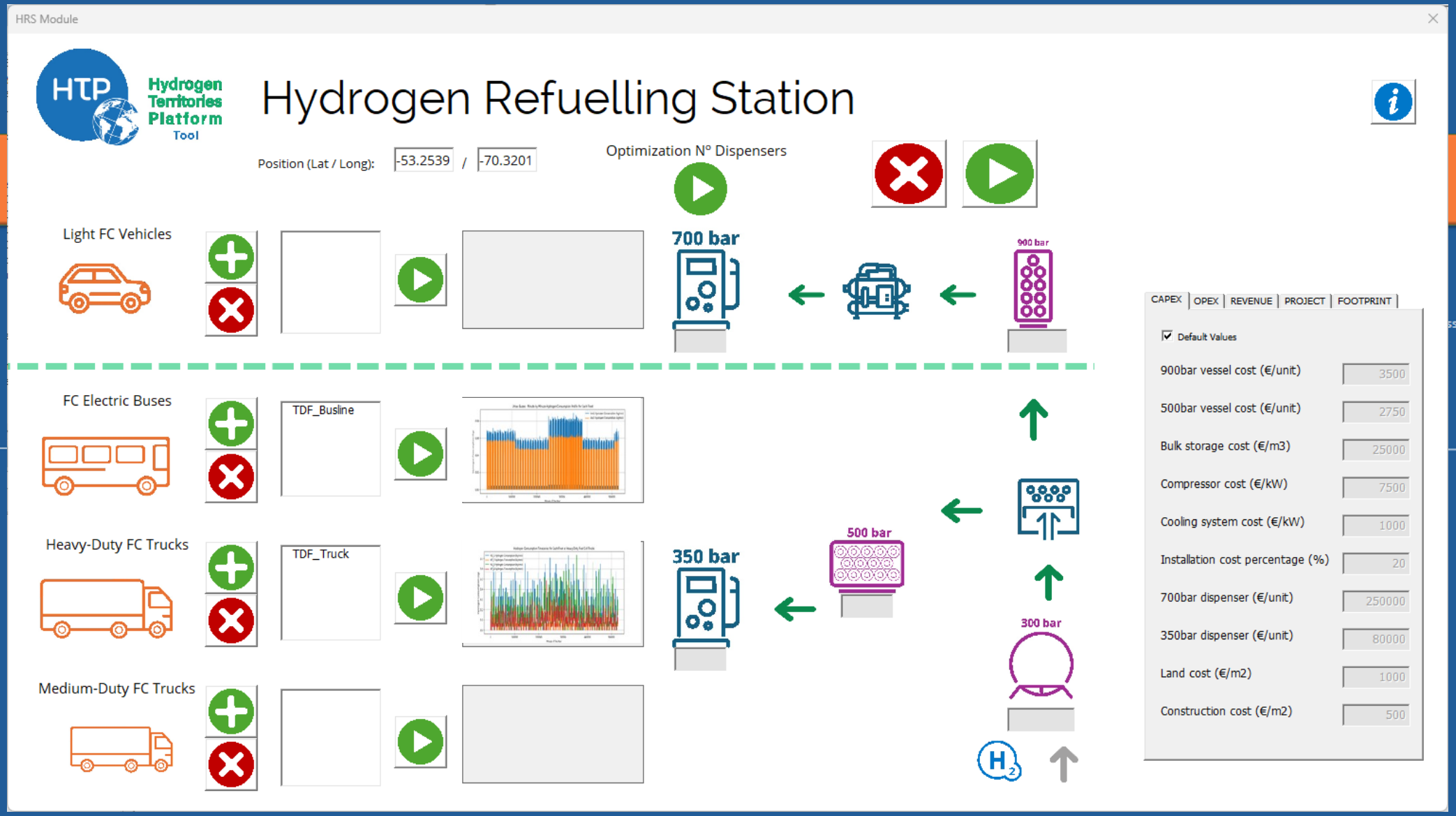
Inputs

Outputs



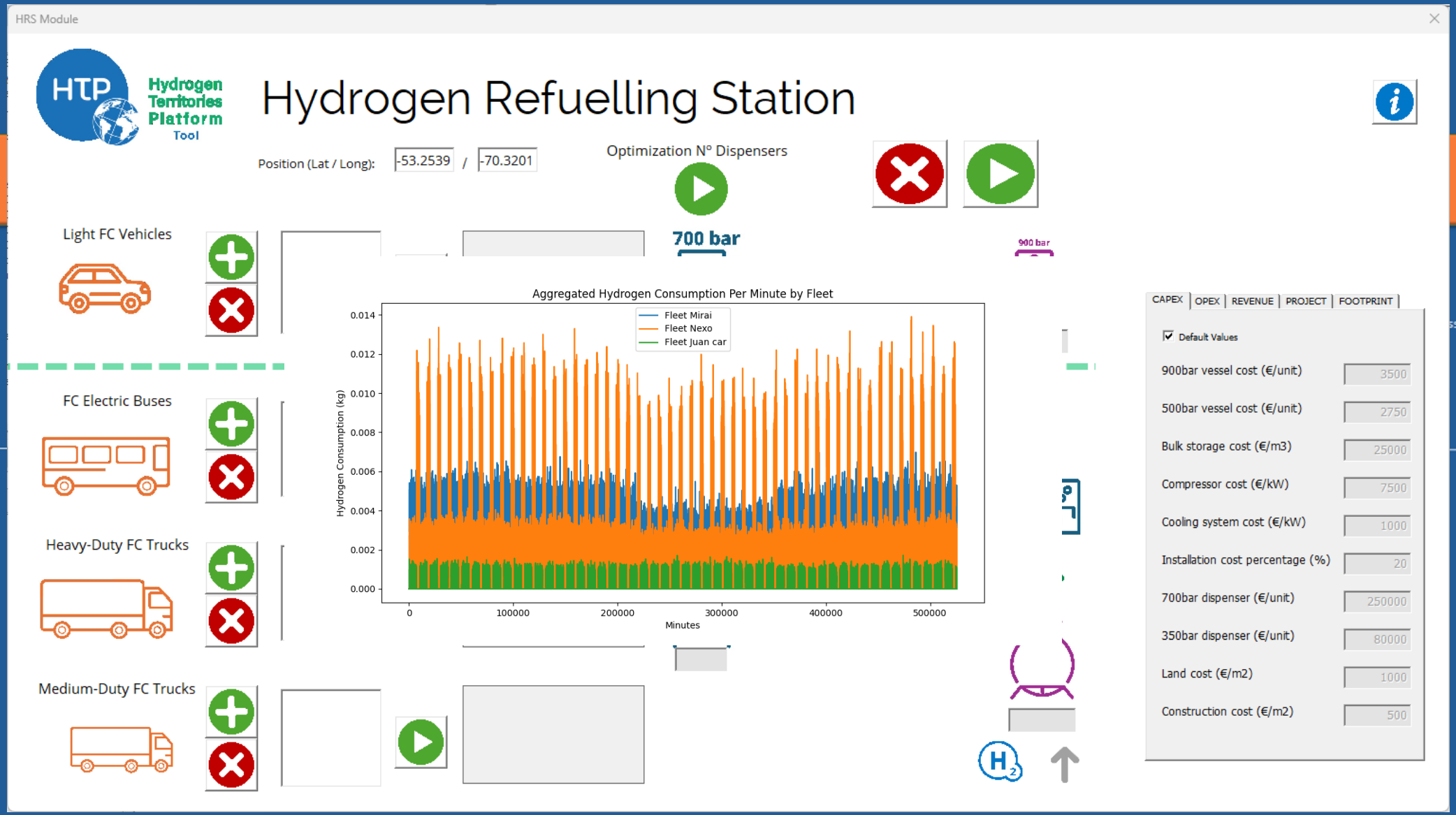
Inputs

Outputs



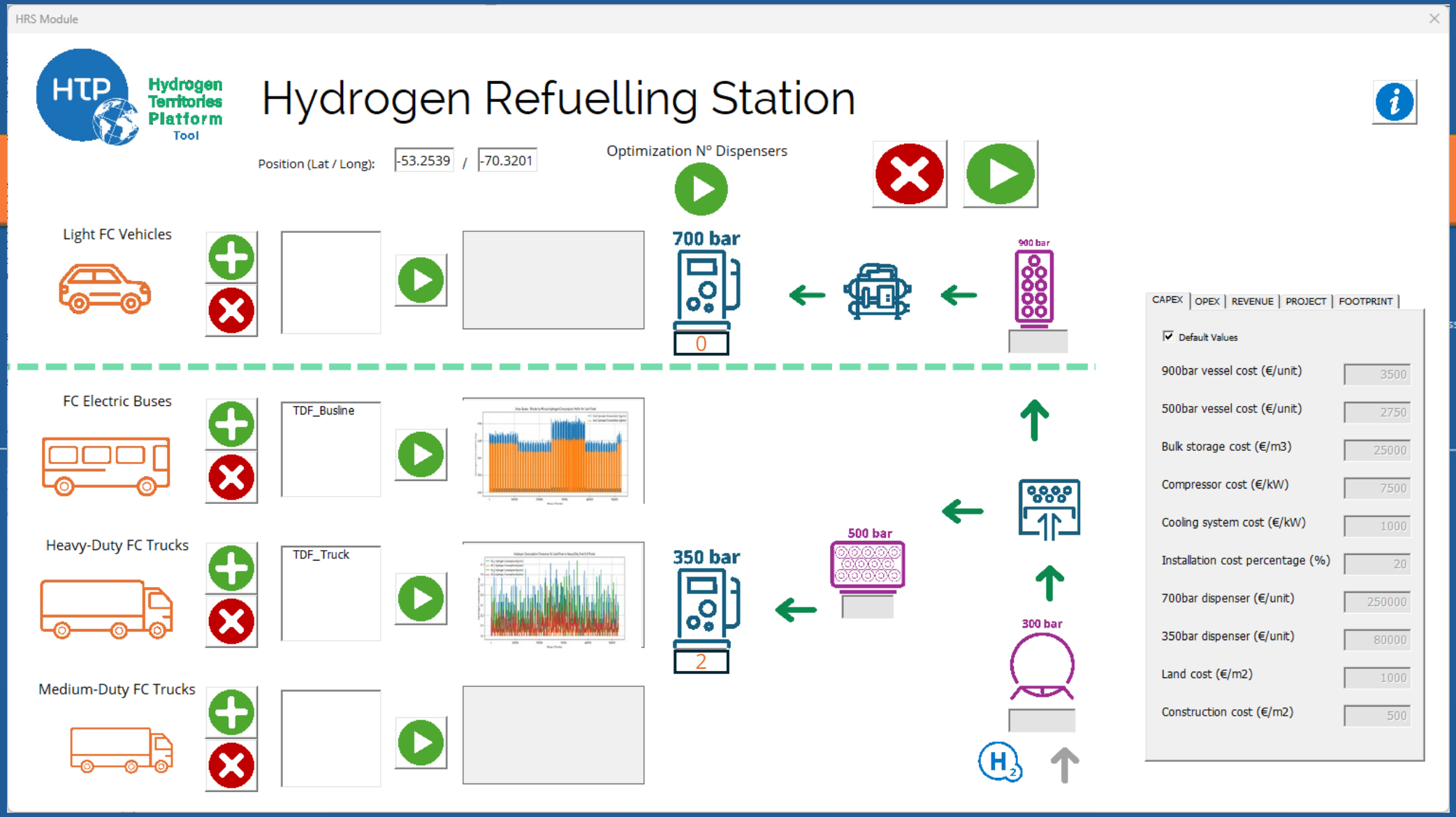
Inputs

Outputs



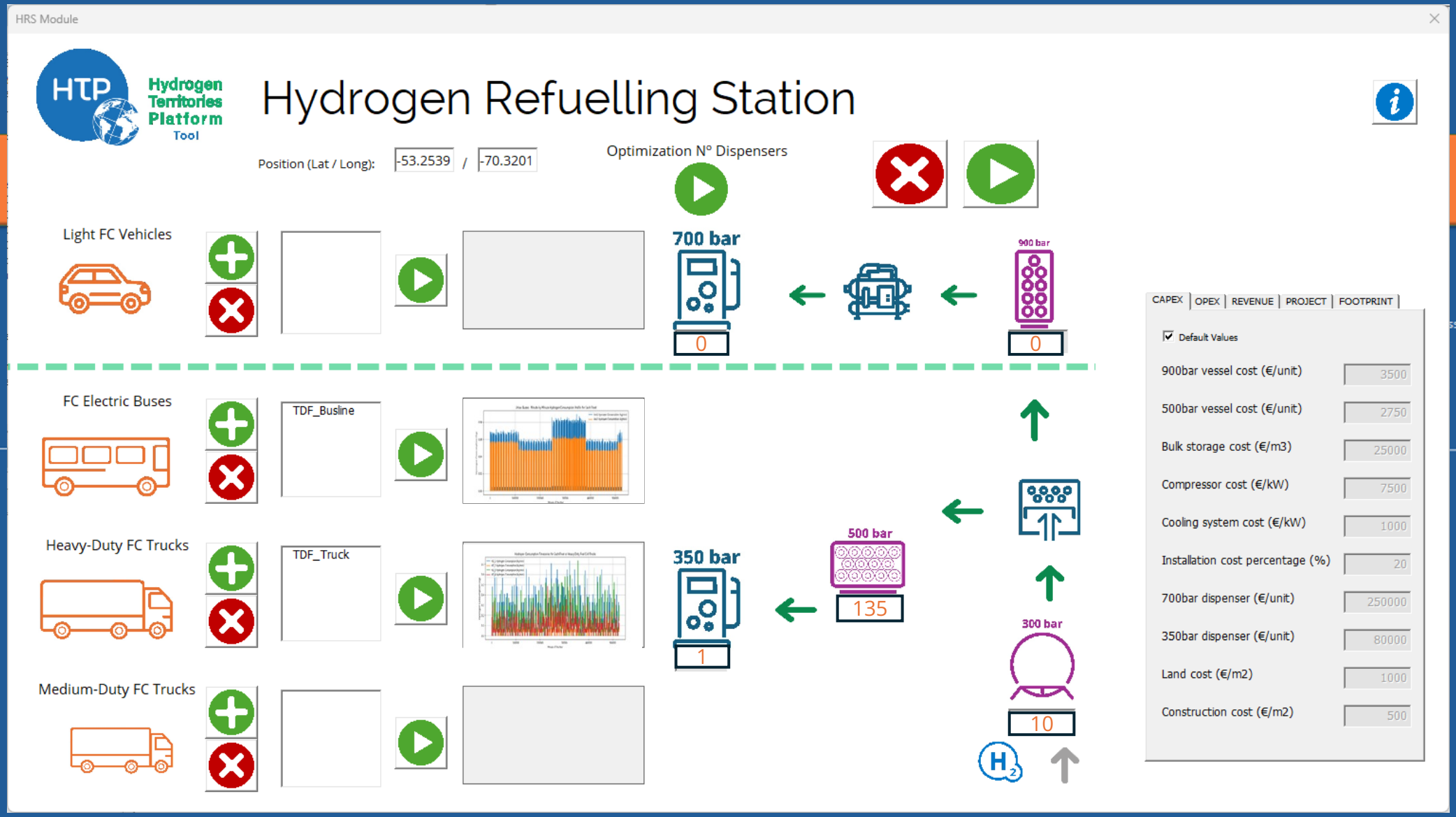
Inputs

Outputs



Inputs

Outputs



HRS: Hydrogen Refueling Station

Inputs

Light FCEV	Bus FCEV	Heavy-Duty FCEV	Medium-Duty FCEV
0 cars	**2** buses	**2** heavy duty	**0** medium duty
0 km/year	**376680** km/year	**268320** km/year	**0** km/year

constants

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

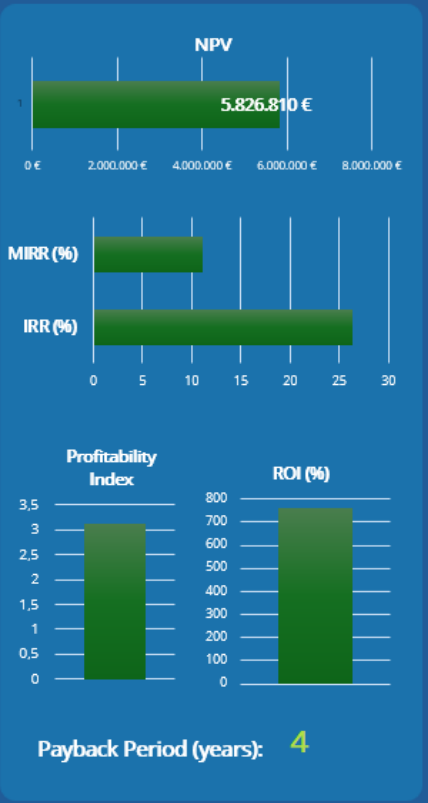
Outputs

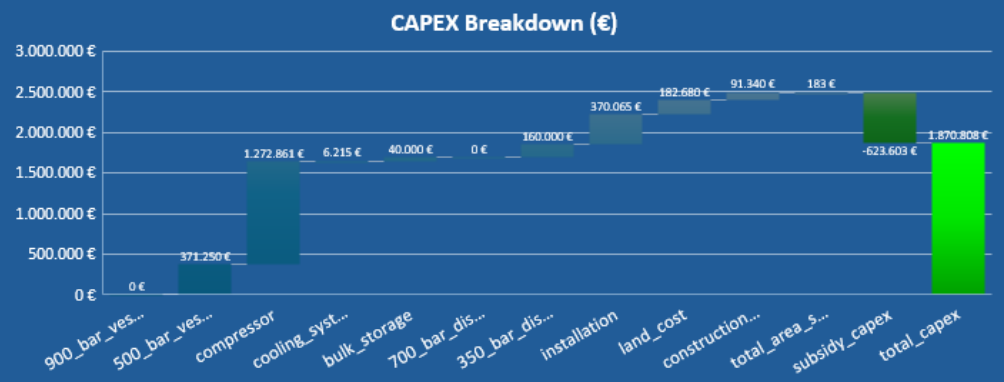
Annual H2 Delivered:	58.382 kg/year
Avg. H2 Dispensed Per Day:	160 kg/day
Annual Carbon Savings:	525.441 kg CO2

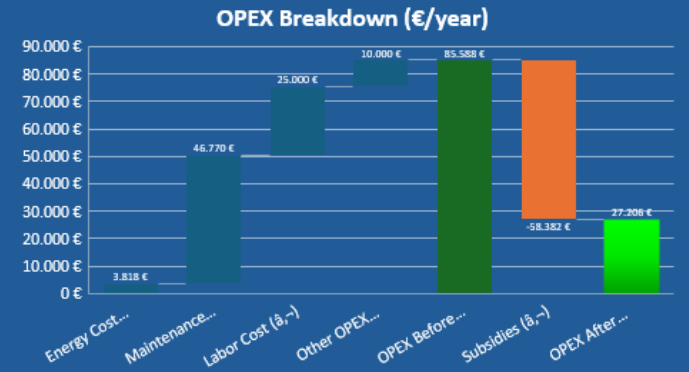
nº 900 bar vessels:	0
nº 500 bar vessels:	135
nº bulk storage:	10

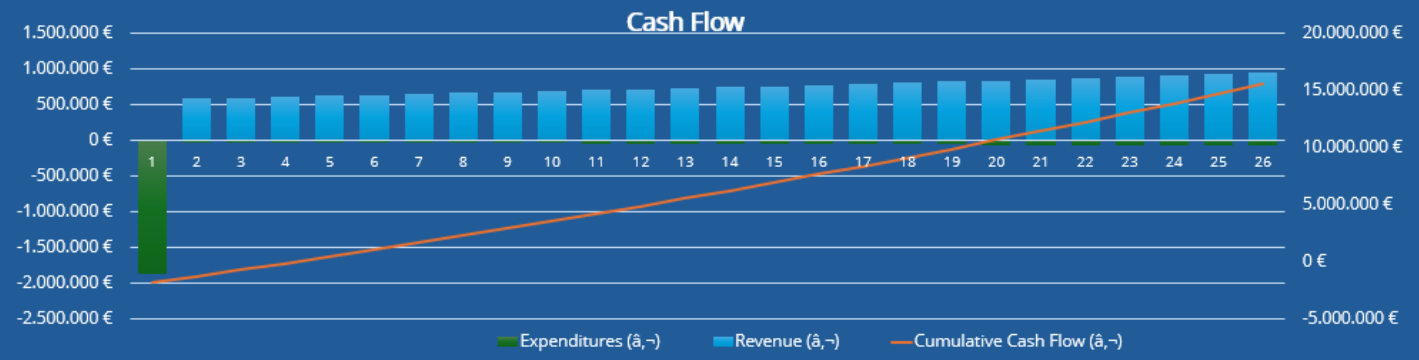
700 bar:	0 dispenser(s)
350 bar:	2 dispenser(s)

Economic results









FCH primary power system

Inputs

1 Ports

0 Industries

0 Data Centers

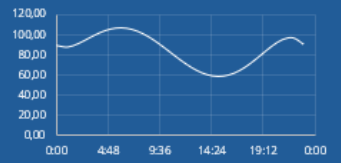
0 CSVs

0 Custom

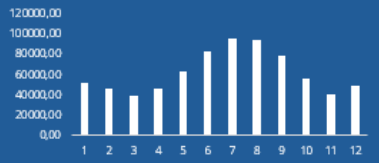
Annual Power Supply: 747.143 kWh/year

Avg. Power Supply: 85,3 kWh/day

Power supply



Power supplied by year

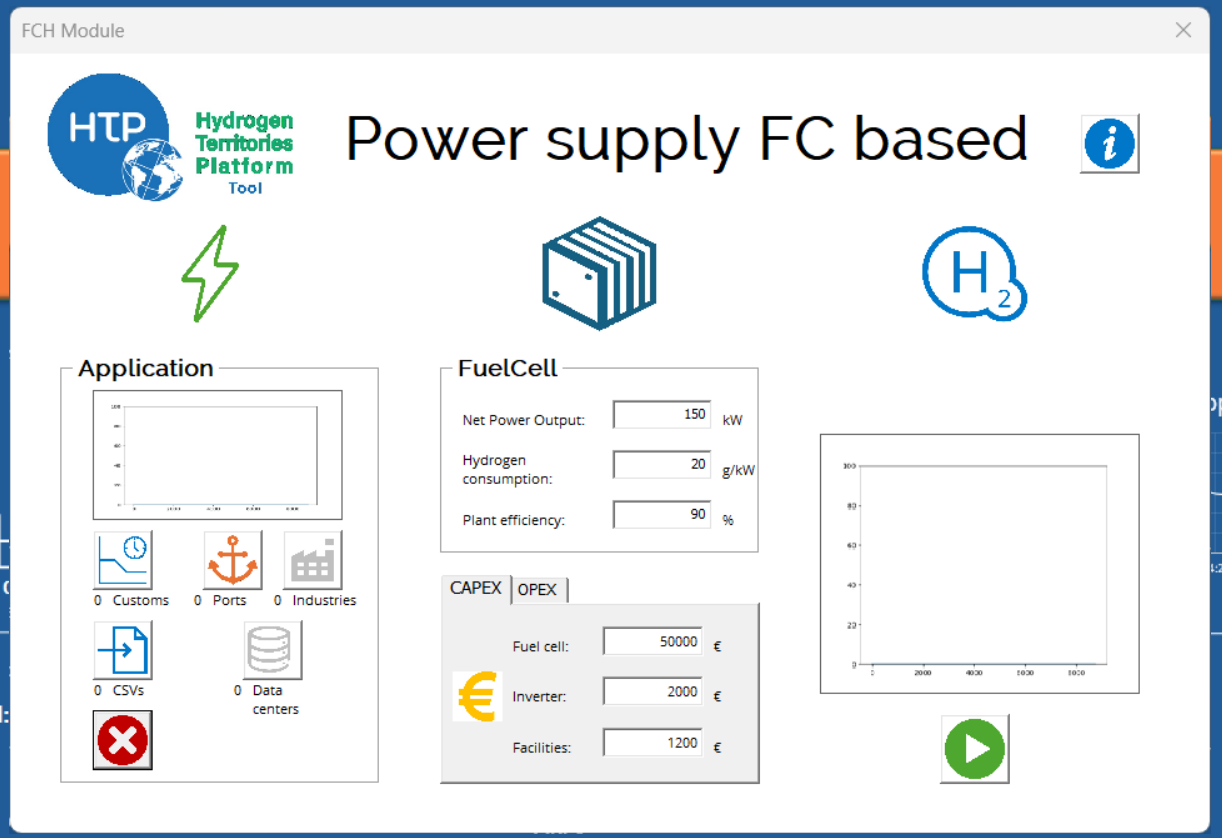


Outputs

Annual H2 Demand: 32.468 kg/year

Avg. H2 Demand: 3,7 kg/day

206 ton CO2e saved per year



Inputs

1 Ports

0 Industries

0 CSVs

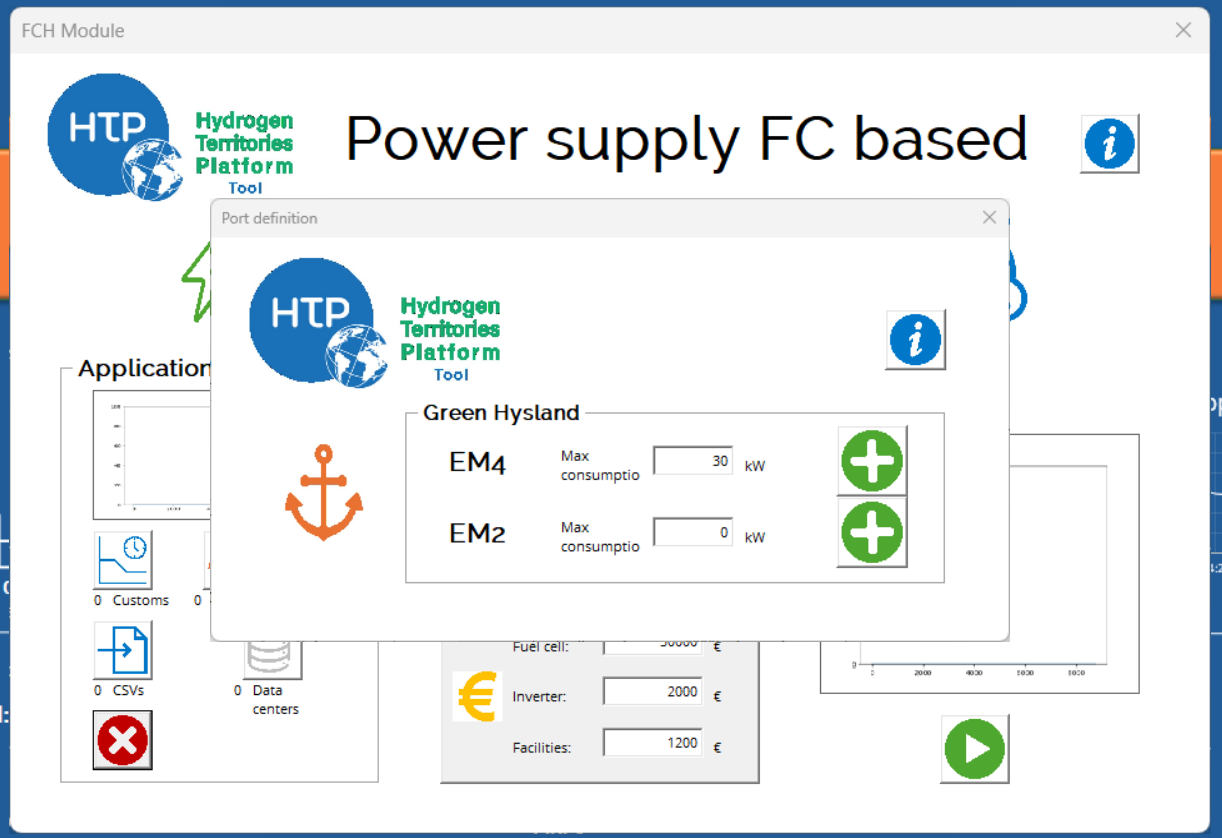
Power supplied by year

Outputs

Annual H2 Demand:

Avg. H2 Demand:

206 ton CO2e saved per year



Inputs

1 Ports

0 Industries

0 CSVs

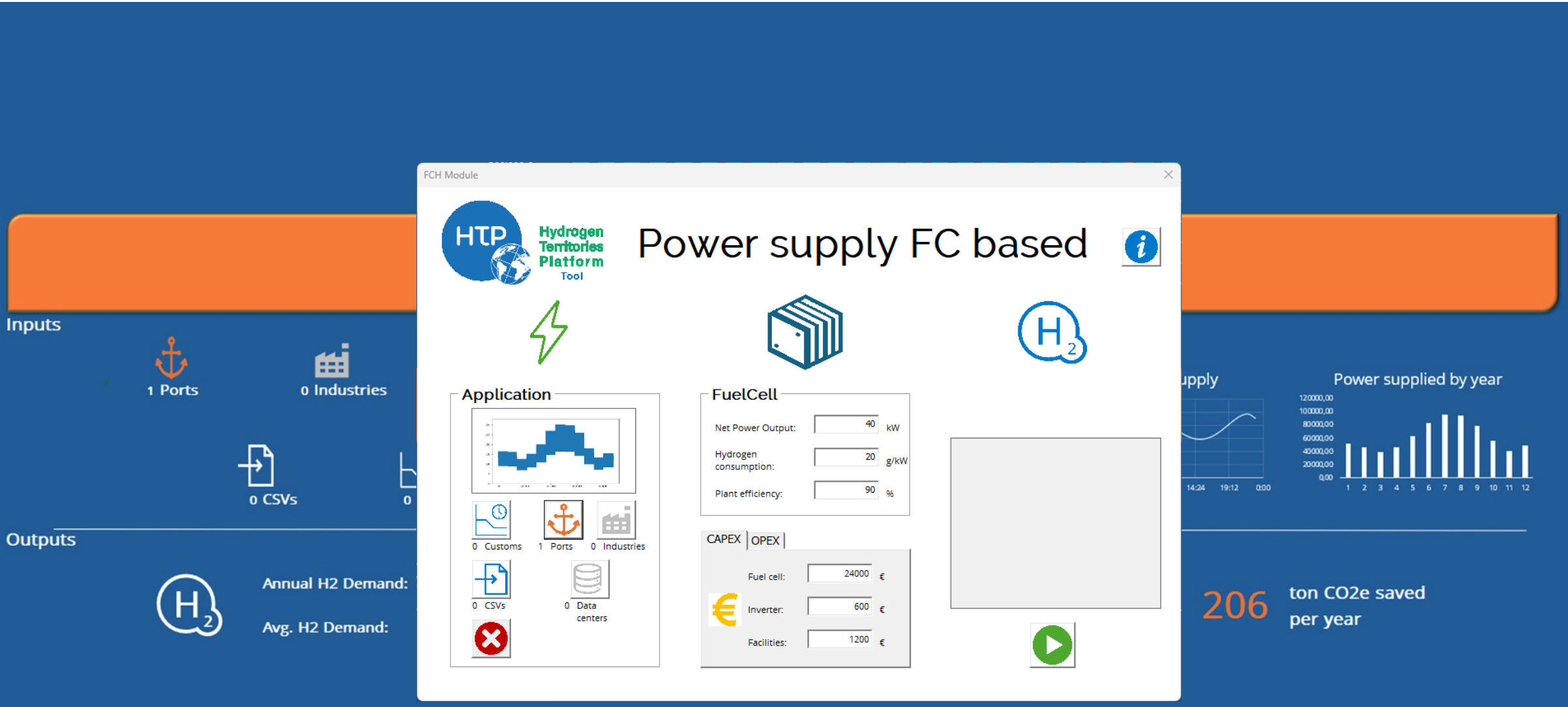
Power supplied by year

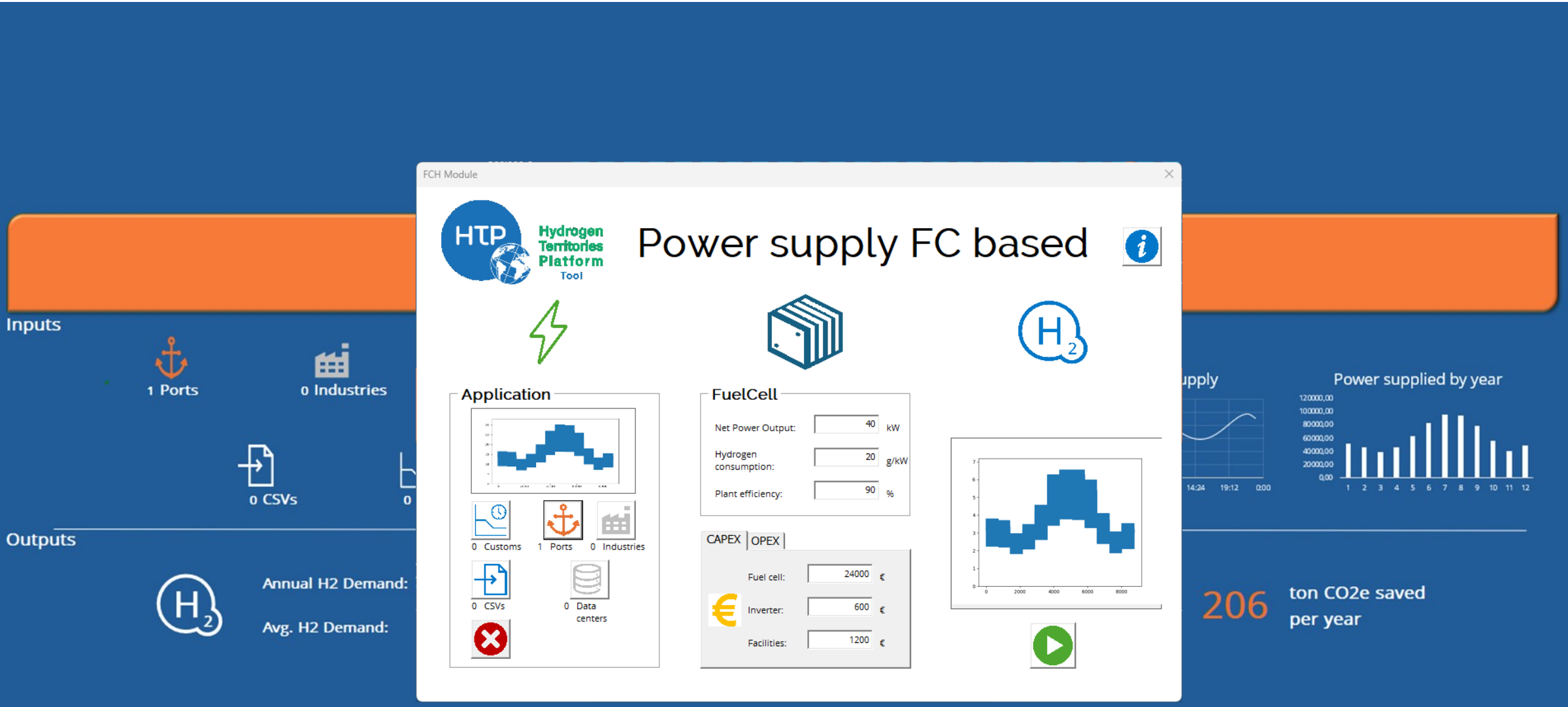
Outputs

Annual H2 Demand:

Avg. H2 Demand:

206 ton CO2e saved per year


Inputs
1 Ports
0 Industries
0 CSVs
0
Outputs
Annual H2 Demand:
Avg. H2 Demand:
upply
Power supplied by year
120000,00
100000,00
80000,00
60000,00
40000,00
20000,00
0,00
1 2 3 4 5 6 7 8 9 10 11 12
14:24
19:12
0:00
206
ton CO2e saved
per year
FCH Module
HTP
Hydrogen
Territories
Platform
Tool
Power supply FC based
Application
0 Customs
1 Ports
0 Industries
0 CSVs
0 Data
centers
FuelCell
Net Power Output:
40
kW
Hydrogen
consumption:
20
g/kW
Plant efficiency:
90
%
CAPEX
OPEX
Fuel cell:
24000
€
Inverter:
600
€
Facilities:
1200
€


Inputs
1 Ports
0 Industries
0 CSVs
Outputs
Annual H2 Demand:
Avg. H2 Demand:
Power supplied by year
206
ton CO2e saved
per year
FCH Module
HTP
Hydrogen Territories Platform Tool
Power supply FC based
Application
0 Customs
1 Ports
0 Industries
0 CSVs
0 Data centers
FuelCell
Net Power Output:
40
kW
Hydrogen consumption:
20
g/kW
Plant efficiency:
90
%
CAPEX
OPEX
Fuel cell:
24000
€
Inverter:
600
€
Facilities:
1200
€

FCH primary power system

Inputs

1 Ports

0 Industries

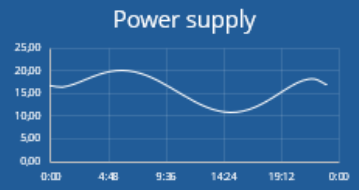
0 Data Centers

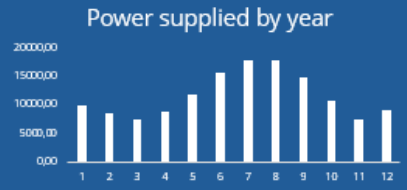
0 CSVs

0 Custom

Annual Power Supply: 139.433 kWh/year

Avg. Power Supply: 15,9 kWh/day





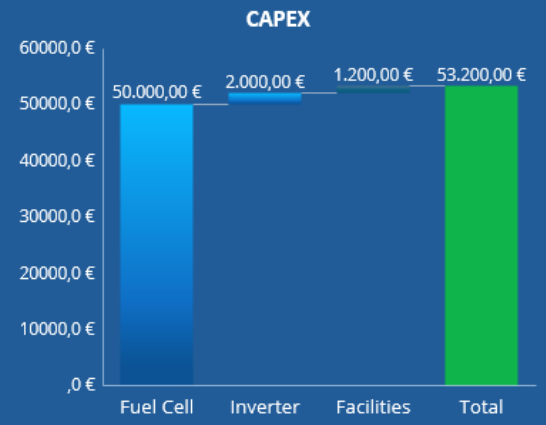
Outputs

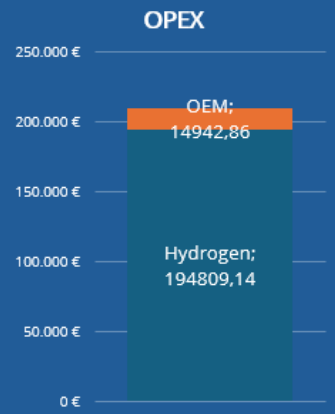
Annual H2 Demand: 15.263 kg/year

Avg. H2 Demand: 1,7 kg/day

38,3 ton CO2e saved per year

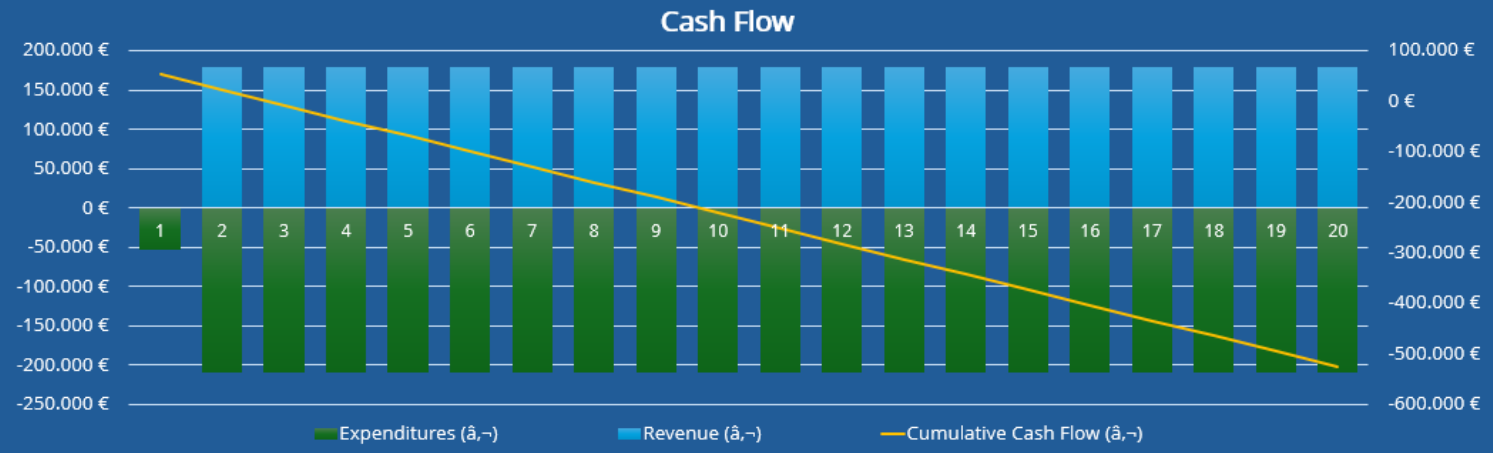
Economic results





Break-even price point of H2

5,06 €/kg



FC-based CHP system

Inputs

1 Hotels

200 Homes

0 Universities

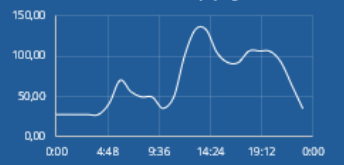
0 CSVs

0 Custom

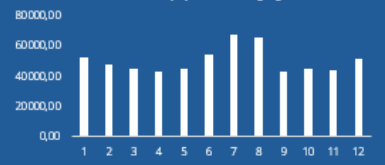
Annual Power Supply: 607.406 kWh/year

Avg. Power Supply: 69,3 kWh/day

Power supply



Power supplied by year



Outputs

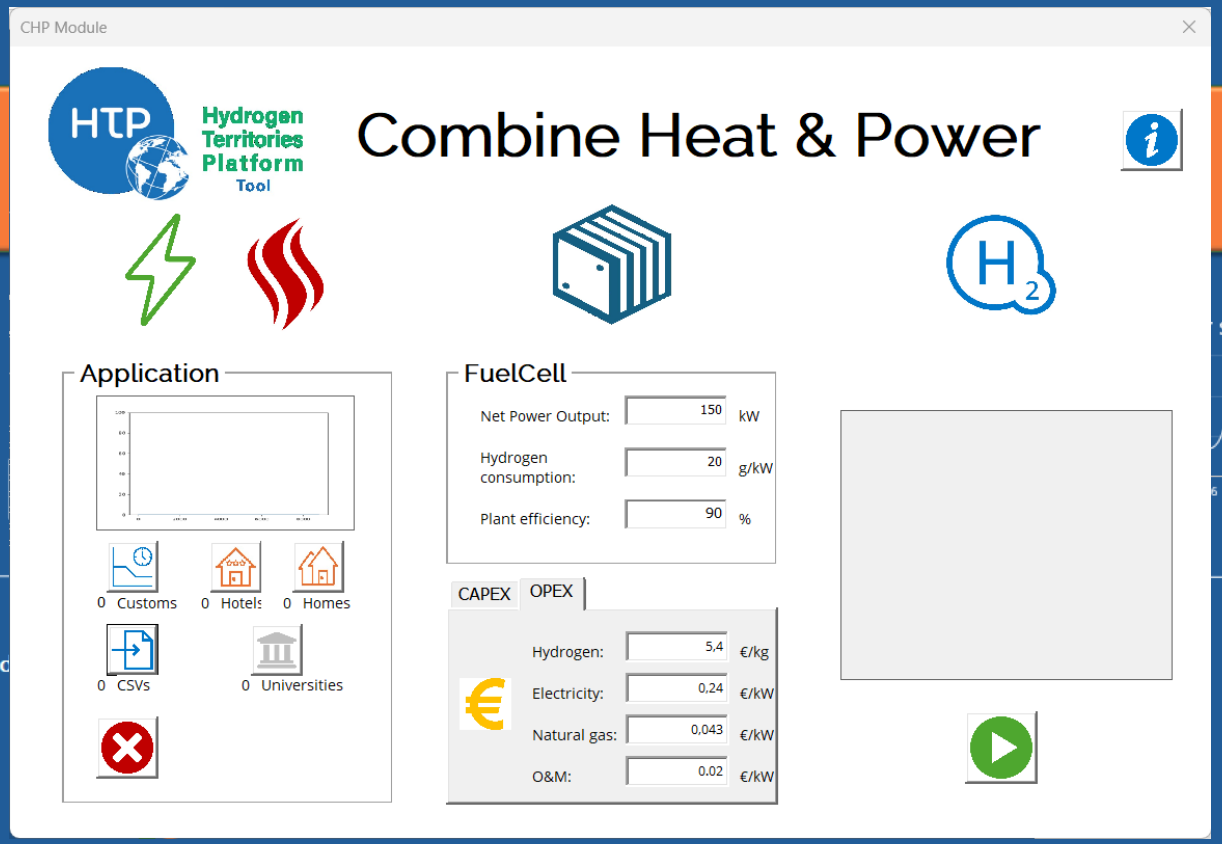
Annual H2 Demand: 26.123 kg/year

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



Inputs

1 Hotels

200 Homes

0 CSVs

supply

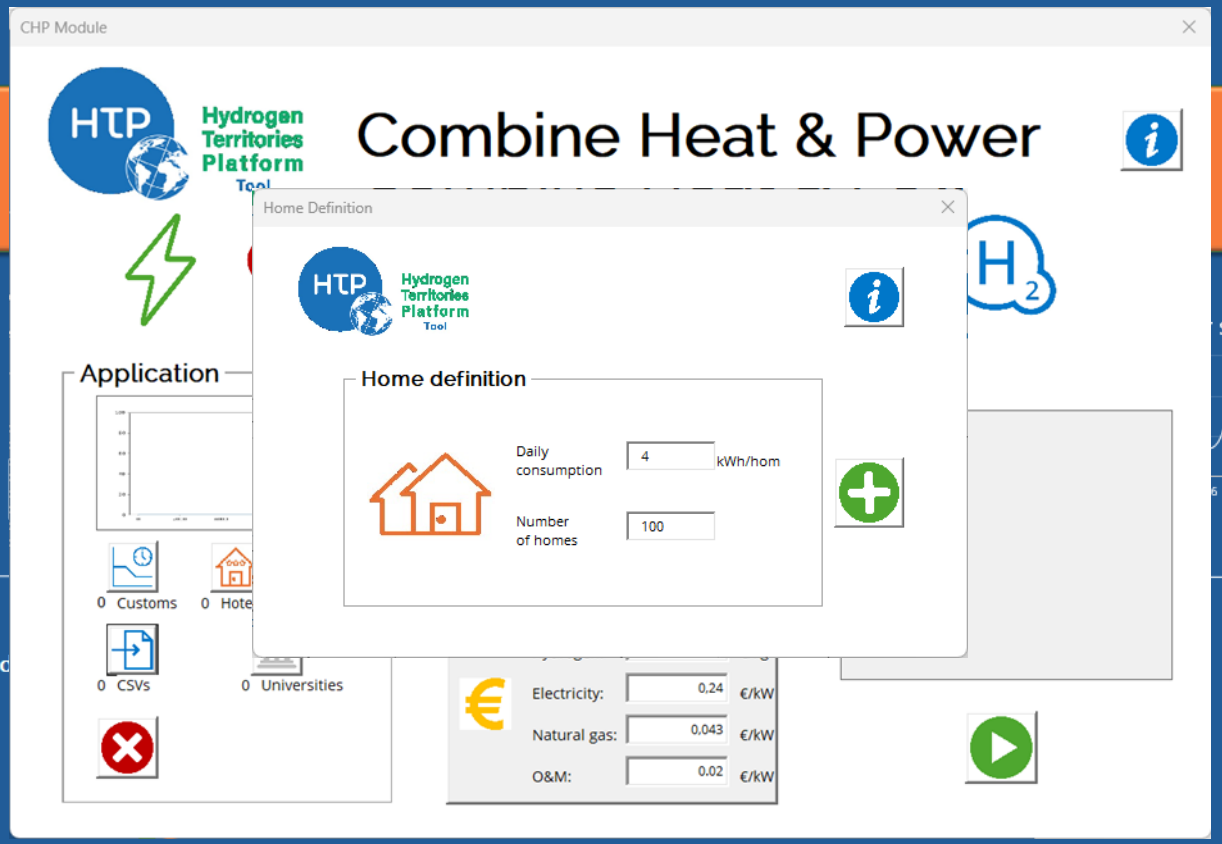
Power supplied by year

Outputs

Annual H2 Demand

Avg. H2 Demand:

167 ton CO2e saved per year



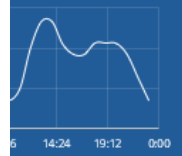
Inputs

1 Hotels

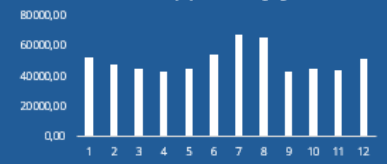
200 Homes

0 CSVs

supply



Power supplied by year



Outputs

Annual H2 Demanc

Avg. H2 Demand:

167 ton CO2e saved per year

Inputs

1 Hotels

200 Homes

0 CSVs

Outputs

Annual H2 Demand

Avg. H2 Demand:

supply

Power supplied by year

80000,00
60000,00
40000,00
20000,00
0,00

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

14:24 19:12 0:00

167 ton CO2e saved per year

CHP Module

HTP Hydrogen Territories Platform Tool

Combine Heat & Power

Application

0 Customs 1 Hotels 200 Homes

0 CSVs 0 Universities

FuelCell

Net Power Output: 150 kW

Hydrogen consumption: 20 g/kW

Plant efficiency: 90 %

CAPEX OPEX

Fuel cell: 50000 €

Inverter: 2000 €

Facilities: 1200 €

Inputs

1 Hotels

200 Homes

0 CSVs

Outputs

Annual H2 Demand

Avg. H2 Demand:

supply

Power supplied by year

167 ton CO2e saved per year

CHP Module

Hydrogen Territories Platform Tool

Combine Heat & Power

Application

0 Customs

1 Hotels

200 Homes

0 CSVs

0 Universities

FuelCell

Net Power Output: 150 kW

Hydrogen consumption: 20 g/kW

Plant efficiency: 90 %

CAPEX | OPEX

Fuel cell: 50000 €

Inverter: 2000 €

Facilities: 1200 €

FC-based CHP system

Inputs

0 Hotels

100 Homes

0 Universities

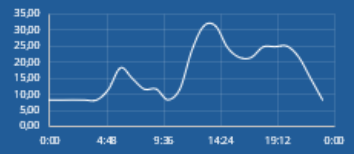
0 CSVs

0 Custom

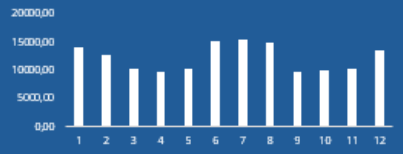
Annual Power Supply: 146.140 kWh/year

Avg. Power Supply: 16,7 kWh/day

Power supply



Power supplied by year



Outputs

Annual H2 Demand: 6.951 kg/year

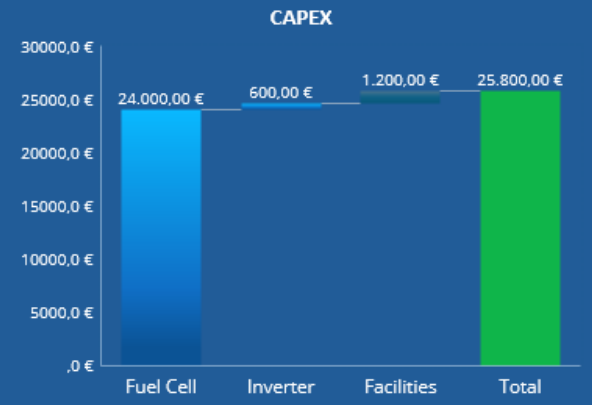
Avg. H2 Demand: 0,8 kg/h

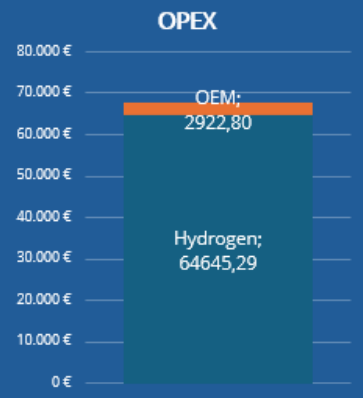
Annual Heat Demand: 186.371 kWh/year

Avg. Heat Demand: 21,3 kWh

40,2 ton CO2e saved per year

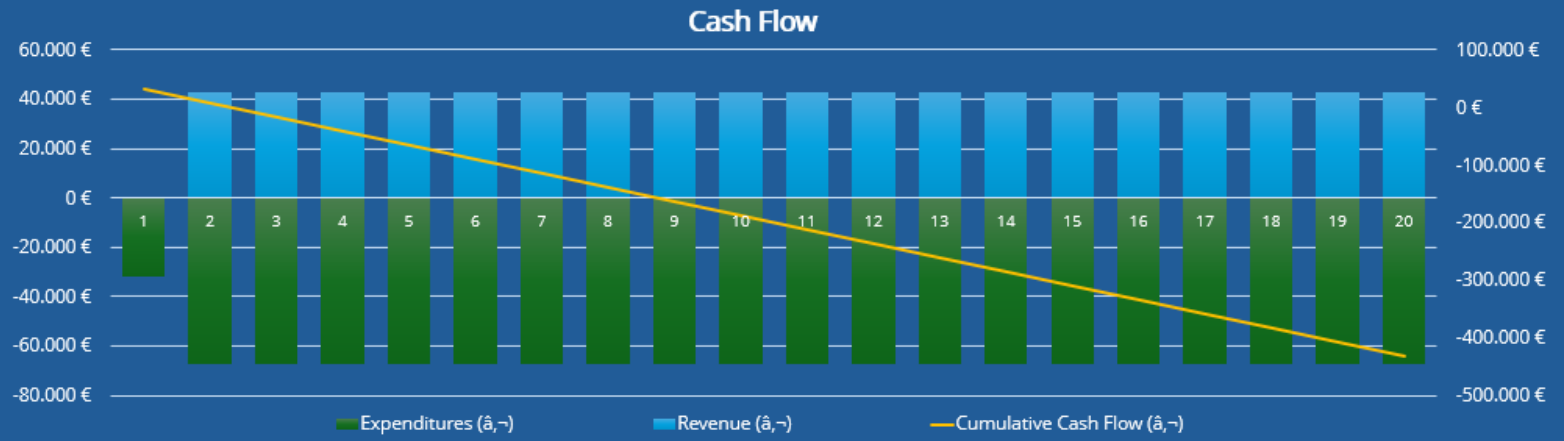
Economic results



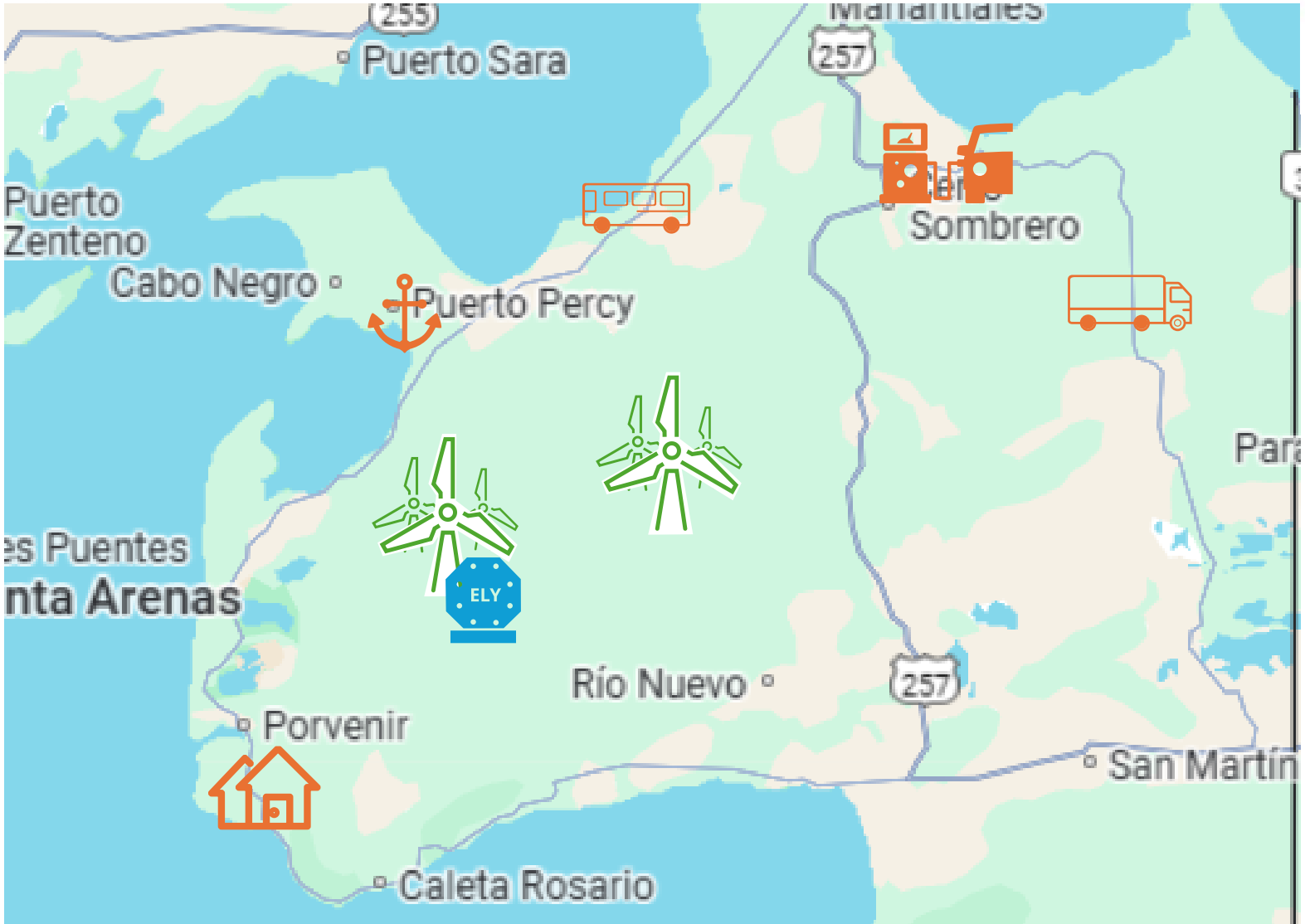


Break-even price point of H2

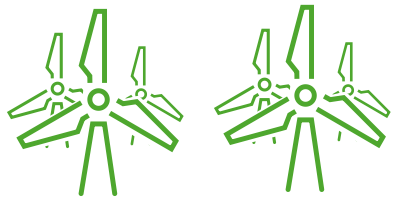
5,78 €/kg



Case Study


255
Puerto Sara
257
Puerto
Zenteno
Cabo Negro
Puerto Percy
Sombrero
ELY
Río Nuevo
257
Porvenir
San Martín
Caleta Rosario

Case Study



2 wind power plants
25 MW peak power

ELY

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