

# BONDALTI

## NEW ENERGY FOR A NEW SUSTANABLE SOCIETY

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TOMORROW MATTERS

# Business Profile

**BONDALTI**

## Iberian Industrial Group

- Larger Iberian producer of Chlorine and sodium hypochlorite
- European Leader in Aniline & Nitrobenzene (sales)
- 1,720 tons of products produced (2022)
- Main Iberian player in water treatment & reuse
- ~600 M€ sales (2022)
- 700 employees (2022)
- José de Mello group > 120 years
- Leadership in Sustainability (Ecovadis Rating)



# Operating in 3 sectors

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## INDUSTRIAL CHEMICALS

### Aniline & derivatives

- Nitric acid
- Nitrobenzene
- Aniline
- Sulphanilic acid

### Chlor-Alkali

- Chlorine
- Caustic soda
- Hypochlorite acid
- Hydrochloric acid
- Hydrogen



## WATER TREATMENT AND REUSE

### Offer in the Total Water Cycle

- Design, engineering and assembly
- Operation, maintenance and technical assistance
- Specialized equipment
- Certified Laboratory



## GREEN ENERGY

### Hydrogen

- Create production capacity

### Lithium

- Create production capacity



# Improving everyone's day-to-day

## BONDALTI



WE ARE  
THE INDUSTRY  
OF INDUSTRIES

incorporate into several products  
and solutions of our daily life

- Mobility
- Construction
- Metallurgy
- Pulp & paper
- Water treatment
- Pharmaceutical
- Hygiene and disinfection



WE BRING  
SUSTAINABILITY  
TO CLIENTS

promoting circular water solutions,  
avoiding its waste

- Agrofood & beverages
- Auto industry
- Pulp & paper
- Pharma & laboratories
- Other industrial
- Services (hospitals, hotels,  
main offices)



WE PROMOTE  
THE ENERGY  
TRANSITION

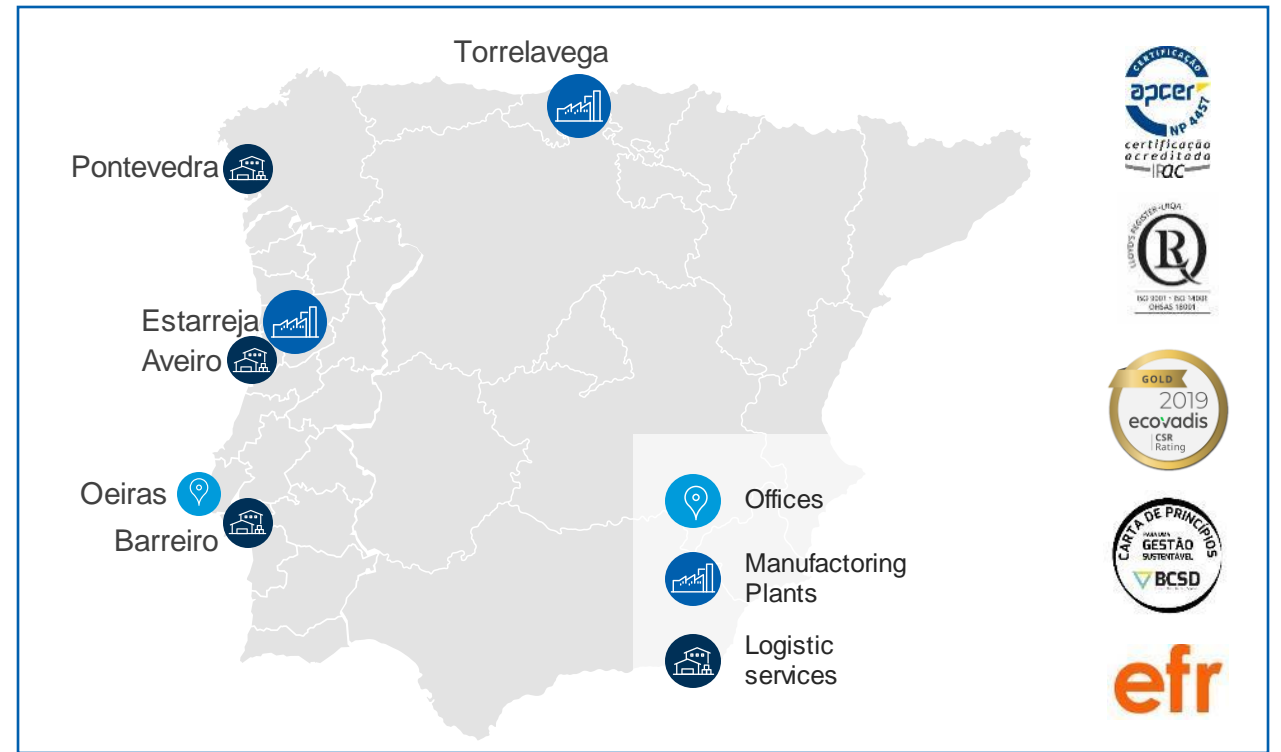
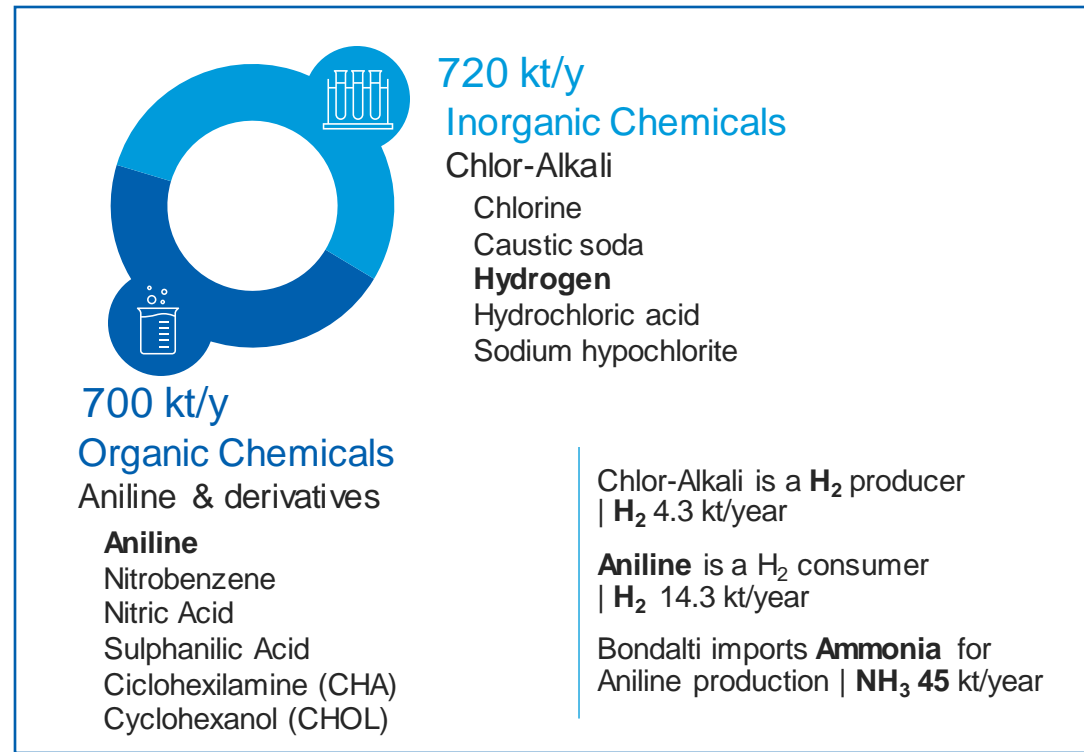
with innovative renewable  
projects

- Auto-consumption
- Mobility
- Natural gas grid
- Industrial sector

# Bondalti | key Figures Hydrogen

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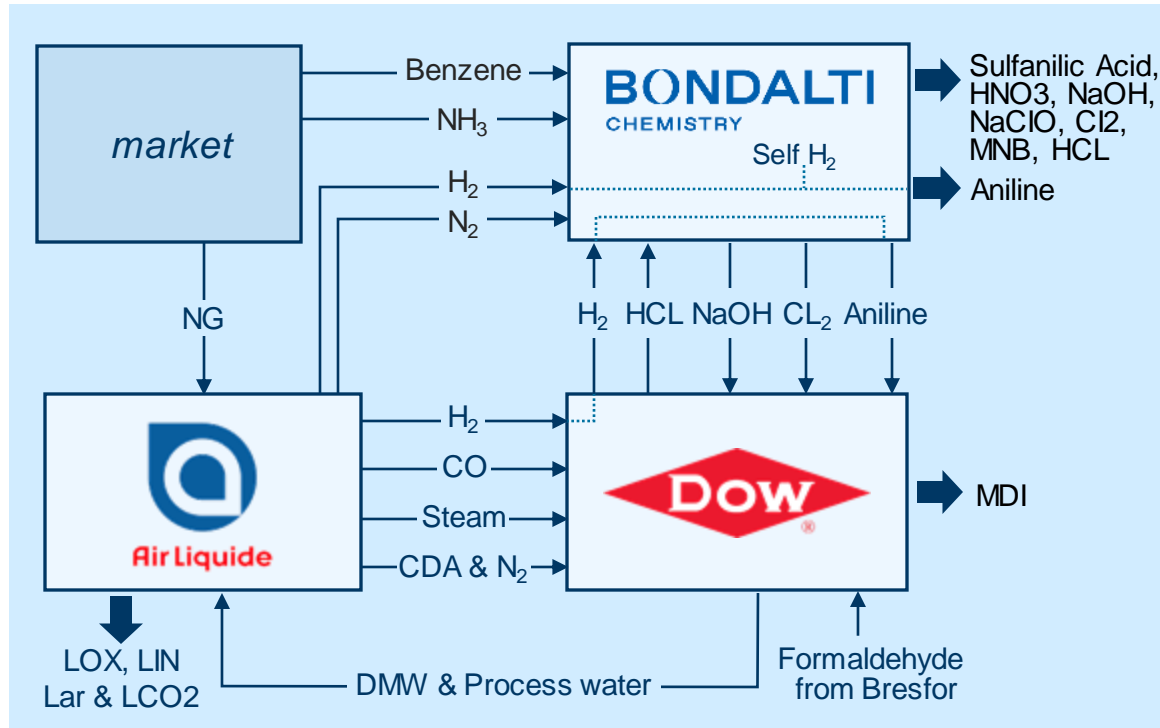
- One of the main players in the world of non-integrated Aniline production | > 200 kton/y
- 2nd Largest Iberian Chlor-Alkali producer | 720 kton/y
- In Portugal: 2<sup>nd</sup> largest H<sub>2</sub> and NH<sub>3</sub> consumer | 15 kton/y, 45kton/y
- Largest single electricity consumer (largest electrolyzer capacity installed) | 50 MWp





# Estarreja Chemical Complex

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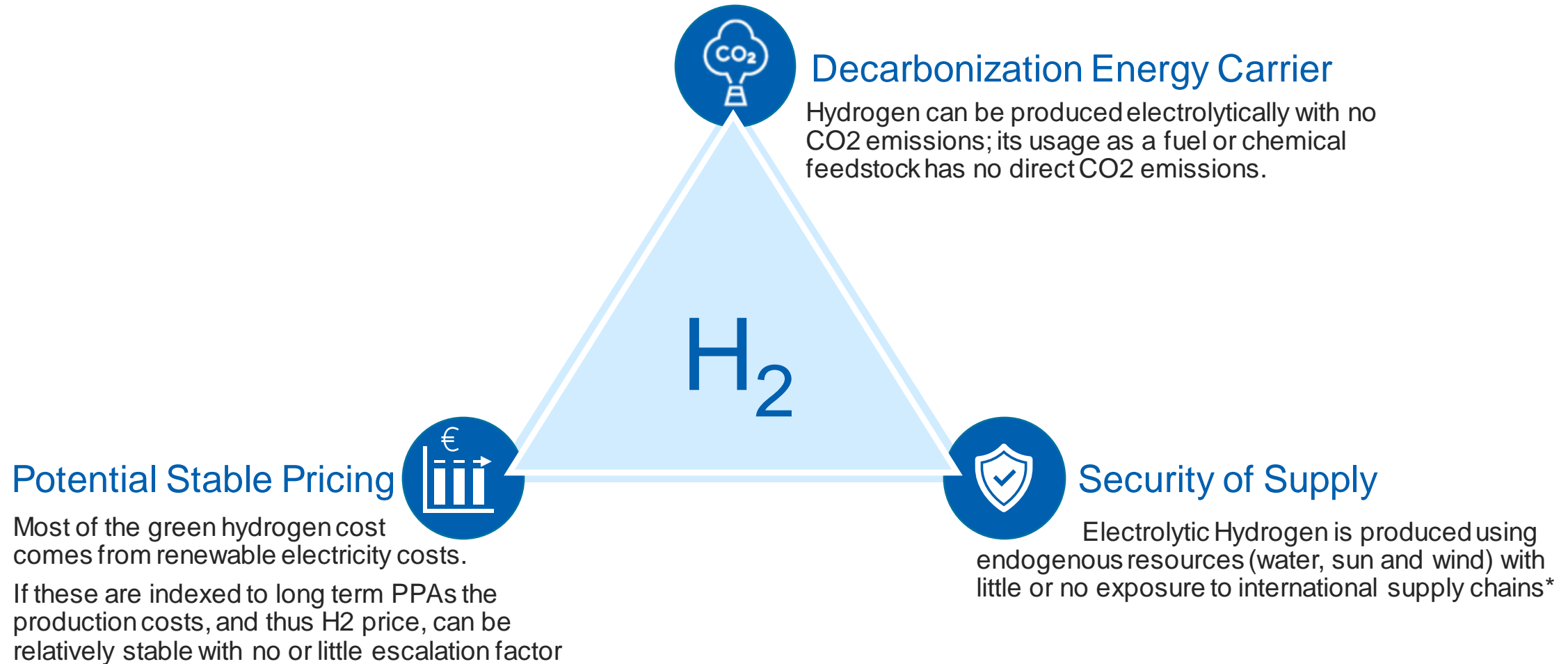
# Green H<sub>2</sub> Transition Vector



# Green H<sub>2</sub> – value proposition

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## Decarbonization, safety and diversification of supply





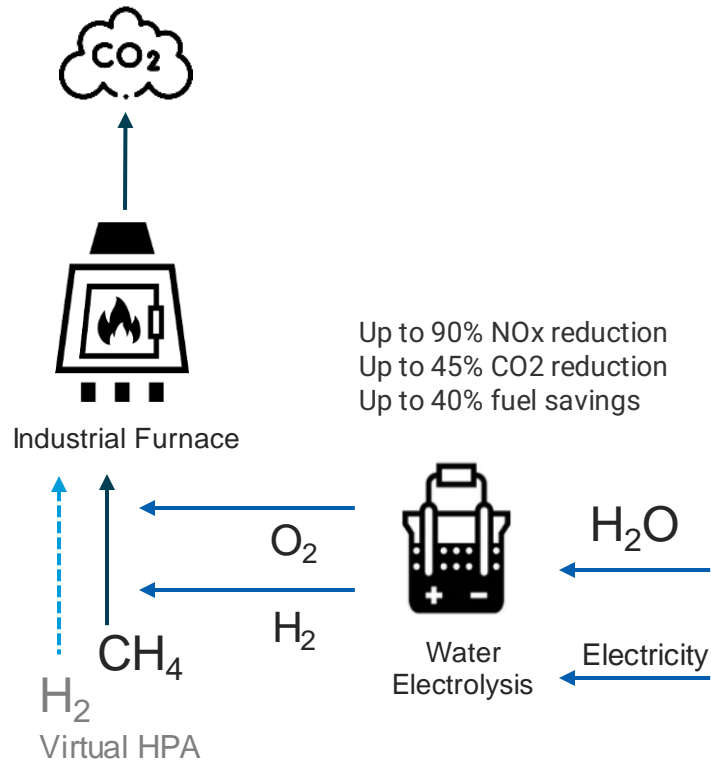
# Green H<sub>2</sub> – value proposition

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## A Decarbonization, safety & supply diversification

H<sub>2</sub> as fuel

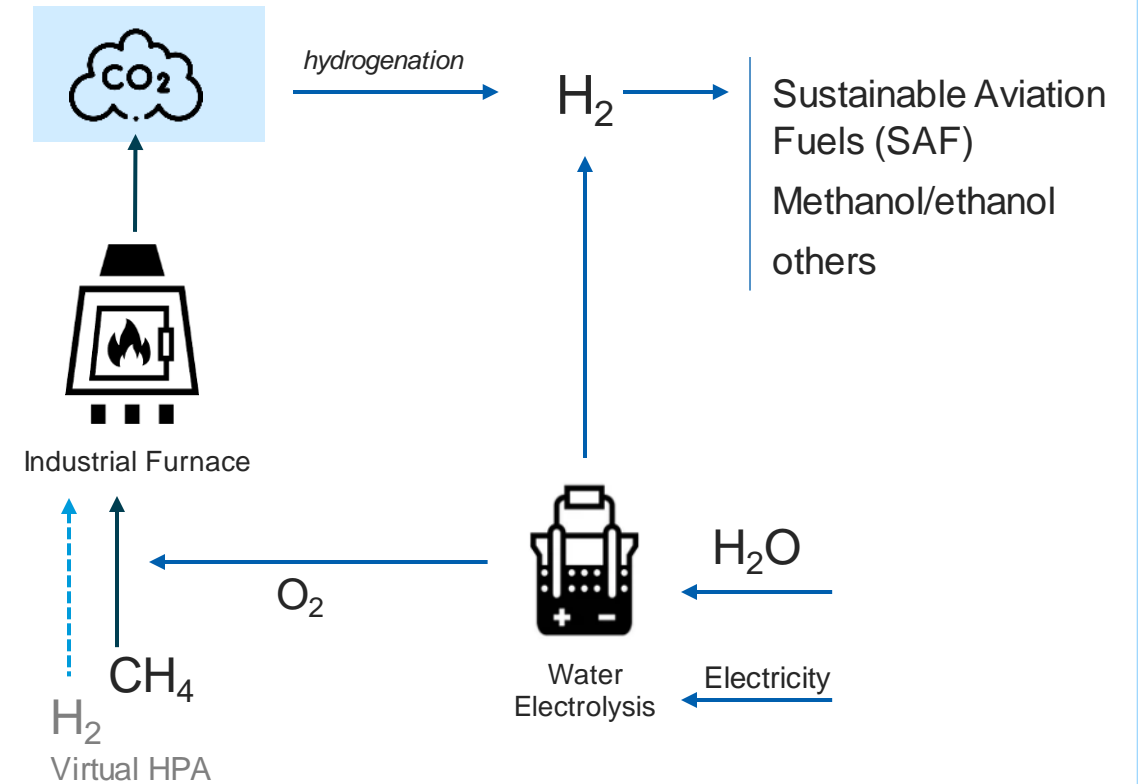
O<sub>2</sub> as combustion enhancer



## B Utilization of CO<sub>2</sub> as Added value products

H<sub>2</sub> as raw material and/or as a fuel

O<sub>2</sub> as combustion enhancer

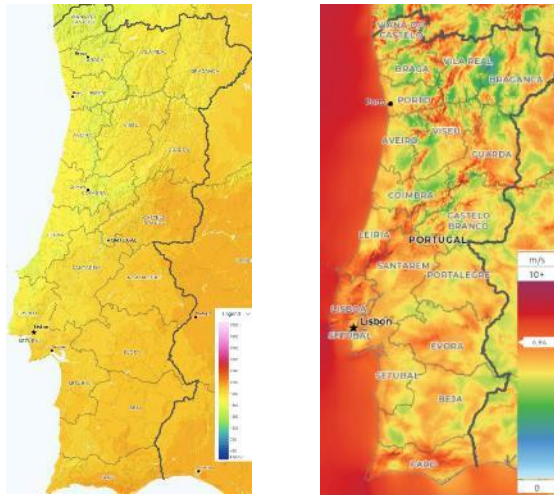


# Green H<sub>2</sub> – value proposition

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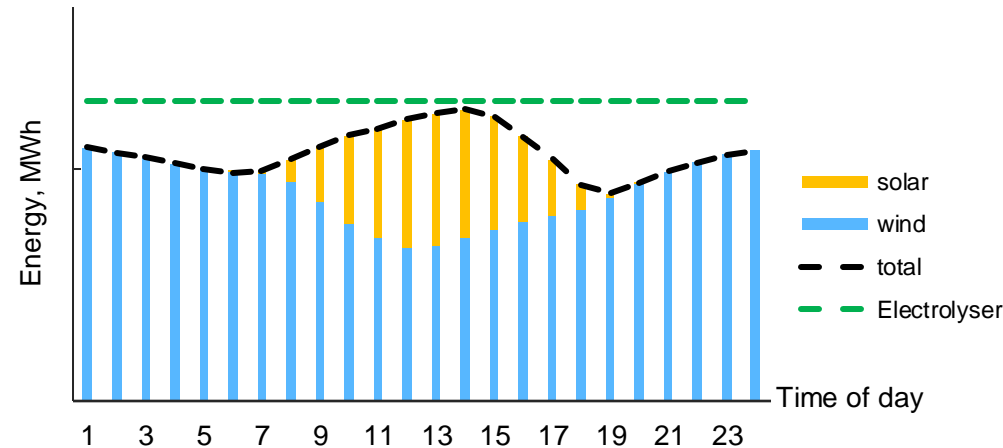
## Excellent complementarity and intensity of Solar and Wind

### Average Solar irradiance & wind speed



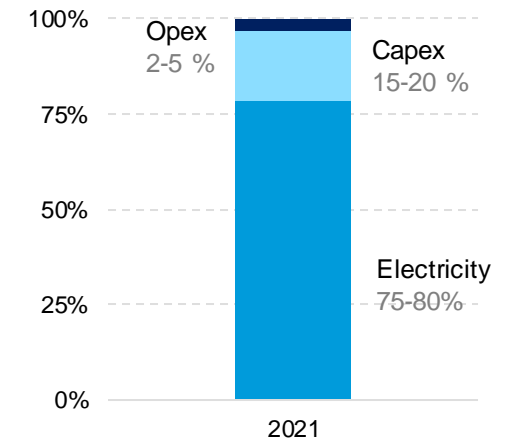
Source: <https://globalsolaratlas.info/> <https://globalsolaratlas.info/>

### Average daily forecast Output



75 % capacity factor | RES curtailment < 10%

### LCOH breakdown



### Regulatory Framework (Portugal)

#### Remote RES Self-consumption

- Allows to install RES generation units in highly competitive and complementary locations and use electricity without TPAs (75%) - 2022
- Reduction in Grid fees from electro intensive industries - 2022
- Power-to-x industries grid fees reduction

### Closing the Green premium

#### Capex Support

- PRR, Innovation Fund, Green deal, etc

#### Opex Support trough CfDs

- Green H2 auctions (Innovation Fund)

## The Hydrogen Way for Our Chemical Future

FID<sup>1</sup> – 2023 | COD<sup>2</sup> – 2025



### Scope:

- Fit-for-55 target
- Entrada em novos mercados de H<sub>2</sub> verde



European Commission



### Support Mechanisms

- EU IPCEI-H<sub>2</sub> – *Important Projects of Common European Interest status approved*
- Portuguese C5 PRR – *Approved within Portuguese PRR*

### Main numbers

- Green H<sub>2</sub> Plant – 40 MWp capacity
- 148 M€ investment (5M€ in R&D)
- 400 kton of CO<sub>2</sub> eq avoided in 10 years

### Partners



APQuímica  
Química para a vida



Note: <sup>1</sup> FID – Final Investment decision; <sup>2</sup> COD – commercial operations date;



# H2Enable

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Commission approves up to €5.2 billion support by 13 Member States for an Important Project of Common European Interest (IPCEI) in the Hydrogen value chain "IPCEI Hy2Use"

Hydrogen Infrastructure

Hydrogen applications in Industry

Air Liquide France	Borealis
Air Liquide Netherlands - Curthyl	Enel Green Power/Endesa
Air Liquide Netherlands - ELYgator	ENGIE Belgium
Bay of Biscay Hydrogen (Petronor/Repsol)	Everfuel*
<b>Bondalti</b>	Hybrit Development
Cartagena Hydrogen Network (Repsol)	IAM Caecius
ENGIE Belgium	NextChem
ENGIE Netherlands	RINA-CSM
Fluxys	RONA
H2 Aboño (EDP)	SardHy Green Hydrogen
H2-Fifty	Solar Foods*
H2 Los Barrios (EDP)	South Italy Green Hydrogen
HyCC	TECforLime
Iberdrola	TITAN Cement
MassHyliia (TotalEnergies and ENGIE France)	VERBUND
Ørsted	
P2X Solutions*	
PKN Orlen	
Shell	
Uniper	

## Companies with approved projects:

### Oil and Gas



### Energy

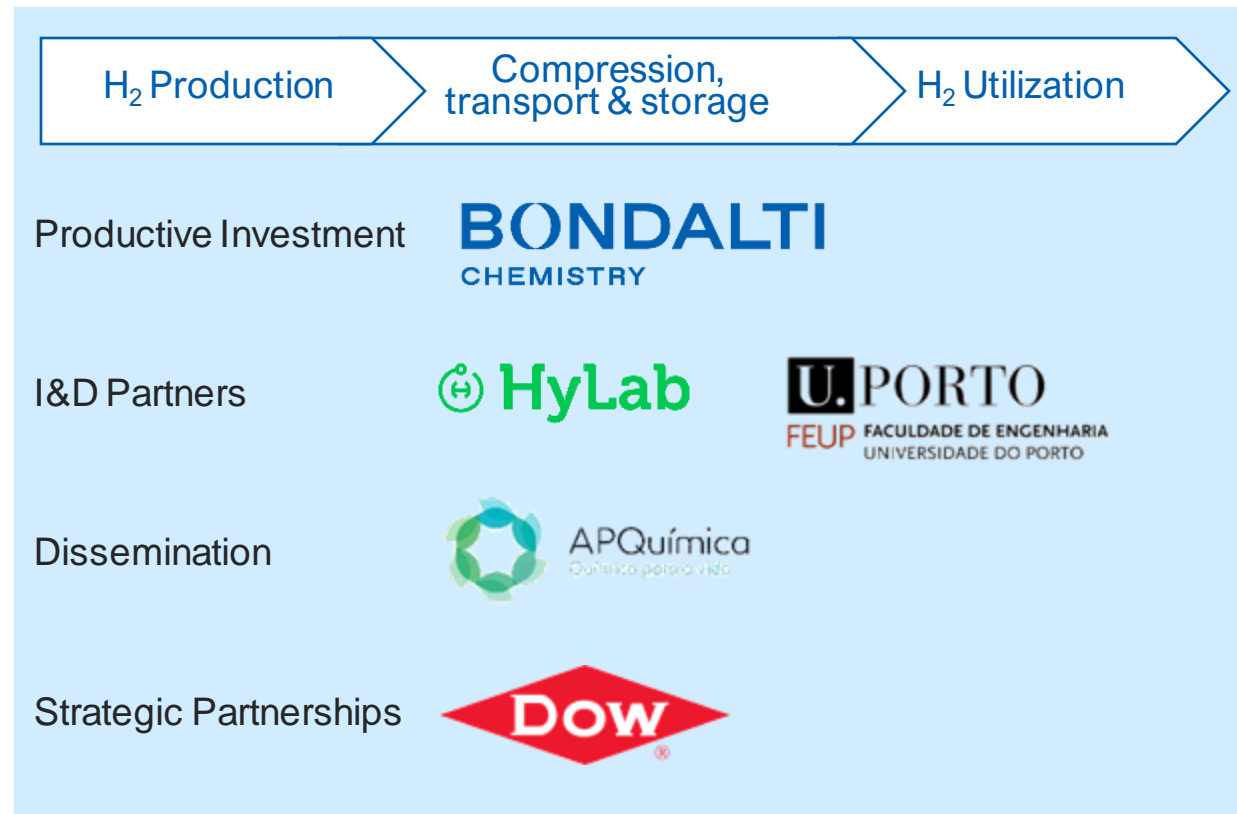


### Gases



### Chemicals





## Market Segment

Integration in low CO<sub>2</sub> footprint chemicals value chain



Decarbonization of hard to abate industrial heat



Heavy duty transport

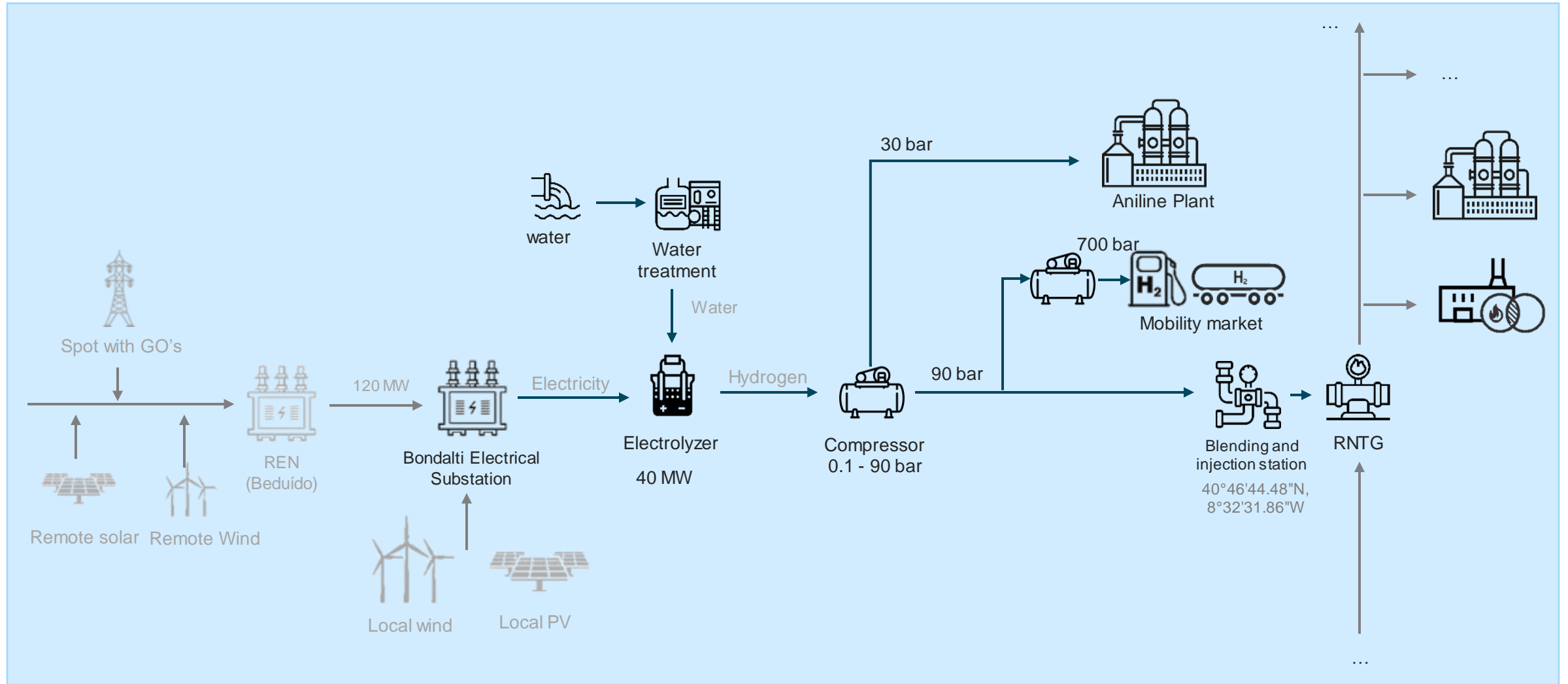


Electrical System services



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Impact in  
commercial  
trade balance

Import Reduction  
240 GWh of natural gas per year



**50**  
**Employees**

**18**  
**Scientific  
publications**



Electrical  
System  
Reliability

Modulation capability allows  
providing essential system services  
to the penetration of intermittent  
renewable energies in the system,  
such as solar and wind energy.



Innovation  
Degree

H2Enable is part of an innovative European project with the  
potential to complement the international H<sub>2</sub> value chain. Will be  
part of the first European projects on the >20 MW scale



Dragging  
Effect

Construction, maintenance and operation of a new large-scale  
industrial unit, potential socio-economic impact in the region,  
through expansion and creation of new businesses.

Ex. Smes: construction companies, installation and maintenance of  
industrial equipment, R&D centers, mobilization of universities,  
local social infrastructure, etc.



Productive  
Investment

**143 M€**

New green H<sub>2</sub> plant



Production  
capacity

**6 kton**

per year of green H<sub>2</sub>



Emissions  
Reduction

**400 kton**

of CO<sub>2</sub> eq in  
10 years of operation

# Production, process and storage of hydrogen

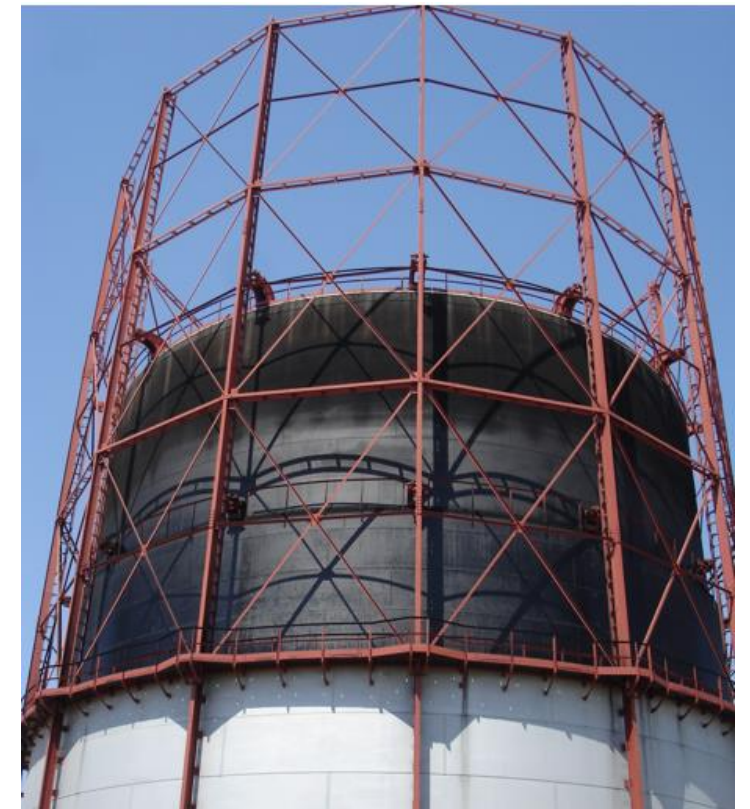
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*Brine Electrolysis*



*Hydrogen Processing*



*Hydrogen storage*

# Renewable H<sub>2</sub> e NH<sub>3</sub> in 1950

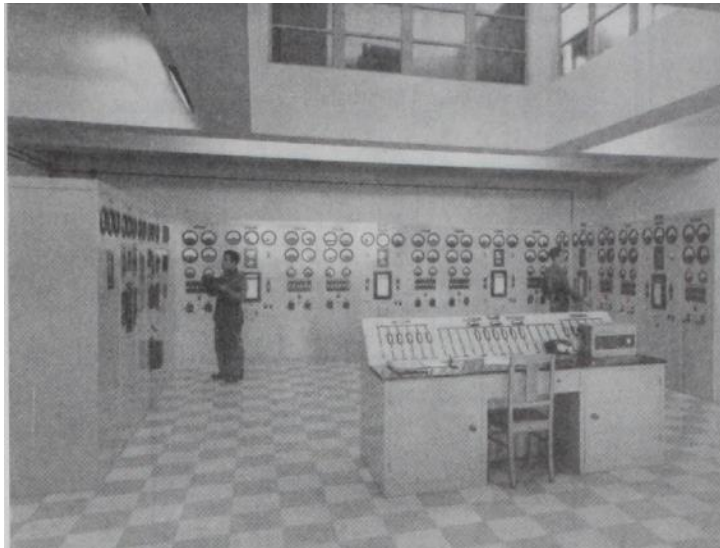
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## Companhia União Fabril – CUF | Estarreja

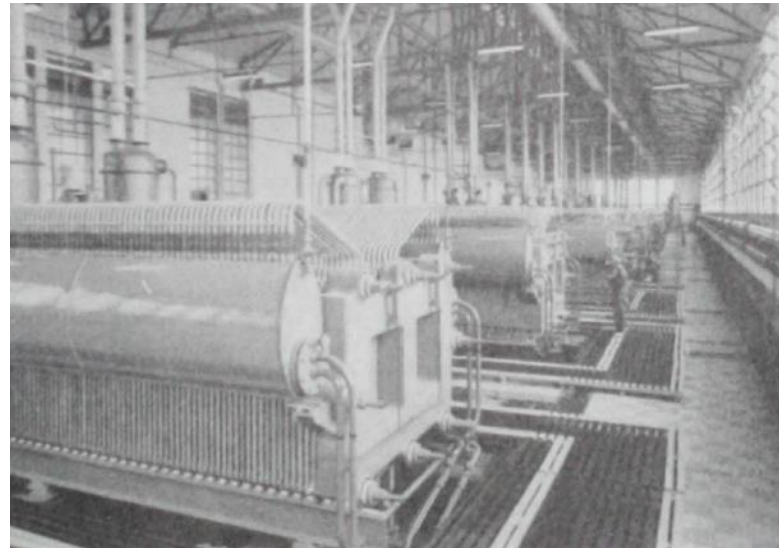
In 1950, due to the high availability of hydroelectric energy in Portugal, in Estarreja chemical complex production of NH<sub>3</sub> was done using H<sub>2</sub> from water electrolysis and nitrogen obtained by cryogenic air separation.

- H<sub>2</sub> : 4800 Nm<sup>3</sup>/h | **4 kton/y**
- NH<sub>3</sub>: 8 ton per day | **3 kton/y**
- Using today's available technology: **20-30 MW** Electrolysis capacity (AWE)

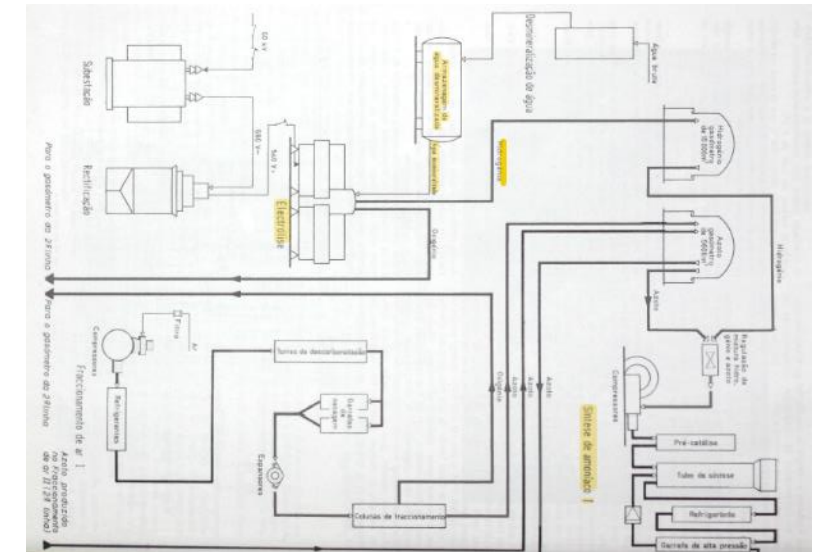
Bondalti benefits for past experience in the operation of large scale electrolysis



Electrolyser Control room



Electrolyser room



H<sub>2</sub> and NH<sub>3</sub> production | simplified flow diagram



# Our Purpose

Working for a better world  
by creating innovative  
and sustainable chemistry

T O M O R R O W   M A T T E R S



