



Shaping the global energy transition.

H2Global: Bringing the clean H2 market to fruition

November 2024



H2Global

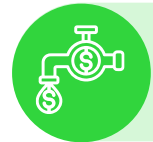
Market creation first, then market ramp up.

Functioning markets have:



Price transparency

- No clear pricing signal on supply or demand side
- Indexes based on assumptions



Liquidity

- Limited number of transactions, large volumes only
- Over the Counter (Otc) and “point-to point” only



Legal security / rules based

- Lack standards and certification schemes
- Insecurity in terms of recognition and methodologies



Low market barriers

- High entry barriers

Clean energy commodity markets currently have:

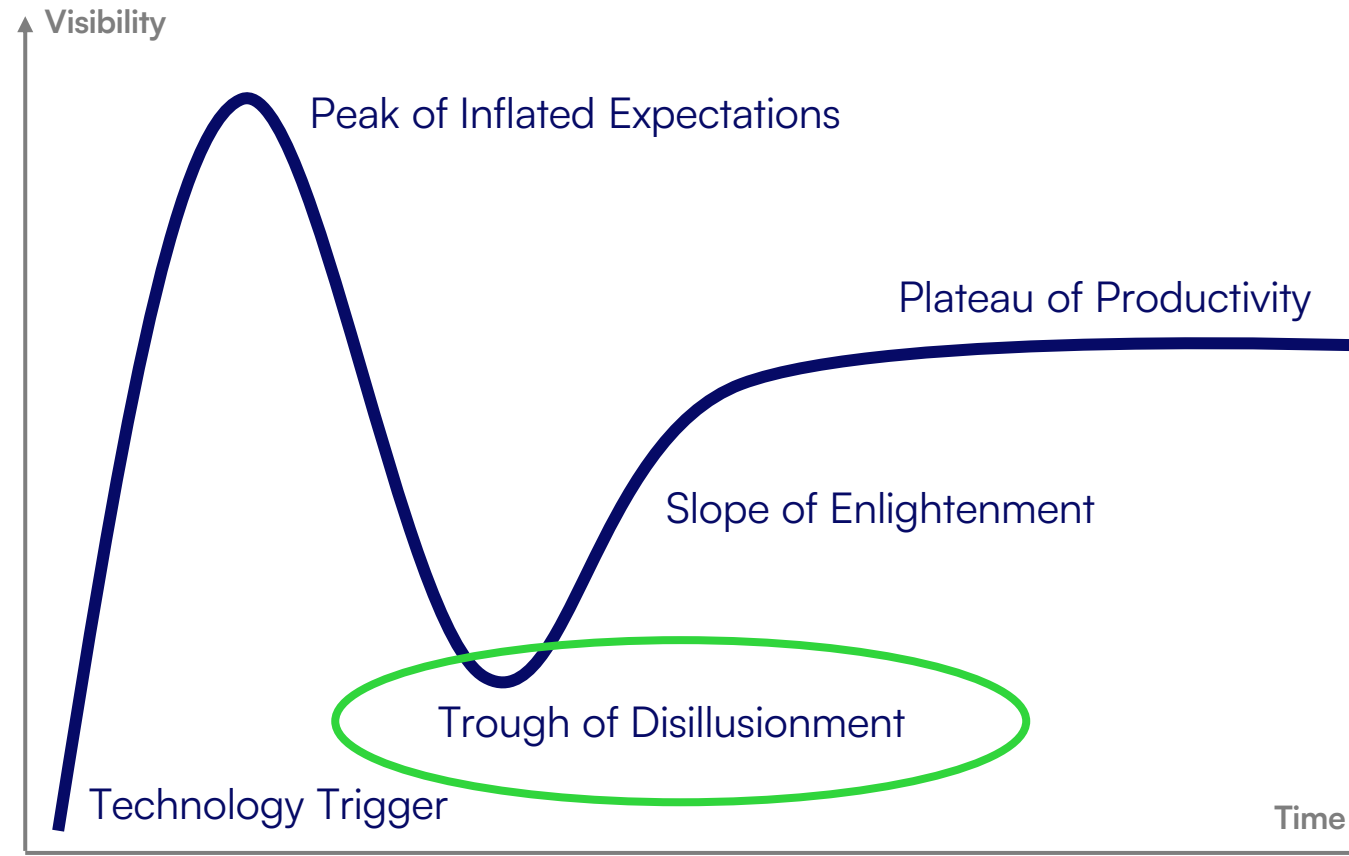


KEY TAKEAWAY

Clean commodity markets are nascent, and to meet climate targets we need to accelerate their creation.

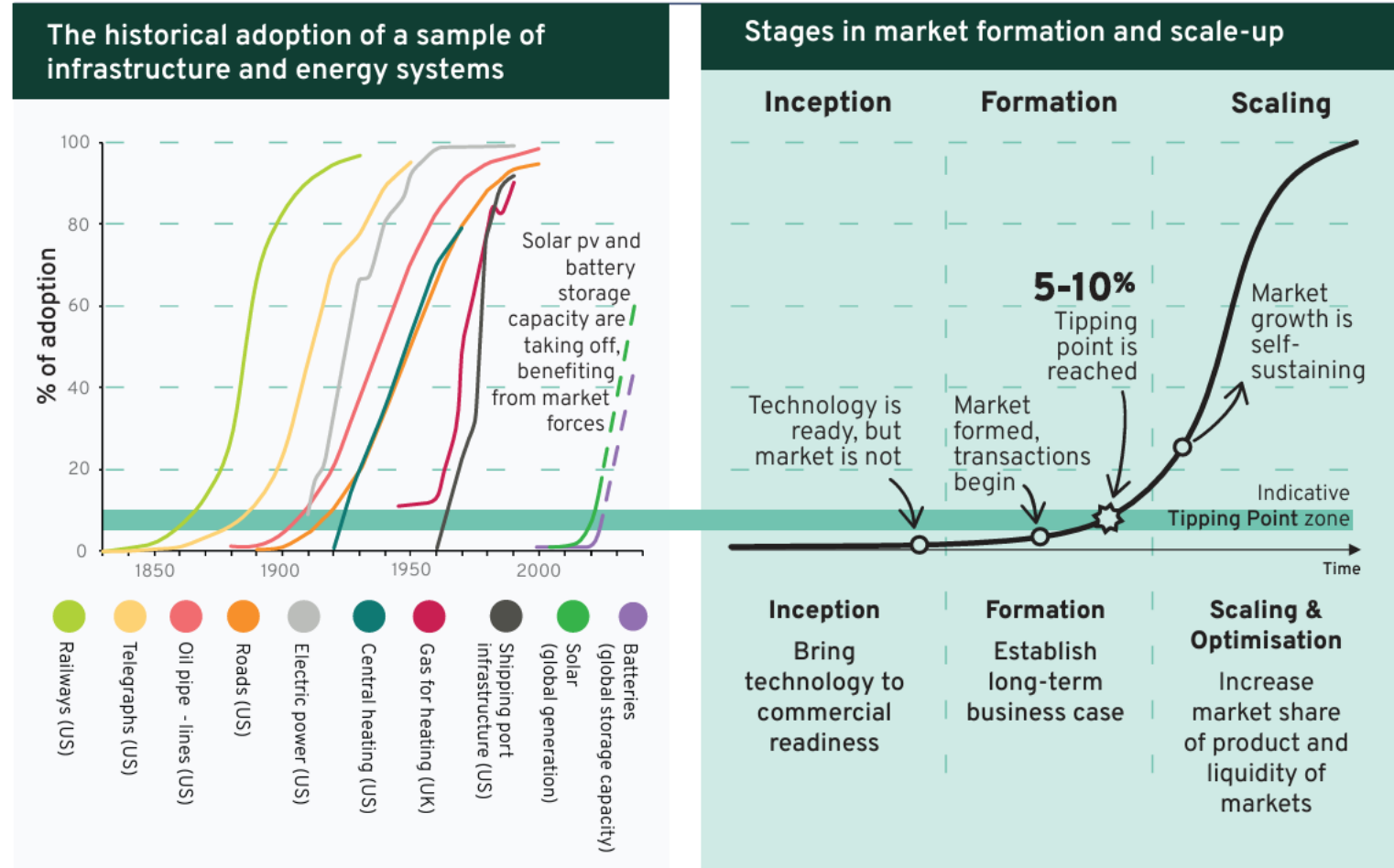
The hydrogen economy is currently passing the 'Trough of Disillusionment' requiring further engagement to develop

The Gartner Hype Cycle



Trough of Disillusionment: Interest wanes as implementations fail to deliver. Producers of the technology shake out or fail.

Market forces have driven uptake of new technologies from the industrial revolution to the take-off of renewable energy

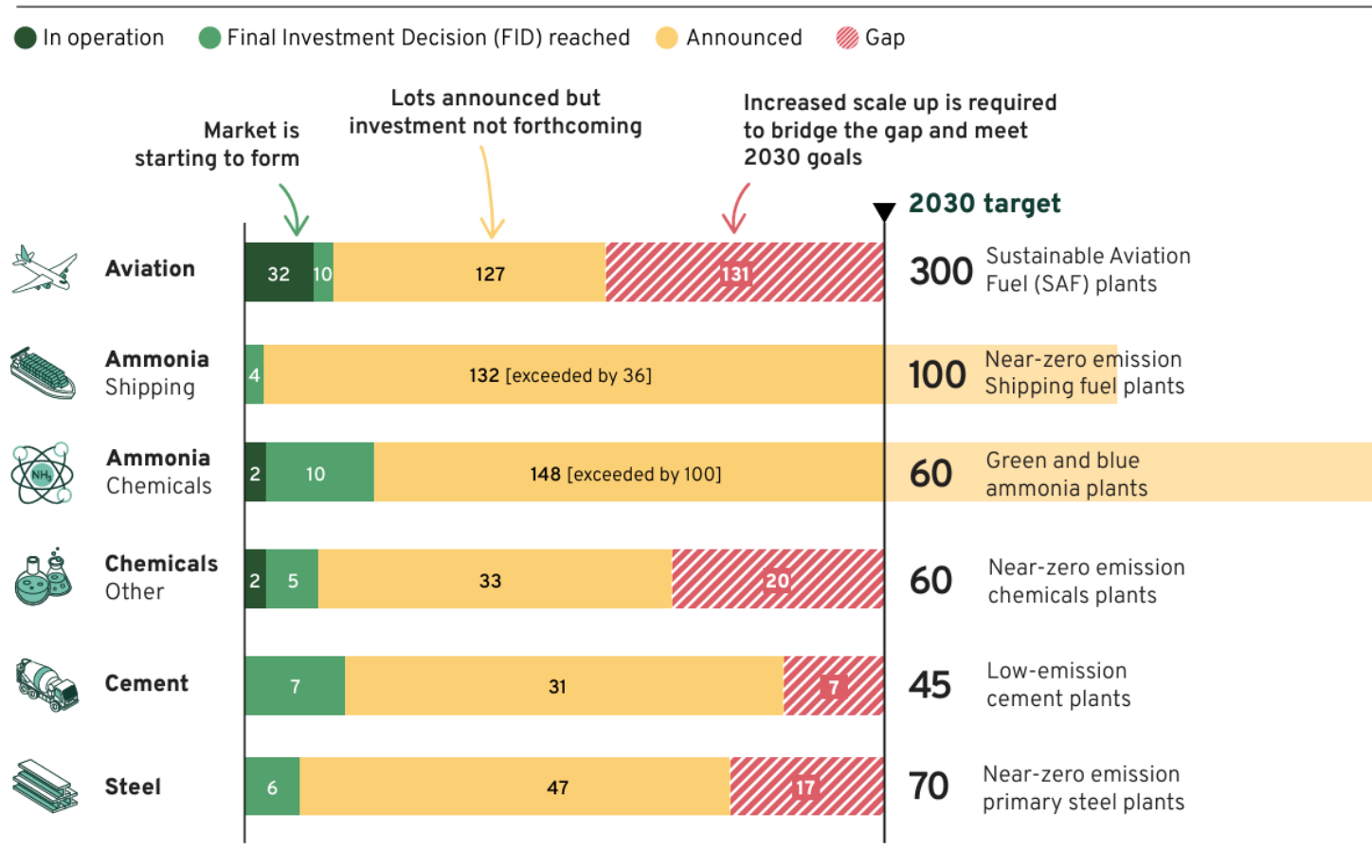


When markets reach a tipping point, market forces lead to exponential adoption thereafter.

Source: Mission Possible Partnership, 2024. Unleashing market forces to scale green industry: the role of Green Market Makers."

Greening industry is the next industrial growth opportunity: the transition is underway, but investment remains too slow

By accelerating the deployment of green industry, governments and the private sector can jointly spur industrial growth as well as support the realisation of climate ambitions.

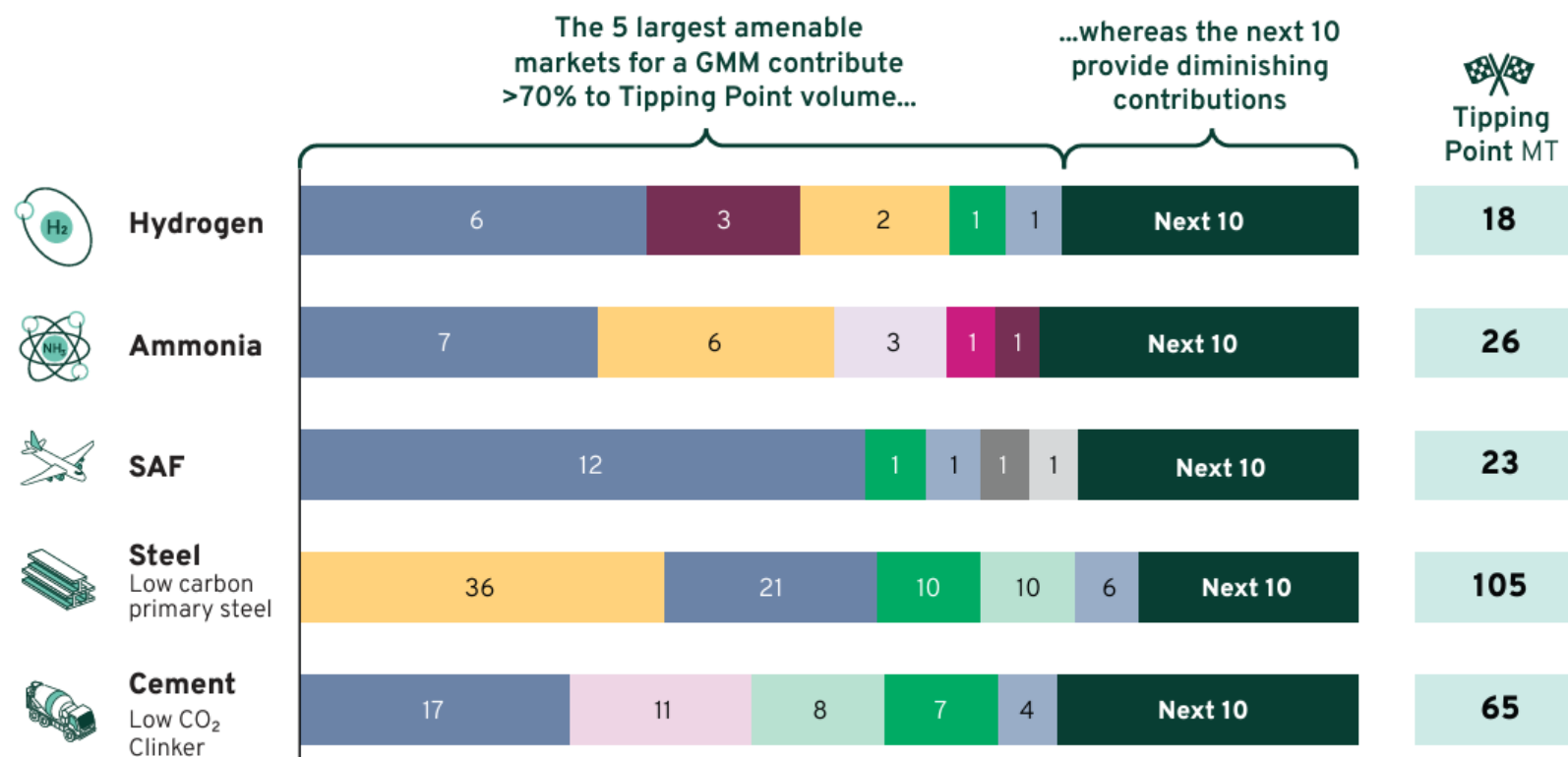


Source: Mission Possible Partnership, 2024. Unleashing market forces to scale green industry: the role of Green Market Makers."

If major geographies join forces, tipping points unlocking exponential growth in green markets can be reached faster

Low carbon demand required to achieve global tipping points of the 15 largest economies* (MT).

● US ● Japan ● Indonesia ● South Korea ● Saudi Arabia ● India ● Canada ● Germany
● Singapore ● UAE ● Next 10 economies

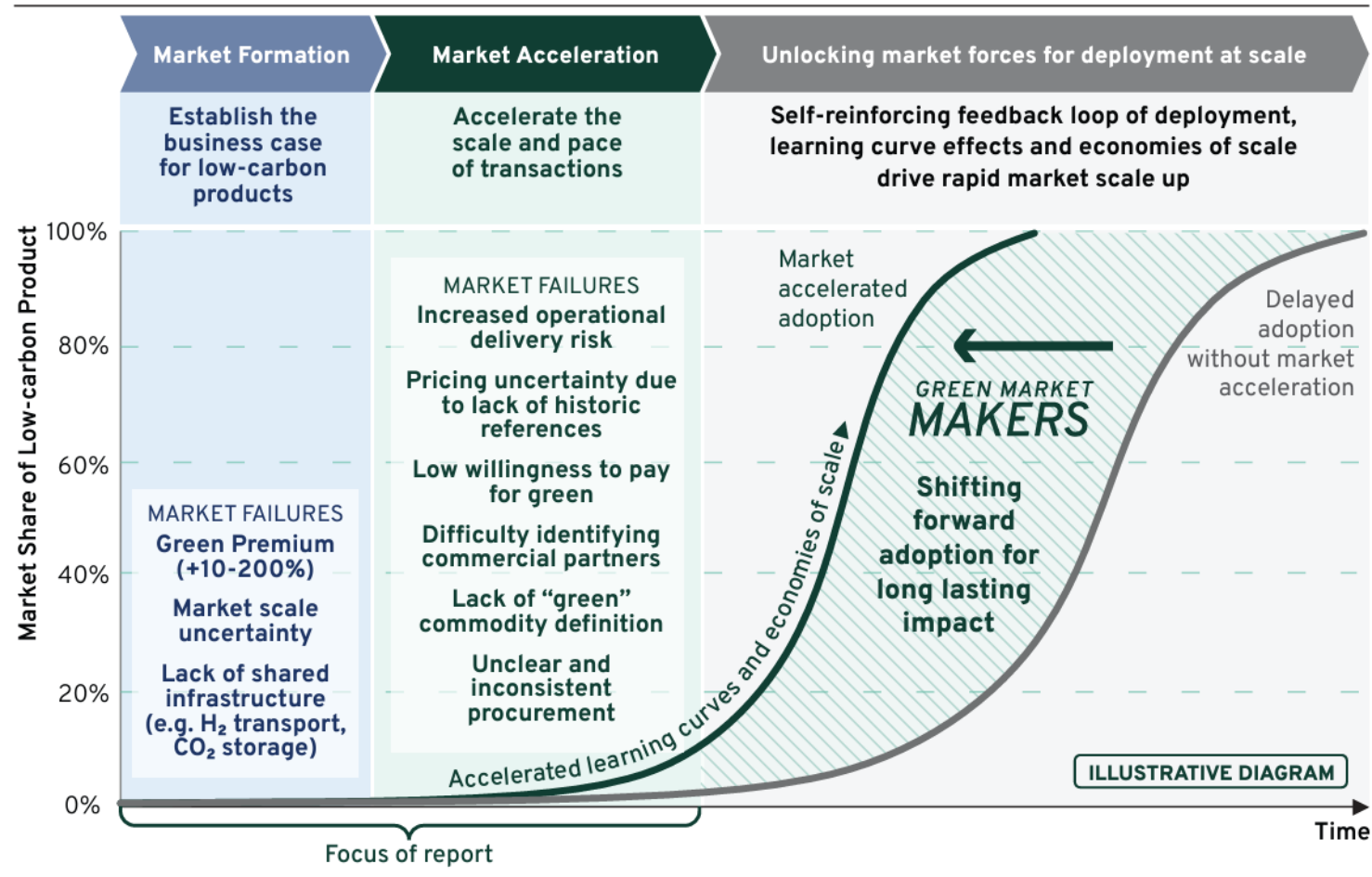


Source: Mission Possible Partnership, 2024. Unleashing market forces to scale green industry: the role of Green Market Makers."

The top 5 economies per sector can constitute the majority of the global low-emissions commodity volumes needed to hit tipping points.

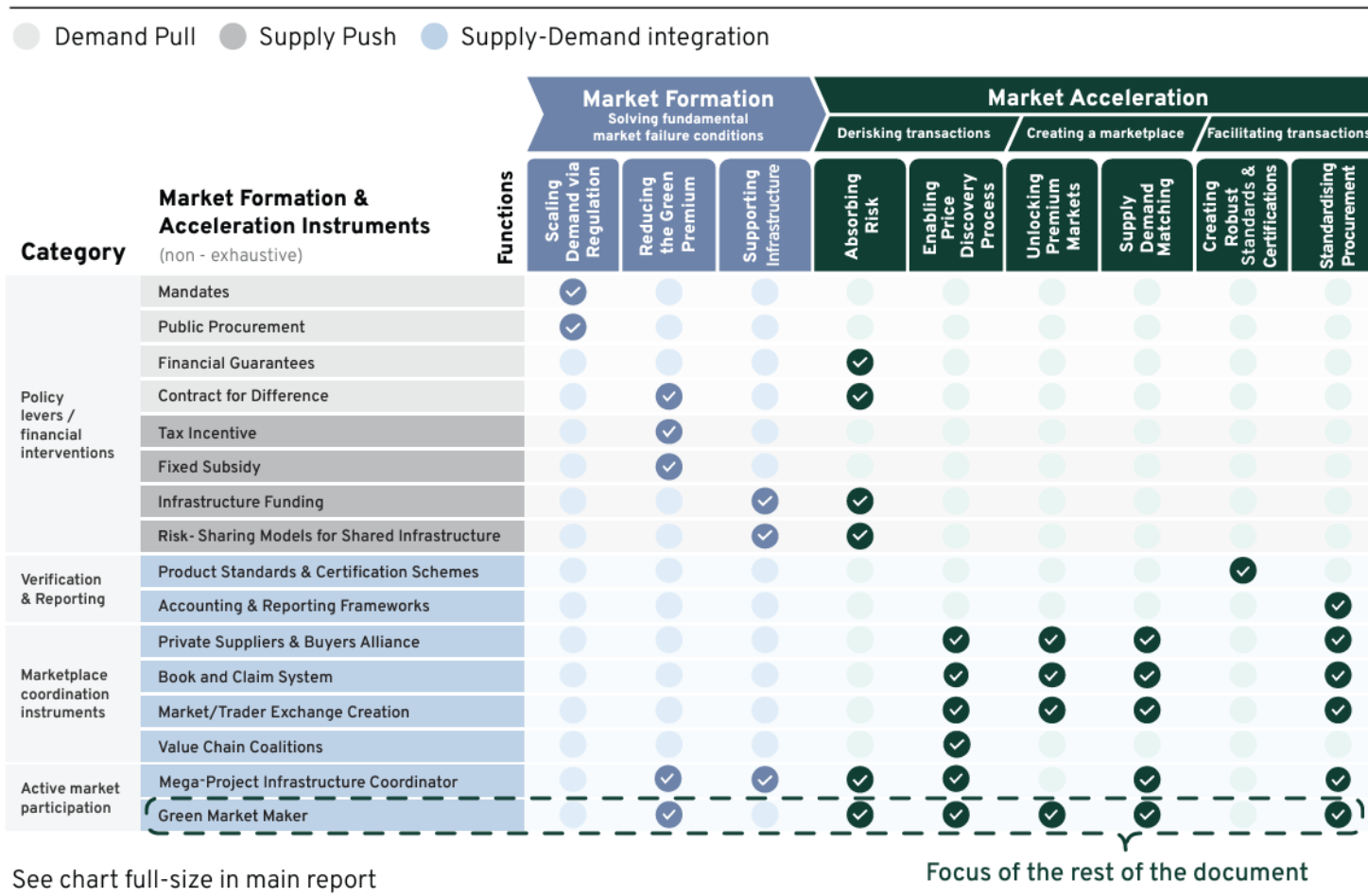
Green commodity markets are slow to scale at first. Targeted interventions can bring forward exponential growth.

The market acceleration phase occurs when the scale and pace of critical early transactions is supercharged.



Source: Mission Possible Partnership, 2024. Unleashing market forces to scale green industry: the role of Green Market Makers."

A toolbox of public policy and private sector instruments can form and accelerate green markets



GMMs work to simultaneously form and accelerate markets, bridging the green premium and facilitating transactions.

Source: Mission Possible Partnership, 2024. Unleashing market forces to scale green industry: the role of Green Market Makers."

Today, green commodity markets benefit from a rich, but fragmented landscape of market acceleration instruments

● Multiple Exist ● Single Exists ● In development (or comparable) ○ Nothing in operation ⇅ Working in conjunction

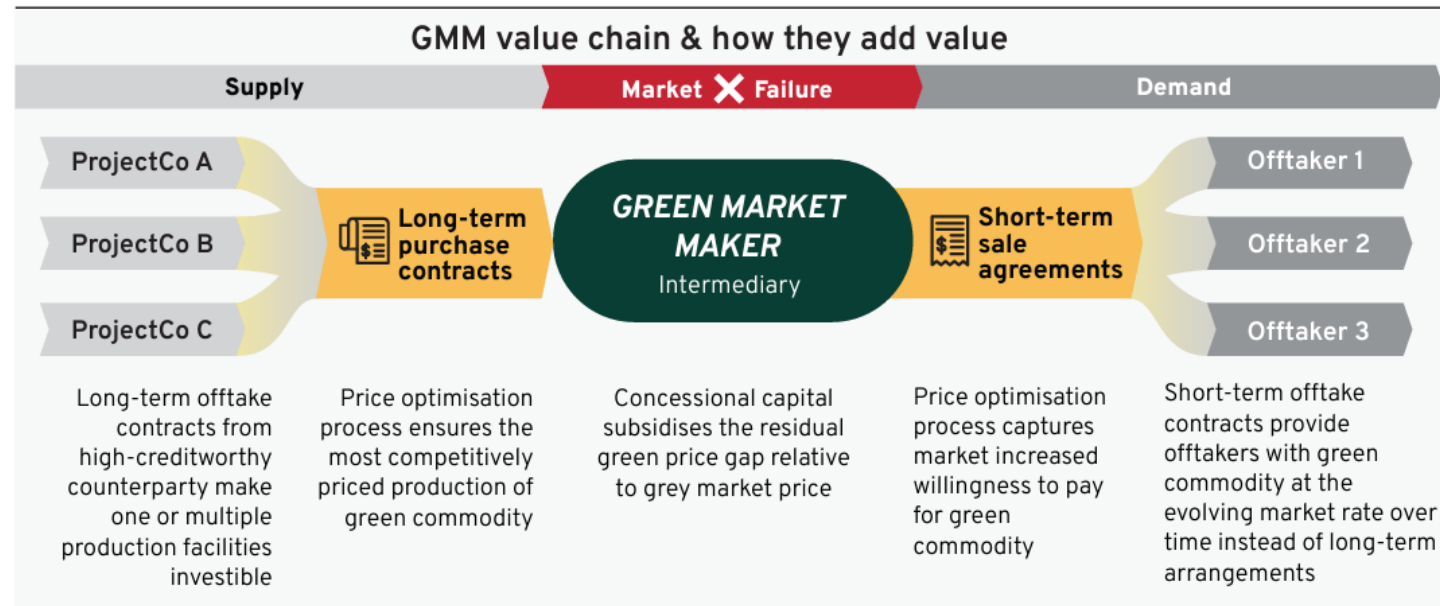
NON-EXHAUSTIVE key examples highlighted

		Hydrogen	Shipping	SAF	Steel	Cement
Corporate Enablers		SBTi sector guidance, GHG-Protocol				
Verification and Reporting	Product standards & certification schemes	Open Hydro Initiative, Green Hydrogen Organisation, CertifHy	RSB, ISCC	RSB, ISCC (CORSA, EU RED, PLUS)	Responsible Steel Standard	Concrete Sustainability Council
	Buyer Corporate Claims Guidance		RMI & MMMCZCS Maritime B&C Scheme	SAFc B&C Guidance	RMI Green Iron B&C scheme	GMA-RMI Concrete initiative
Marketplace Coordination	Value chain coalitions (buyer commitments)	Clean Hydrogen Mission	First Movers Coalition	First Movers Coalition, IATA	First Movers Coalition, SteelZero	First Movers Coalition, ConcreteZero
	Private Suppliers and Buyers Alliance	Multiple regional efforts exist	Zero Emission Maritime Buyers Alliance (ZEMBA)	Sustainable Aviation Buyers Alliance (SABA)	Sustainable Steel Buyers Platform	GMA-RMI Concrete initiative
	Book and Claim System		RMI & MMMCZCS B&C registry, RSB	SAF Certificates (e.g., SAFc registry, RSB, Fly-I)		
Active Market Participants	Green Market Makers	H2Global				

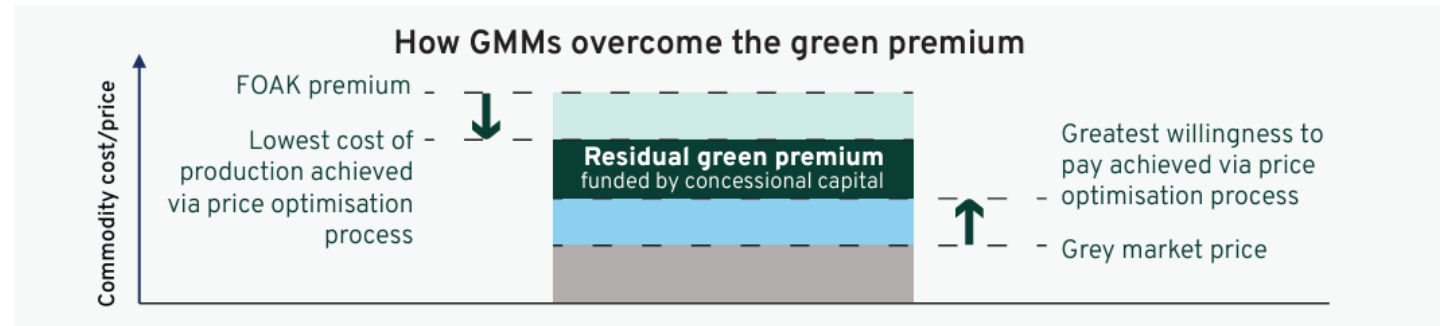
Source: Mission Possible Partnership, 2024. Unleashing market forces to scale green industry: the role of Green Market Makers."

The lack of coordination between instruments fragments the landscape, and variations in quality can also dilute impact.

A new game-changing instrument has emerged to jumpstart markets: the Green Market Maker



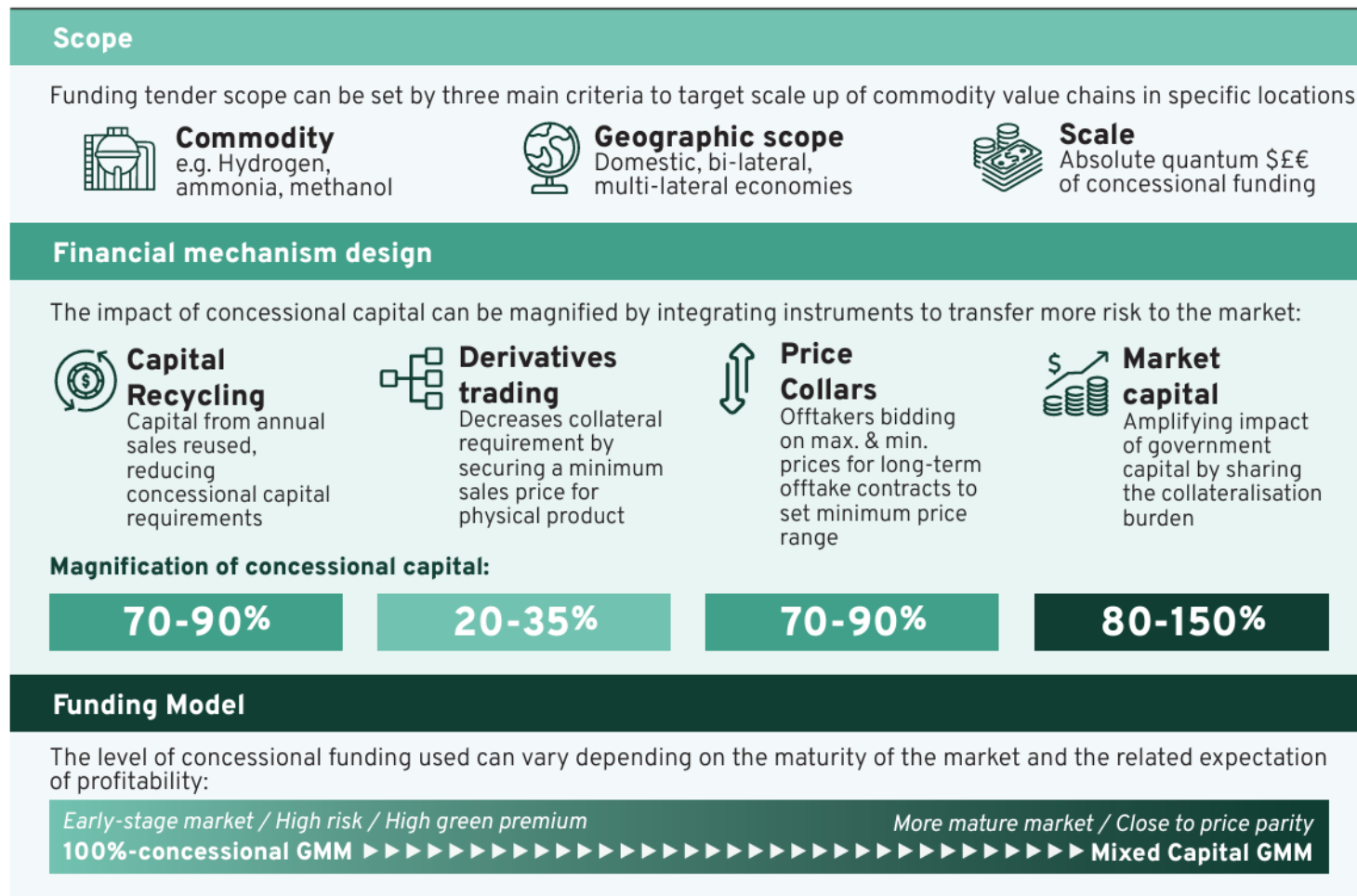
A GMM aims to bridge the 'green price gap' between sellers and buyers and to facilitate transactions.



Source: Mission Possible Partnership, 2024. Unleashing market forces to scale green industry: the role of Green Market Makers."

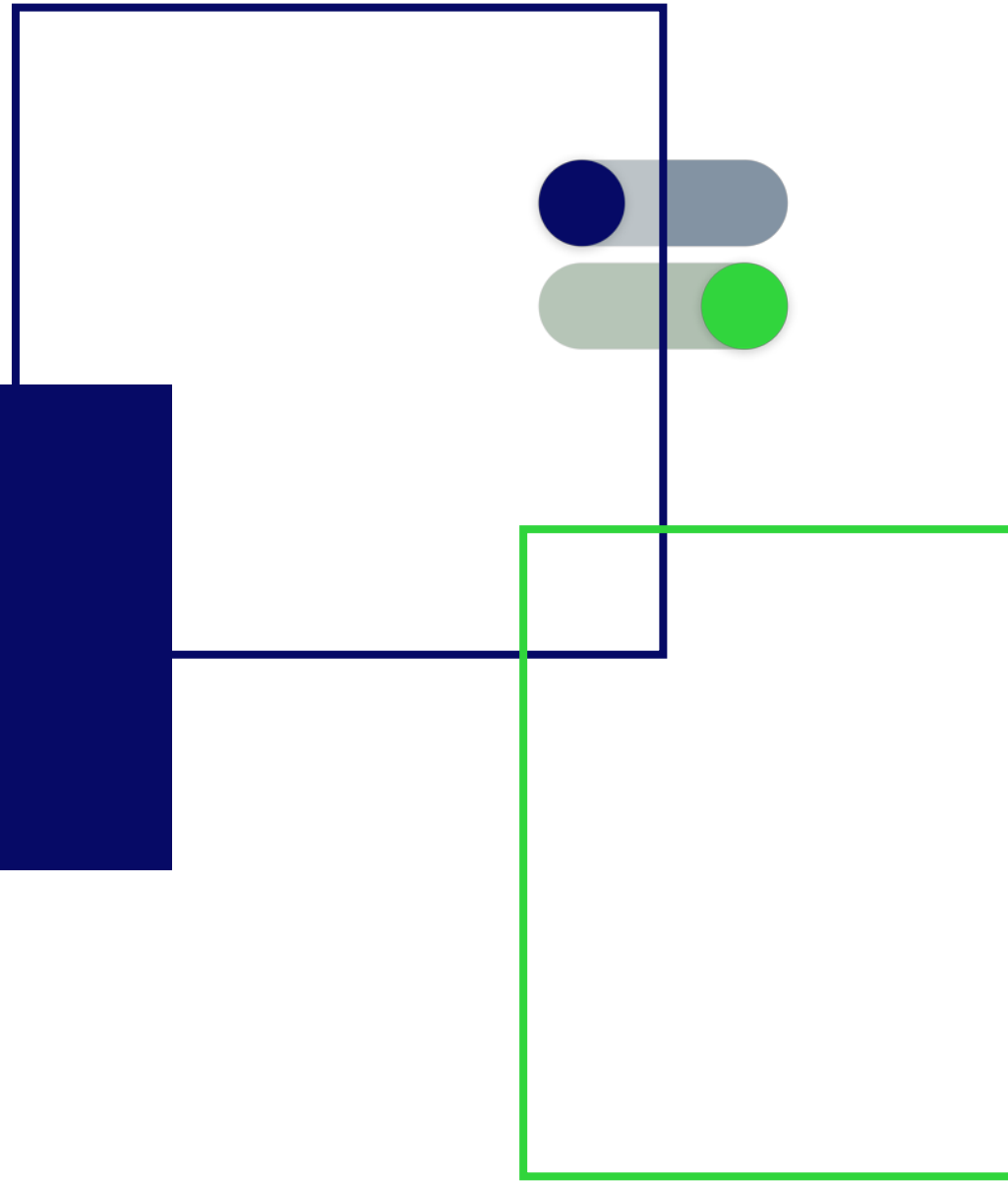
Green Market Makers are flexible in design, offering targeted support to achieve desired effects.

Each GMM tender can target a particular commodity, geographic scope, and scale, based on the priorities of the relevant government(s) or other funding entities.



Source: Mission Possible Partnership, 2024. Unleashing market forces to scale green industry: the role of Green Market Makers."

The H2Global Mechanism



H2Global's mechanism promotes timely and effective market creation for green commodities such as clean hydrogen

Key elements

Investment Security



Creating business cases and investment security.

Shifting the timing of market creation by promoting the market ramp-up until a viable low-carbon market has developed.

Defined System



Long-term purchase agreements over 10 years.

Clear definition of max. funding volume, products, geography and (sustainability) criteria by funding body.

Cost of Difference compensation



Financial compensation of Cost of Difference.

Set up of an intermediary — the **Hydrogen Intermediary Company**.



Competition



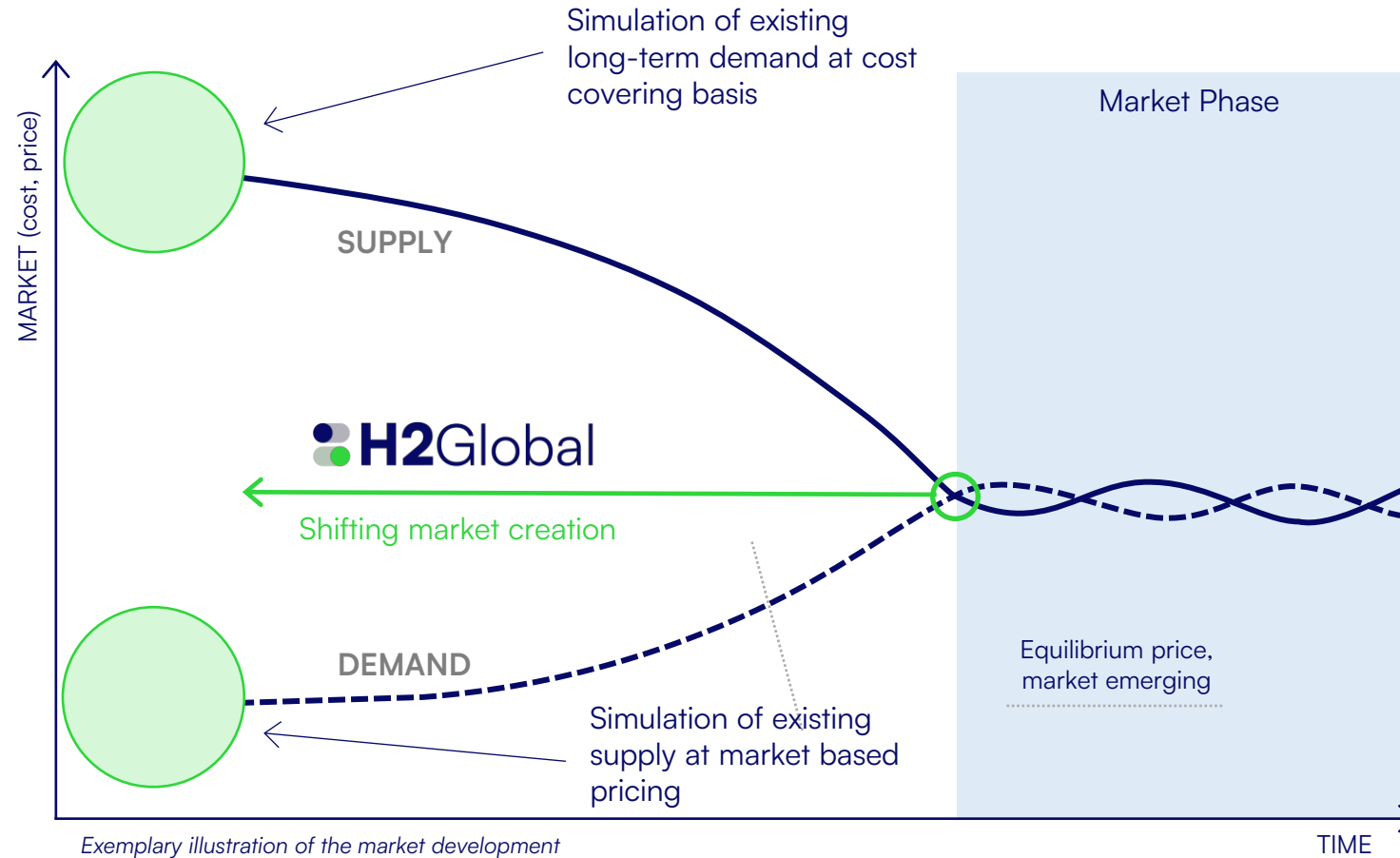
Double-auction: Market-based bidding procedures on the supply and demand side.

Minimization of the price difference to be compensated by public funds.

Market simulation has a catalytic effect and shifts market creation forward

Simulate to create

Immediate creation of simulated market on supply and demand side.



KEY INSIGHT

H2Global stands as the sole active global green market maker.

The Double-Auction Sequence

1

SUPPLY SIDE

DEMAND SIDE

2

APPR. 12MONTH PRIOR TO DATE OF DELIVERY

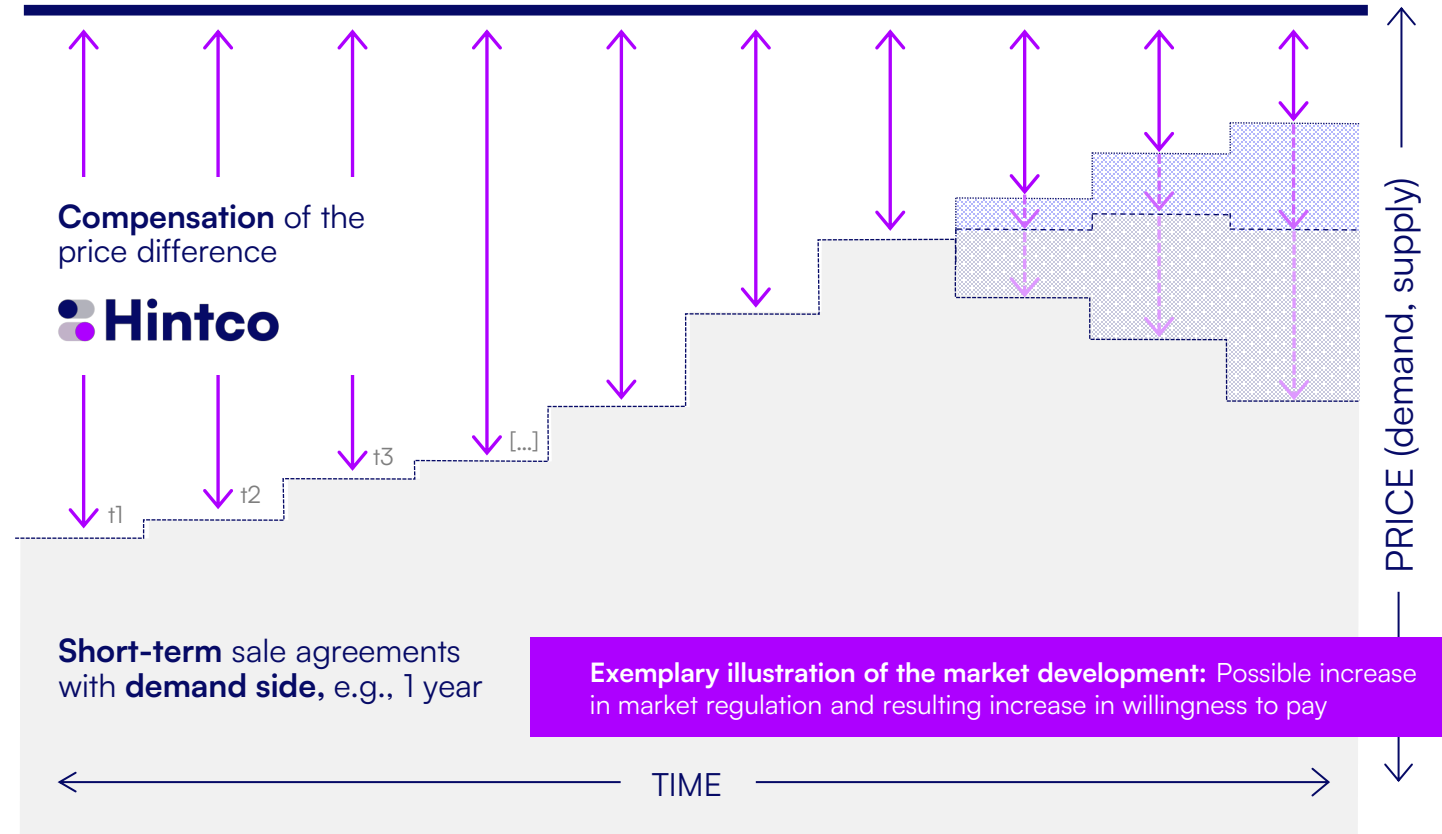


The H2Global market-driven compensation mechanism ensures the most efficient use of funds for maximum impact

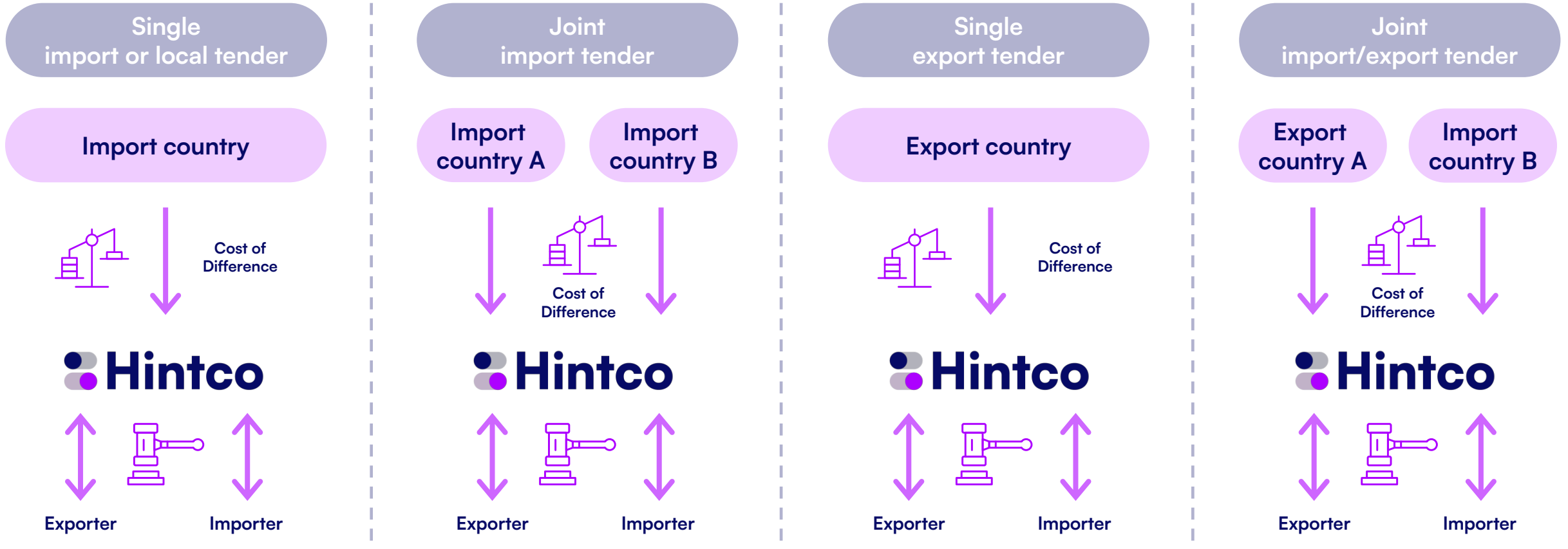
H2Global auctions uncover supplier and offtake pricing dynamics.

To create **liquidity** and support market development, **short-term** and **broad-based price signals** are **decisive**.

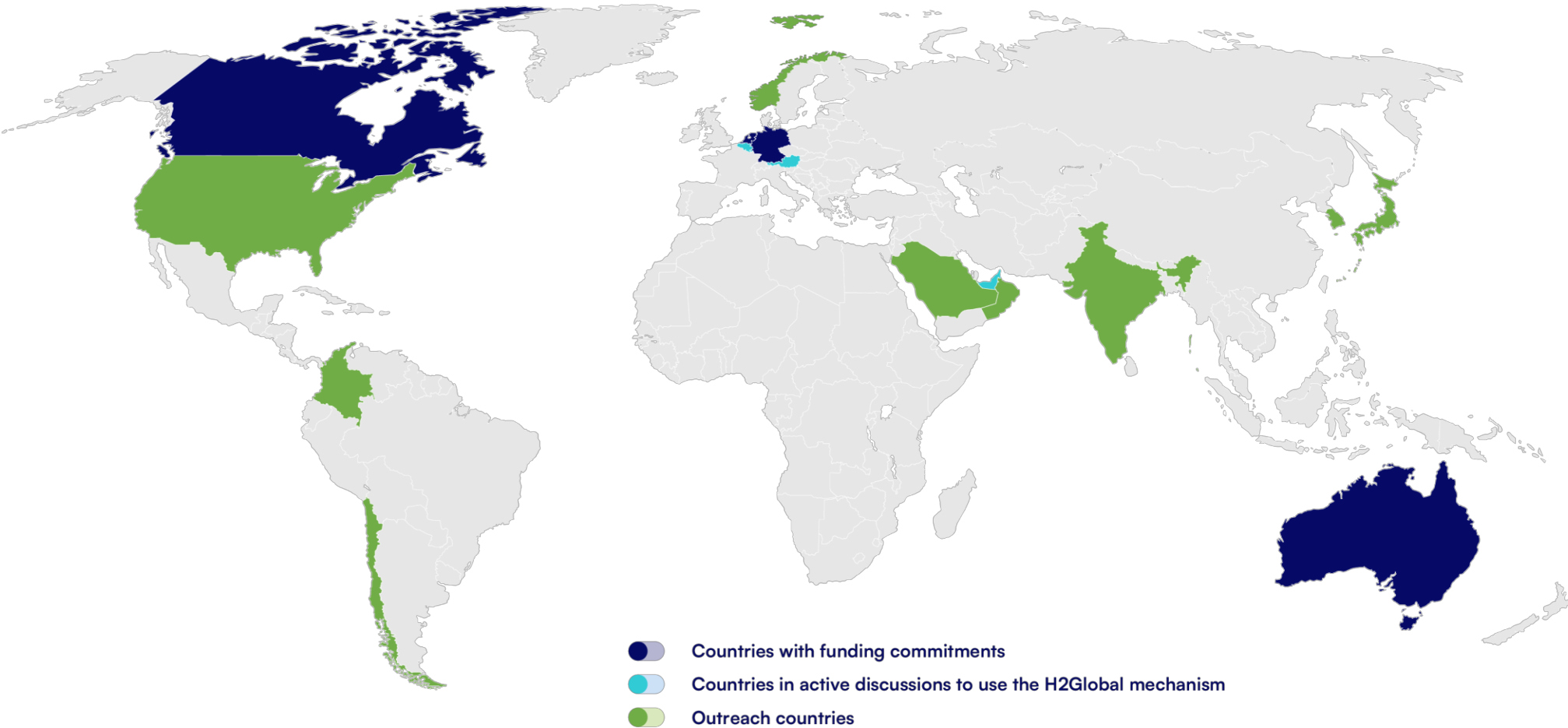
Long-term purchase agreement with **supply side**, multi-year fixed price and terms



Exporters and importers of clean hydrogen can all make use of H2Global tenders

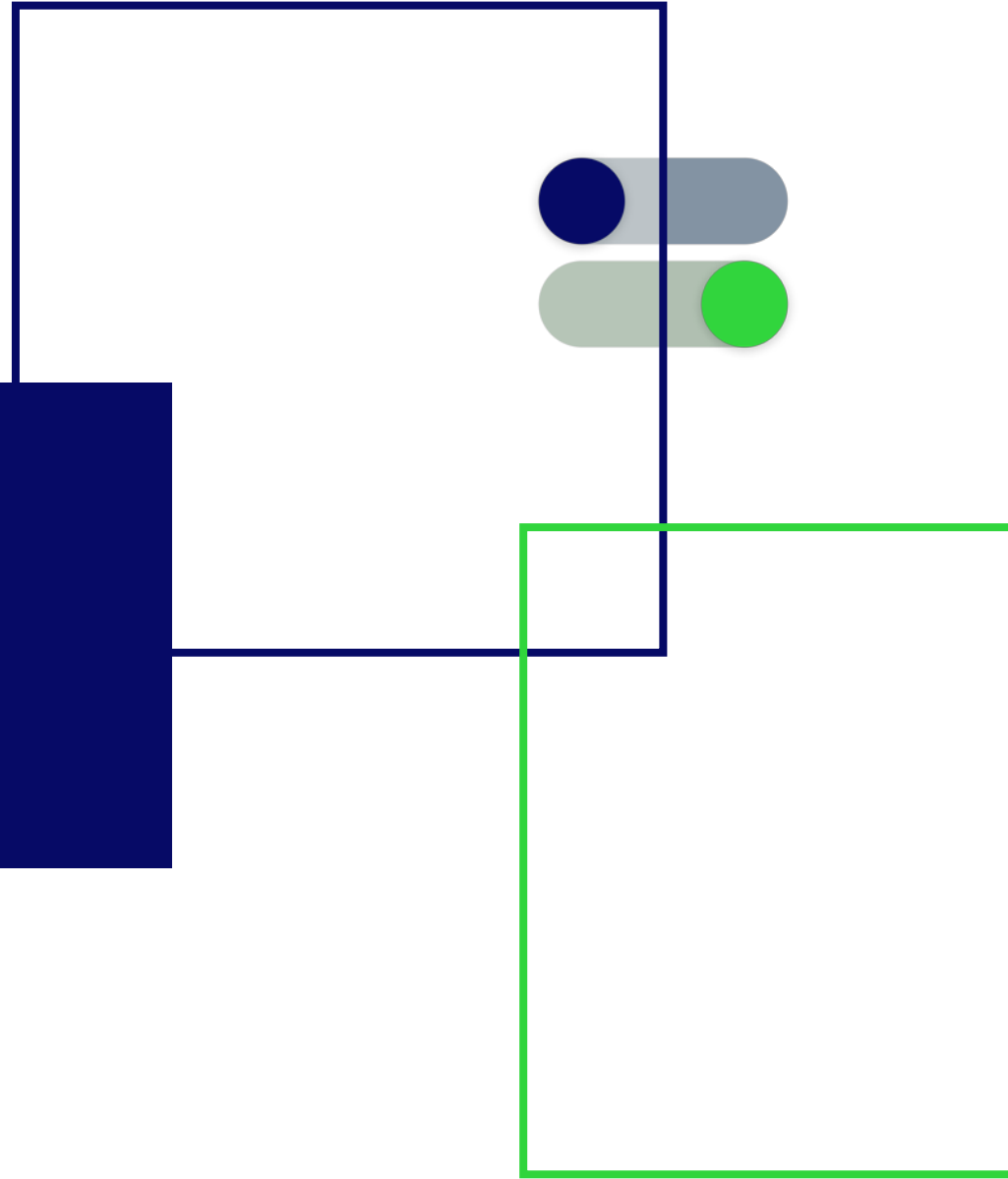


H2Global worldwide

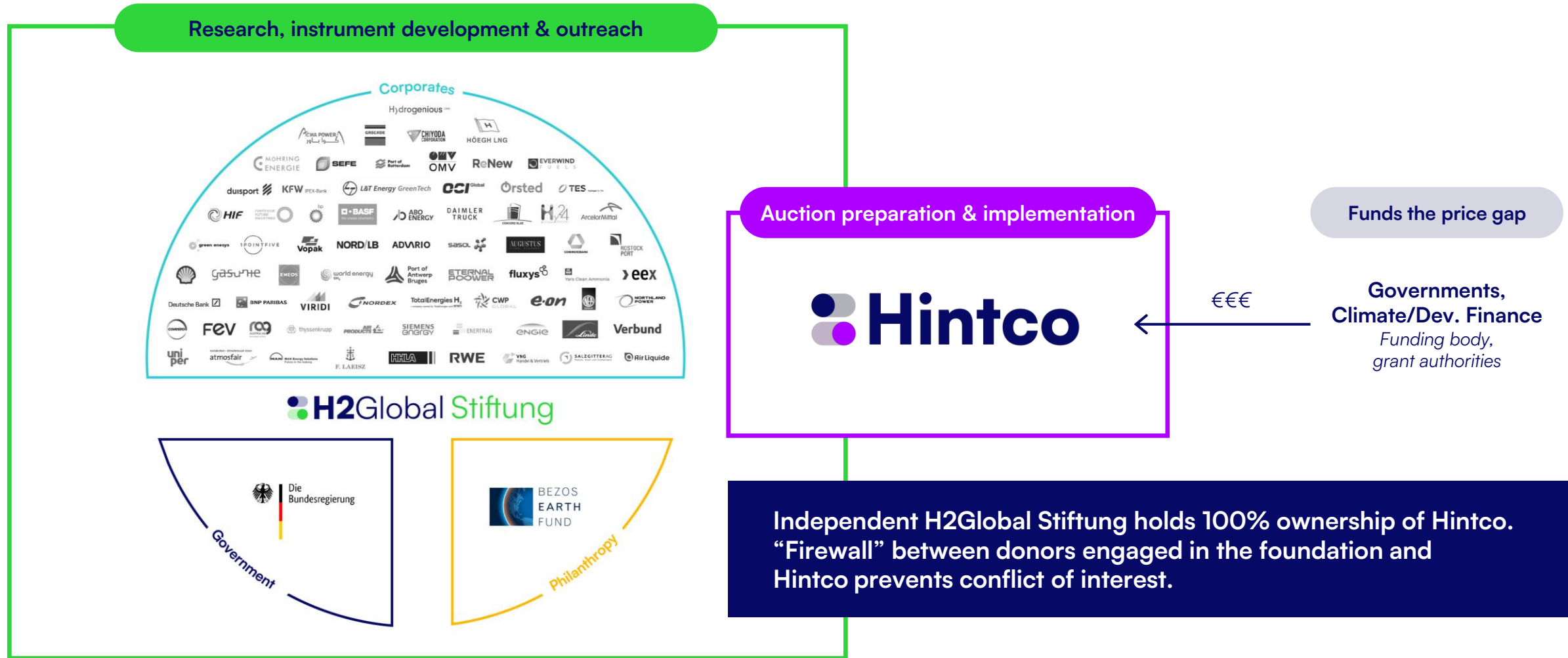


- Australia
- Austria
- Belgium
- Canada
- Chile
- Colombia
- Germany
- India
- Japan
- Luxembourg
- Netherlands
- Norway
- Oman
- Saudi Arabia
- South Korea
- UAE
- USA

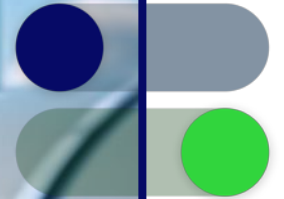
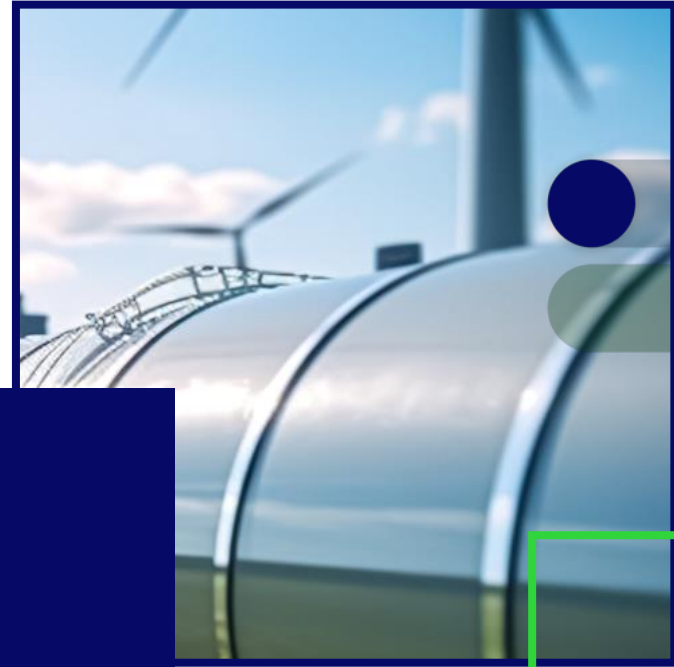
The H2Global Set-Up



A non-profit foundation with a for-profit intermediary



H2Global: Tenders and international cooperation



The H2Global mechanism is flexible and can be customized according to funders' objectives

To date, **€5.83bn billion** have been committed or earmarked for the H2Global tenders

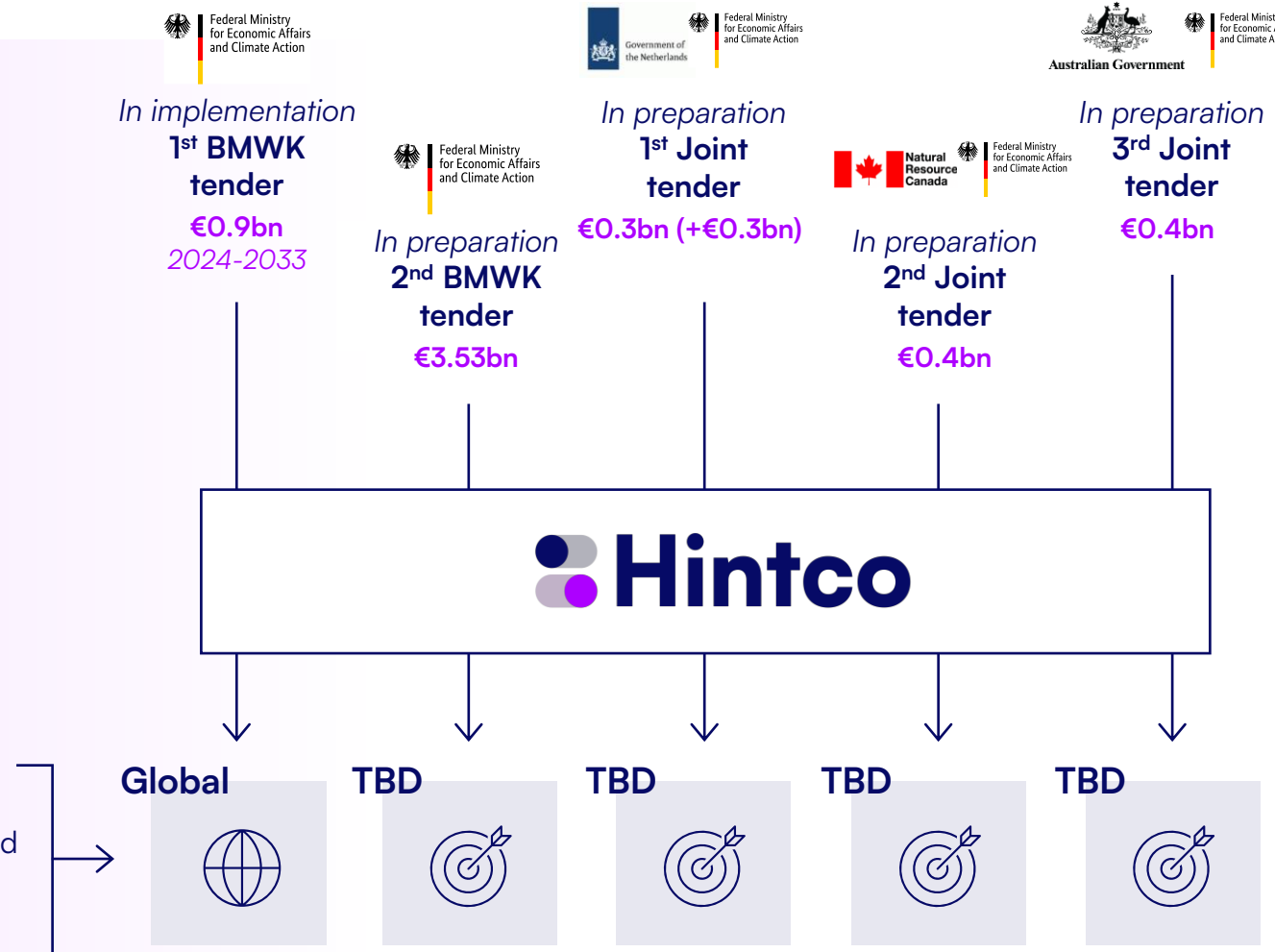
Customized regarding:

- Geography (global, regions, countries)
- H2 product selection
- Product and sustainability criteria

Adaptable to targets:

- Price optimization
- Promotion of green technologies
- Energy security
- Decarbonization of specific sectors
- Development policy

Customized tenders



Results of the first round of auctions: Lot 1 — Renewable Ammonia



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

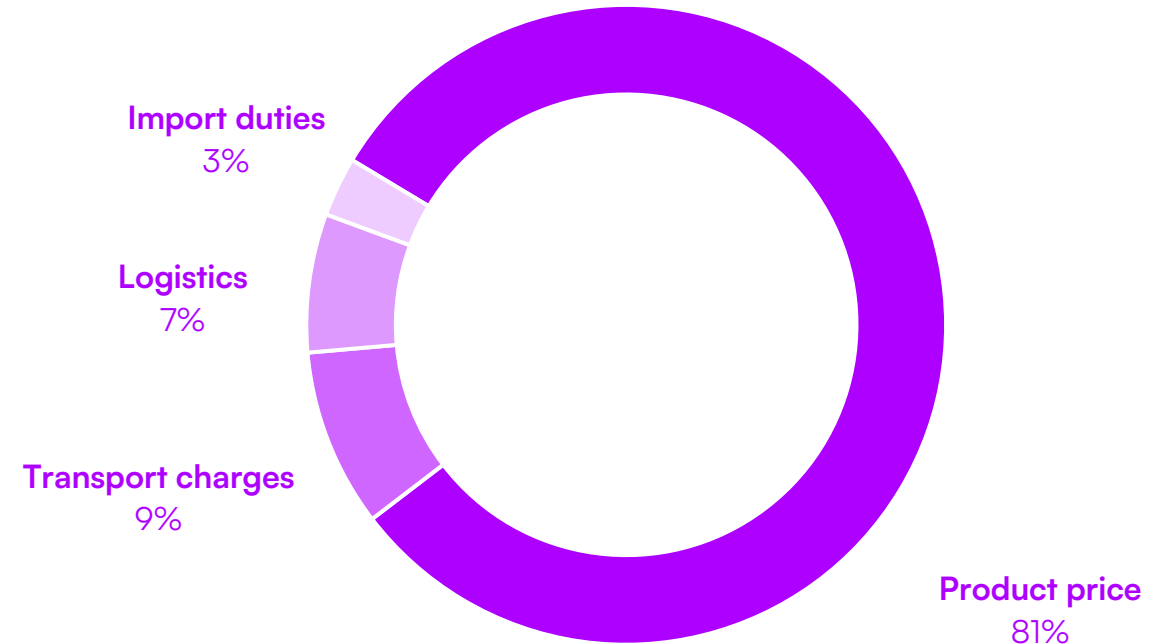


Lot 1
Renewable ammonia

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

81%

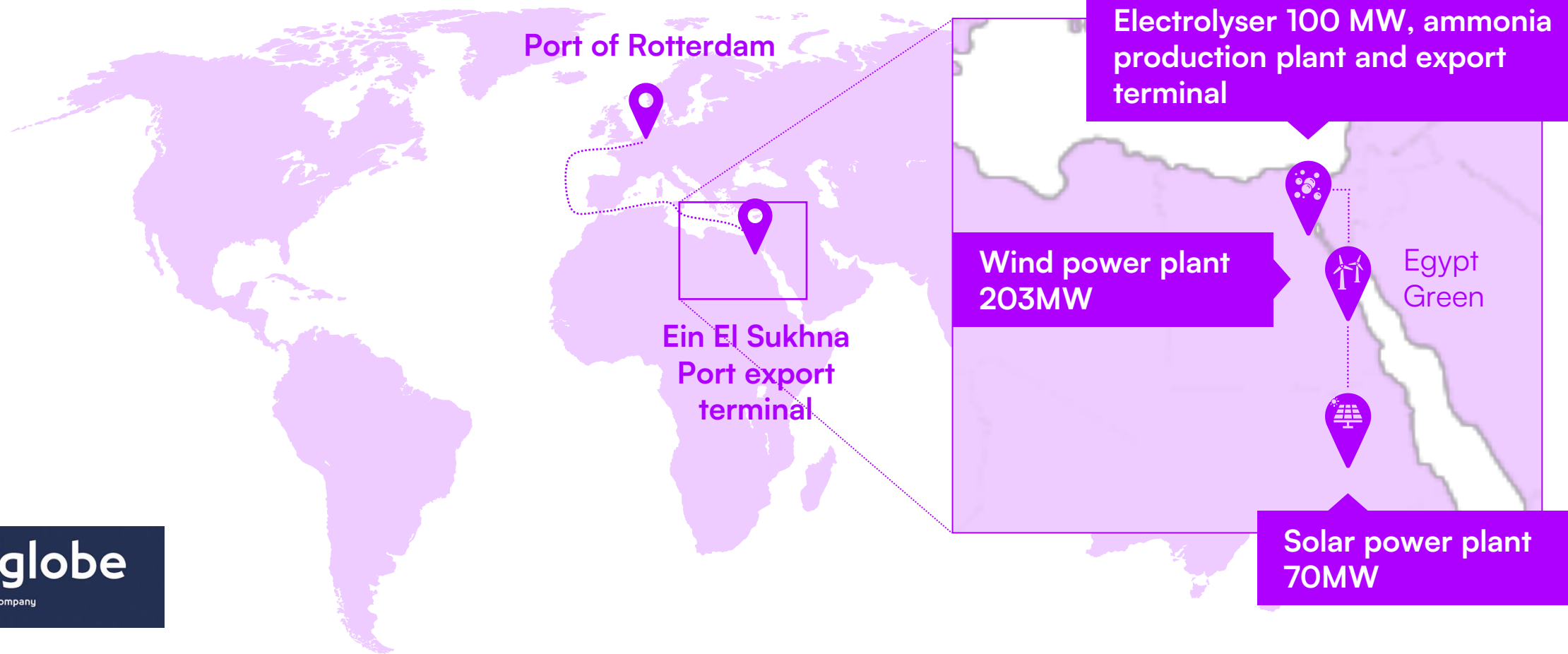
On average the net product price contributes 81% of the contract price



HPA — Winning Bidder — Fertiglobe — Egypt Green



Lot 1
Renewable ammonia



Renewable Ammonia Output / Offtake



Lot 1
Renewable ammonia



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

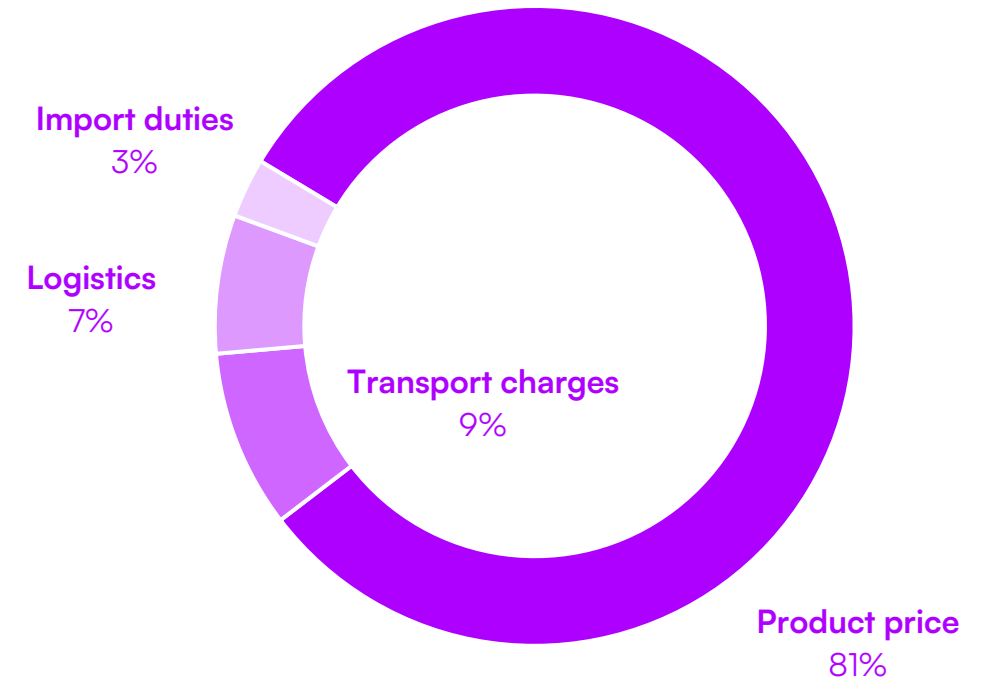
(ex-factory) net product price

37%

lower than the bid cap

TOTAL 1,000 €/t

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



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.

H2Global's 2nd tender EUR 3.53bn + EUR 0.3bn in preparation

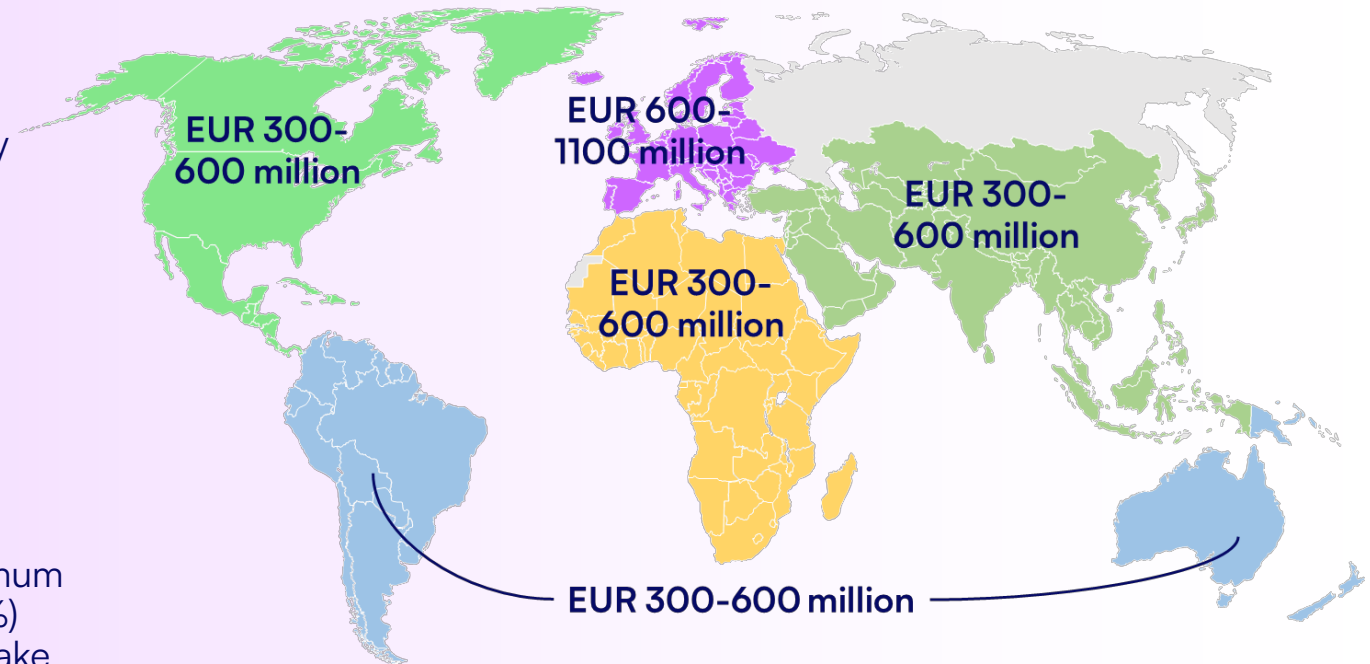
Objectives of tender*

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

Design*

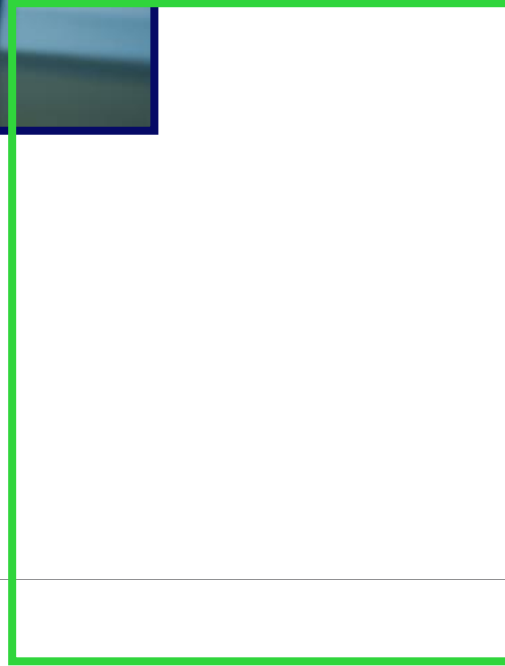
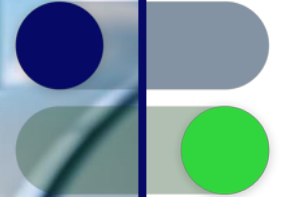
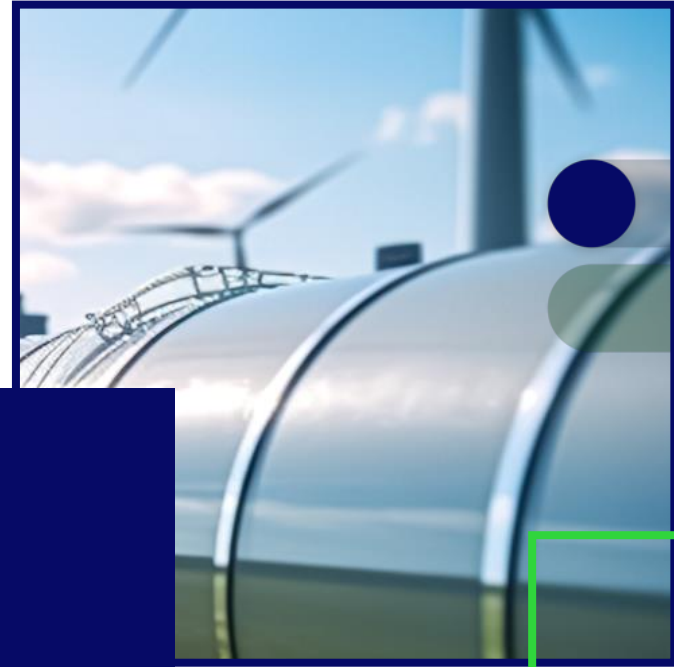
- Application of RFNBO criteria of RED II and Delegated Acts
- Vector-open or product-open design
- Point of first delivery: GER or NL
- HPA:
 - 10 years (2026-2036)
 - fixed price
 - awarded by price per ton or energy (70%) and maximum volume or basic volume plus optional quantities (30%)
 - Marginal 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.

H2Global & shipping



Shipping: Climate impact and targets

80%

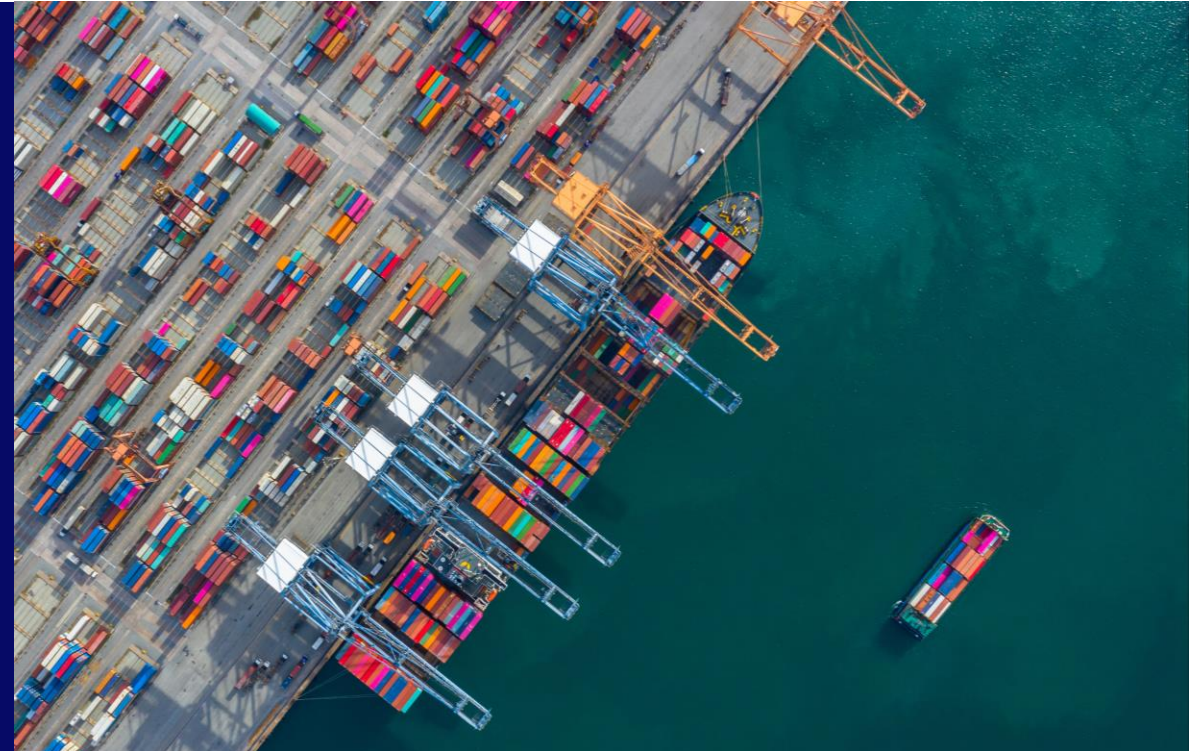
Today, more than 80% of the world's traded goods travel by ship

2-3%

Maritime transport accounts for 2-3% of GHG emissions.

40%

IMO aims to fully decarbonize international shipping by 2050, reduce carbon intensity of international shipping by at least 40% by 2030.



+ CBAM, ECAs and EU ETS create additional regulatory pressure to decarbonize

Key barriers to scaling zero-emission fuel supply

Fuelling the Future of Shipping:
Key Barriers to Scaling Zero-Emission Fuel Supply



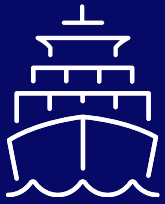
Ten key barriers across five categories surfaced in 1:1s and live roundtable discussions with stakeholders across the shipping value chain

Customer and consumer demand	<ol style="list-style-type: none"> 1 Lack of clear demand signals with sufficient willingness to pay: Methanol uptake volumes in dual-fuel ships remain uncertain. Companies struggle to absorb green premiums alone 2 Expectations gap between fuel producers and carriers on terms of offtake agreements: Friction on length (long term vs. spot), volume (how much) and price (what premiums are acceptable)
Economics and finance	<ol style="list-style-type: none"> 3 Lack of credible third-party cost estimates: Makes it difficult for financiers and offtakers to assess investments and contract options for different zero-emission fuel pathways 4 Lack of fit-for-purpose financing instruments: Time horizons and risk appetite of existing financing options not suitable, e.g. PE fund life too short, infrastructure funds come in too late, insufficient pre-FID funding
Regulatory issues	<ol style="list-style-type: none"> 5 Lack of strong near- to mid-term mandates or a global price on carbon: Policies emerging (e.g. EU, IMO) but need geographically reciprocal regulations to set a demand-side price and volume floor 6 Lack of standard definitions, methods and certifications: Hinders contracting terms, e.g. what defines "green"; how to measure, track and report emissions; how to assure quality
Supply chain and infrastructure enablers	<ol style="list-style-type: none"> 7 Methanol- and ammonia-specific risks: Access to biogenic CO₂ for methanol, especially in locations close to cheap renewables, is getting tougher. Safety, especially for use as a marine fuel and handling at ports, is the biggest barrier for ammonia 8 Competition and lack of alignment with other sectors: Shipping competing against vs. collaborating with chemicals for methanol, fertilizers for ammonia and more broadly across sectors for H₂ and CO₂ 9 Zero-emission fuels infrastructure gap: Uncertainties on responsibility for last-mile logistics. Physical gap between promising e-fuel locations and major ports — the infrastructure still needs to be expanded
Organizational factors	<ol style="list-style-type: none"> 10 Decision-making and risk appetite are limited by gaps in expertise: Decarbonization decisions and P&L do not always sit with the same team, creating friction and requiring new ways of working together within companies

Source: Interviews with maritime decarbonization decision-makers from private-sector companies along the value chain; London International Shipping Week roundtable

- 1 Lack of clear demand signals with sufficient willingness to pay:** Methanol uptake volumes in dual-fuel ships remain uncertain. Companies struggle to absorb green premiums alone
- 2 Expectations gap between fuel producers and carriers on terms of offtake agreements:** Friction on length (long term vs. spot), volume (how much) and price (what premiums are acceptable)
- 3 Lack of credible third-party cost estimates:** Makes it difficult for financiers and offtakers to assess investments and contract options for different zero-emission fuel pathways

Actions underway to scale zero-emission fuel supply



Public-private demand aggregation to drive offtake agreements (ZEMBA)



Integrators pulling the supply chain together to accelerate action (e.g. MMC, Green corridors)

More than 50 announced green shipping corridor initiatives



H2Global: Creating Fit for Purpose Tenders — Shipping Edition



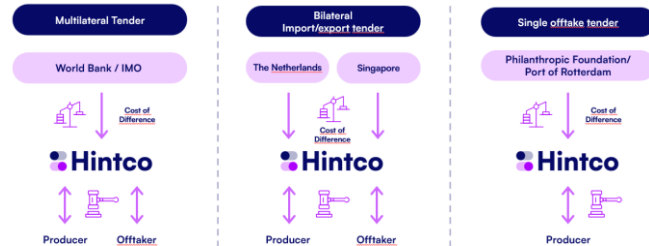
Potential tender design options for clean shipping fuels

Key components

Funding Allocation

Funding for differential cost in a Green Corridor can be provided by **multilateral funding, the host countries of the involved ports, or a combination of the ports and philanthropies** interested in clean shipping.

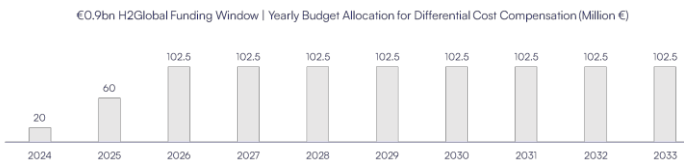
For tenders with multiple countries involved, countries may decide to split the budget evenly or not.



Duration

H2Global tenders typically have a funding period of **10 years on the supply side. Demand side contracts are short-term**, fitting volatile and price-sensitive offtake from **dual-fuel ships**.

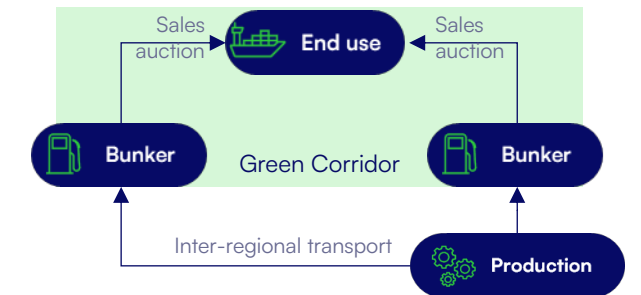
Hintco can annually seek the required funds from funders, and these funds are distributed gradually over the funding period, or funds can be provided as a single lump sum upfront.



Geographical Focus

For Green Corridors, the geographical origin of hydrogen products is best defined as **global**.

The target for deliveries in Green Corridors would be defined as either of the **two ports** on the end of the green corridor.



Product Selection

Joint decision on the specifics of the funding window in terms of the targeted hydrogen product(s).

Options in the shipping sector target clean shipping fuels, including **clean ammonia, clean methanol or e-methane**. Funders may choose to focus on one clean fuel type per lot.

Sustainability Criteria

For the tenders, countries need to specify emission thresholds and/or eligible production technologies, in line with relevant regulations.

Additionally, **funders may want to include other environmental and social sustainability criteria** in their tender.



For more information on **Hintco's website**



For more information on **H2Global's website**



To stay informed about **Hintco's tenders**



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