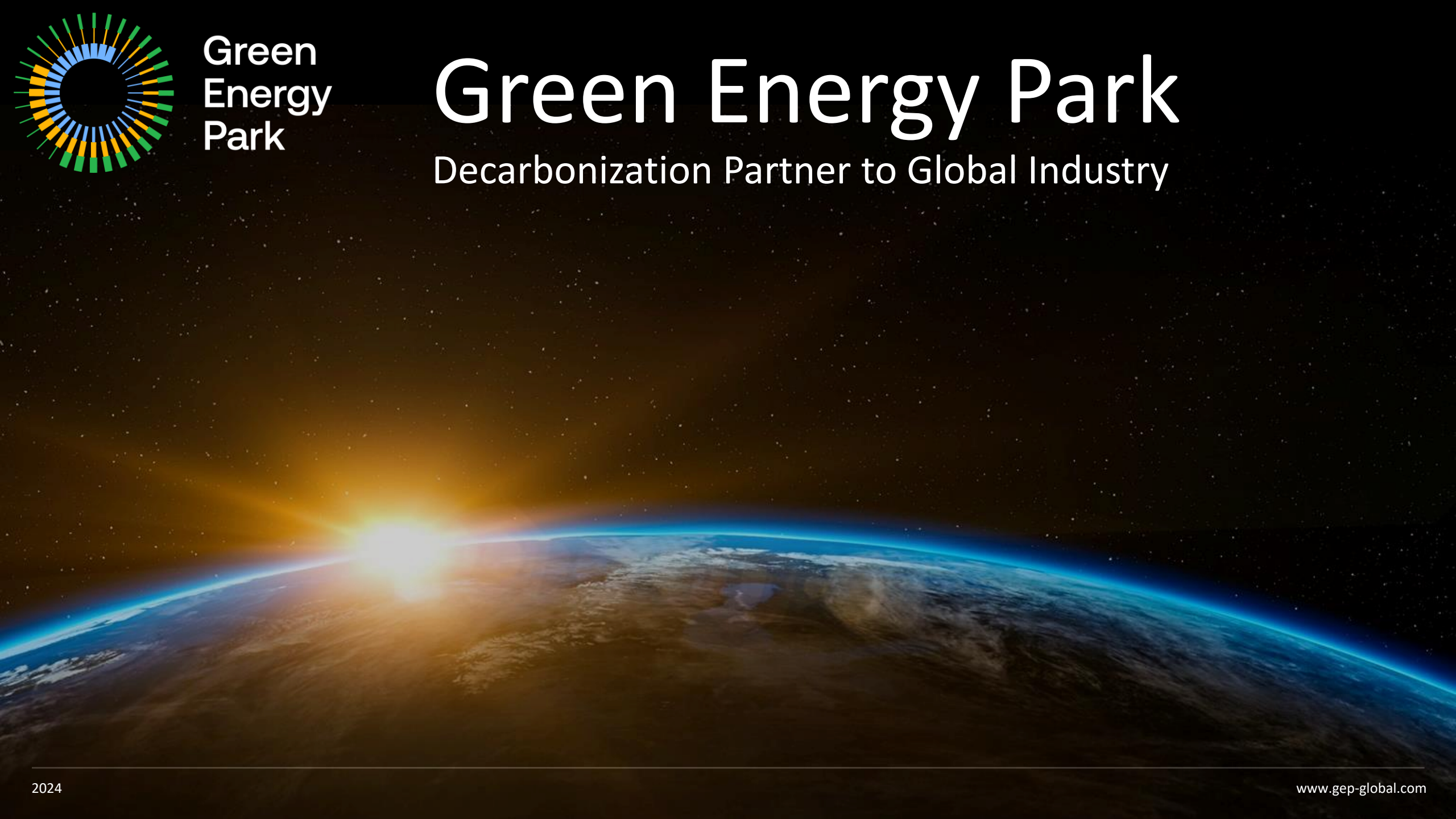




Green  
Energy  
Park

# Green Energy Park

Decarbonization Partner to Global Industry



Reference projects  
in [Annex](#)

## Group Activities and References:

- Over +40 years in Energy Infrastructure and LNG Terminals EPC
- Over +20 years of leadership in Renewable Hydrogen
- Reference projects in 39 countries





# Reference Projects



39 Countries

- Storage Tanks & Terminals
- Energy Infrastructure EPC
- Industrial Metals Manufacturing\*

\* projects delivered

# Leadership in Hydrogen



Bart Biebuyck, CEO  
Green Energy Park Group

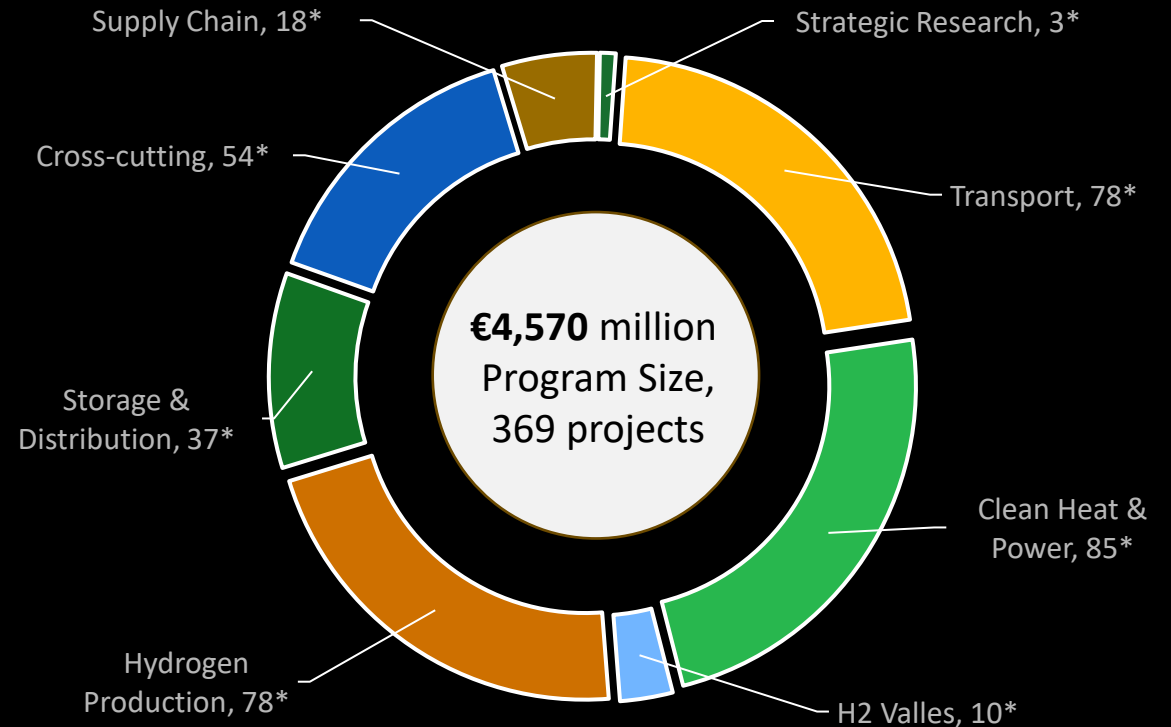
## Executive Director of the European Commission's Clean Hydrogen Partnership (2016-2023)

- Seven-year leadership of the largest hydrogen undertaking of its kind in the world
- Total Program value of EUR 4,570 million in public and private funds
- Initiated the EUR 3,000 million European Hydrogen Bank

| Program        | Number of Projects | EU Budget    |
|----------------|--------------------|--------------|
| FP7            | 154                | 450          |
| H2020          | 133                | 665          |
| Horizon Europe | 82                 | 1,200        |
| <b>Total</b>   | <b>369</b>         | <b>2,315</b> |

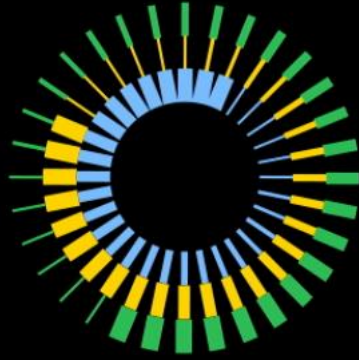
| Program             | IKAA Funding |
|---------------------|--------------|
| IKAA H2020          | 1,285        |
| IKAA Horizon Europe | 970          |
| <b>Total</b>        | <b>2,255</b> |

|                    |            |              |
|--------------------|------------|--------------|
| <b>Grand Total</b> | <b>369</b> | <b>4,570</b> |
|--------------------|------------|--------------|



\* Number of projects





Making the Hydrogen Economy a reality

# Executive Board

Reference projects  
in [Annex](#)

## Implementing the energy transition



### CEO Bart Biebuyck

Founder of Hybart,  
R&I and institutional

Former Executive Director of  
the Clean Hydrogen Partnership  
of the European Commission

Invented EU Hydrogen Valleys  
and Hydrogen Bank concept



### CTO Tobias Puklavec

Owner of Gasfin Group  
Co-owner TGE Gas Engineering  
(350 people)

One of the world's leading EPC  
contractors for ammonia  
terminals and LNG infrastructure



### COO Mindaugas Zakaras

Founder of MT Group  
Founder of Nord Steel  
CEO Zakaras Holding  
(350 people combined))

EPC for on/off-shore pipelines, gas  
terminals, and port infrastructures

Manufacturing facilities



### CFO Mario Reinisch

Co-Founder of EXOGEN Hydrogen  
Solutions

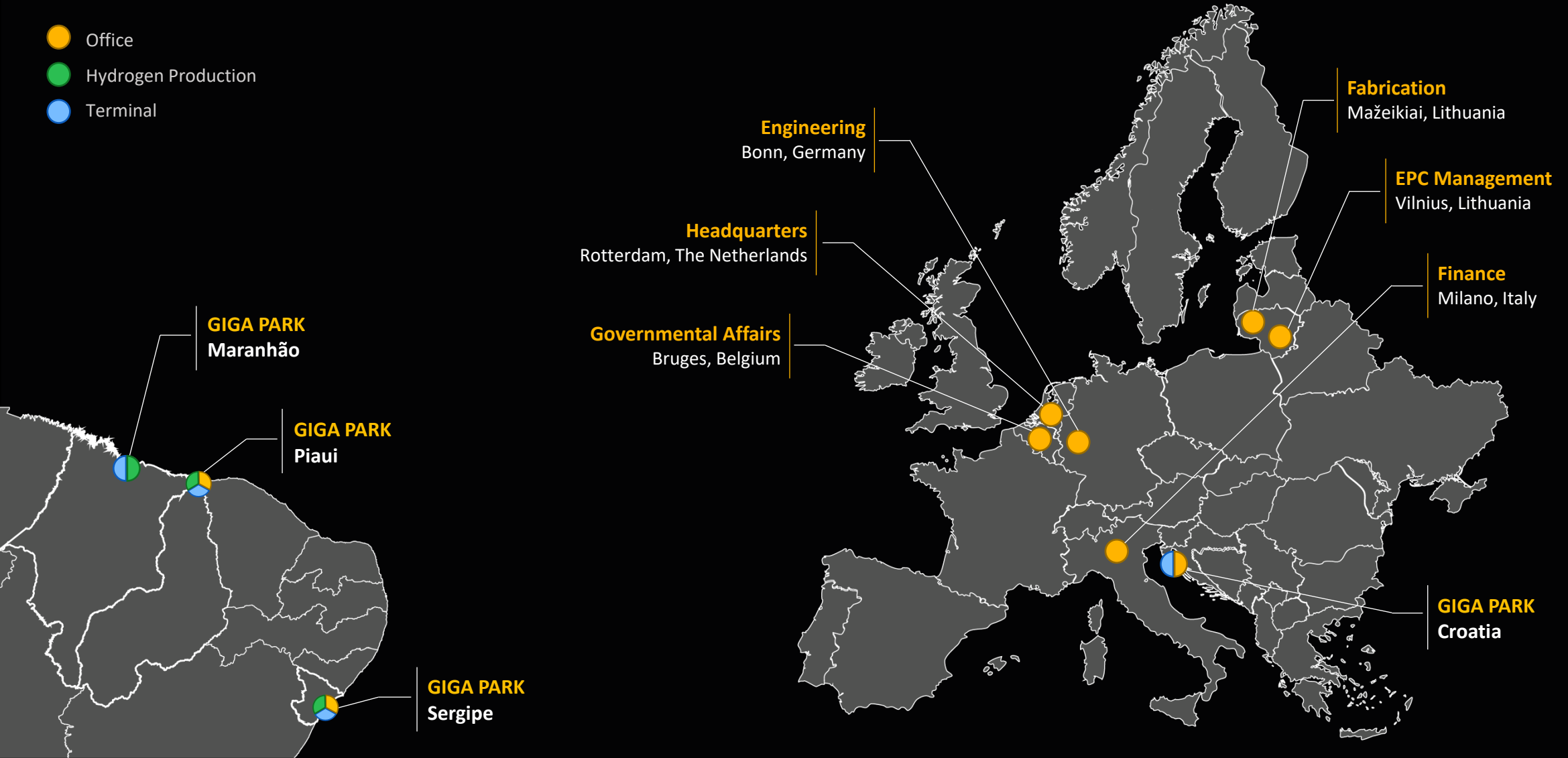
Senior Partner at Park Lane Advisory,  
London, UK

M&A advisory at Morgan Stanley,  
New York, USA



# International Presence

- Office
- Hydrogen Production
- Terminal





# Endorsement by President von-der-Leyen

President von-der-Leyen keynote address at the EU Hydrogen Week, 20 Nov 2023



Quote:

“Together with President Lula of Brazil, we are announcing the European Union's support to build one of the biggest hydrogen projects in the world, in the Brazilian State of Piauí. It is part of a two-billion-euro Global Gateway investment in the hydrogen value chain in Brazil.

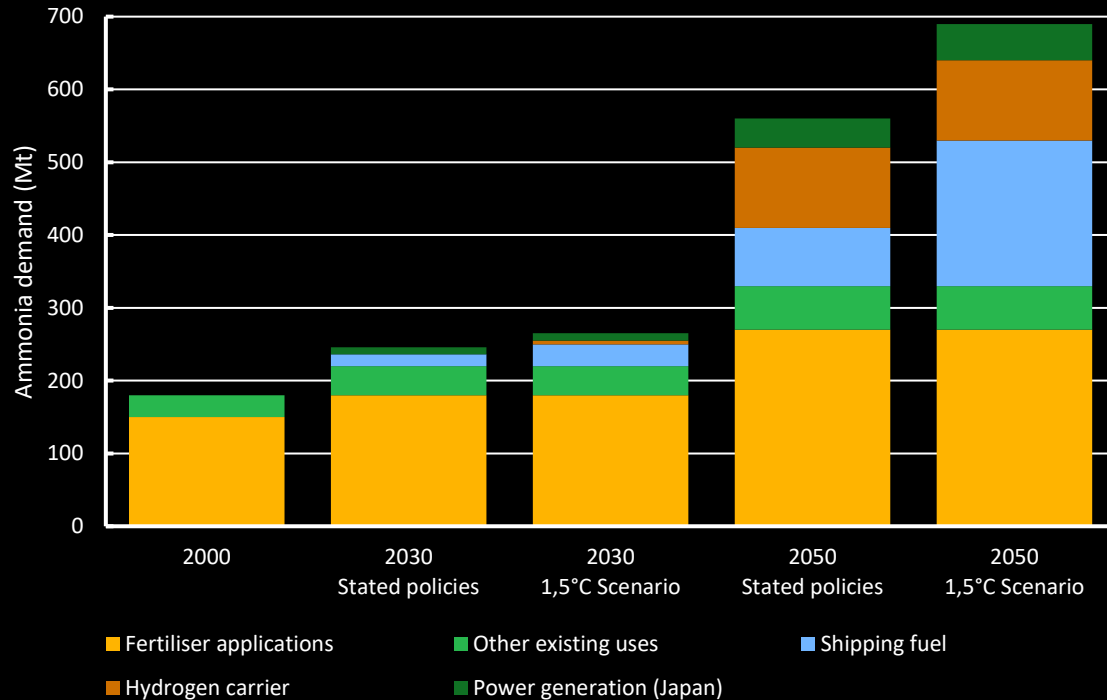
This new Green Energy Park will be a 10 GW production facility for clean hydrogen and ammonia, which will then be shipped to the island of Krk in Croatia. From there, hydrogen will travel to serve industrial off-takers in South-East Europe. And in parallel, this project will create local jobs and value chains in Brazil.”

# Hydrogen Market Growth

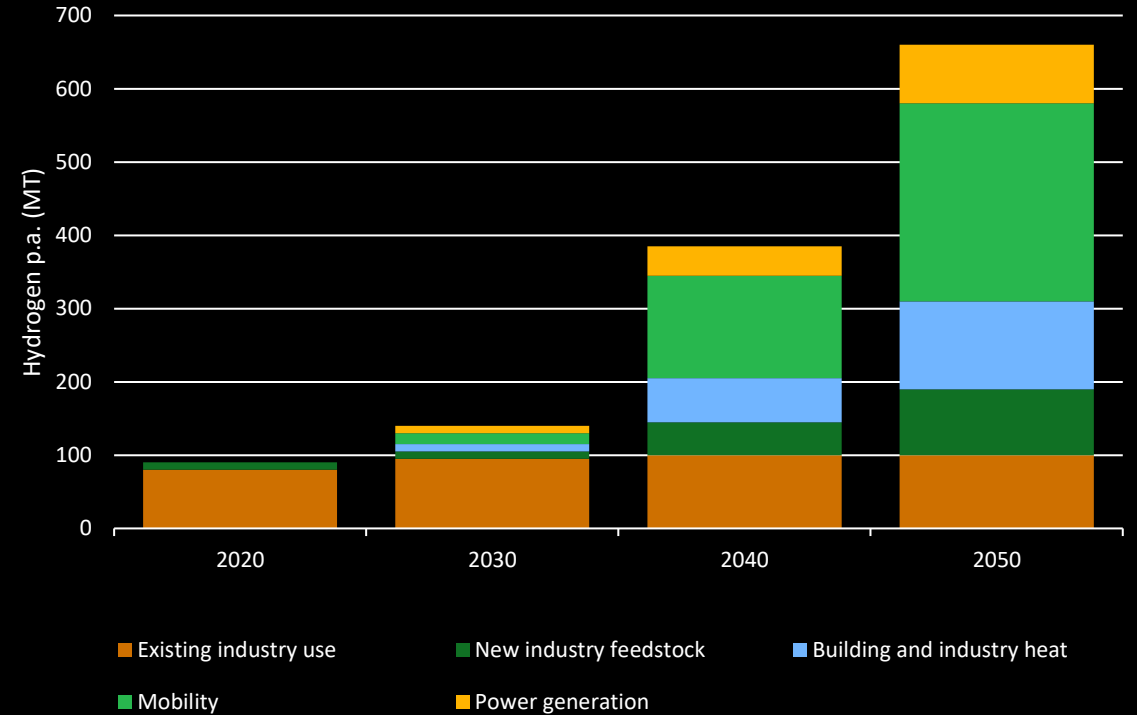
**+6,000 GW of installed electrolyzer capacity needed to reach Net Zero emissions by 2050**

- Strong hydrogen demand from industry, transport, and the buildings sector
- Ammonia as hydrogen carrier will play a larger role than consensus forecast
- Ammonia as a shipping fuel is set to propel market growth

Ammonia Demand Segments



Hydrogen Applications

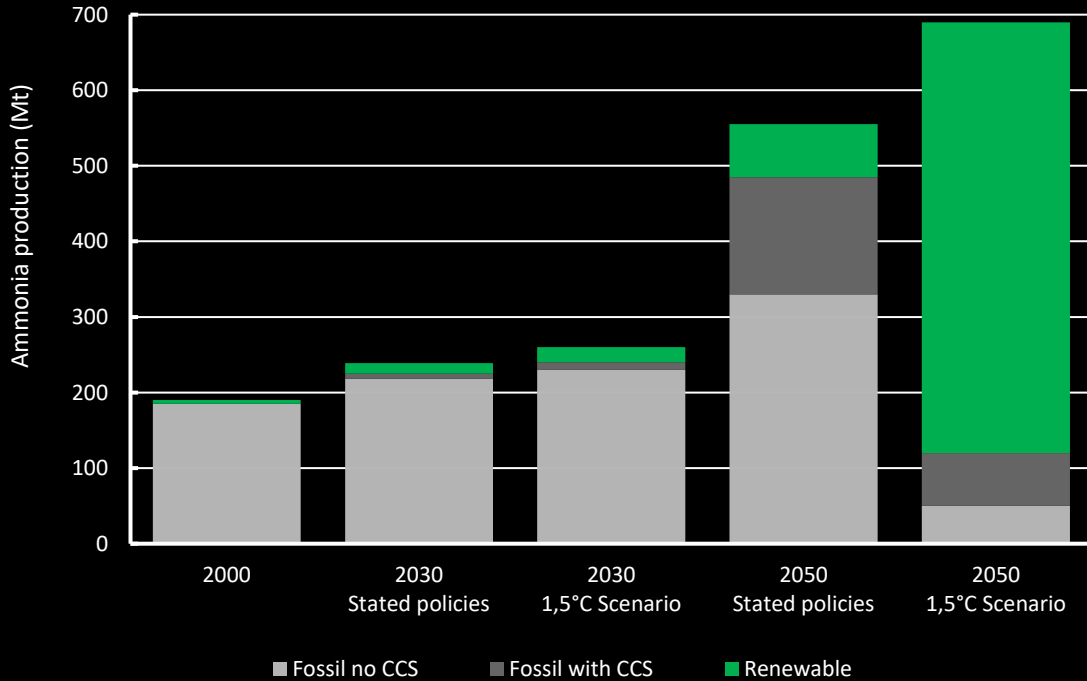


# Ammonia Market Growth

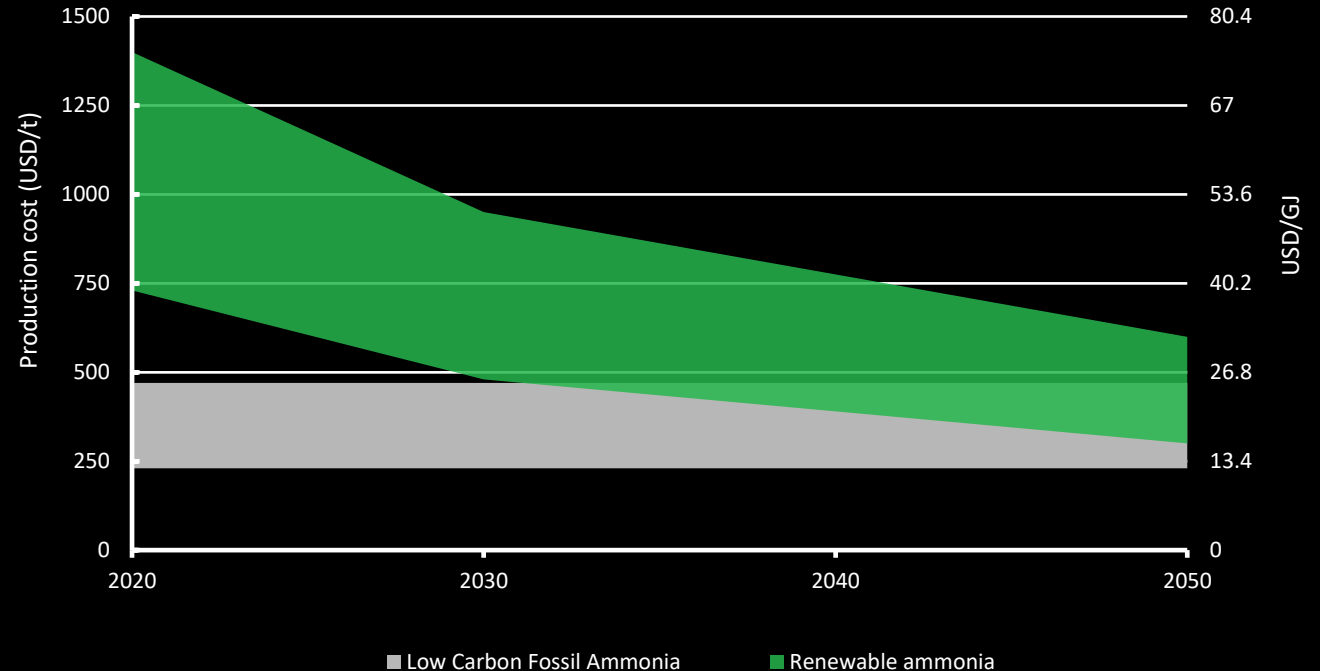
Rising demand, and falling costs

- The ammonia market will more than triple by 2050
- In 2030, most of the ammonia volume will still be derived from fossil fuels
- By 2050, the majority of ammonia consumed must come from renewables
- Ammonia cost will drop from an avg. of 1,000 today to below 500 USD/t

Ammonia Market Growth



Ammonia Price Forecast



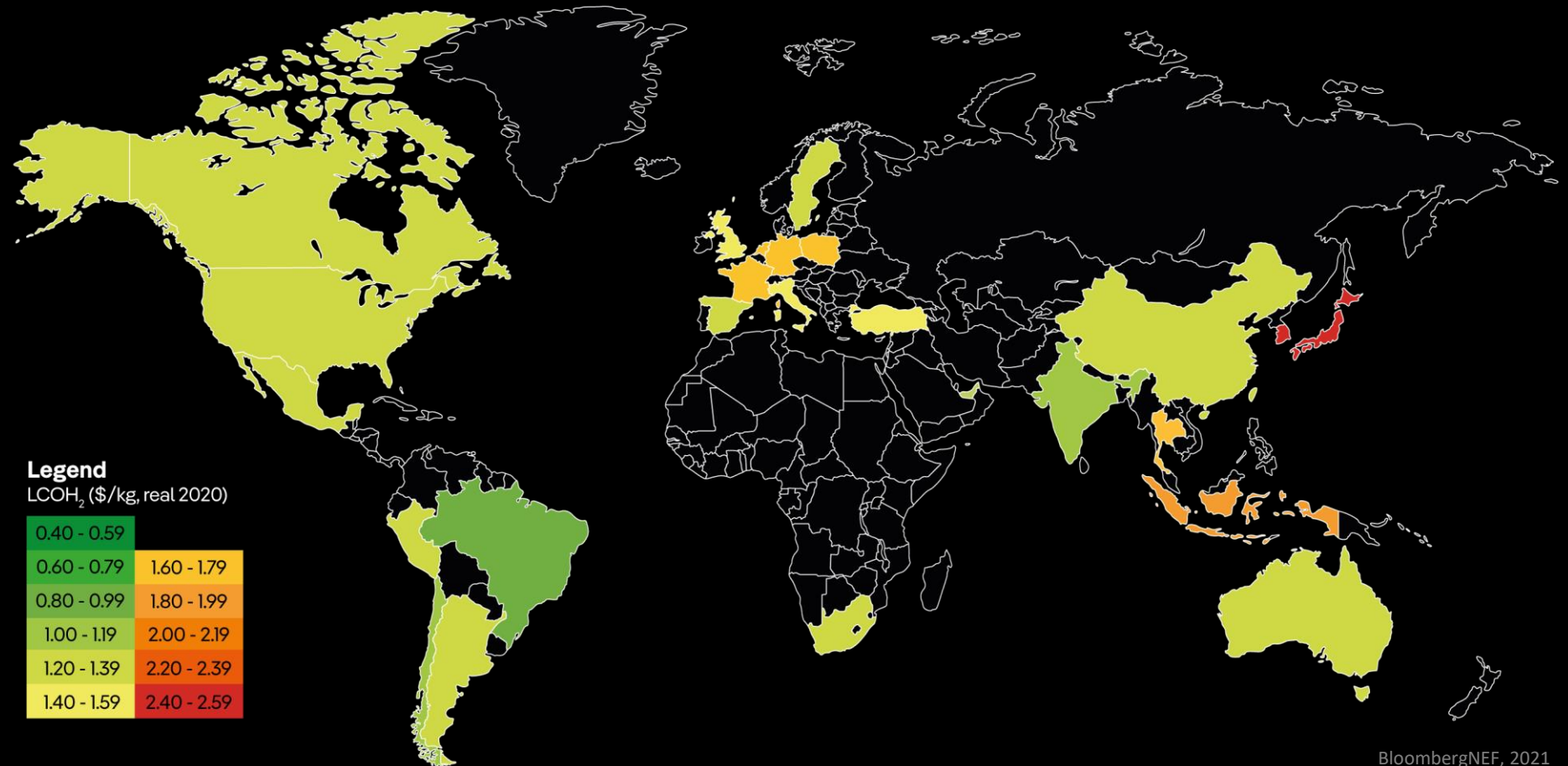


# Why Brazil?

World-class  
renewables

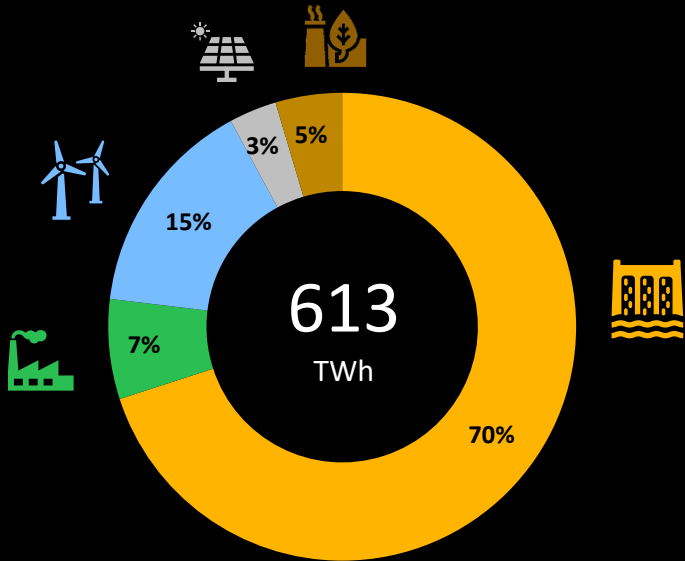
Low-cost green  
hydrogen

LCOH<sub>2</sub> from renewable electricity



# Green Electricity Grid

## Electricity Mix in Brazil<sup>1</sup>



## Modern Transmission System

**172**  
thsd. km

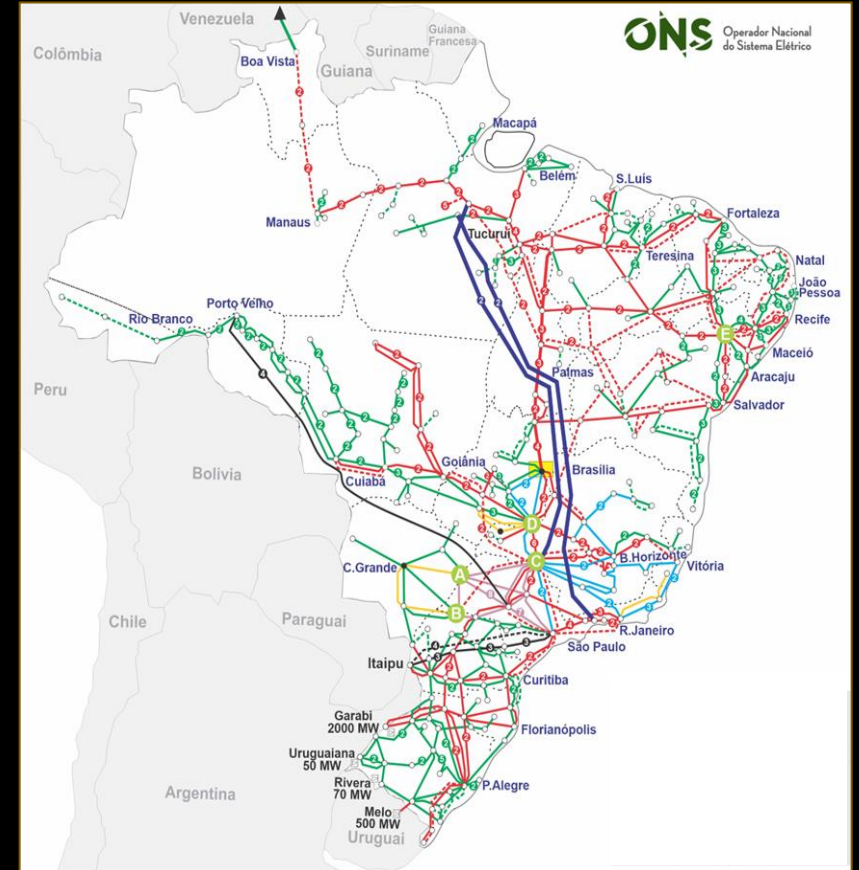
Transmission lines granting reliable access and competitiveness

**+30**  
thsd. km

Planned by 2027

### Northeast Subsystem (NE):

- Over 90% renewables
- Net power export region: solar, wind, and hydro-power at highly competitive rates
- RED III compliant



# Access to +10 GW of Hydroelectric Power

## Strategic Partnership with Eletrobras

Green Energy Park is the official hydrogen partner of Eletrobras.

- Eletrobras is one of the leading renewable energy companies in the world, with 44.7GW installed capacity, of which 94.6% are hydroelectric.
- Together the companies have signed a strategic partnership agreement for over +10GW of renewable hydrogen projects in Brazil, and in Europe.



Public Announcement at the World Hydrogen Summit & Exhibition in Rotterdam, 14-May-2024  
Governor of the State of Piauí, Rafael Fonteles; Governor of the State of Sergipe, Fábio Mitidieri; CEO Hydrogen Europe, Jorgo Chatzimakakis  
Members of the Board of Directors and the Executive Board at Eletrobras; Executive Board of Green Energy Park

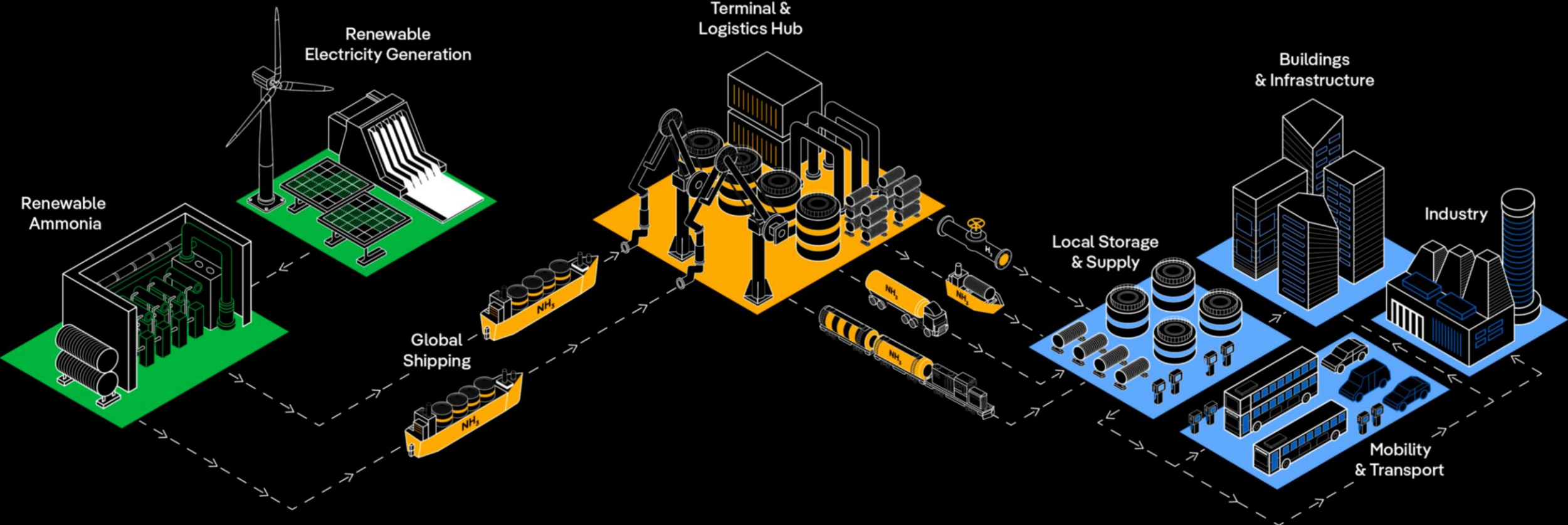


# Integrated Value Chain is Key to Success

## 1. UPSTREAM

## 2. MIDSTREAM

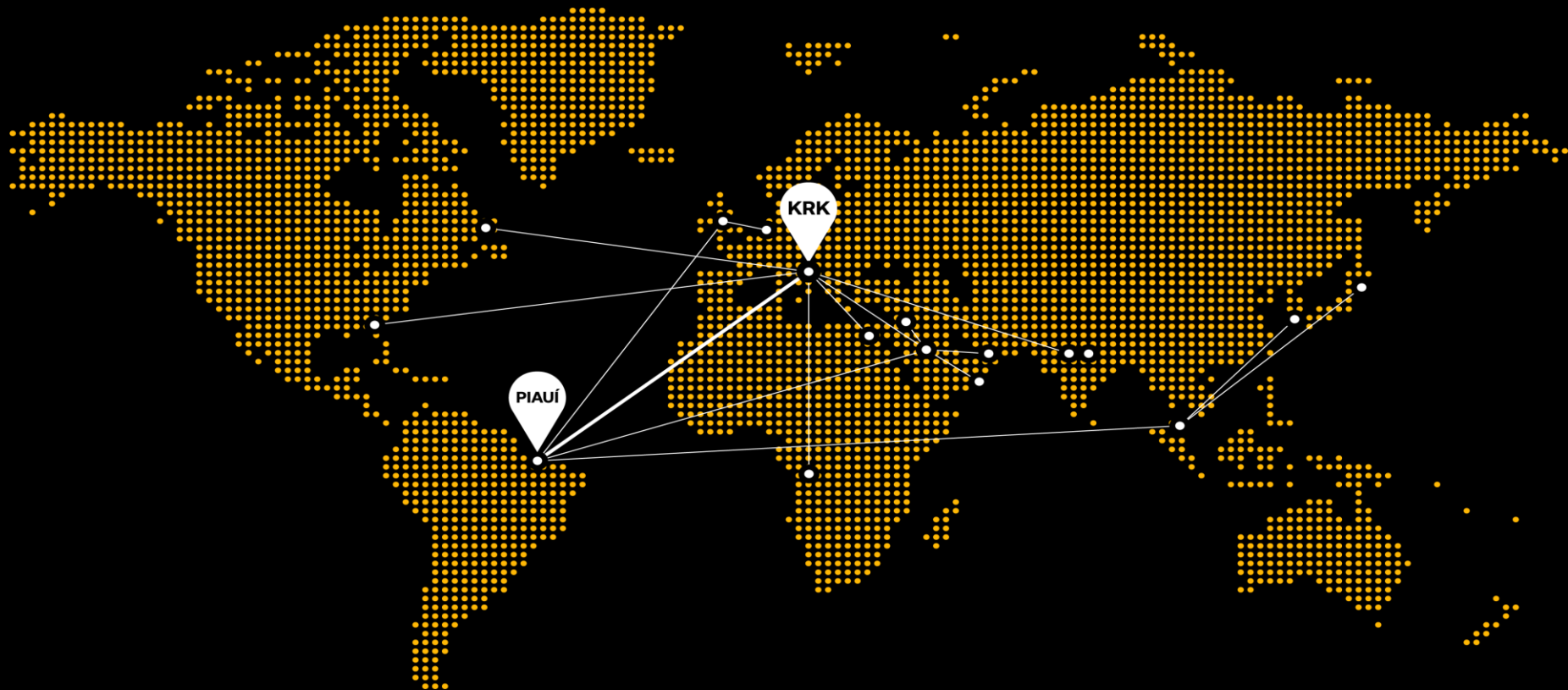
## 3. DOWNSTREAM



# Global Supply Network

[www.gep-global.com](http://www.gep-global.com)

- Green hydrogen production facilities in Brazil
- Midstream facility in Krk Croatia, serving Central Europe
- Strategic partnerships with bunkering hubs and terminal facilities in NW-Europe and around the world





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# GIGA PARK

Piauí

[www.gep-piaui.com](http://www.gep-piaui.com)

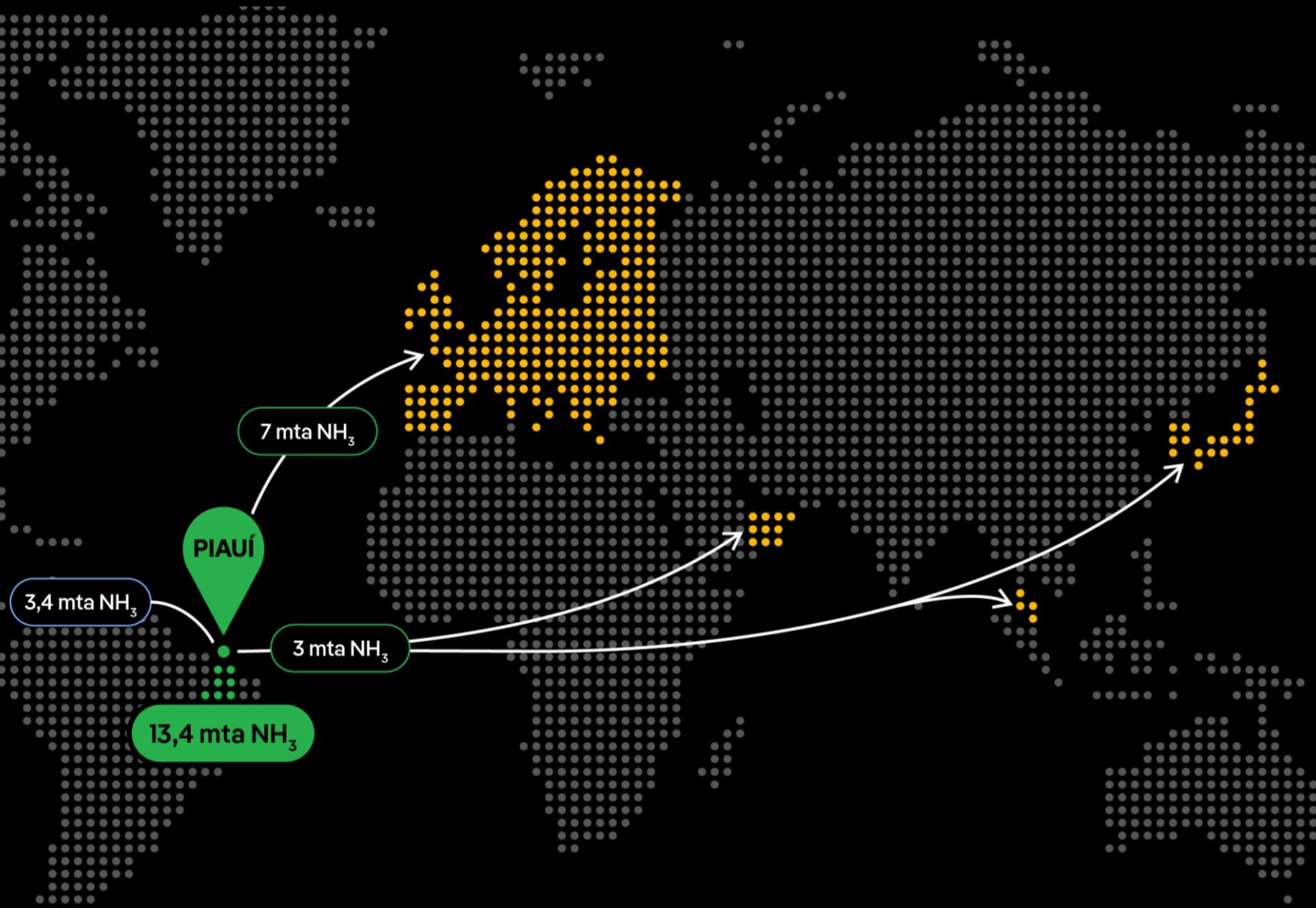






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# Local & Export Markets



The provided numbers are indicative



# Piauí Milestones



Public endorsement by  
President von-der-Leyen  
at the European  
Hydrogen Week 2023  
(Brussels, BE)

20-Nov-23



Inauguration  
of GEP Piauí  
by Vice-President of Brazil  
Geraldo Alckmin  
and State Governor  
Rafael Fonteles  
(Parnaíba, BRA)

15-Dec-23



27/28-Mar-24

EU Ambassador  
Mirian Schuegraf  
visit to Piauí  
on behalf of the  
Global Gateway  
(Teresina & Parnaíba, BRA)

6-Sep-23

Partnership Agreement  
with the State of Piauí  
at the World Hydrogen  
Congress 2023  
(Rotterdam, NL)



4/8-Dec-23

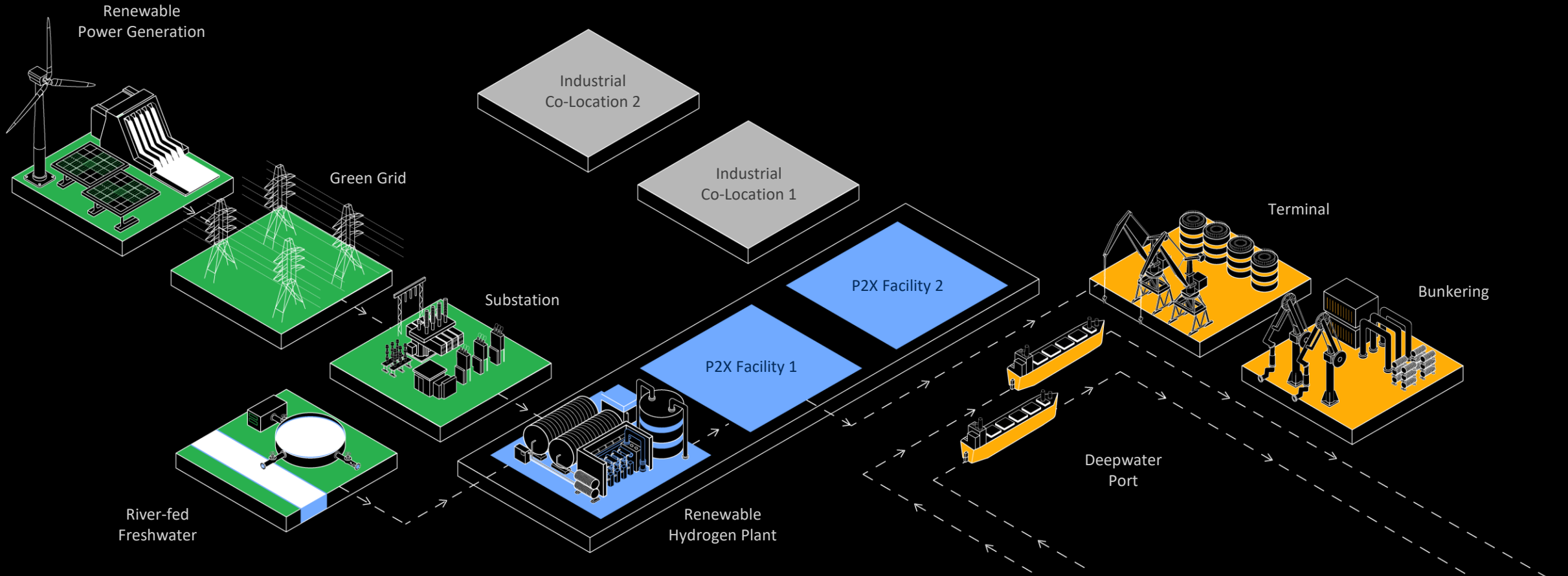
GEP Piauí  
at COP 28  
(Dubai, UAE)



# Giga Park Piauí

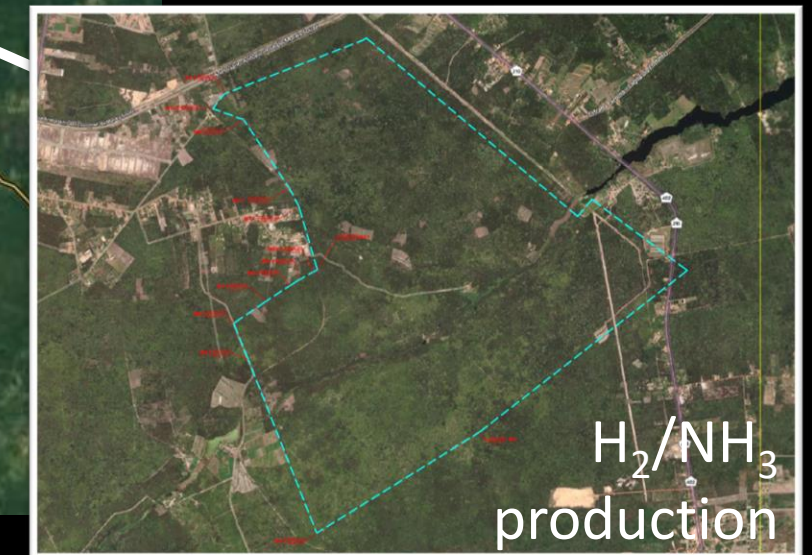
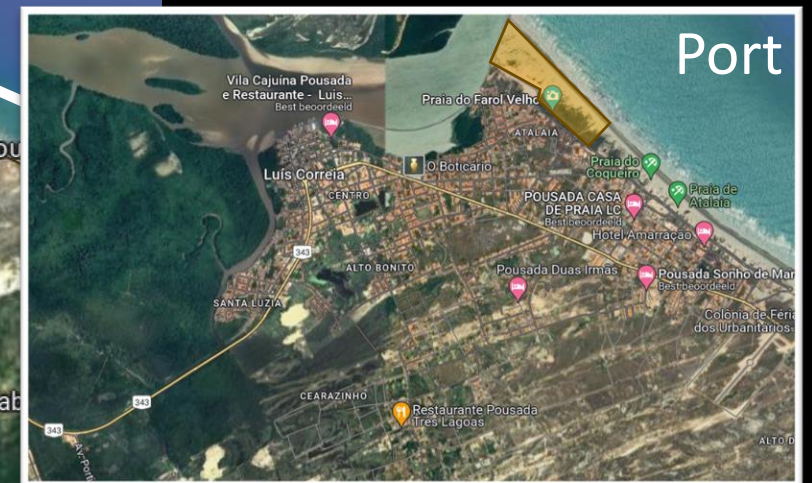
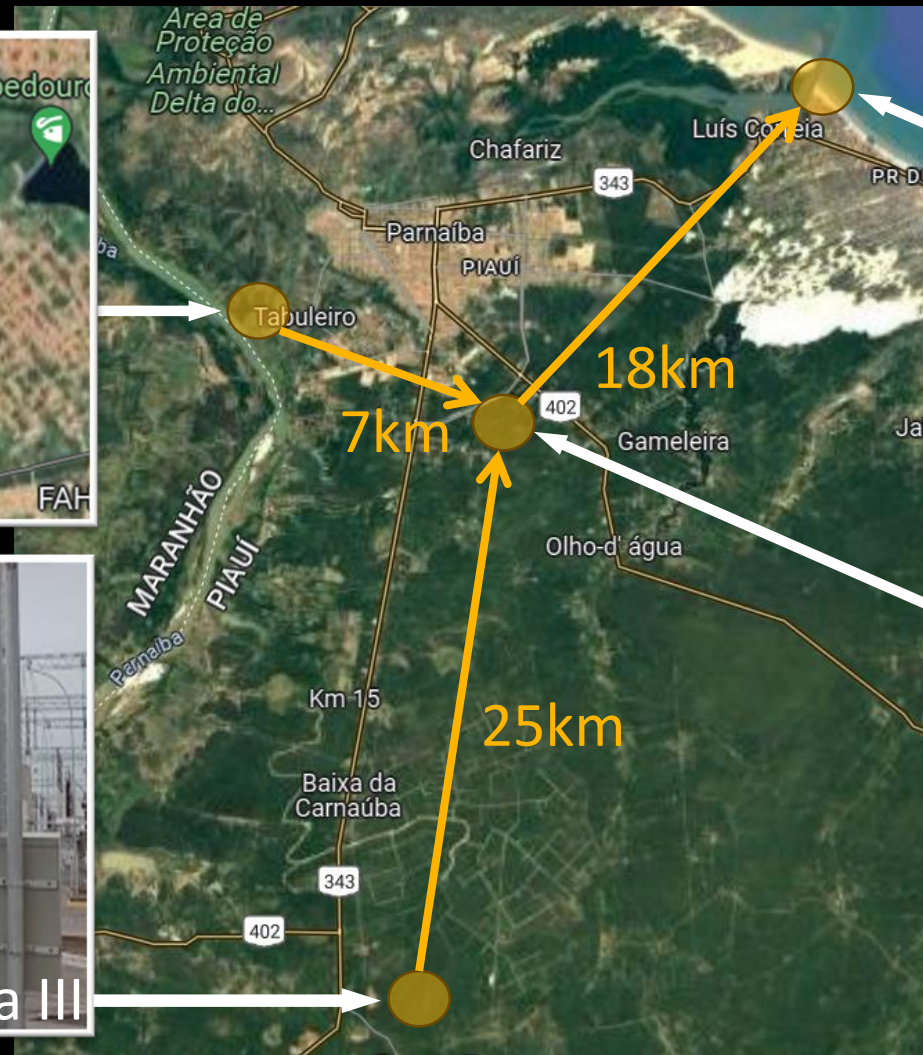
Enabling industrial decarbonization:

- Leverages existing infrastructure
- Anchored by renewable P2X facilities
- Co-location of industries and services
- Green industrial growth platform

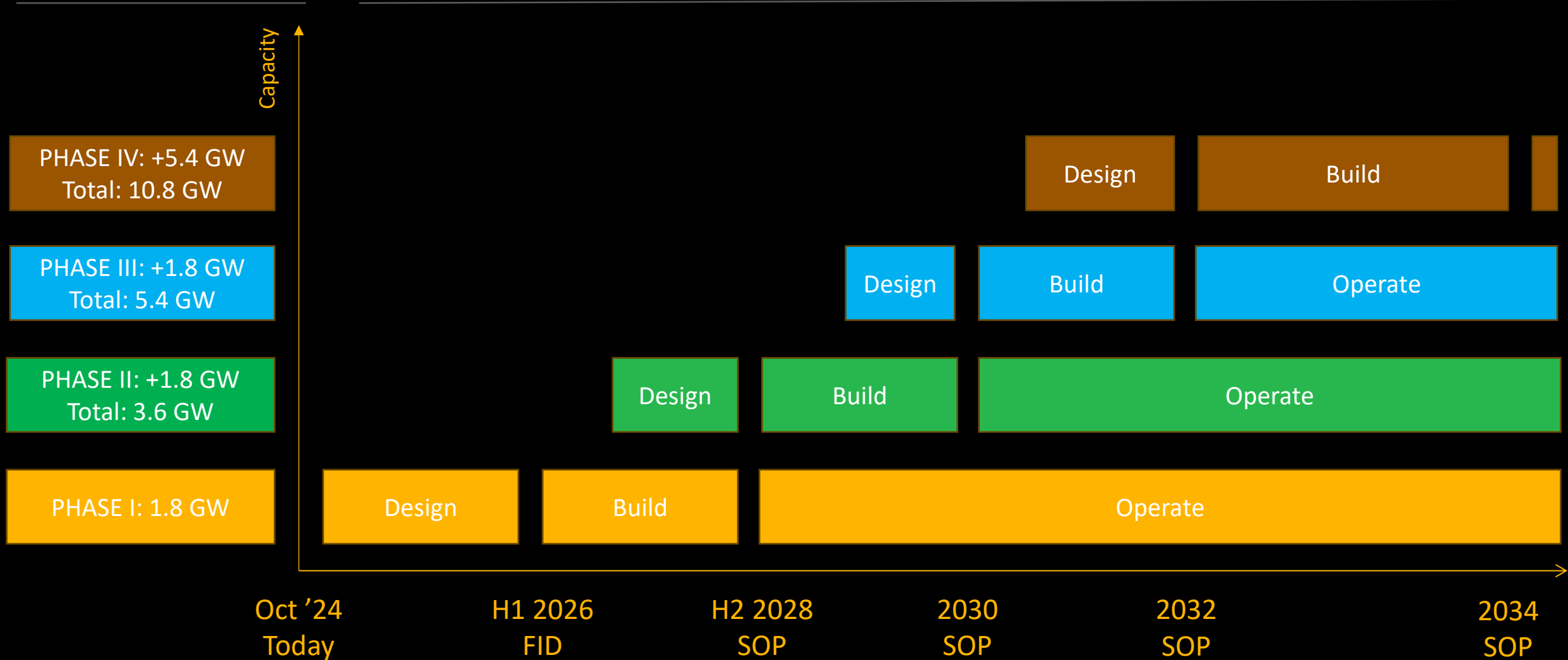




# Infrastructure and Location



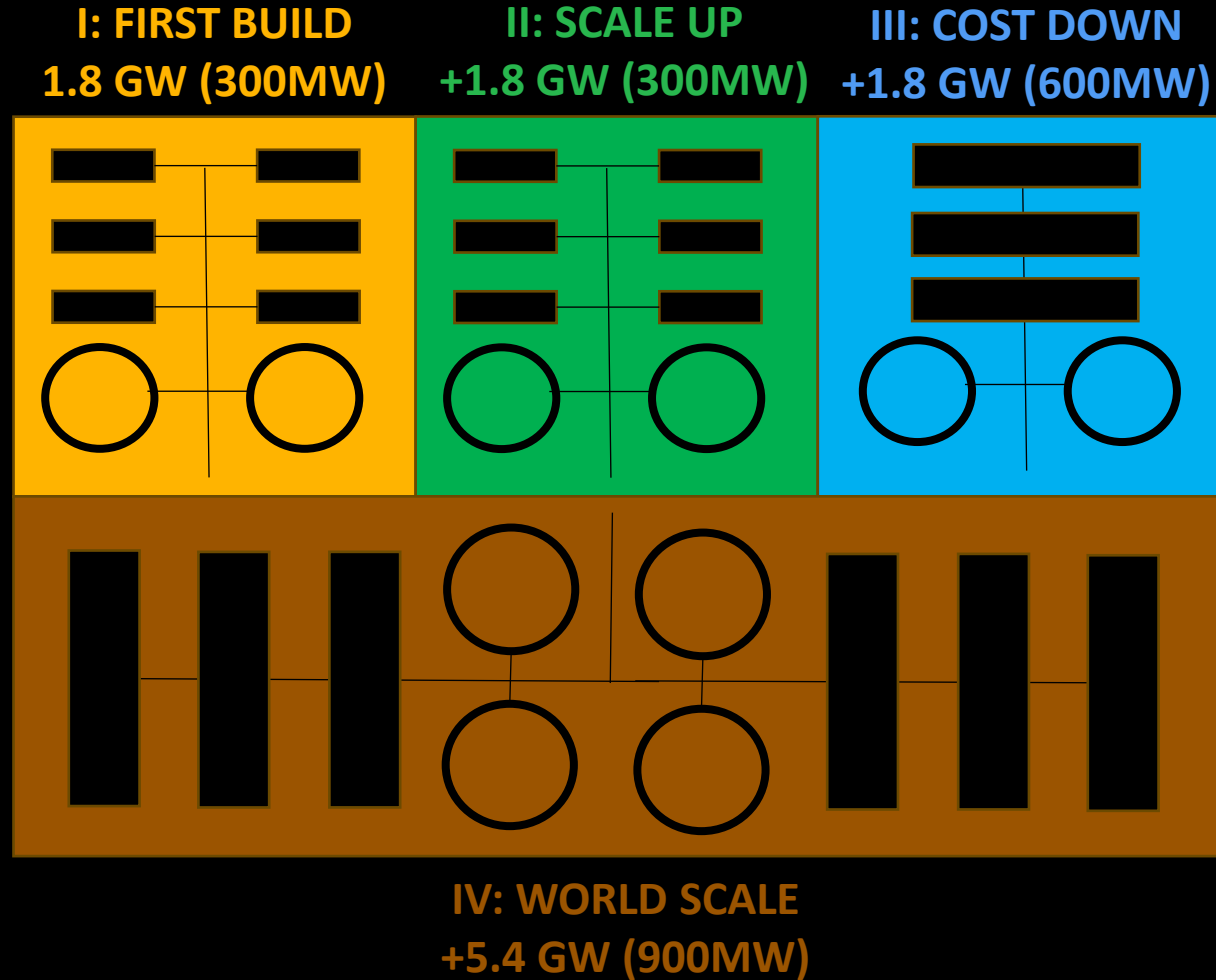
# 10.8 GW Staged Development





# Standardized & Modular Plant Design IP

Detailed engineering plans are available in personal meetings.





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# GEP and Vale

Strategic Partnership for Green Steel



LUDMILA NASCIMENTO  
Green Energy Park



BART BEBUYCK  
Green Energy Park



Green  
Energy  
Park



Strategic  
Partnership  
for Green Steel



# Long-term Industrial Collaboration

## Strategic Partnership with Vale

Green Energy Park is the official decarbonization partner of Vale.

- Vale is the biggest iron ore and nickel mining company in the world.
- Green Energy Park is a leading energy infrastructure and hydrogen technologies company.
- Together the companies have signed a partnership agreement for Green Steel and other industrial decarbonization projects.



Public Announcement on 1-Oct-2024 in Brussels, hosted by Member of European Parliament Hildegard Bentele, Director General at Eurofer Axel Eggert, and CEO of Hydrogen Europe Jorgo Chatzimarkakis

Picture: (right) Ludmila Nascimento, Director Global Energy and Decarbonization at Vale; (left) Bart Biebuyck, CEO at Green Energy Park

# Vale, a Global Industry Leader

## Global Operations, 2023

- 321 Mt Iron Ore
- 165 kt Nickel
- 326 kt Copper

Vale operates in **18 countries** across the world, generating **USD 42 bn of revenues** in 2023



+ 200 k employees



+2000 km of railroads



4 ports in Brazil



+40 Mt/y pellets production capacity





# Partnership for Green Steel



## European steel at risk<sup>1</sup>:

- Growing unilateral carbon costs
- Unfair international steel competition
- Strong headwinds from the energy crisis



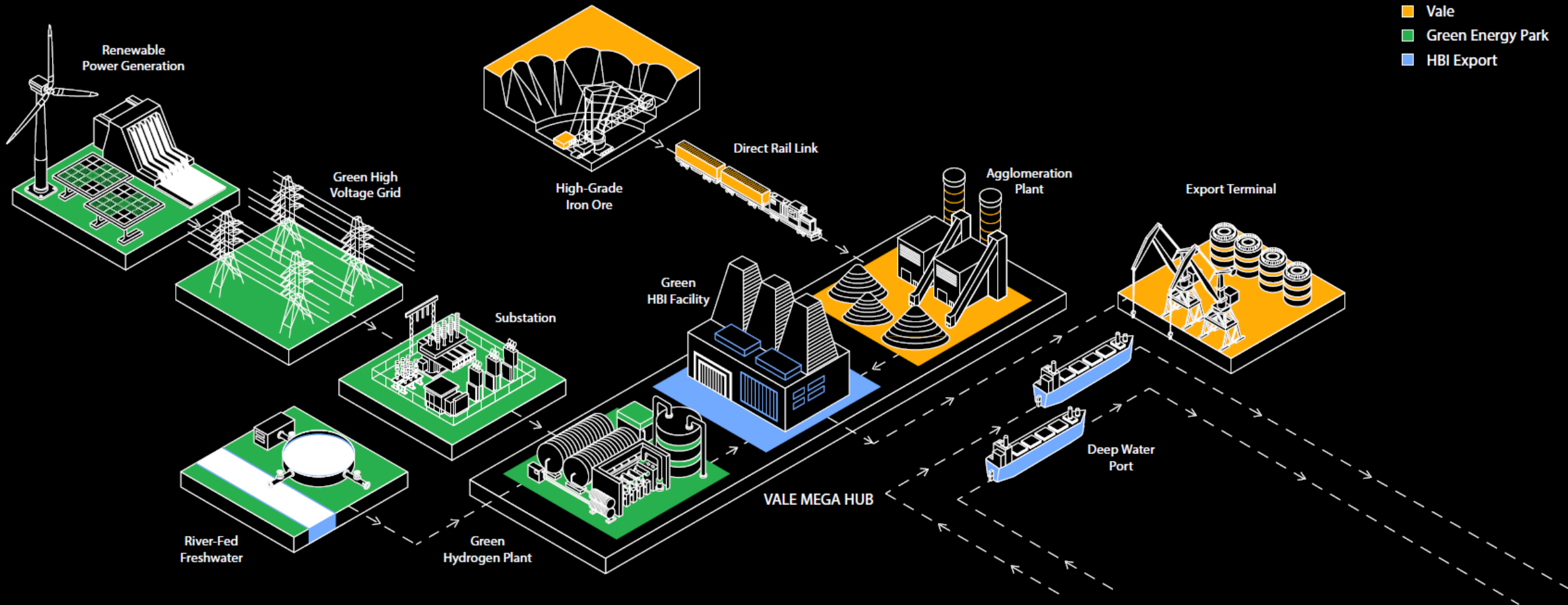
## Brazil is the solution:

- Abundant, low-cost renewable energy
- High-graded iron ore supply
- Green grid<sup>2</sup>, ideal for renewable hydrogen production

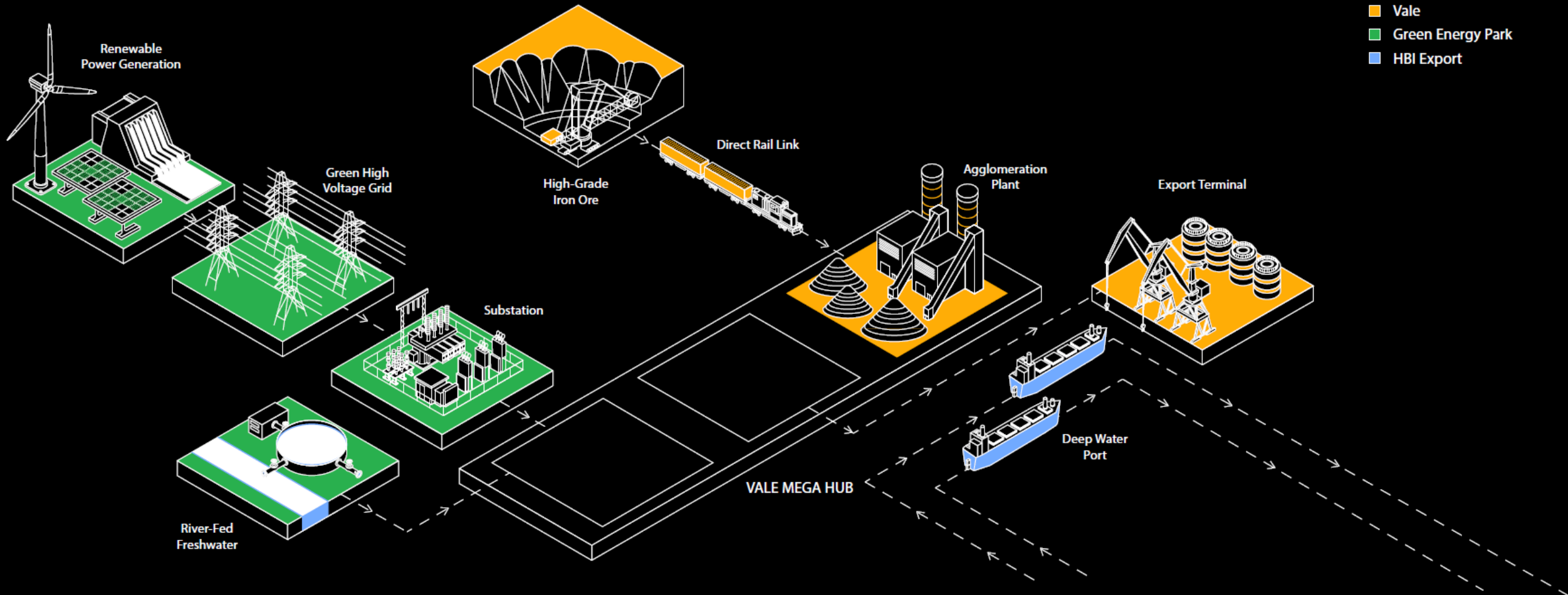
(1) EUROFER, press release, 5-Sep-2024

(2) Expected to be compliant with the Delegated Act (RED 2, Article 4)

# Giga Park Maranhão



# Existing Infrastructure



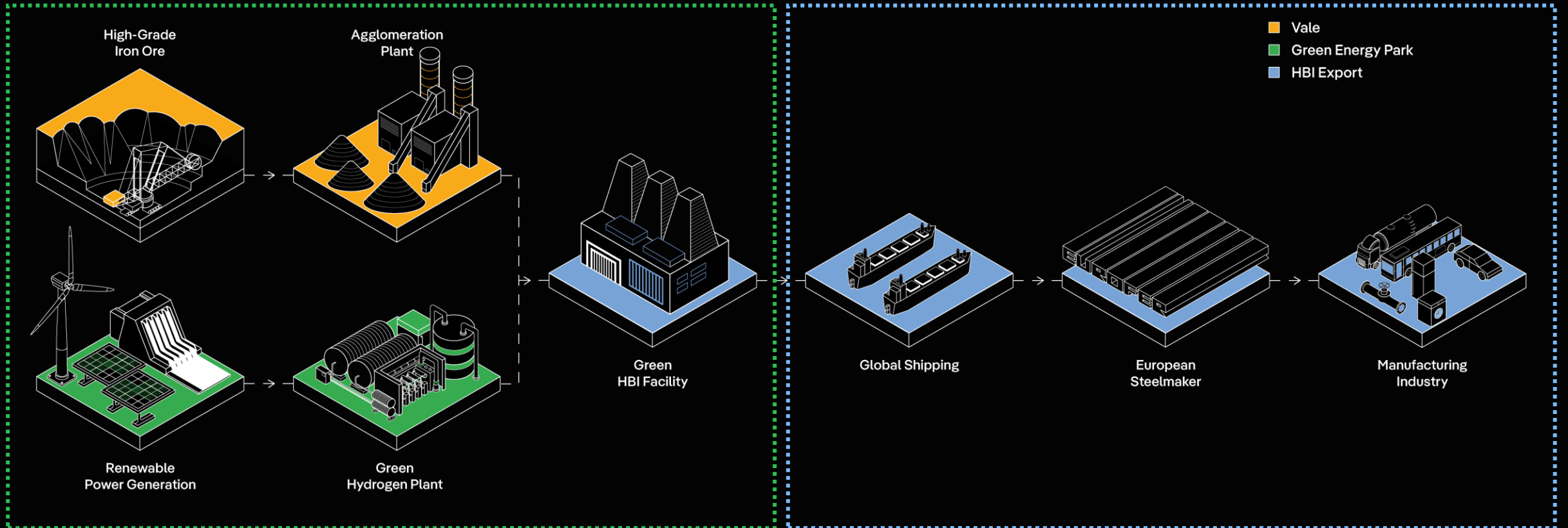
# Integrated Steel Value Chain



## Ironmaking Brazil













## Steelmaking Europe





# EU Green Steel at Competitive Costs

## Input Costs

|   |  |   |
|---|--|---|
|    | High-grade DR Pellets<br>USD 170-190/t       |    |
|    | Electricity<br>USD 30-35/MWh                 |    |
|    | Green Hydrogen<br>USD 2,5-3,0/kg             |    |
|  | Scrap Metal<br>USD 360-440/t                 |  |
|  | Carbon Cost<br>USD 100-130/t CO <sub>2</sub> |  |

## EU Green Steel / HBI Brazil

USD 650-670/t<sup>1</sup>

~ 0,4 t  
CO<sub>2</sub>/t of steel

## Conventional EU Steel

USD 690-780/t<sup>2</sup>

~ 2,0 t  
CO<sub>2</sub>/t of steel

**80%**  
GHG reduction

EU steelmakers can eliminate up to 80% of CO<sub>2</sub>/t steel with unchanged economics

1. DRI-EAF route. Scopes 1,2 and 3 were considered (CI of pellets and scope 2 based on electricity in France), including carbon costs  
 2. BF-BOF route. Carbon intensity: 2,01 t CO<sub>2</sub>/t steel, reference from CBAM (code 7208), including carbon costs



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# GIGA PARK

Croatia

[www.gep-krk.com](http://www.gep-krk.com)



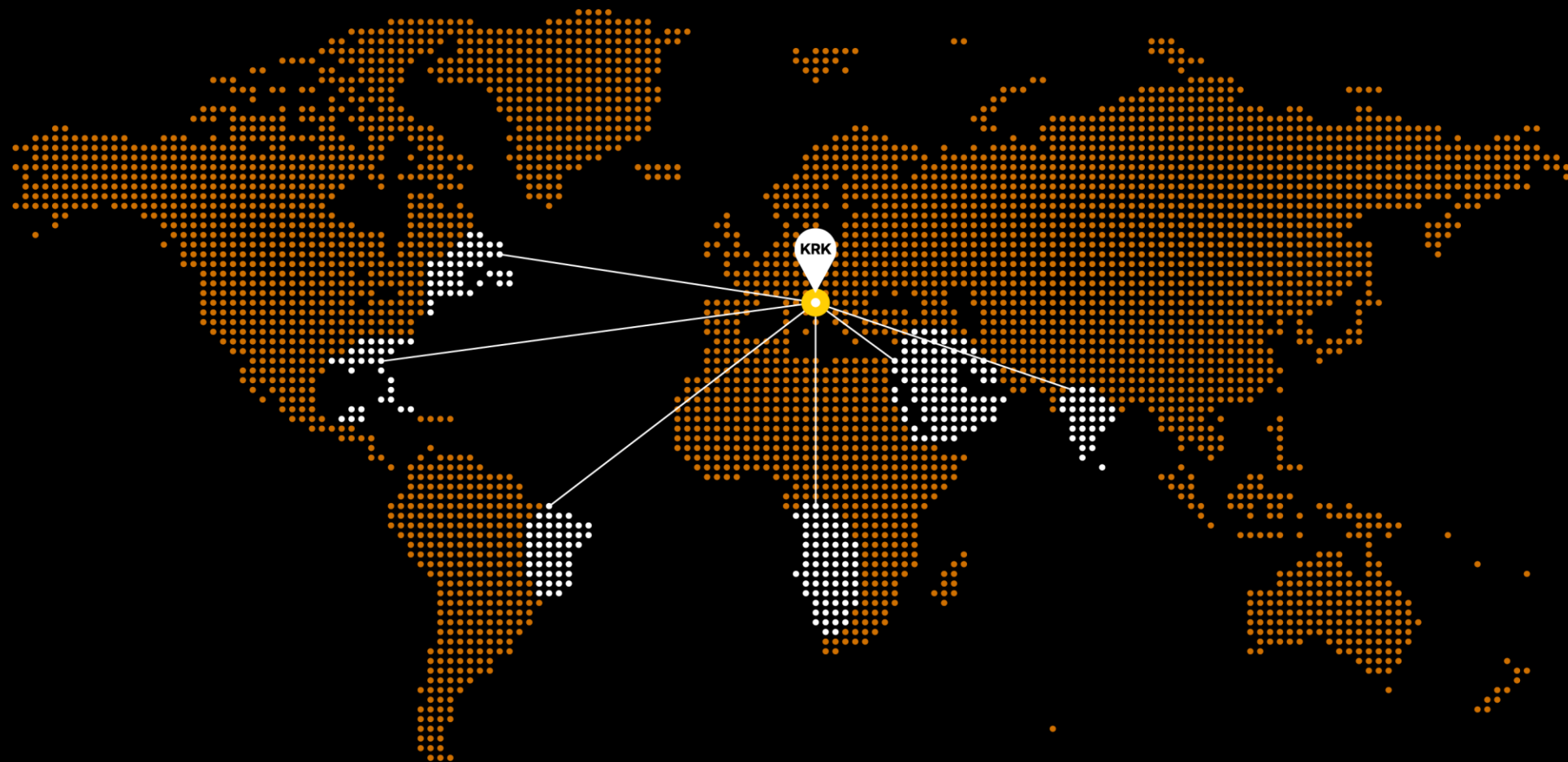




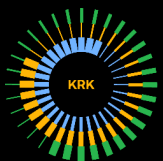
Green  
Energy  
Park

# Global Sourcing

Sourcing up to 10m tons from different locations when fully build







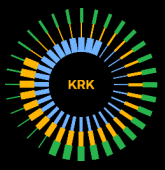
Green  
Energy  
Park

# Unique Location

The Central European Gateway for Renewable Hydrogen Supply





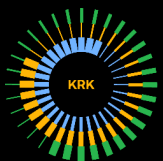


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# Current Site





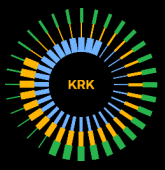


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# Mooring Area and Jetty



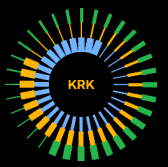




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# Petrochemical Permits





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# On-site Power Plant

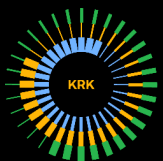




# Water-Cooling / Pipeline System

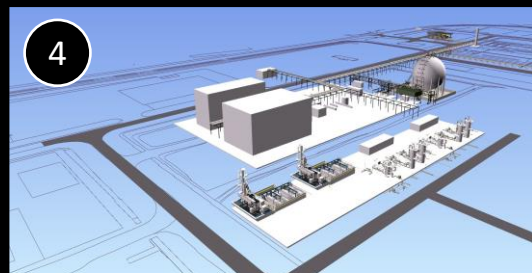
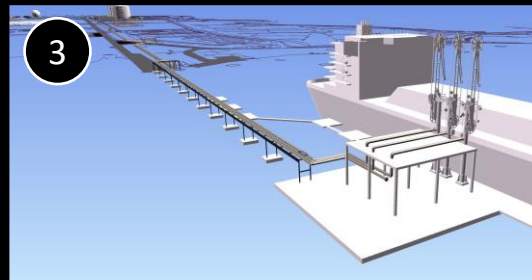






Green Energy Park

# Unique Asset



The original owners, Dow Chemicals of the US and INA, spent approx. USD 400 million in the early 1980s to build the site-infrastructure. Today, inflation adjusted, the asset value is substantial.



Zoning and build-out plan

# Regional Offtake

Supplying European industrial heartlands representing over € 3.0trn in GDP



- Industrial heartlands of Italy (incl. Po Region)
- Industrial heartlands in South Germany and Austria
- Countries in in the Balkan Region
- North Adriatic Hydrogen Valley (NAHV): Croatia, Slovenia, and Friuli Venezia Giulia

## North Adriatic Hydrogen Valley (NAHV)

- €800m total investments
- €225m in public funding
- Over 30 consortia partners: large off-takers in steel, glass, and cement



NAHV Forum, 23rd May 2023 in Slovenia



Contact:

Bart Biebuyck, CEO

[bart@gep-global.com](mailto:bart@gep-global.com)

