

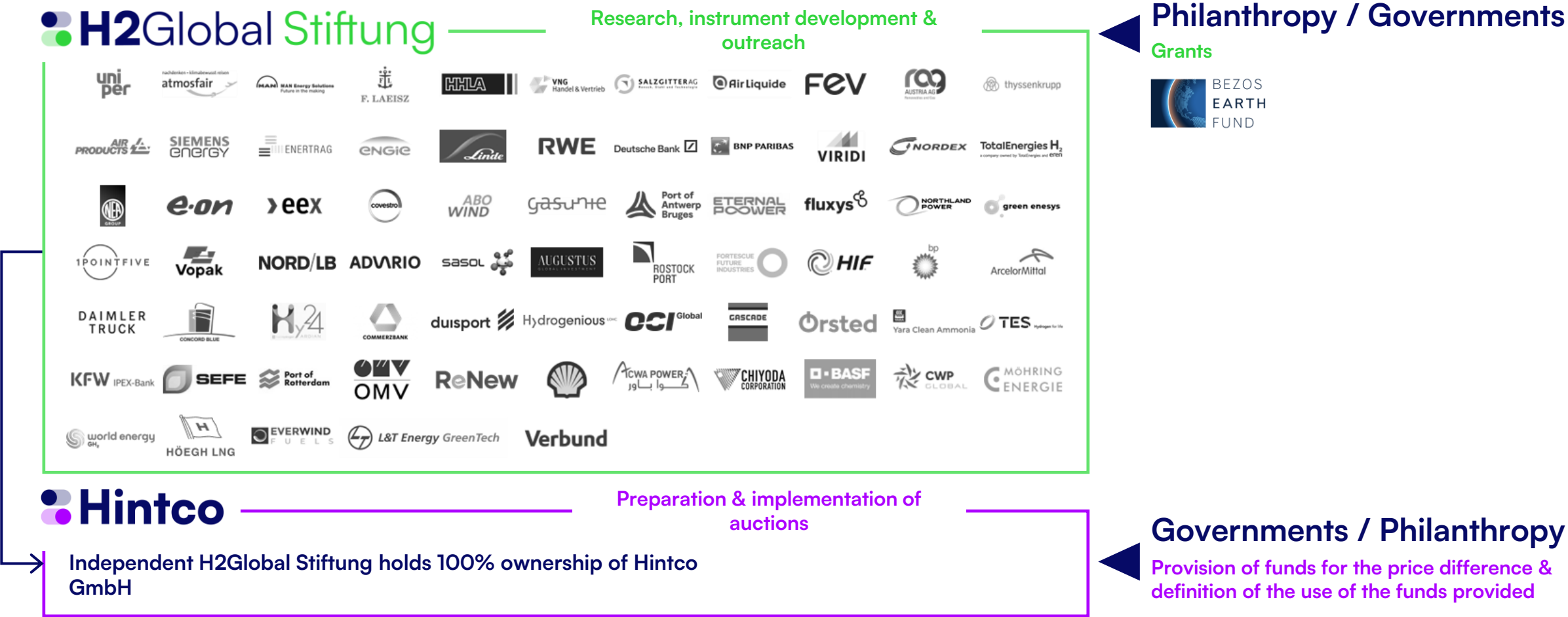


# H2Global Stiftung Results of the H2Global Pilot auction

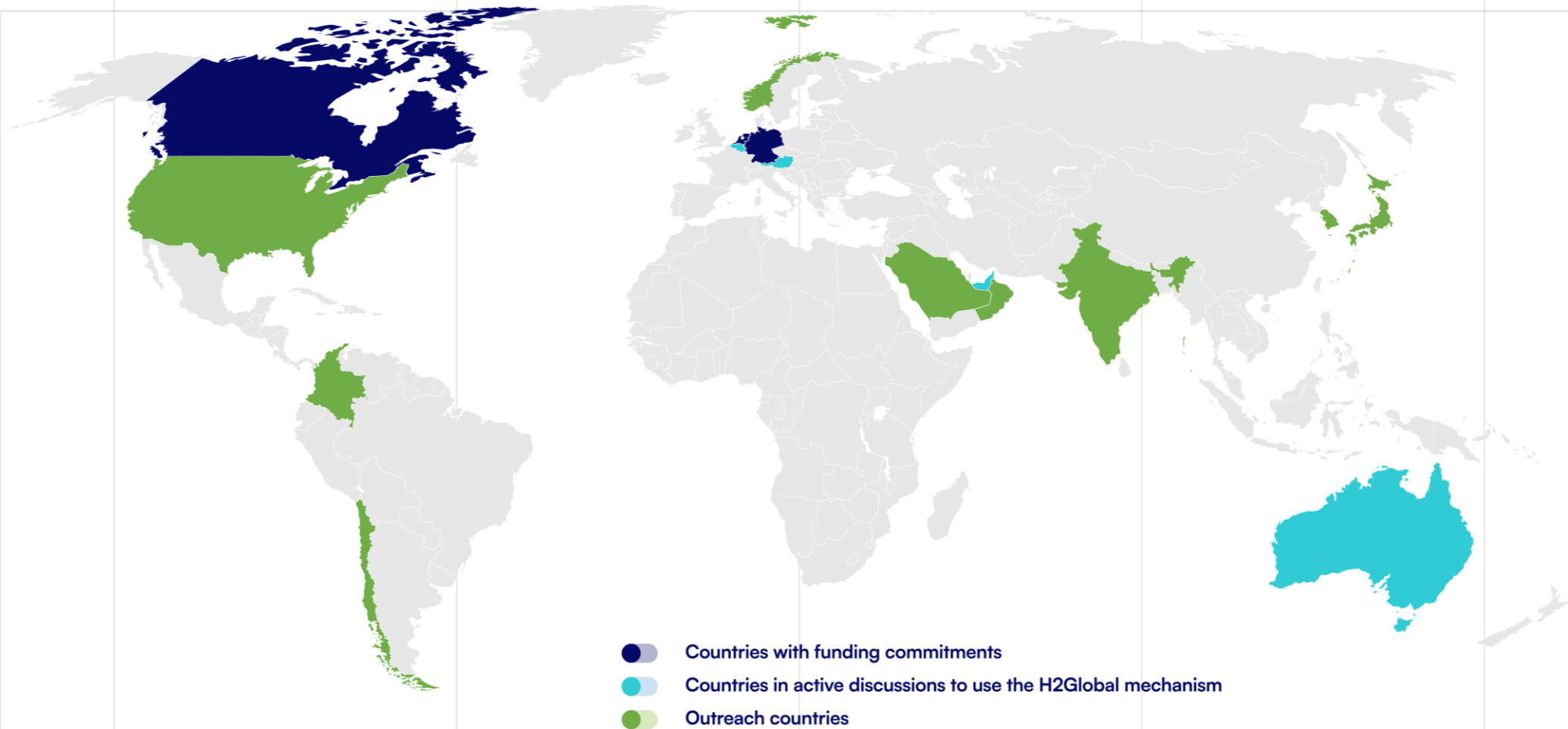
H4D Webinar // September 2024

 **H2Global** Stiftung

# The non-profit H2Global Foundation is dedicated to fostering international cooperation and raising awareness about the H2Global mechanism



# H2Global worldwide



- Australia
- Austria
- Belgium
- Canada
- Chile
- Colombia
- Germany
- India
- Japan
- Luxembourg
- Netherlands
- Norway
- Oman
- Saudi Arabia
- South Korea
- UAE
- USA

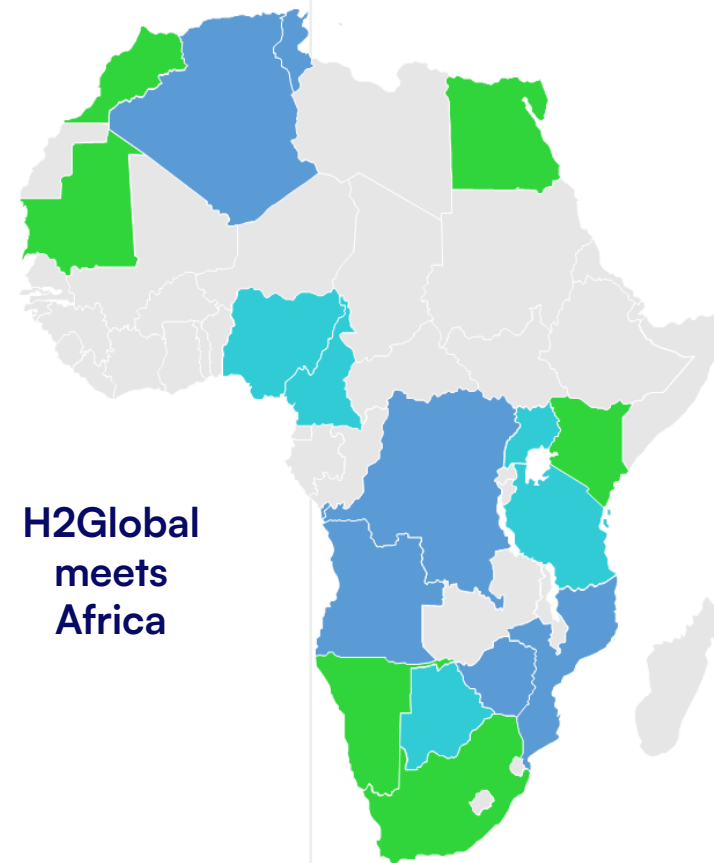
# Both research programs of H2Global have advanced and taken steps towards producing new research



**Fraunhofer**  
IEE

**OTH**  
REGENSBURG

SPONSORED BY THE



**H2Global  
meets  
Africa**

SPONSORED BY THE



# The H2Global Knowledge Hub is now fully operational

## NEW SECTION ON THE WEBSITE

- Collecting and sharing knowledge on the clean hydrogen economy
- Starting with basic knowledge on the general role of clean hydrogen in the energy transition
- Adding new and advanced insights over time

## WORKING GROUPS MET 21x, INCL. 3x IN-PERSON

Average participation in working groups in 2024:

**24**

WG  
Infrastructure  
Finance

**23**

WG Demand

**20**

WG Auction  
Design

Numbers do not include H2Global employees nor Knowledge Partners



## PUBLICATION OF THREE REPORTS IN FALL 2024

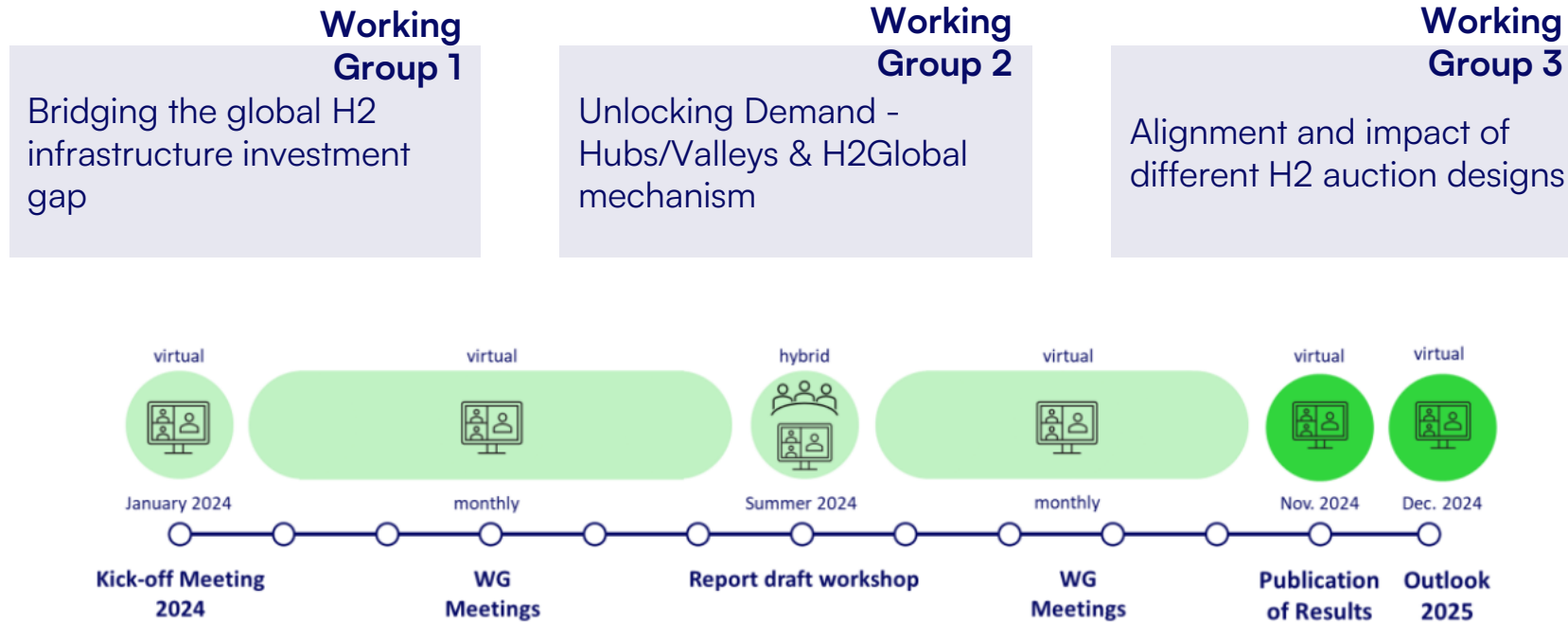
- Bridging the infrastructure finance gap
- Unlocking demand
- Aligning auction designs

## NEW COLLABORATION WITH KNOWLEDGE PARTNERS FROM:

- Oxford Institute for Energy Studies
- World Bank
- OECD
- Center on Global Energy Policies at Columbia University
- IRENA



# Three working groups currently serve to advance the discussion on critical issues affecting clean H2 market ramp-up

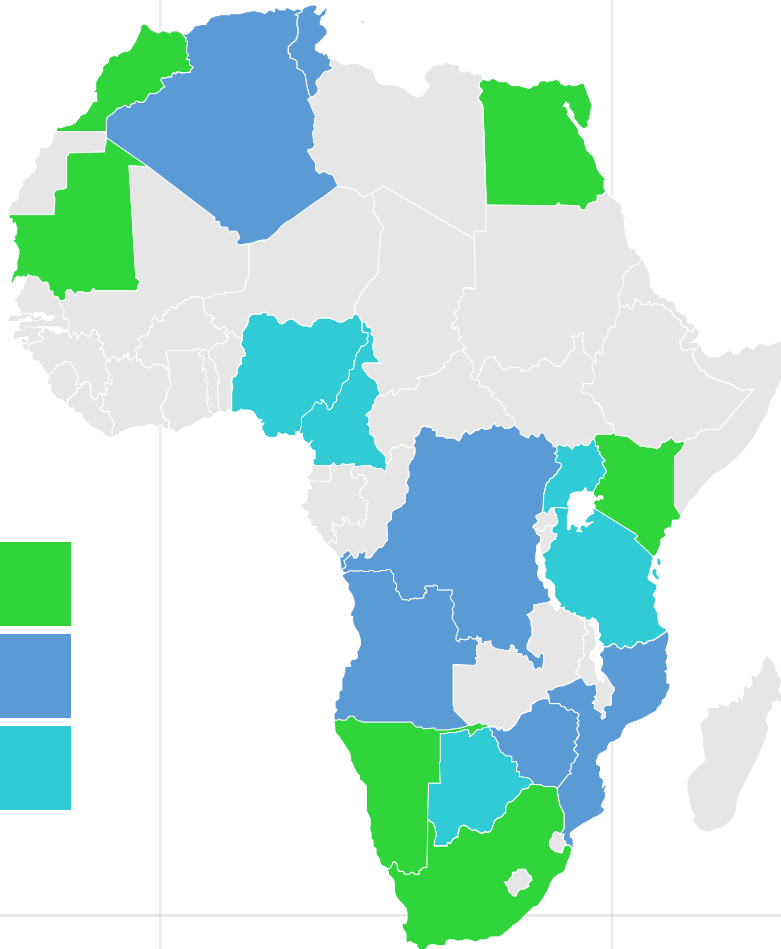


Accelerating hydrogen deployment requires action on multiple fronts. H2Global Foundation engages its donors to discuss important questions regarding the ramp-up of the hydrogen economy in its working groups.

# "H2Global meets Africa" has delivered first results and taken steps towards producing new research



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Front runners

Upcoming stars

Strong Foundation

## Country Clustering

Based on socio-economic potential to produce renewable hydrogen.

### 5 Dimensions

- Renewable hydrogen commitment
- Water & renewable energy potential
- Domestic anchor demand
- Export Infrastructure
- Country risk

### Clustering Approach

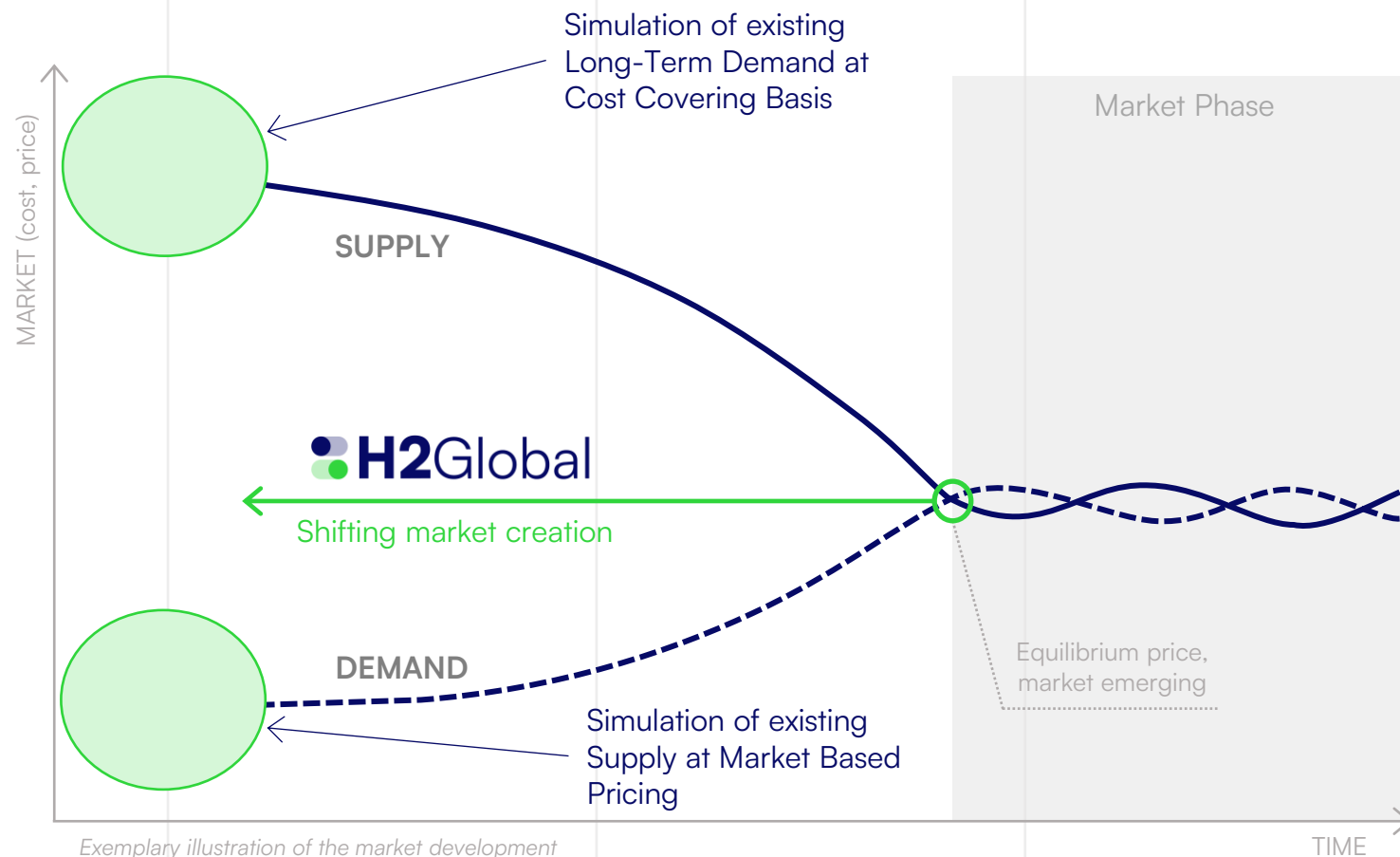
- Method: Hierarchical clustering
- Agglomeration of 55 countries in seven steps
- Final cluster step results in four clusters
- Collaboration with the African Development Bank through a short-term research consultancy
- Stakeholder workshop in Cape Town planned for Q1 2025 to discuss finance for clean H2 projects in partnership with World Bank



# Market simulation has a catalytic effect and shifts market creation forward

## Simulate to Create

Immediate creation of  
simulated market on  
supply and demand side.





# The H2Global market-driven compensation mechanism ensures the most efficient use of funds for maximum impact

## Supply market

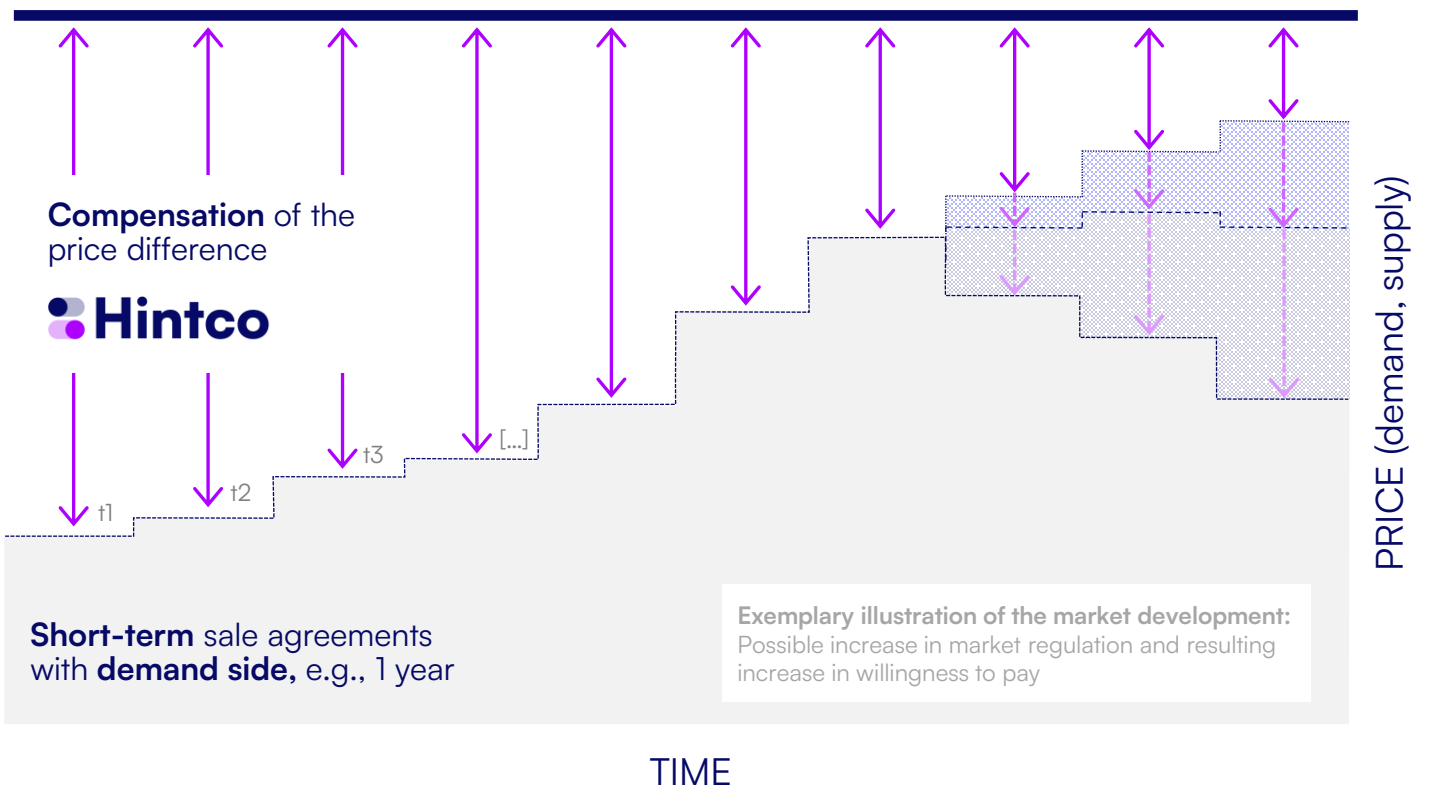
- Long-term purchase agreements offer the necessary investment security
- Generated price signal for defined product qualities create transparency and reduce information asymmetries

## Demand market

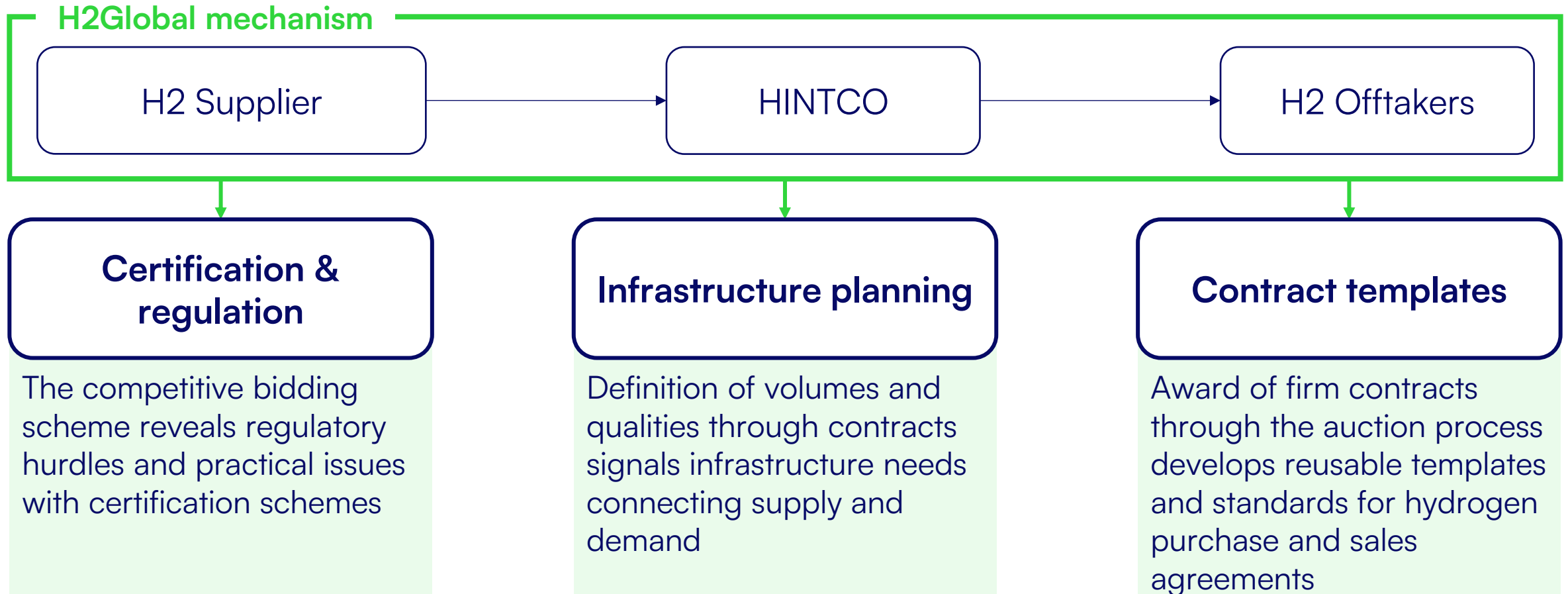
- Short-term sales contracts generate regular price signals and liquidity: a prerequisite for market emergence
- Perspective: Long-term sales contracts based on H2Global reference price signals

Double auctions ensure minimal use of subsidies and dynamic adjustment of the subsidy requirement to market developments.

Long-term purchase agreement with **supply side**, multi-year fixed price and terms



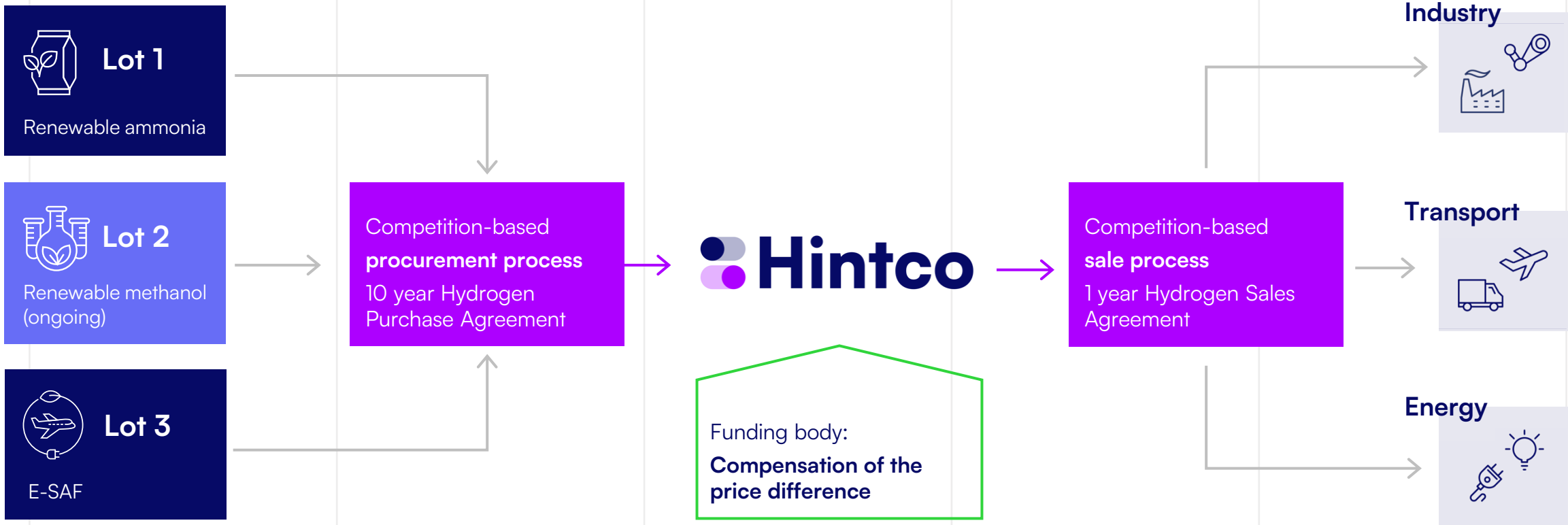
# H2Global mechanism provides several positive externalities




# H2Global double-auction mechanism

Scope of current auction: HPA side only


HSA auctions expected from 2025/2026



# H2Global Pilot Auction



Die  
Bundesregierung



EUR 900m

## Pilot auction powered by the H2Global mechanism



**Lot 1** | Renewable ammonia



**Lot 2** | Renewable methanol (ongoing)



**Lot 3** | E-SAF

EUR 900m

# Hydrogen Purchase Agreements - Two-stage award process

## STAGE 1 Preliminary competition (qualification phase)



Maximum of five bidders invited to submit indicative bids and enter into negotiation phase

## STAGE 2 Negotiation and bidding phase



Final bids, followed by one award



Final Investment Decision



# LOT 1 — Renewable Ammonia

# Overview



**Lot 1**  
Renewable ammonia

Renewable ammonia produced by mixing and processing renewable hydrogen and nitrogen.

**2022**

The auction  
was launched  
at the end of  
2022

**65**

countries across  
five continents  
expressed interest  
in the auction

**1,300+**

downloads from private  
companies, regulatory  
authorities, and  
academic institutions.

**Resulting in one awarded bidder**



# Results



**Lot 1**  
Renewable ammonia

## Participants

**STAGE 1** Preliminary competition  
(qualification phase)

22

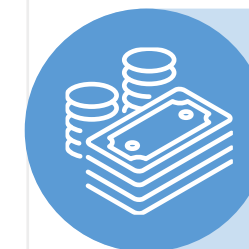
Maximum of five bidders invited to submit indicative bids and enter into negotiation phase

**STAGE 2** Negotiation and  
bidding phase

5

Final bids, followed  
by one award

1



**Final  
Investment  
Decision**

# Timeline



**Lot 1**  
Renewable ammonia



• • • Multiple extensions were requested at different stages by bidders

# Aggregated bid insights



Lot 1  
Renewable ammonia

Insights from aggregated binding and non-binding bids

All projects proposed the use of alkaline electrolyzers, two of which proposed the use of pressurised alkaline electrolyzers.



145MW

Average electrolysis capacity of 145 MW, with the construction of an average of 295 MW of additional renewable energy.



# Aggregated bid insights

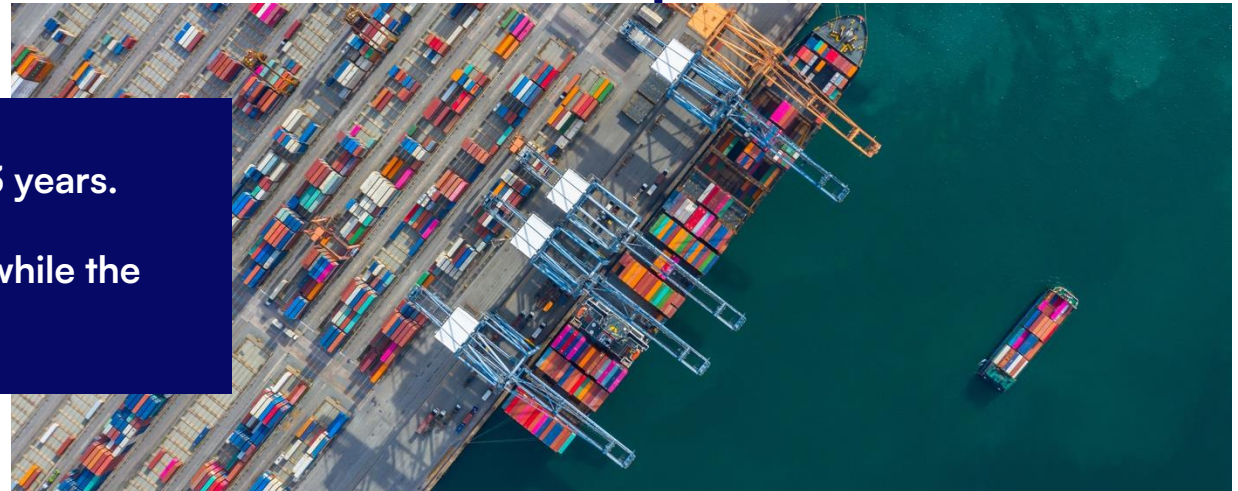


**Lot 1**  
Renewable ammonia

Insights from aggregated binding and non-binding bids

The first deliveries were expected within a period of 2-3 years.

One project proposed delivery to the port of Antwerp, while the other four proposed delivery to the port of Rotterdam.



**210,000-475,000 tons**

Supply quantity range offered in the binding and non-binding offers (guaranteed plus additional quantities).

# Aggregated bid insights

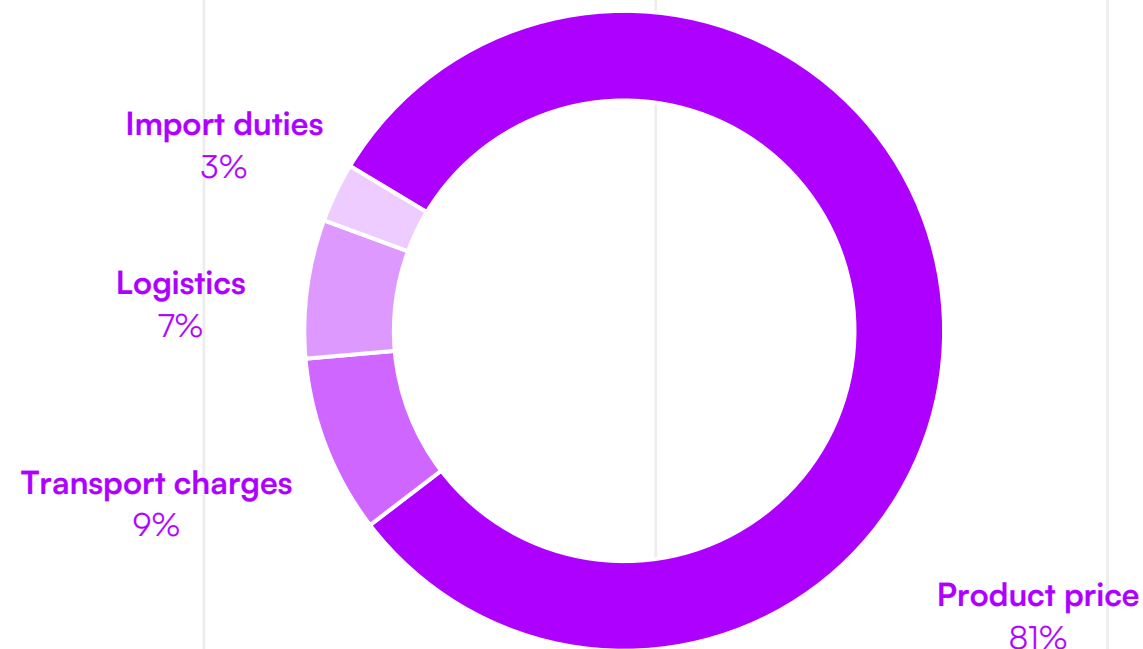


**Lot 1**  
Renewable ammonia

The **net product prices** of the bids, incl. initial and final bids submitted, averaged at **1,048 €/t**.

**81%**

On **average** the net product price contributes 81% of the contract price



# HPA — Winning Bidder — Fertiglobe — Egypt Green



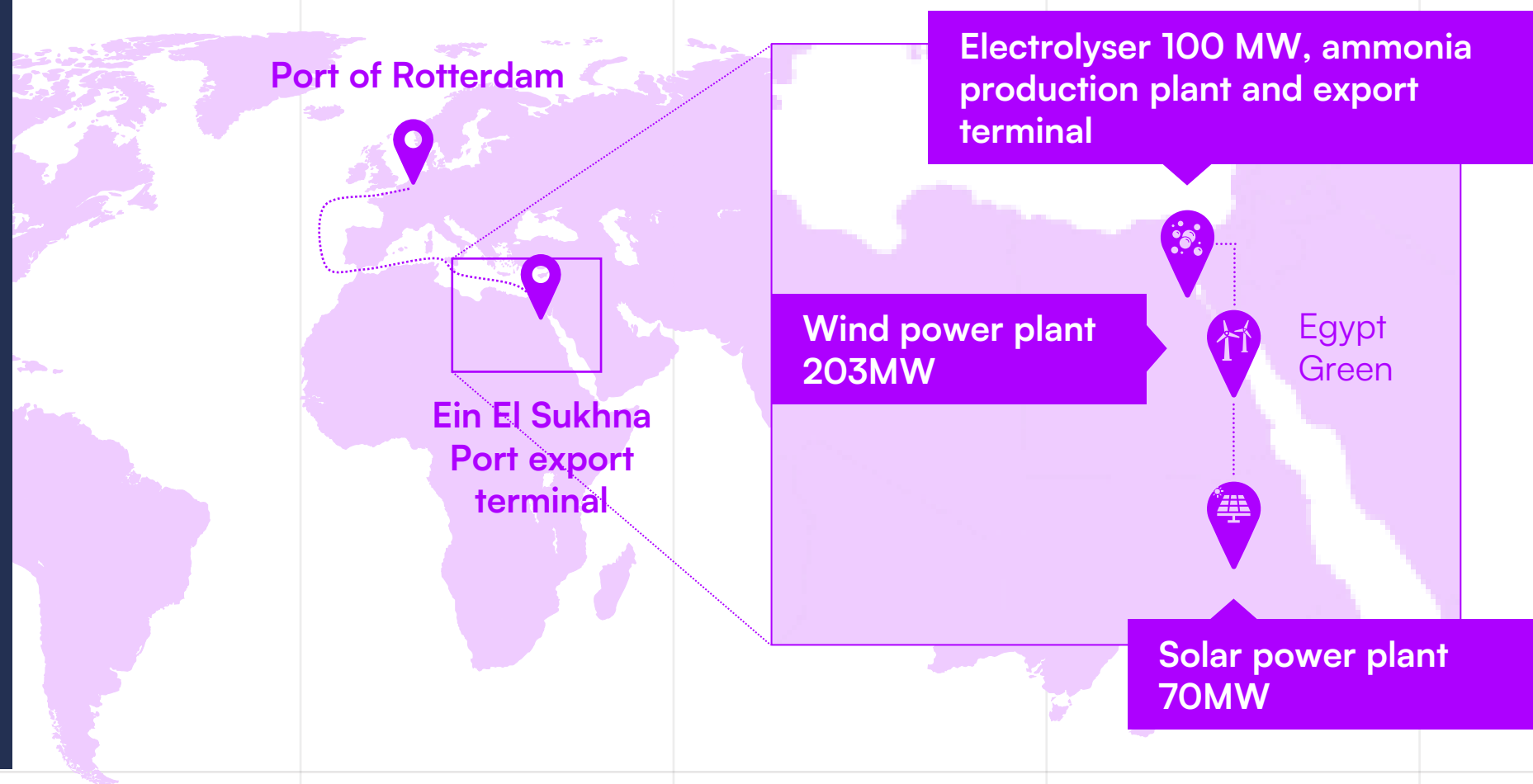
Lot 1  
Renewable ammonia

“This award marks a significant milestone for Fertiglobe in advancing sustainable ammonia production and a further critical step towards FID of Egypt Green Hydrogen, expected in H1 2025. Our selection as the winning bidder in H2Global’s pilot auction underscores our leadership in supplying low-carbon products and our commitment to shaping a more sustainable future, and I appreciate the work of our incredible team to make this award possible. We are leveraging this vital program which makes our investment in sustainable ammonia economically viable, supporting critical decarbonization technology, while maintaining our disciplined growth strategy.

Ahmed El-Hoshy, Chief Executive Officer

**Fertiglobe**

An ADNOC and OCI Company





# Fertiglobe

Fertiglobe, a strategic partnership between ADNOC and OCI Global, is incorporated in Abu Dhabi and listed at the Abu Dhabi Securities Exchange (ADX).

Fertiglobe's supply of renewable hydrogen will come from Egypt Green Hydrogen, a consortium between Fertiglobe, Scatec ASA, Orascom Construction, the Sovereign Fund of Egypt, and the Egyptian Electricity Transmission Company. The project is in the Suez Canal Economic Zone.

# Fertiglobe

An ADNOC and OCI Company



**Fertiglobe is the largest producer of nitrogen fertilizers in the MENA region, and a pioneer in sustainable ammonia. It is also the world's largest seaborne exporter of urea and ammonia combined.**





# Egypt Green Hydrogen Project: Overview



**Lot 1**  
Renewable ammonia

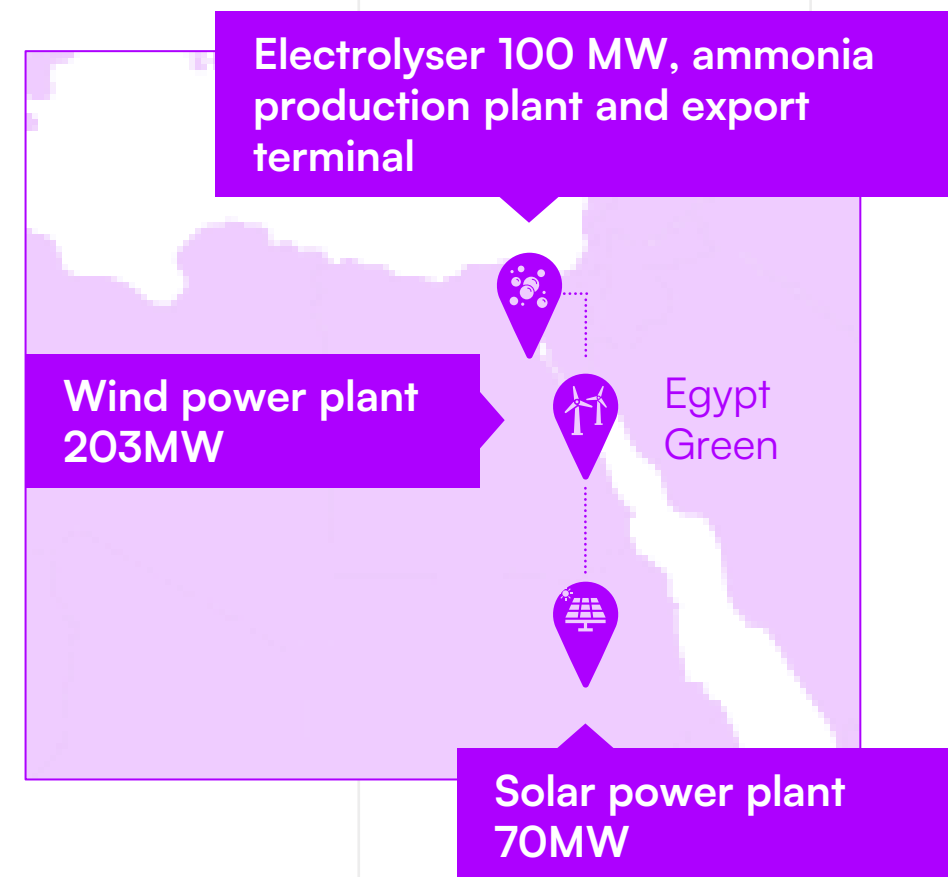
Technical upgrading of an existing Haber-Bosch plant to process renewable hydrogen into ammonia.

Electricity used in the production process will be generated in newbuild onshore wind park and a newbuild solar PV plant.

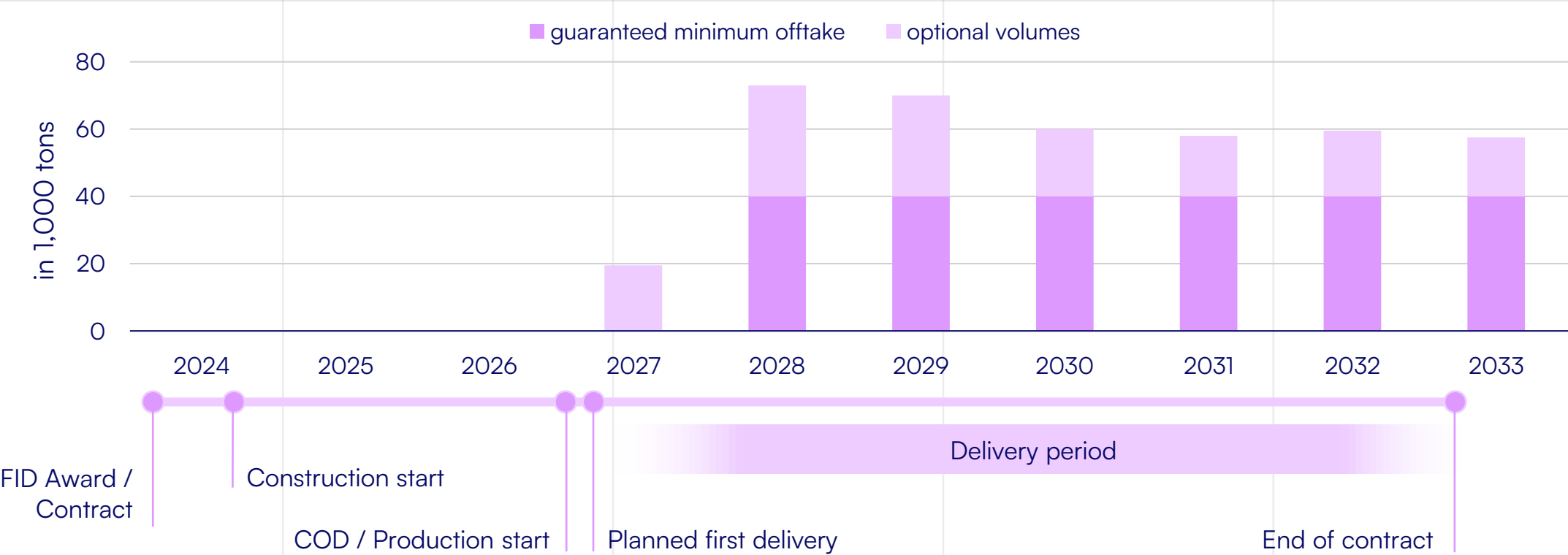
Egypt's national power grid will be utilized for the transmission of the electricity to the production site.

# 1,330

Up to 1,330 jobs are expected to be created in the project's construction and O&M phases.



# Renewable Ammonia Output / Offtake



The HPA guarantees the successful bidder an annual minimum offtake of approximately 40,000 tons, based on Hintco's available purchase budget of €40 million per year.

# Prices



**Lot 1**  
Renewable ammonia

The **maximum net product price was set** at 1,280 €/t.

**Fertiglobe**

An ADNOC and OCI Company

**811 €/t**

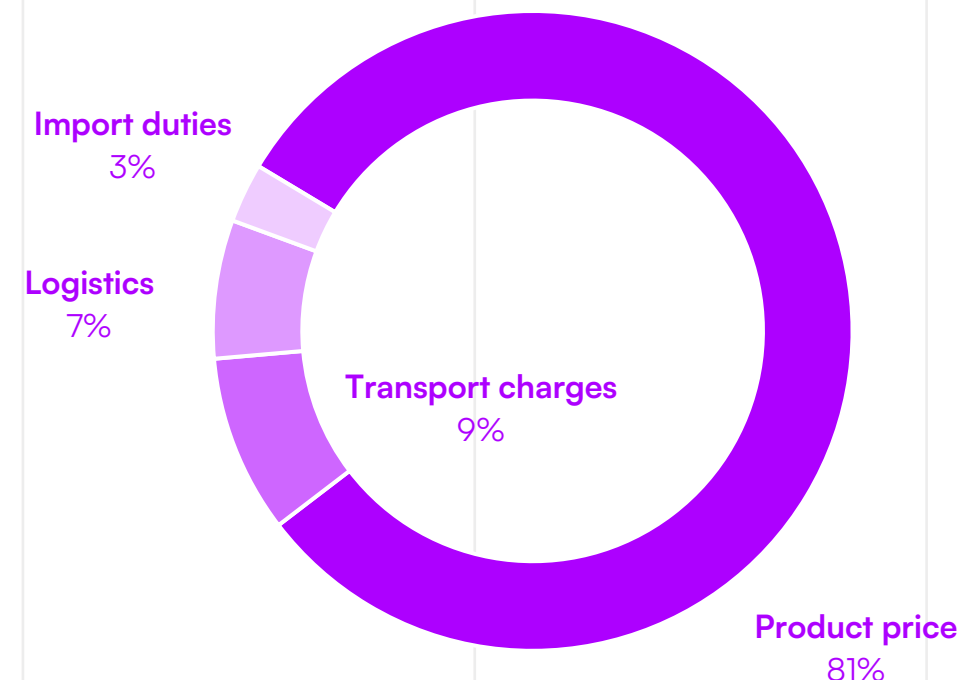
(ex-factory) net product price

**37%**

lower than the bid cap

**TOTAL 1,000 €/t**

incl. net product price,  
transport and logistic  
charges, import and export  
duties



# Transport to Europe and sales



**Lot 1**  
Renewable ammonia

Renewable ammonia will be transported to ammonia storage tanks at Ein El Sukhna Port via an existing 7 km ammonia pipeline.

The seaborne delivery to Europe will be overseen by Fertiglobe International Trading, a wholly owned subsidiary of Fertiglobe PLC.

The renewable ammonia will be delivered to the Port of Rotterdam and is going to be sold by Hintco in batches of 500tons as standardised quantities in annual auctions.



**Hydrogen Sales Agreements (HSAs) auctions will provide frequent and uncorrelated price data regarding the markets willingness and ability to pay for renewable ammonia in Europe, contributing to the development of a functioning market.**

# Sustainability Requirements



**Lot 1**  
Renewable ammonia

Per auction design, the producer must:

- Meet EU standards for renewable hydrogen (RED II and Delegated Acts (DAs))
- Meet the sustainability criteria (defined by BMWK)
- Conduct Environmental and Social Impact Assessment (EIA and SIA) in accordance with IFC/World Bank standards
- Document how the project will contribute to meeting Paris Climate Agreement goals and the Sustainable Development Goals (SDGs).



**Sustainability criteria** include protection of arid regions, sustainable land use, protection from forced resettlement, conservation of biodiversity, implementation of an environmental management system, local value creation, equal opportunities and gender, adherence to International Labour standards (ILO).

# Greenhouse gas savings

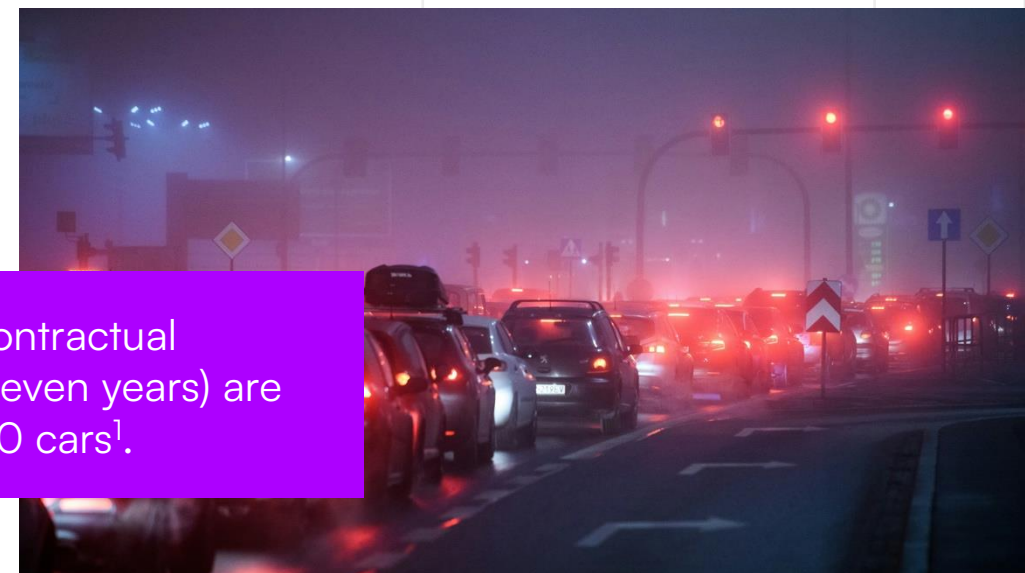


Lot 1  
Renewable ammonia

The produced renewable ammonia will achieve an emissions intensity reduction of approx. **75.5 %** relative to ammonia produced based on unabated fossil fuels.

62,000

The emissions savings associated with the contractual maximum supply commitment (397 kt over seven years) are equivalent to the annual emissions of 62,000 cars<sup>1</sup>.



Validated by



Reviewed and validated Fertiglobe's proposal's adherence to sustainability criteria.



Reviewed and validated Fertiglobe's proposal's compliance with regulatory requirements (RED II and (DAs).

<sup>1</sup> Assuming an ammonia output of 70,000 t per year from the facility with the ammonia produced directly displacing existing grey ammonia. With: 108.1 gCO<sub>2</sub>/km emissions per km and 11,298 km/a km driven per car and year.



# LOT 3 — E-SAF



# Overview



Lot 3  
E-SAF

Sustainable, synthetic aviation fuel produced using renewable electricity and hydrogen as an intermediate product (e-SAF) market is in a **very early development stage**.

2022

The auction was launched at the end of 2022

34

countries across five continents expressed interest in the auction

300+

downloads from private companies, regulatory authorities, and academic institutions.

Private sector participation in the e-SAF auction ended up being less intense than in the concurrent auction for renewable ammonia.

# Results



**Lot 3**  
E-SAF

## Participants

STAGE **1** Preliminary competition  
(qualification phase)

**3**

Maximum of five bidders invited to submit  
indicative bids and enter into negotiation phase

STAGE **2** Negotiation and  
bidding phase

**1**

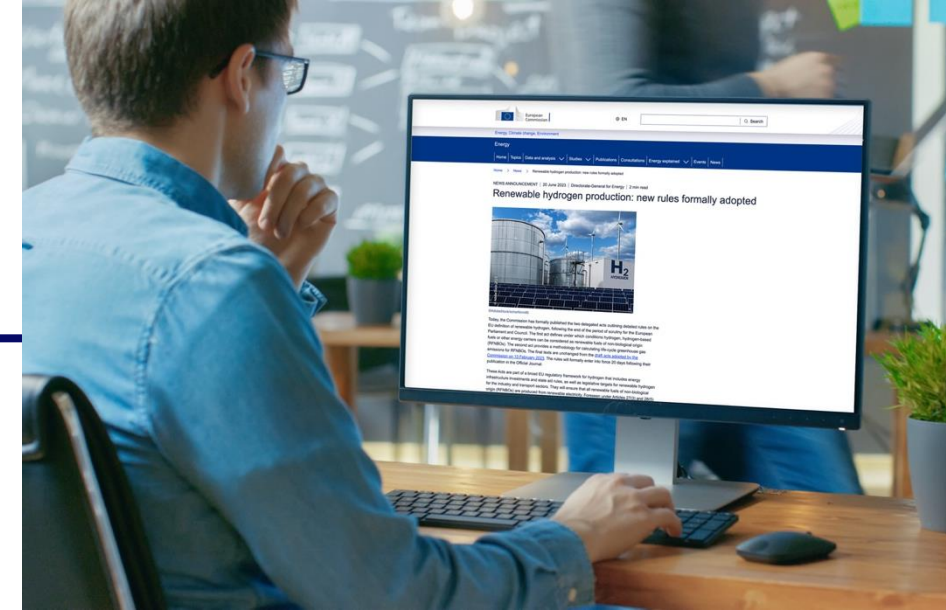
No final bids  
were submitted

—



Two bidders refrained from submitting an indicative bid for two main reasons:

- The implementation of the regulatory framework surrounding the GHG accounting of the carbon intended to produce e-SAF is subject to uncertainties in countries outside of the EU. In order for e-SAF to be marketable, it must meet the requirements set out in the Delegated Acts of the Renewable Energy Directive (DR 2018/2001, "RED II" together with the "DAs").
- The relatively small contract value and duration being offered, which was incompatible with the practicalities of setting up a new e-SAF plant, given the investment volume and project development time required to build such a plant.





The third bidder eventually decided against submitting a final offer because:

- The EU Commission's current interpretation of RED II DA 28(5) requires a 'proportional allocation' of GHG savings to all end products of the Fischer-Tropsch process.
- For an economically viable e-SAF production in an upgraded existing Fischer-Tropsch plant a flexible allocation solely to e-SAF rather than a proportional allocation of GHG savings across the various products, for which no subsidy nor green market premium currently exist, would have been required.



## Early finding

Reduced regulatory uncertainty + larger lots will be needed to ensure success of future auctions

# Upcoming auctions

# Upcoming auctions

**Lot 2 (renewable methanol)**



Ongoing

**Lot 1 (renewable ammonia) - HSA auctions**



Expected in 2025/26

**€3.5 billion round of auctions**



In preparation -> currently conducting market consultations

**€0.3bn + €0.3bn\* Netherlands — Germany joint auction**



In preparation

# EUR 3.53 billion: BMWK's market consultation\* for the second H2Global funding window

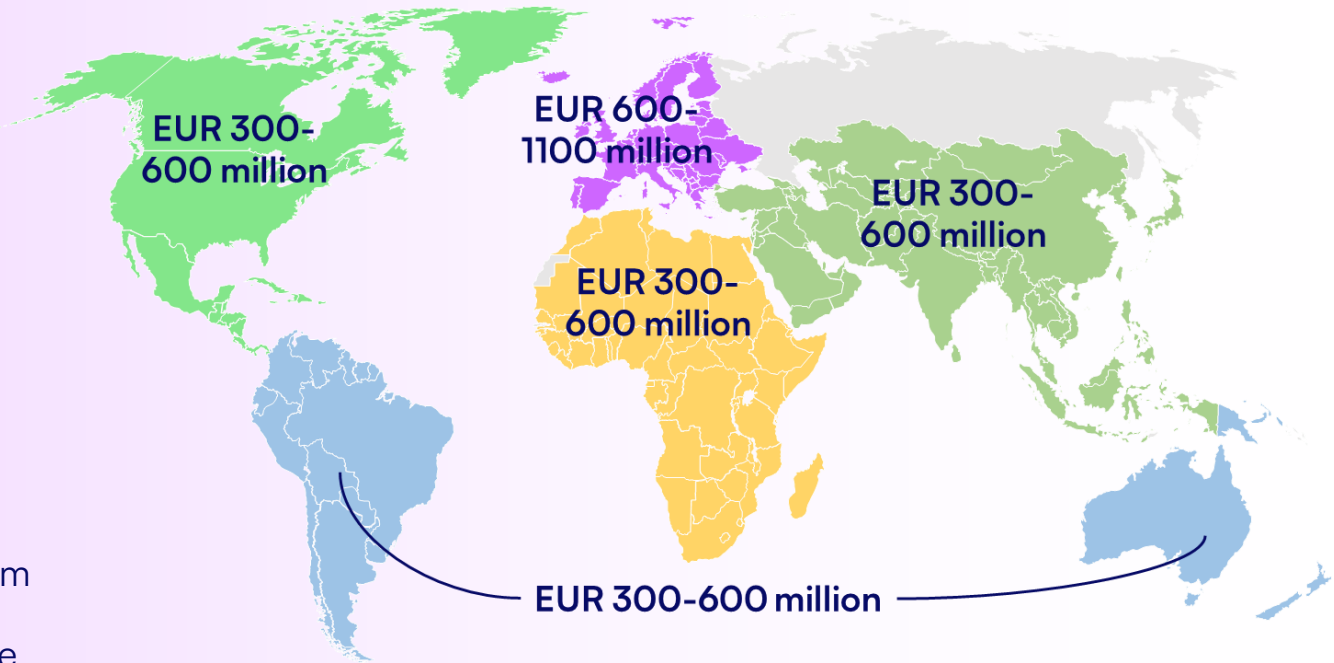
## Objectives of funding window\*

- Support market creation and FID
- Discover real market prices
- Diversify supply geographies and increase security of supply

## Design\*

- Application of RFNBO criteria of RED II and Delegated Acts
- Vector-open or product-open design
- Point of first delivery: GER or NL
- HPA:
  - 10 years (2026-2036)
  - fixed price
  - awarded by price per ton or energy (70%) and maximum volume or basic volume plus optional quantities (30%)
  - Marginal bidder will be offered reduced volume to make maximum use of the budget
- HSA: “significantly shorter” contract duration awarded by price

Global lot: EUR 600 million (EUR 300 million from the Dutch government)



\*Information is based on the BMWK's market consultation publication (11 June to 22 July 2024). All information is subject to changes in the tender documents. Countries under sanctions are excluded from participating in the auctions.



# Lessons learned

# Lessons learned



## Lot Sizes and contract duration

The selected lot sizes (procurement volume) and contract term are "at the lower end" in the current market environment. Bidders are focused on realizing economies of scale and offering marketable prices. The substantially larger lot sizes announced in the upcoming funding window address this obstacle.



## Regulatory Uncertainties

Current regulatory uncertainties, especially the lack of practice in the interpretation of the new EU DAs and the import of derivatives from outside Europe, are difficult for bidders to calculate and thus hinder investment. Specific examples include uncertainties over possible sources of electricity and CO2.



## Bidders' Commitment

Hintco found all bidders involved in the process to be extremely committed and constructive. Many suggestions have already been integrated into the ongoing process, with others under consideration for upcoming tenders. Based on the experience gained to date, Hintco will be able to provide future bidders with more targeted advice and assistance.



## Port Infrastructure Access

Access to necessary port infrastructure is a challenge for many bidders. Hintco aims to overcome any bottlenecks through contractual arrangements.

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