Shaping the global energy transition

H2Global: Bringing the clean H2 market to fruition

February 2026

H2Global

Market creation first, then market ramp up

Market failures

High market spread	High green premium and low willingness-to-pay
Low liquidity	Limited number of transactions, large volumes only
No price transparency	No clear pricing signal on supply or demand side
Legal insecurity	Insecurity around regulation and certification schemes
High market barriers	High investment costs and complex project design

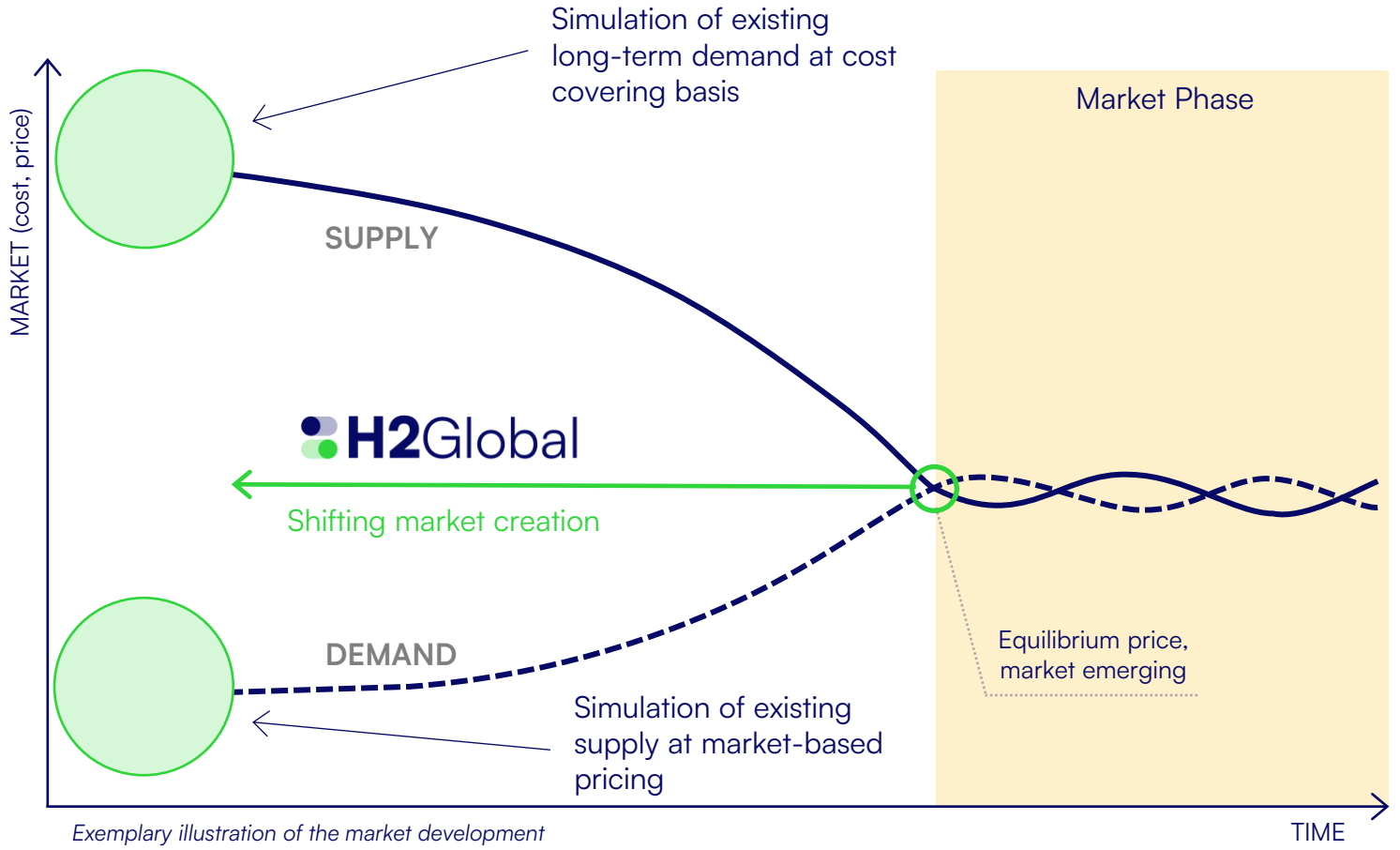
KEY TAKEAWAY

Clean hydrogen markets are nascent. To meet climate targets, we need to accelerate their creation.

Market simulation has a catalytic effect, shifting market creation forward

Simulate to create

Immediate creation of **simulated market** on **supply** and **demand side.**



Exemplary illustration of the market development

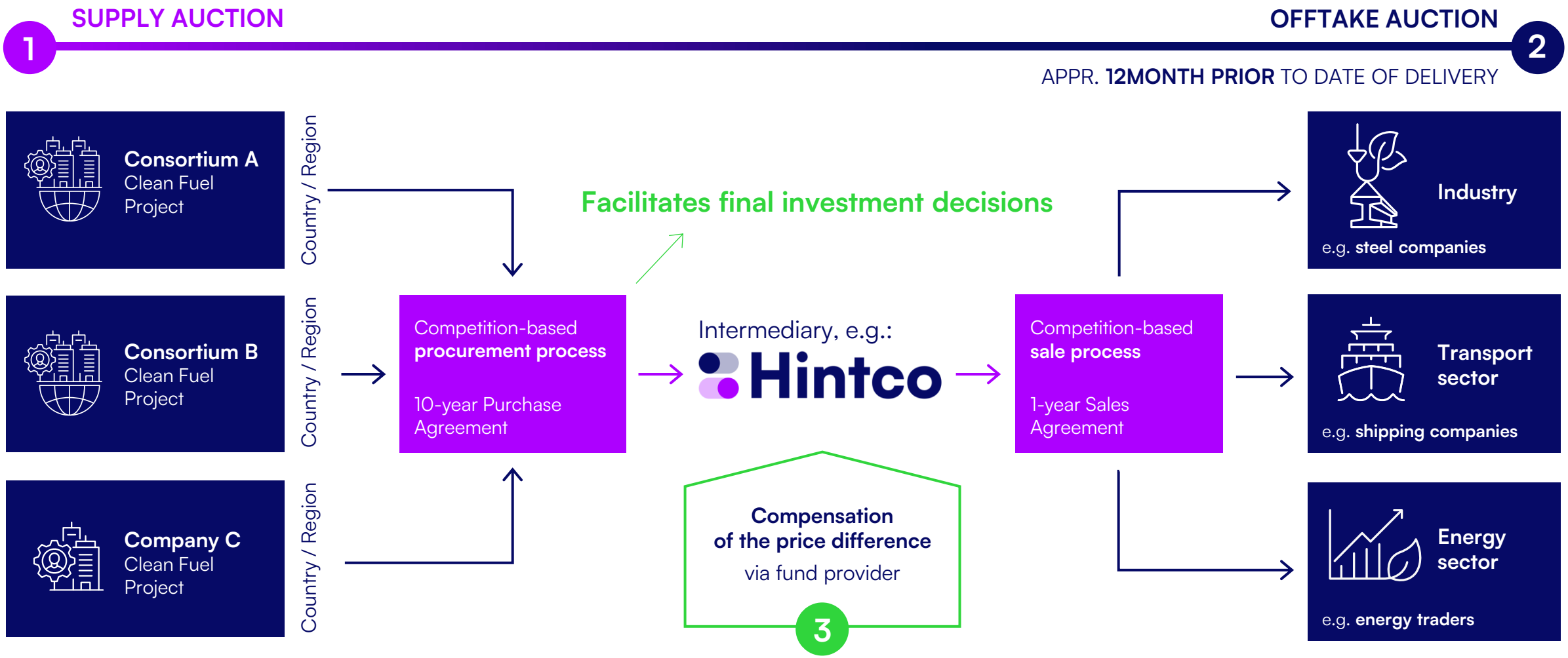
KEY INSIGHT

H2Global stands as the sole active global green market maker.

The H2Global **Mechanism**

H2Global

Our solution — The H2Global's double auction mechanism in a nutshell

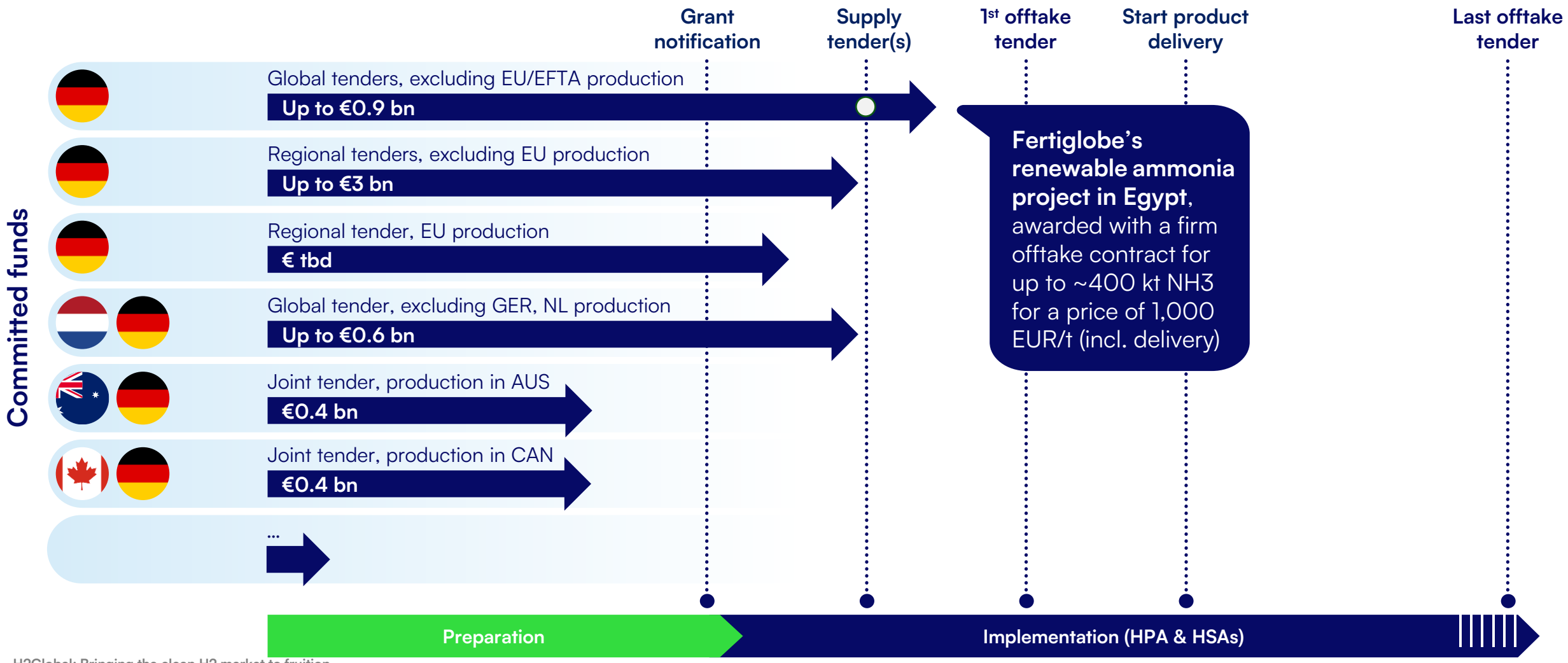


H2Global

H2Global: Tenders and international cooperation

H2Global

H2Global Hintco tenders' progress



H2Global

The H2Global **Set-Up**

H2Global

A non-profit foundation with a for-profit intermediary

Research, instrument development, outreach & networking

Corporate donors

Die Bundesregierung

BEZOS EARTH FUND

Government grantor — **Philanthropic grantor**

H2Global Stiftung

Independent H2Global Stiftung holds 100% ownership of Hintco. The "firewall" between donors engaged in the foundation and Hintco prevents conflict of interest.

Auction preparation & implementation

Hintco

€€€

Funds the price gap

Governments, Climate/Dev. Finance
Funding body, grant authorities

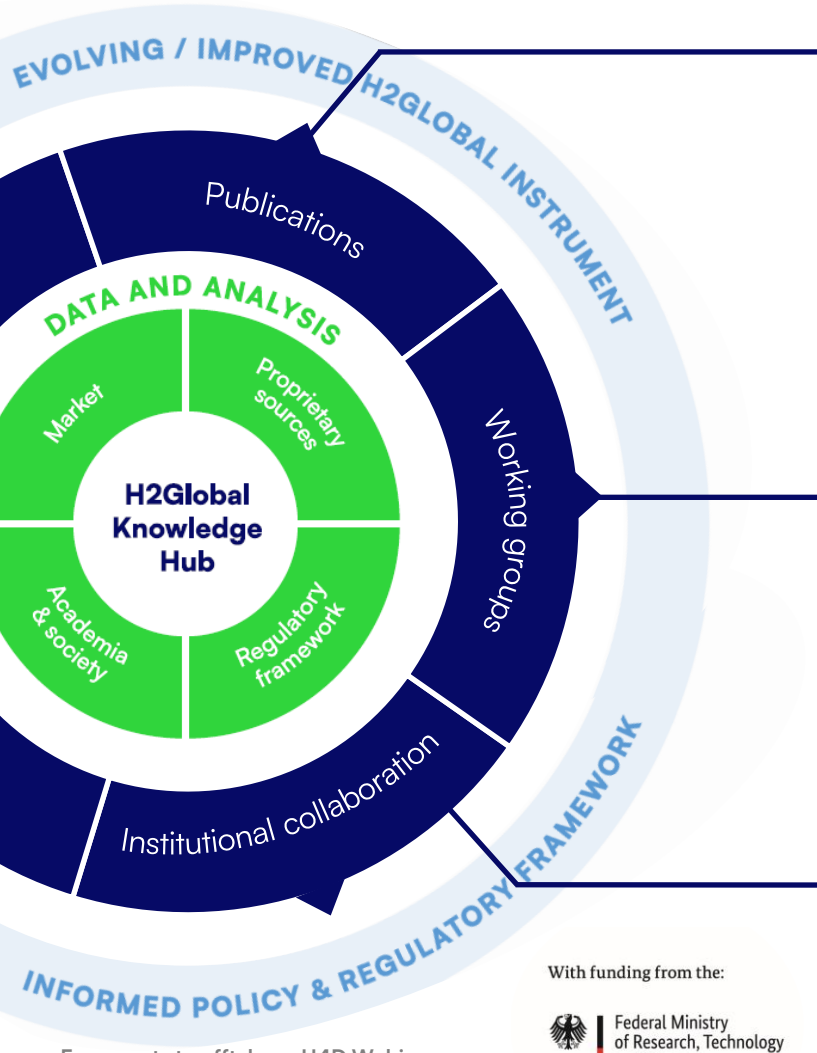
H2Global

From ports to offtakers
Scaling last-mile hydrogen infrastructure

Hydrogen for Development (H4D) webinar
February 2026

H2Global

This report is part of the H2Global Knowledge Hub



THREE PUBLICATIONS IN 2025

- Shoring up demand: Identifying effective instruments that support clean hydrogen demand build-up
- Matter of trust: Securing a Social License to operate for clean hydrogen projects
- **From ports to offtakers: Scaling last-mile hydrogen infrastructure**

CONTRIBUTION OF INDUSTRY EXPERTS COVERING THE WHOLE HYDROGEN VALUE CHAIN

- Regular virtual knowledge exchanges and in-person workshops
- Representation from finance, supply, infrastructure, demand, and manufacturing

COLLABORATION WITH KNOWLEDGE PARTNERS FROM:

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

With funding from the:
Federal Ministry of Research, Technology and Space

H2Global

Agenda

1 Challenge

- Delivering hydrogen and its derivatives from ports to offtakers

2 Infrastructure overview

- Technology readiness level
- Infrastructure availability

3 Gap analysis

- Contrasting future hydrogen import demand with available infrastructure

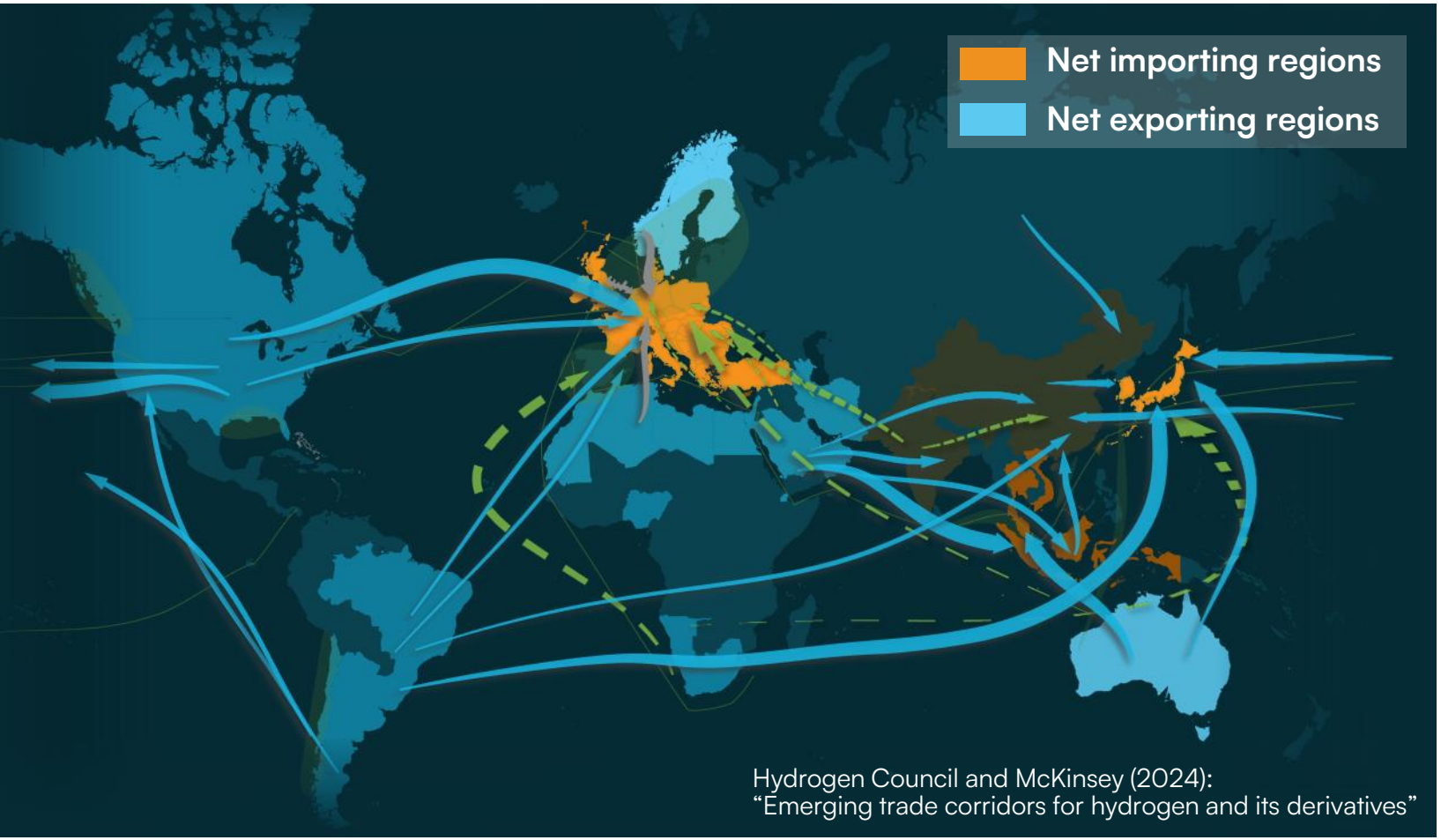
4 Recommendations

H2Global

The challenge

H2Global

The challenge: delivering H2 & derivatives from ports to offtakers



Hydrogen Council and McKinsey (2024):
“Emerging trade corridors for hydrogen and its derivatives”

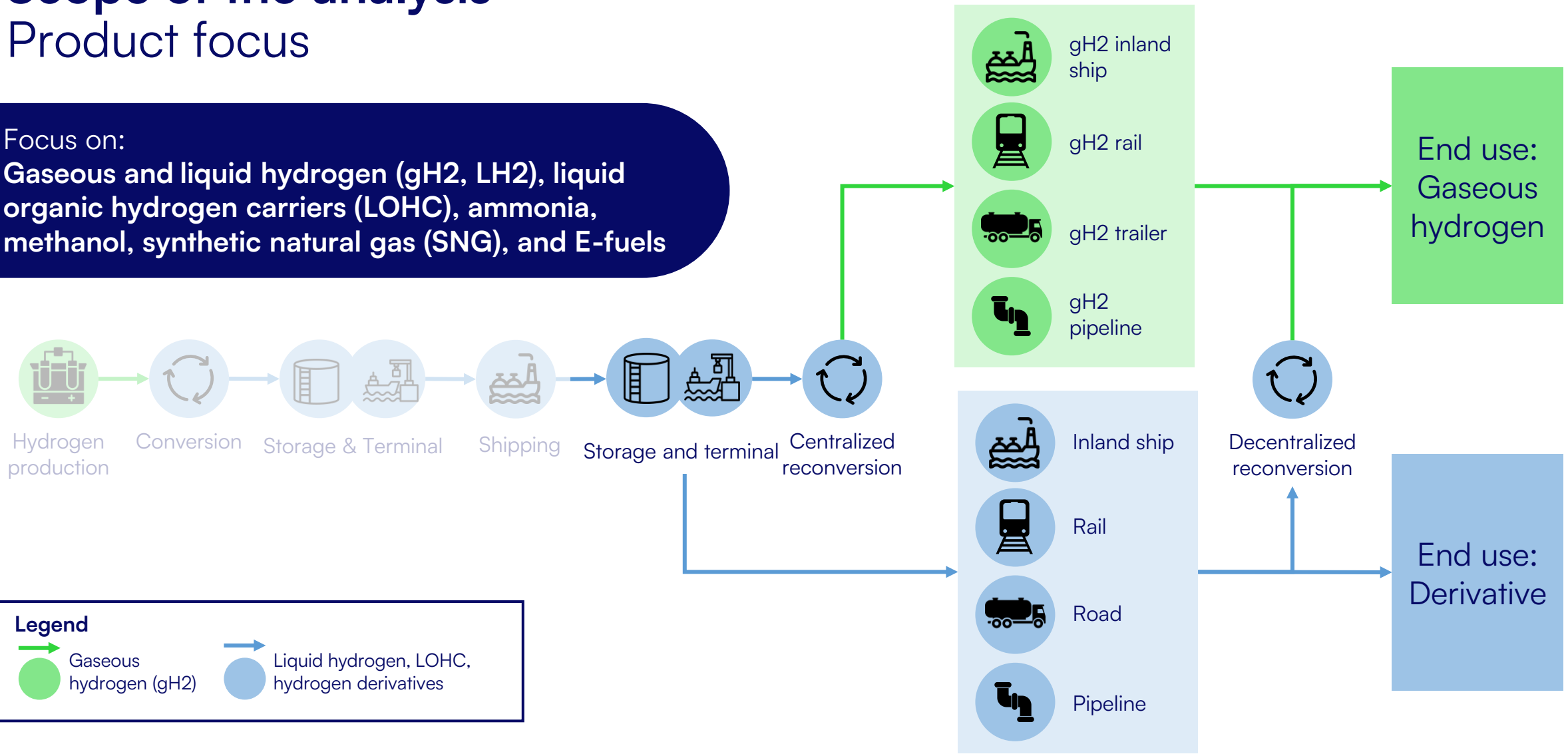
*Europe, Japan, and South Korea will evolve as key future hydrogen **demand centers**.*

*The infrastructure behind the import location is a **key bottleneck** in the hydrogen supply chain. Uncertainty regarding this infrastructure is a substantial risk for demand side projects.*

H2Global

Scope of the analysis
Product focus

Focus on:
Gaseous and liquid hydrogen (gH2, LH2), liquid organic hydrogen carriers (LOHC), ammonia, methanol, synthetic natural gas (SNG), and E-fuels



H2Global

Infrastructure overview

H2Global

Technology readiness levels

TRL definition	
1	Basic principles observed
2	Technology concept formulated
3	Proof of concept demonstrated
4	Components validated in laboratory environment
5	Components validated in relevant environment
6	Prototype system tested in relevant environment
7	Pre-commercial demonstration
8	First-of-a-kind commercial system
9	Commercial operation in relevant environment

	Import terminal	Inland shipping	Rail	Trailer	Pipeline	Reconversion
Gaseous Hydrogen		9 (MEGC) - (bulk)	9 (MEGC)	9 (MEGC)	9 (new) 8 (repurposed)	
Liquid Hydrogen	7	9 (container) 5 (bulk)	9 (container) 3-4 (tank wagon)	9		9
LOHC	9	9	9	9	9	7
Ammonia	9	9	9	9	9	7
Methanol	9	9	9	9	9	9
SNG	9	9	9	9	9	9*
E-fuels	9	9	9	9	9	

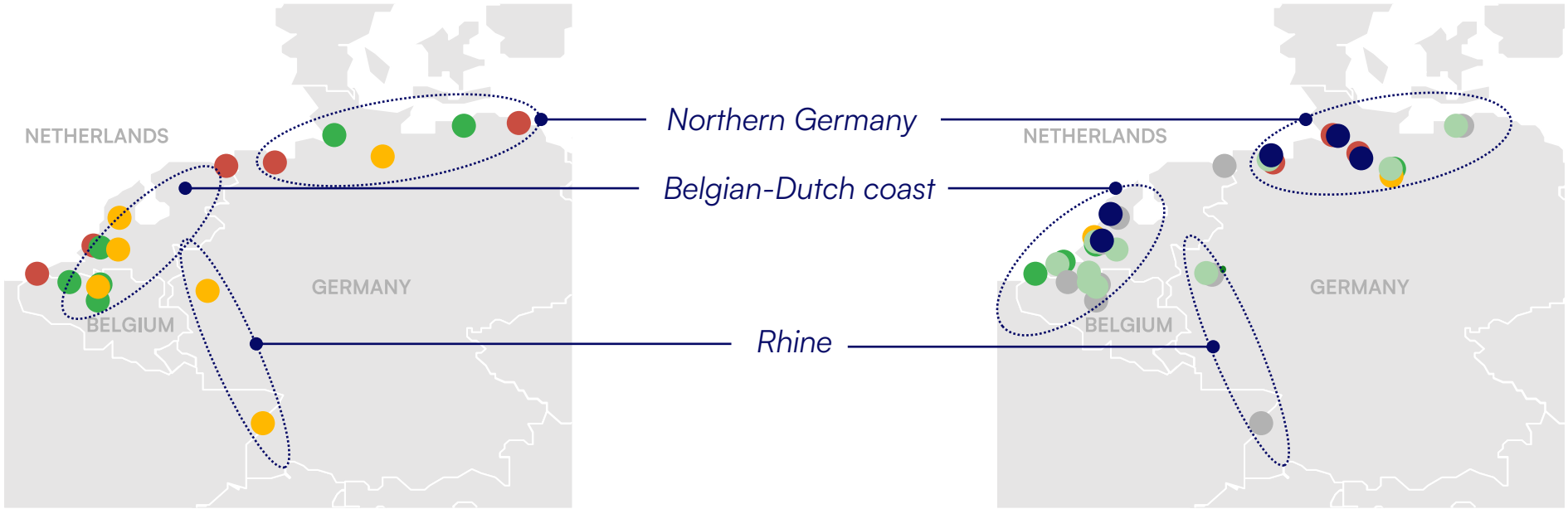
*: SNG reconversion without CCUS.

H2Global

Northwestern Europe — port infrastructure

Existing port infrastructure

Planned port infrastructure

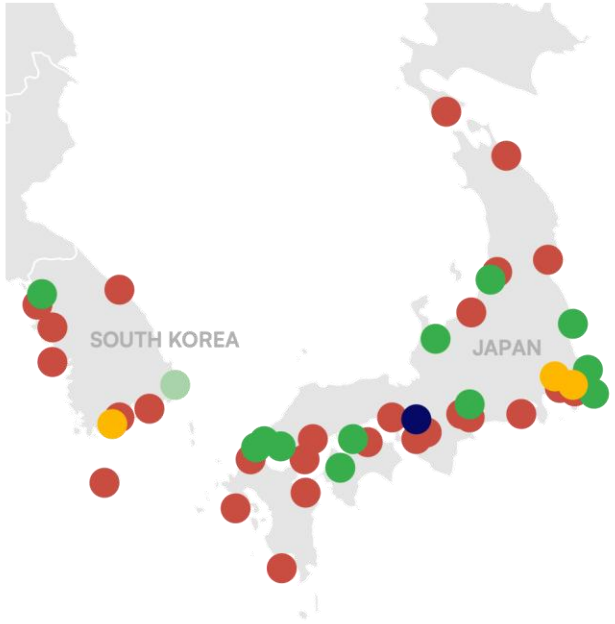


Three regions in Northwestern Europe dominate the expansion of hydrogen-related port infrastructure, focusing on **ammonia** as a key derivative.

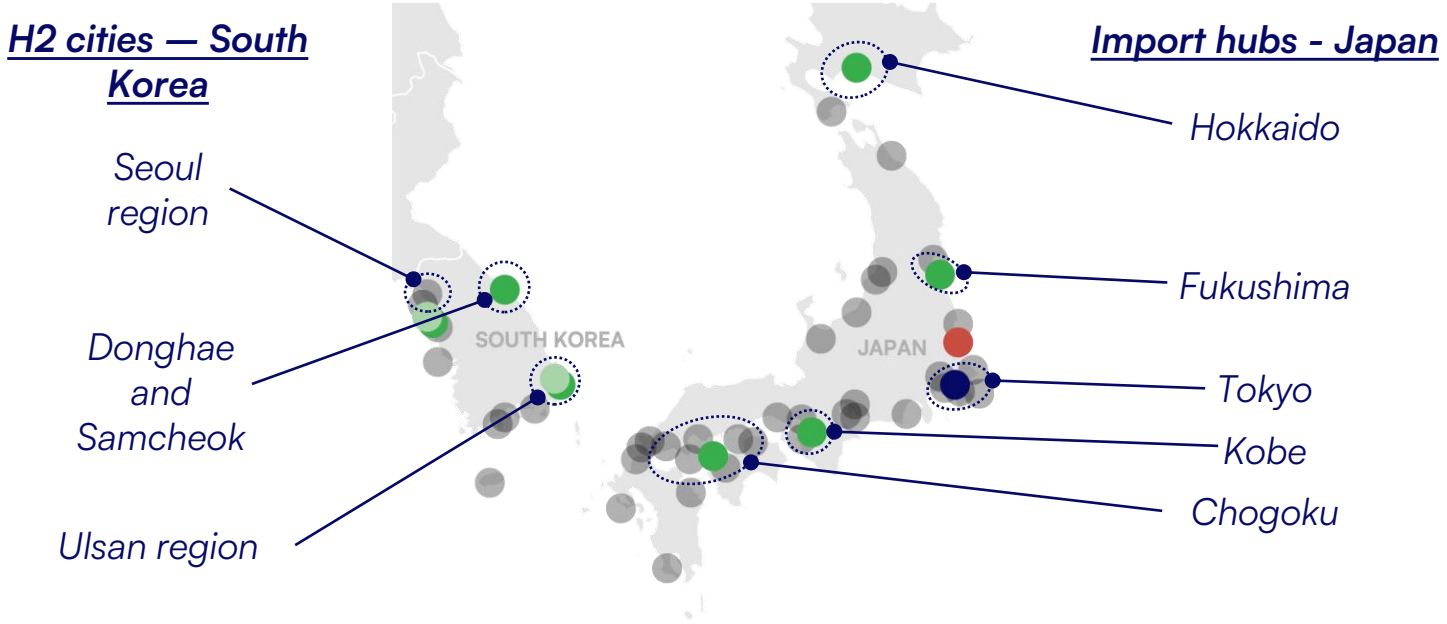
H2Global

Japan and South Korea — port infrastructure

Existing port infrastructure



Planned port infrastructure



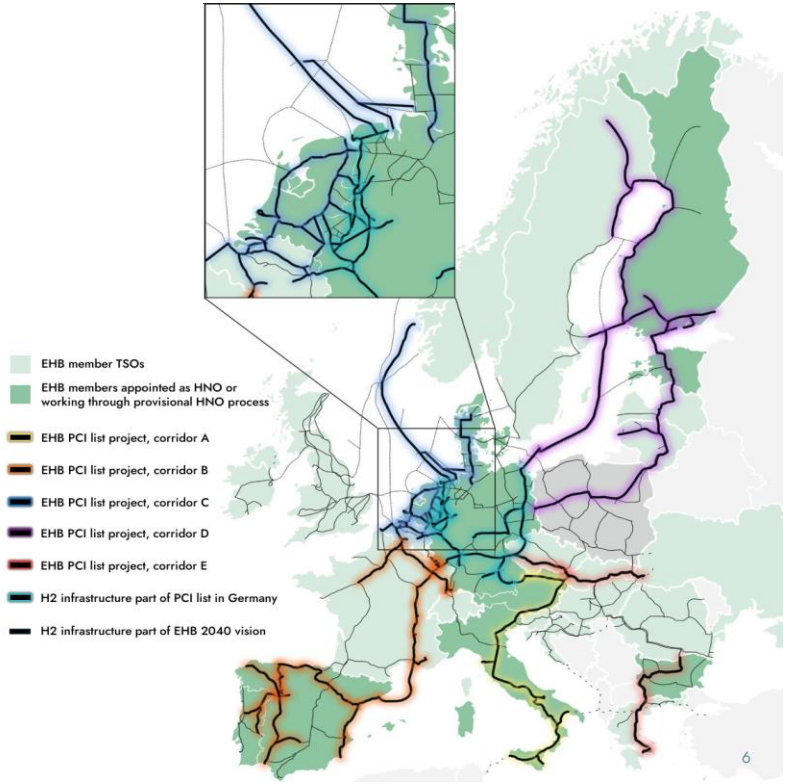
Ammonia terminal · Ammonia cracker · H2 terminal · Methanol terminal · LNG terminal · Operational

Existing maritime clusters with a focus on LNG, ammonia, and methanol infrastructure.
Planned infrastructure is strongly focused on **ammonia** imports.

H2Global

The examined regions exhibit wide-ranging differences in their planned pipeline networks

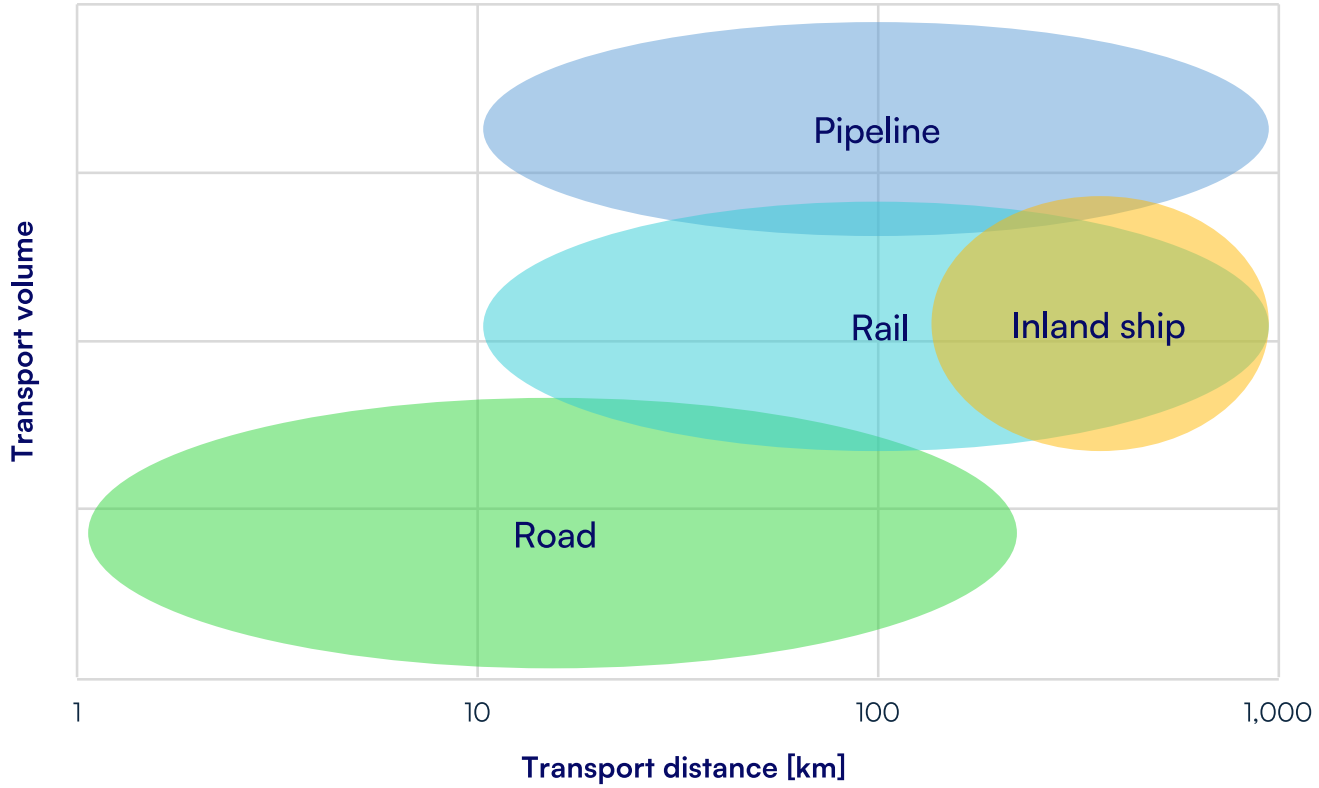
Pipeline infrastructure



- **European hydrogen backbone**: 28,000 km of H2 pipeline operational by 2030 and 53,000 km operational by 2040.
- No concrete plans for H2 pipeline network in **Japan**, although national subsidies are available.
- **South Korea** plans to develop a 1,000km H2 network in the northeast and H2 pipeline networks shall be developed in dedicated H2 cities.

H2Global

Typical use cases for last-mile infrastructure



Best suited last-mile transport is determined by transport distance, volume, geography and existing infrastructure (e.g., rivers, railways).

H2Global

Rail, road and water-bound last-mile infrastructure is available in all analyzed regions

Last-mile transportation is in principle available for hydrogen & its derivatives:

LOHC, ammonia, methanol, SNG

Hydrogen and all derivatives

LOHC, ammonia, methanol

Prevailing challenges

- **Lack of centralized planning**: Comprehensive and centralized capacity data for last-mile hydrogen transportation is largely unavailable. This absence makes coordinated planning difficult.
- **Project-based development**: Last-mile transport solutions for hydrogen derivatives are typically developed on an ad hoc, project-specific basis. This often leads to short lead times and potentially fragmented infrastructure.
- **Limited infrastructure development**: Key stakeholders currently lack concrete plans for large-scale expansion of last-mile infrastructure for hydrogen & its derivatives.

H2Global

Evaluation of infrastructure availability in NW Europe, Japan and South Korea

Legend

- Exists in sufficiently large quantities, and can be booked.
- Exists and can be booked, further expansion to accommodate future demands is planned.
- Exists and can be used, but no concrete plans for expansion to accommodate future demands.
- First operational project(s) and large-scale projects under development/planned.
- First operational project(s). No large-scale projects under development/planned.
- No projects exist, demonstration projects are under development/planned.
- No developments in sight.

	Import terminal	Inland shipping	Road	Rail	Pipeline	Reconversion
Gaseous hydrogen				EU; JPN, KOR	EU, KOR; JPN	
Liquid hydrogen	EU, KOR; JPN			EU; JPN, KOR		EU, KOR; JPN
LOHC*						
Ammonia						EU, KOR; JPN
Methanol						
SNG*	EU; JPN KOR					
E-fuels*						

* SNG, e-fuels, and LOHC are evaluated (in full or in part) based on existing fossil infrastructure with oil infrastructure as proxy for LOHC import terminals and e-fuels, and natural gas infrastructure as proxy for SNG.

H2Global

Gap analysis

H2Global

Gap analysis of terminals and reconversion facilities

Availability

Analysis of existing and planned infrastructure based on IEA data

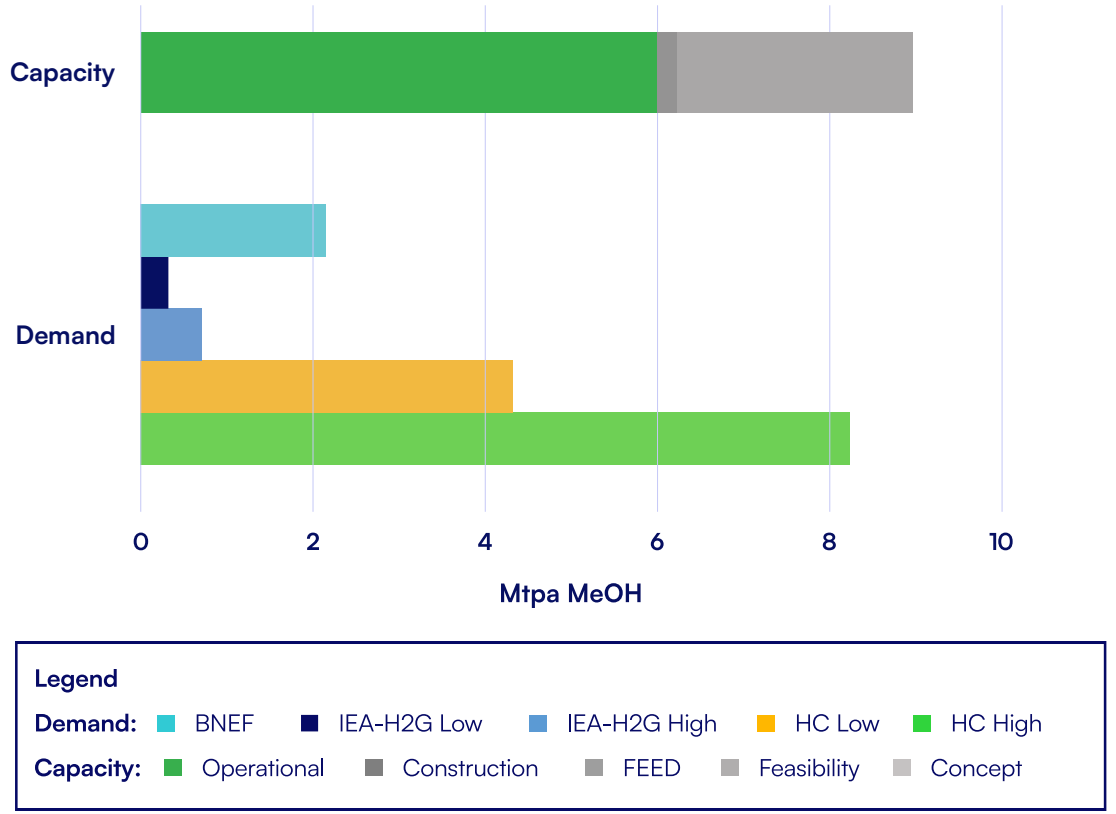
Demand

1) Five scenarios for seaborn import demand in 2035

BNEF	Clean hydrogen offtake tracker
IEA-H2G Low	Potential trade flows based on announcements & cumulative H2 trade volume, w/ offtaker
IEA-H2G High	Potential trade flows based on announcements & cumulative H2 trade volume; w/ & w/o offtaker
HC Low	Hydrogen Council: Modeling of clean hydrogen trade flows, scenario: “Fading Momentum”
HC High	Hydrogen Council: Modeling of clean hydrogen trade flows, scenario: “Further Acceleration”

2) H2Global survey on estimating distribution across pathways

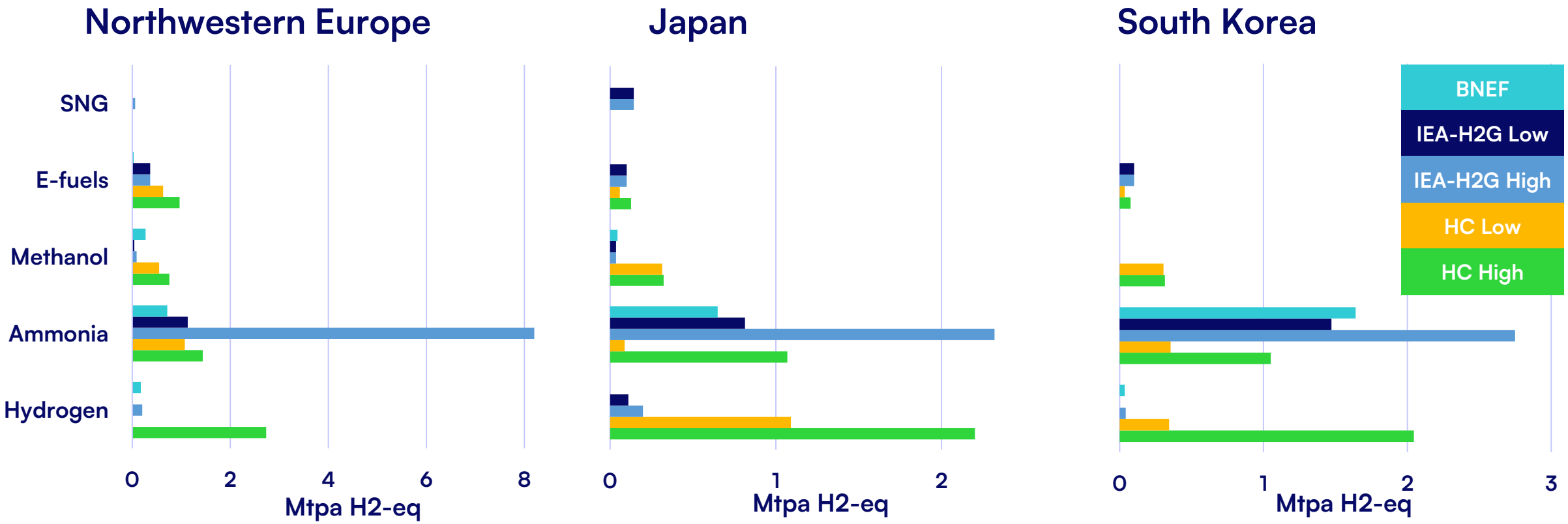
Gap analysis



H2Global

Seaborn import demand scenarios for 2035

Specifying product end use instead of transport vector

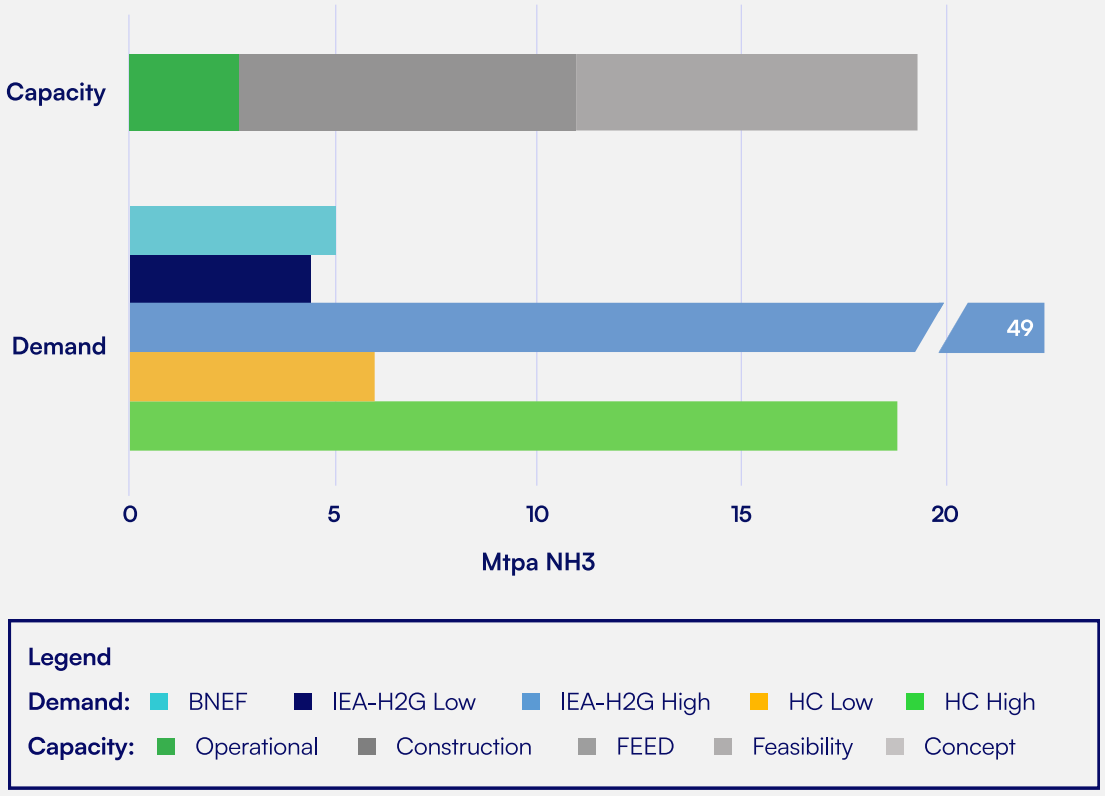


Projections of import demand vary widely, reflecting the inherent uncertainty of these forecasts.

H2Global

Gap analysis for Northwestern Europe

Ammonia terminals



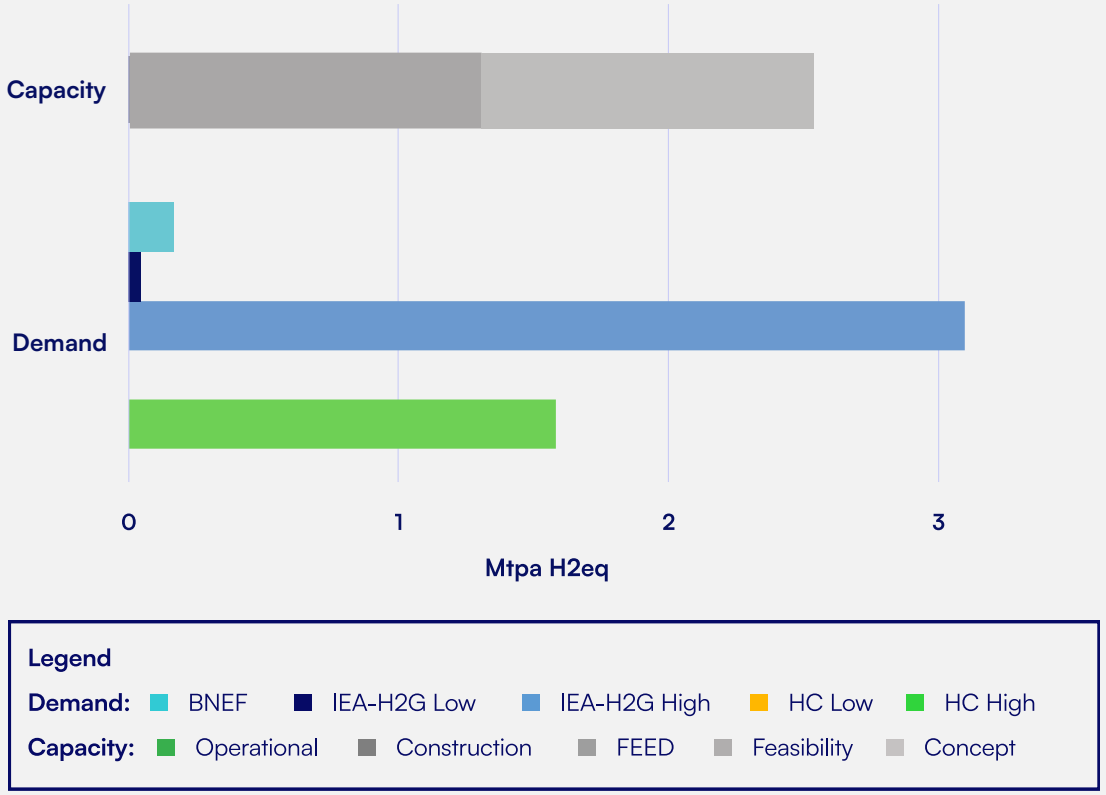
Takeaways

- 6 existing terminals, 9 projects at FEED & 6 at feasibility study stage
- Existing import capacity is far below the projected clean ammonia import volumes for 2035 across all scenarios
- Investment costs estimated at **EUR 1.2 — 13 billion**, depending on the demand scenario

H2Global

Gap analysis for Northwestern Europe

Ammonia cracking



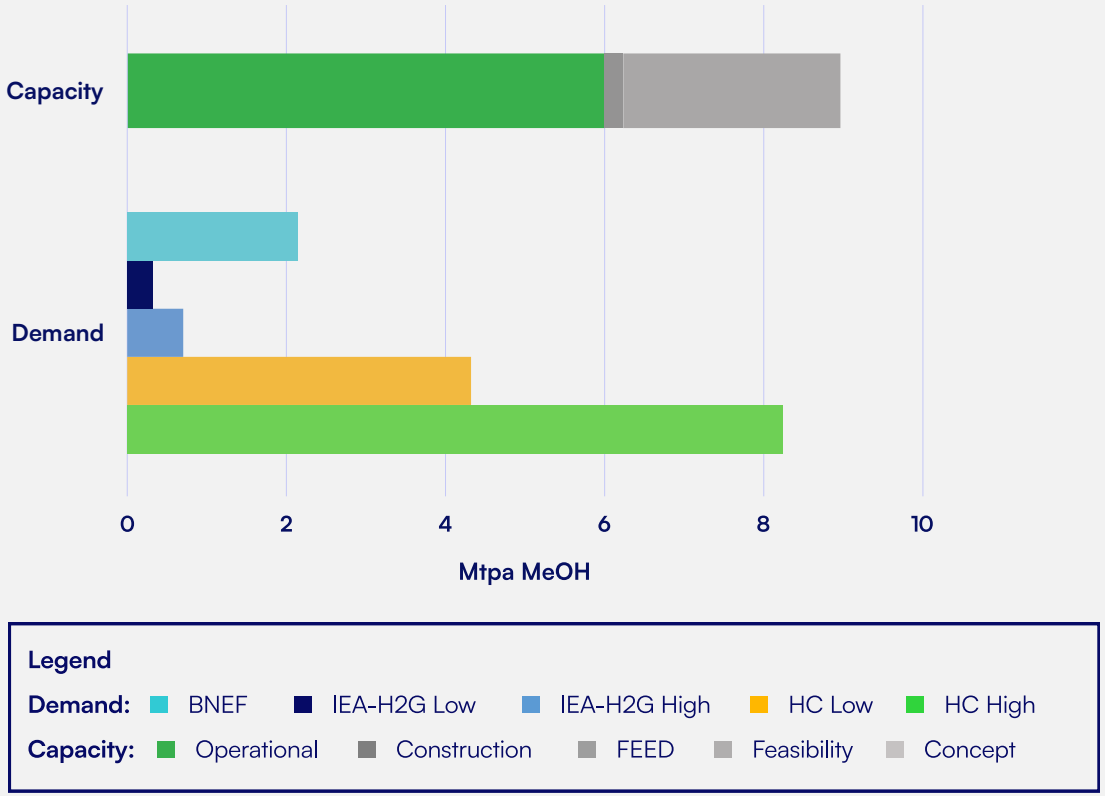
Takeaways

- Large number of announced projects, but only small-scale projects under construction.
- Wide range of scenarios reflect high uncertainty regarding cracking demand
- Investment costs estimated at **EUR 0 — 3.3 billion**, depending on the demand scenario

H2Global

Gap analysis for Northwestern Europe

Methanol terminals



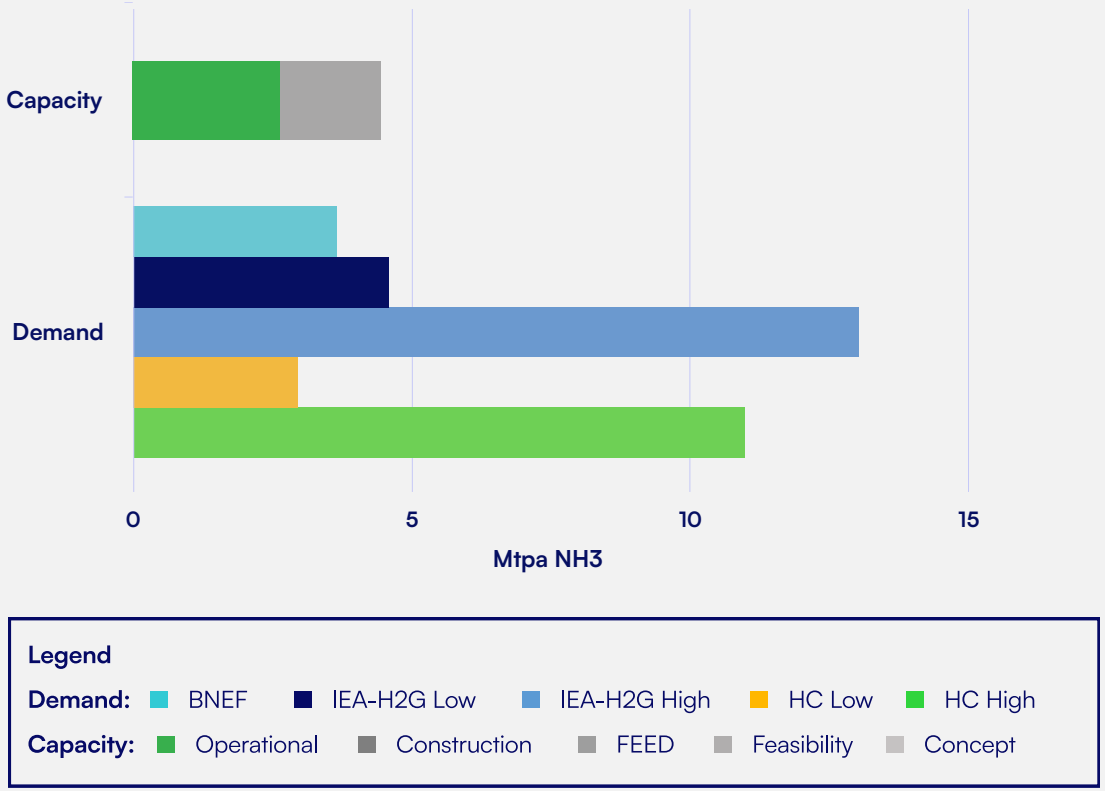
Takeaways

- 6 existing terminals, 2 planned projects
- If clean methanol imports are added on top instead of replacing existing fossil-based imports current infrastructure could become overbooked
- Investment costs estimated at **EUR 9 — 235 million**, depending on the demand scenario

H2Global

Gap analysis for Japan

Ammonia terminals



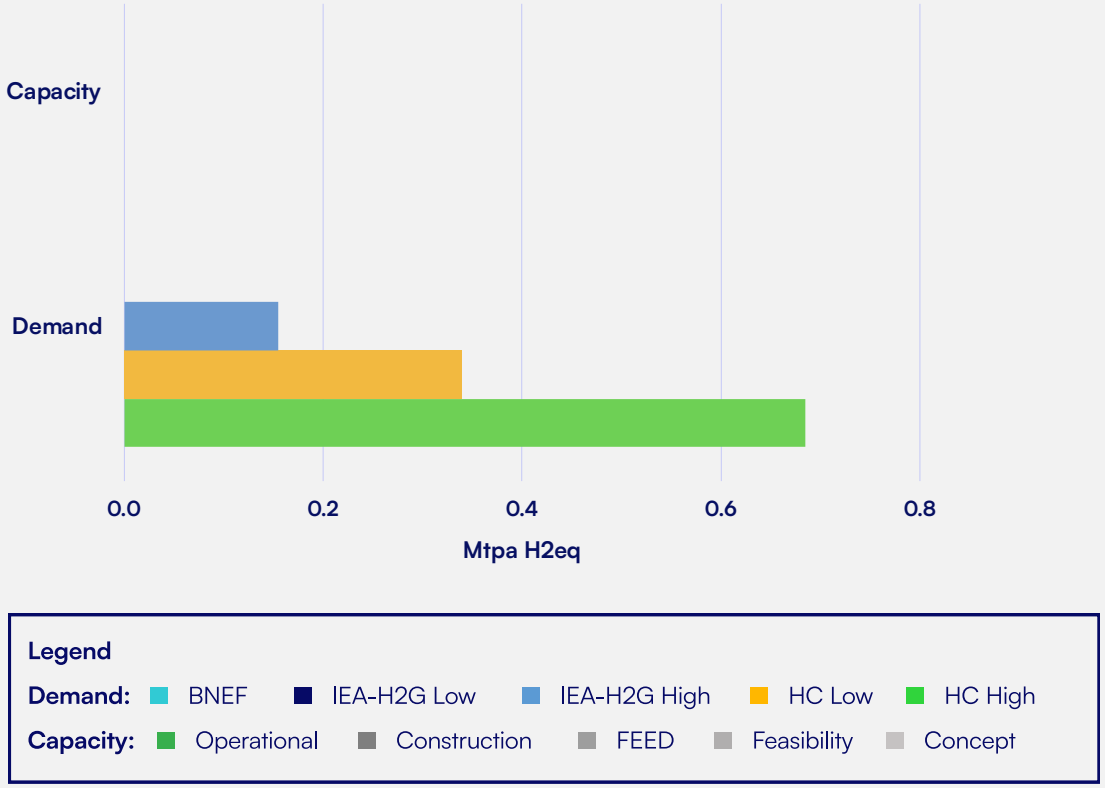
Takeaways

- 12 existing terminals, 4 projects at feasibility study stage
- Existing import capacity is already below the projected clean ammonia import volumes for 2035 across all scenarios
- Investment costs estimated at **EUR 0.8 — 3.4 billion**, depending on the demand scenario

H2Global

Gap analysis for Japan

Ammonia cracking



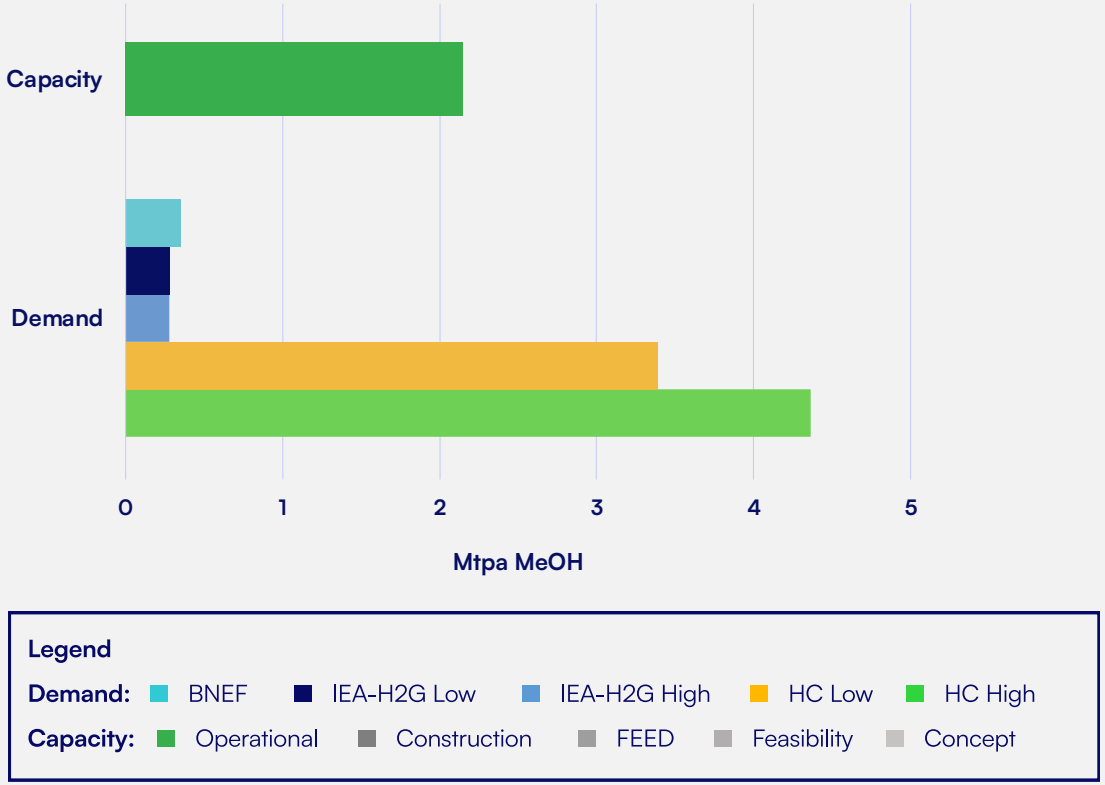
Takeaways

- No operational or planned projects
- Demand outlook is highly uncertain, with two scenarios projecting no demand.
- Investment costs estimated at **EUR 0 — 730 million**, depending on the demand scenario.

H2Global

Gap analysis for Japan

Methanol terminals



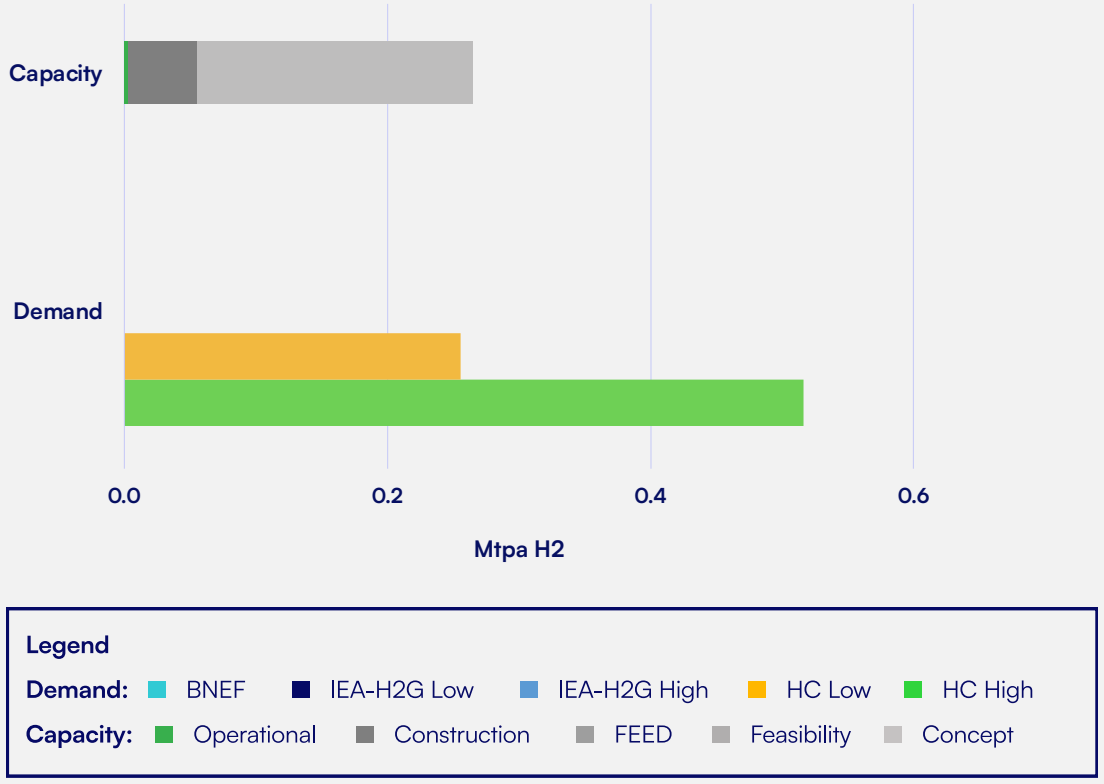
Takeaways

- 2 existing terminals, both in greater Tokyo area
- Risk of bottlenecks if demand arises outside of Tokyo.
- Two scenarios forecast higher demand than current capacity, implying potential gaps

H2Global

Gap analysis for Japan

Hydrogen terminals



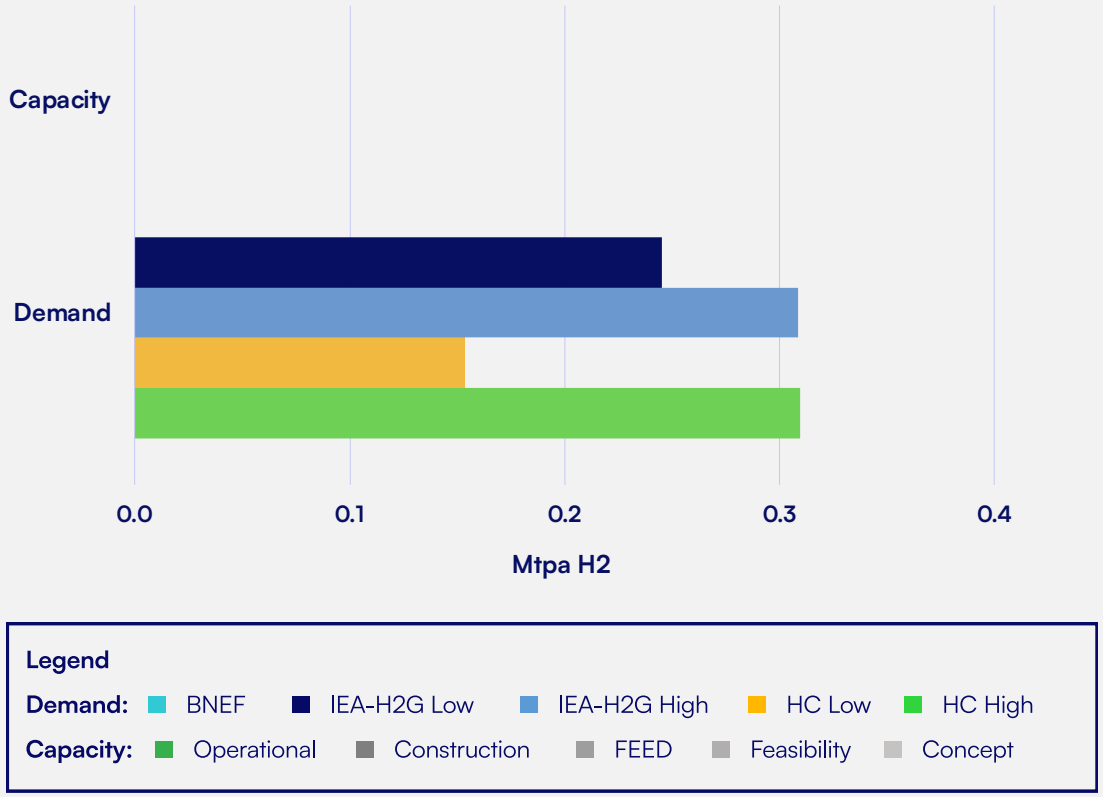
Takeaways

- One operational small-scale LH2 pilot terminal. One terminal under construction, with a planned expansion
- Wide range of scenarios reflect high uncertainty
- Overall, no major gap is expected
- Investment costs estimated at **EUR 0 — 1.7 billion**, depending on the demand scenario

H2Global

Gap analysis for Japan

LOHC reconversion



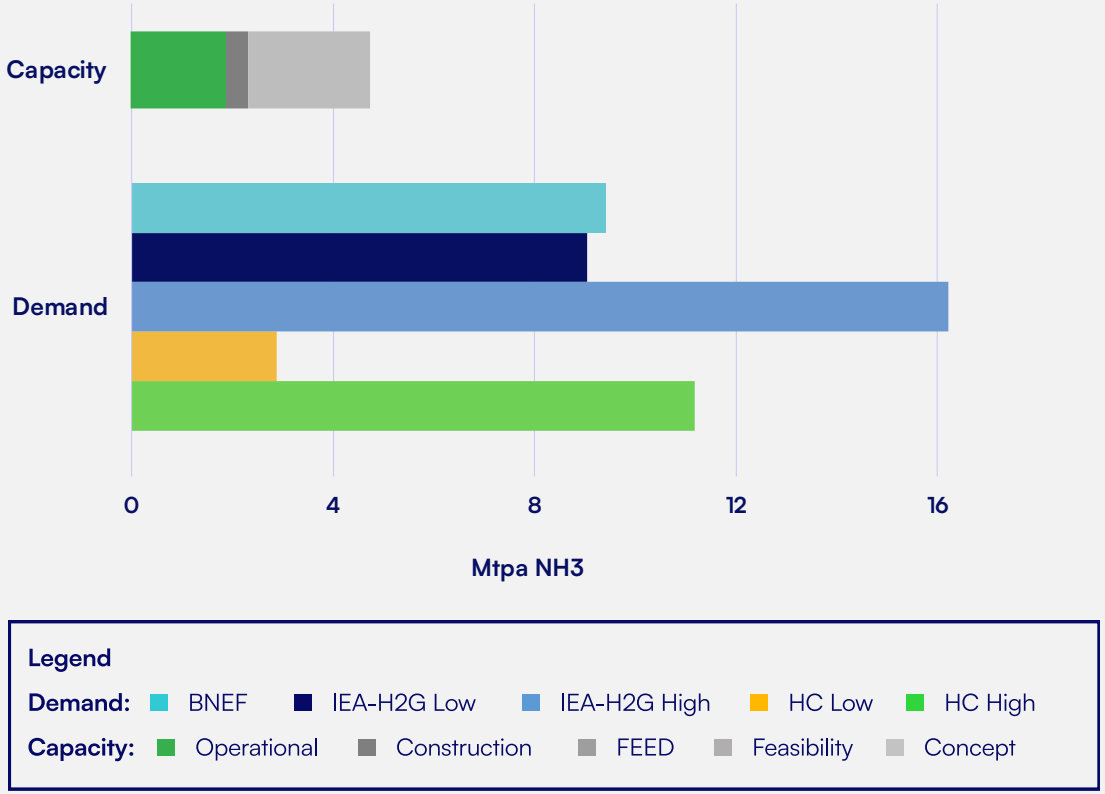
Takeaways

- No existing or planned infrastructure projects
- IEA database lists 5 projects using LOHC as a transport vector
- A relatively small gap is likely, with estimated investment needs of **up to EUR 350 million**

H2Global

Gap analysis for South Korea

Ammonia terminals



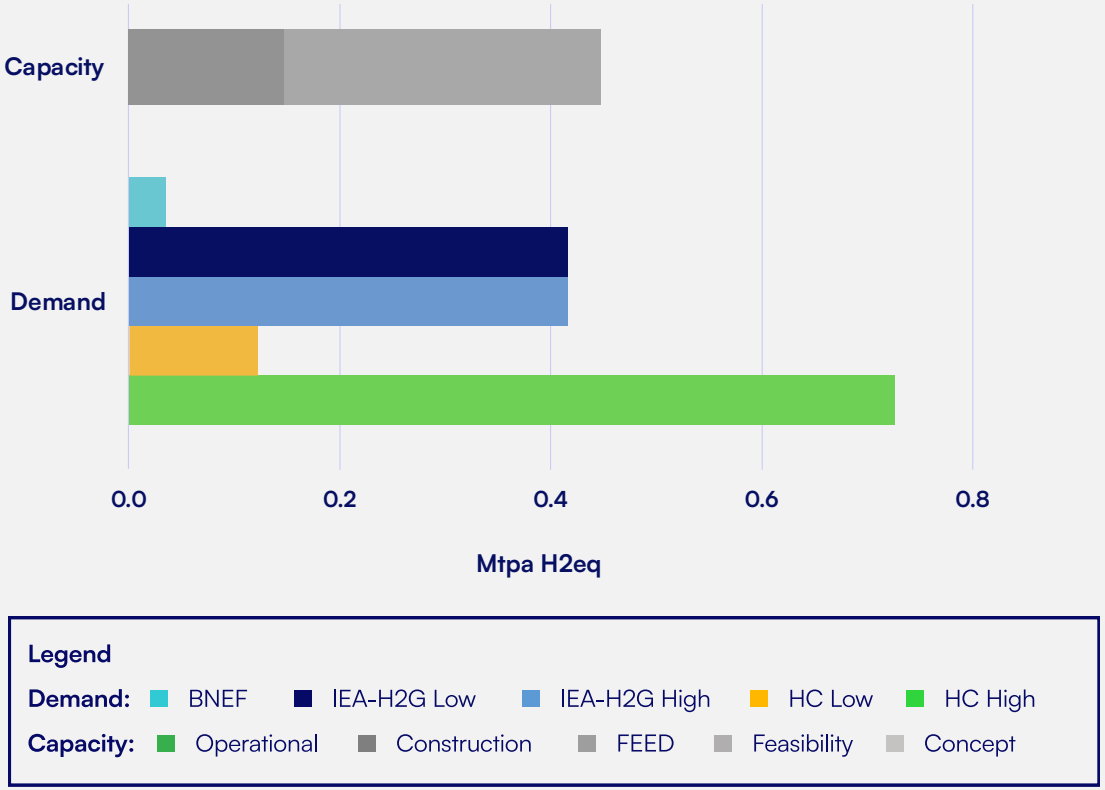
Takeaways

- 3 existing terminals, 1 project under construction, 2 projects at concept stage
- Existing + planned import capacity is already far below the projected clean ammonia import volumes for 2035 across most scenarios
- Significant risk for infrastructure gap
- Investment costs estimated at **EUR 0.75 — 4.2 billion**, depending on the demand scenario

H2Global

Gap analysis for South Korea

Ammonia cracking



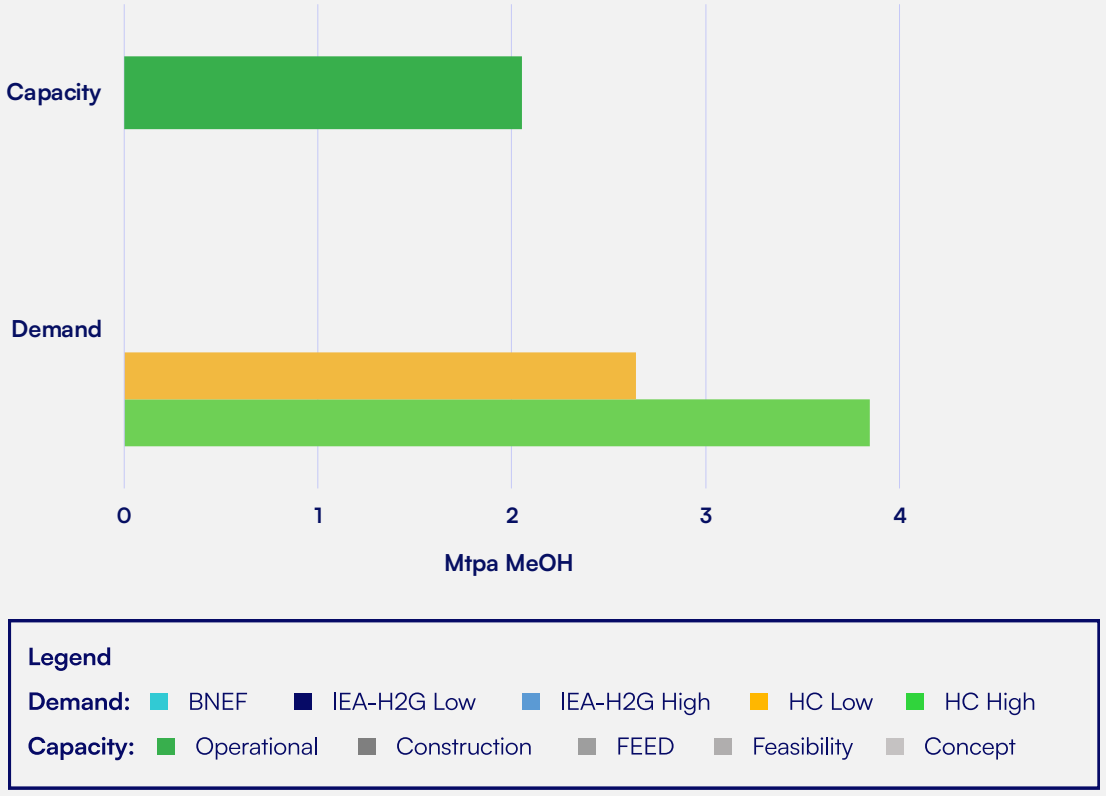
Takeaways

- 1 operational small-scale project, 3 projects at FEED & 1 at feasibility study stage
- Risk of an infrastructure gap is relatively limited, provided planned projects move to FID and construction
- Investment costs estimated at **EUR 40 — 780 million**, depending on the demand scenario

H2Global

Gap analysis for South Korea

Methanol terminals



Takeaways

- 2 existing terminals, no announced projects
- Highly uncertain outlook for clean methanol imports.
- Investment costs estimated at **EUR 0 — 110 million**, depending on the demand scenario.

H2Global

Gap analysis of last-mile infrastructure

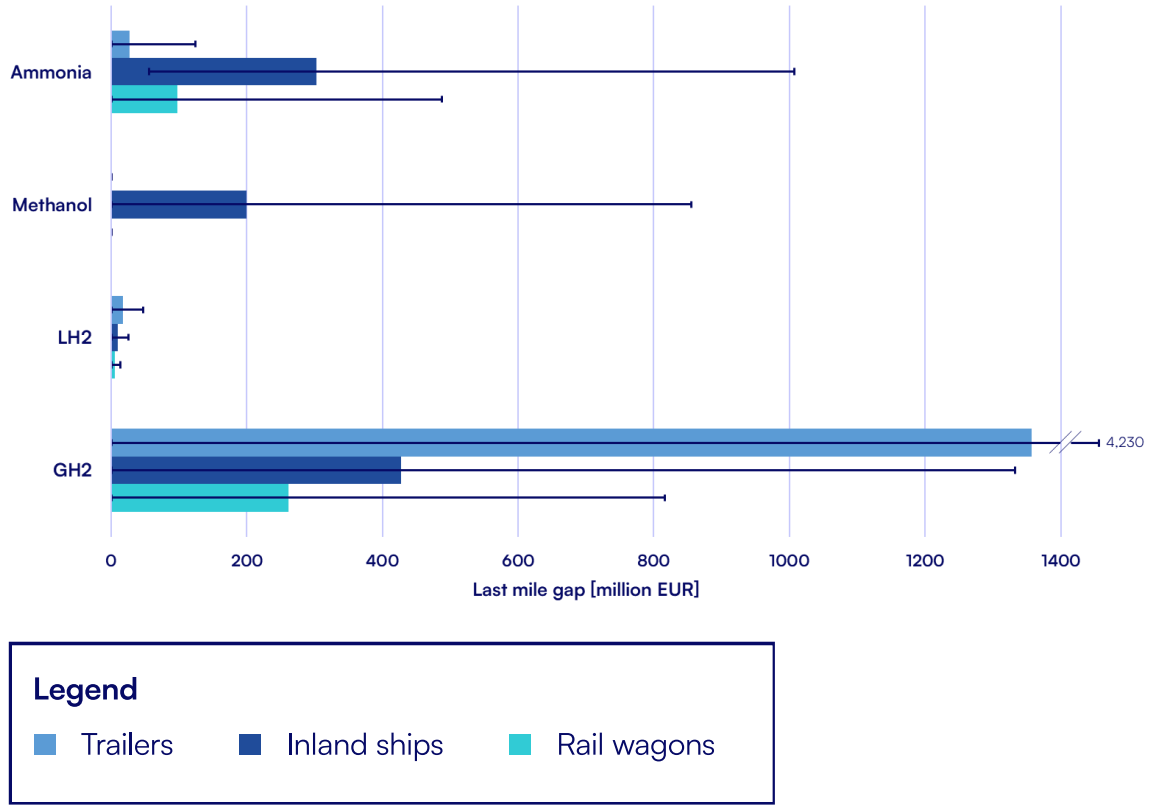
Availability

Analysis of existing transport units based on calculations with capacity estimates per unit and current transport volumes.

Demand

1) Five scenarios for seaborn import demand in 2035
2) H2Global survey on estimating distribution across pathways

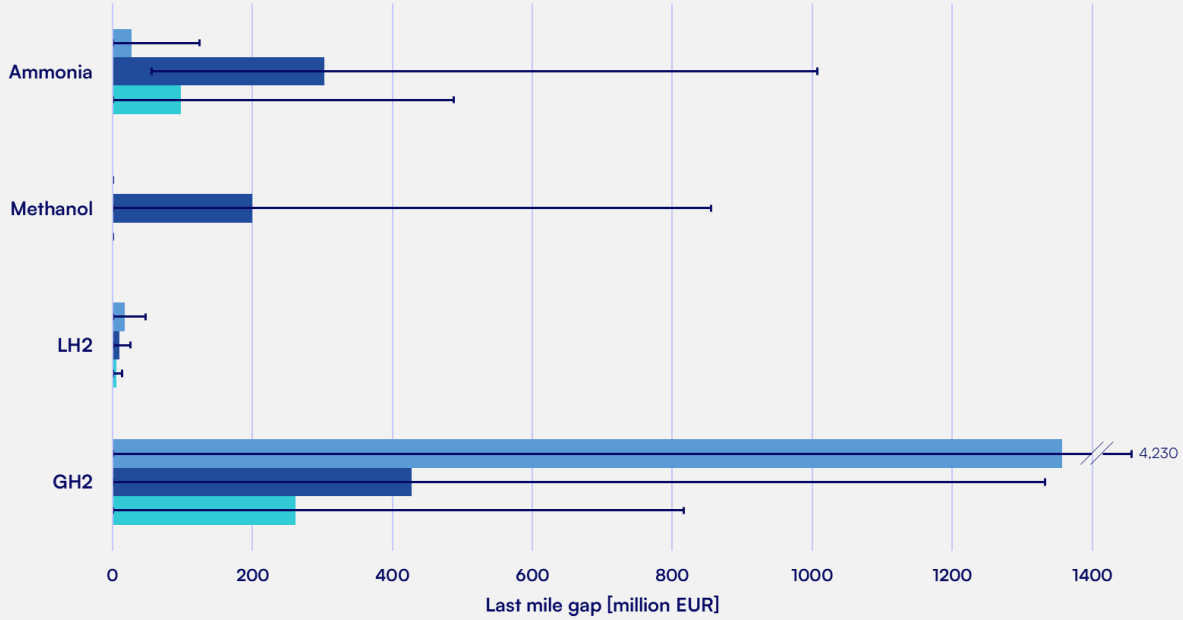
Gap analysis



H2Global

Gap analysis for Northwestern Europe

Last-mile infrastructure



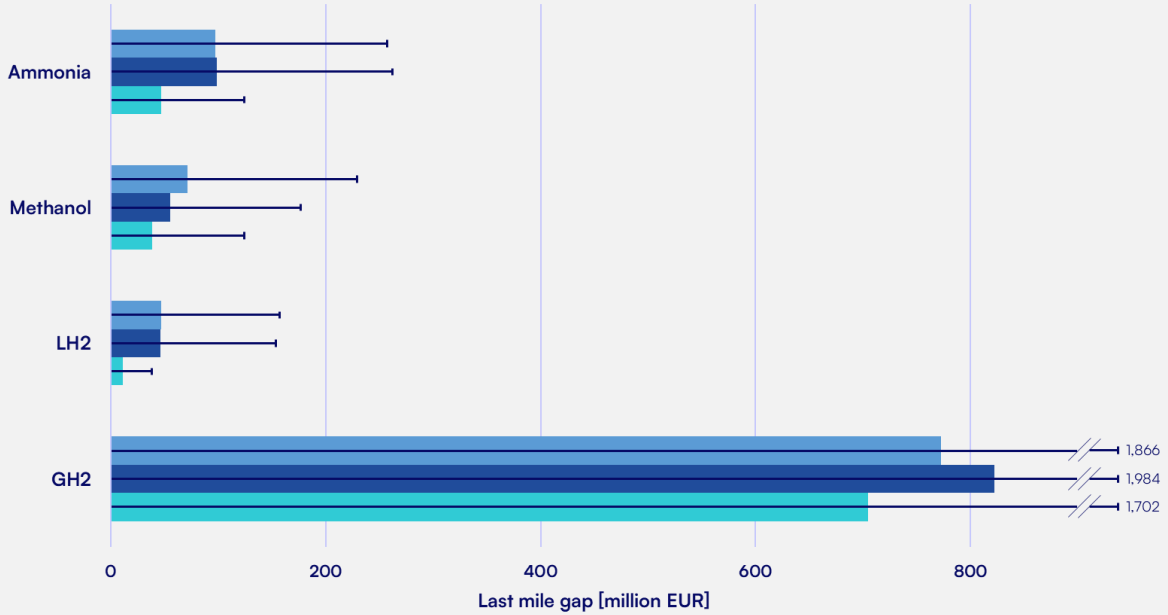
Takeaways

- Ammonia: Three scenarios project only a minor gap which could be addressed with existing production capacities
- GH2: Even with pipelines in place, many trailers will be needed to transport to offtakers not directly connected to the grid
- Overall investment needs range from **EUR 226 million to EUR 7.1 billion**

H2Global

Gap analysis for Japan

Last-mile infrastructure



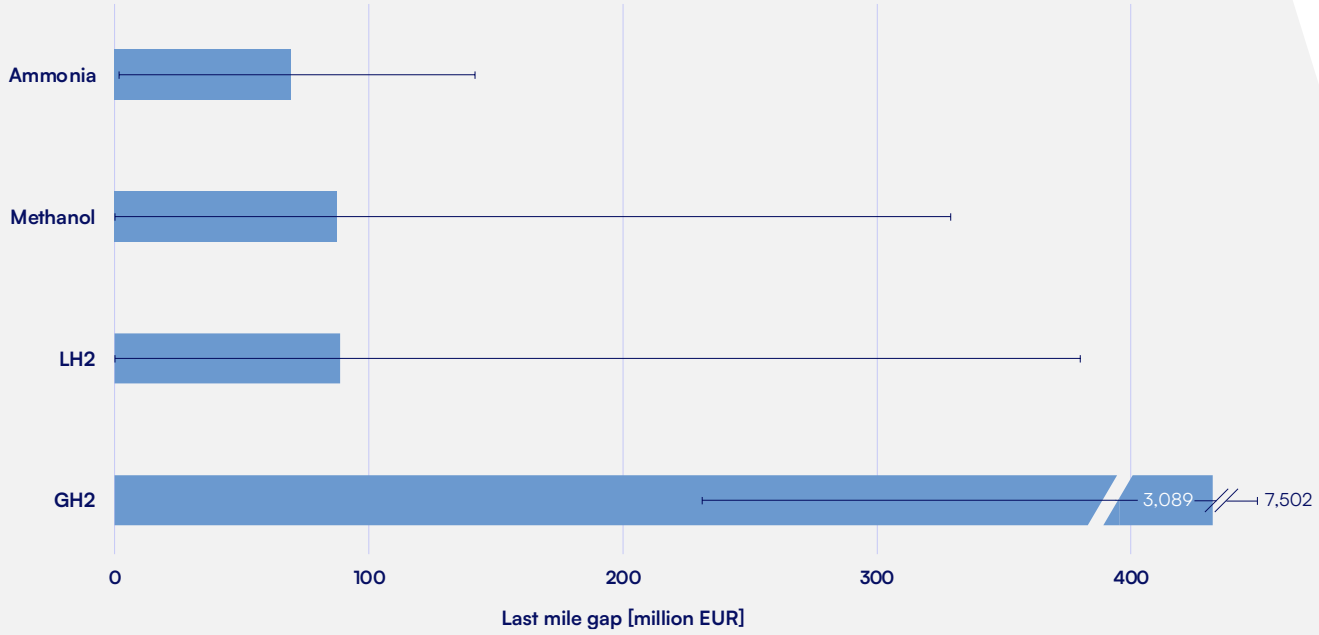
Takeaways

- Most offtakers are co-located with existing ports, leading to low last-mile infrastructure requirements
- GH2: Highly uncertain outlook, ranging from no demand to significant needs
- Overall investment needs range from **EUR 96 million to EUR 6.7 billion**

H2Global

Gap analysis for South Korea

Last-mile infrastructure

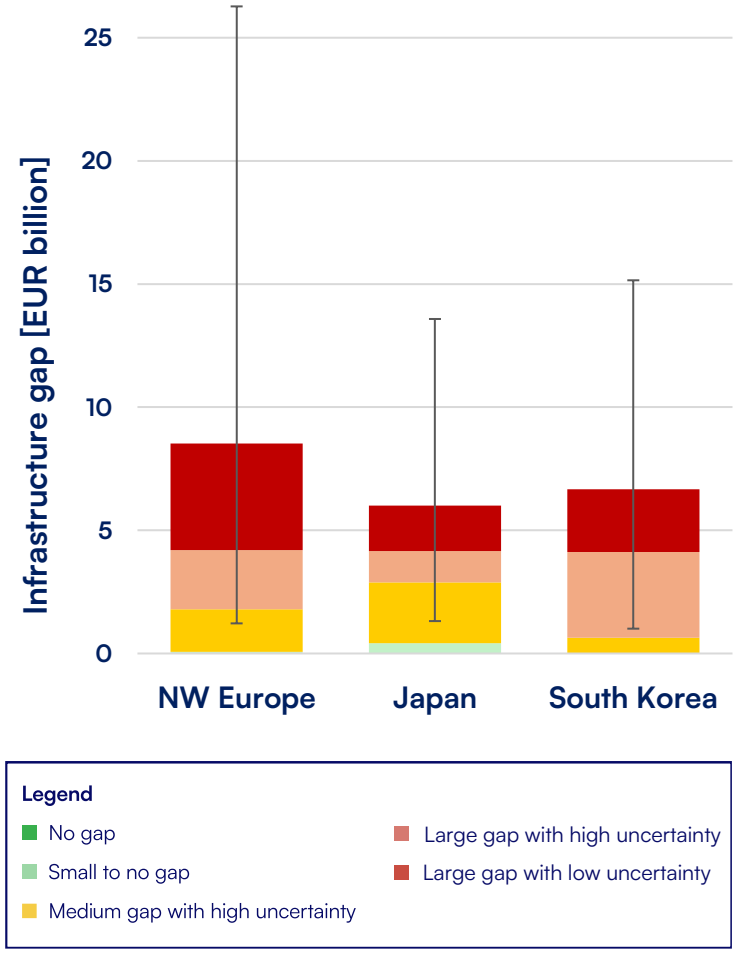


Takeaways

- Most offtakers are co-located with existing ports, leading to low last-mile infrastructure requirements
- Survey responses show that last-mile transport by trailer is the preferred transport mode
- Up to 6,800 trailers needed for GH2 transport
- Overall investment needs range from **EUR 226 million to EUR 7.1 billion**

H2Global

Summary of the gap analysis



	Import terminal	Inland shipping	Trailer	Rail	Pipeline	Reconversion
Gaseous hydrogen		EU, JPN / KOR		EU, JPN / KOR		
Liquid hydrogen	EU / JPN, KOR					
LOHC*						EU / JPN, KOR
Ammonia		EU / JPN, KOR		EU / JPN, KOR		EU / JPN, KOR
Methanol		EU / JPN, KOR				
SNG*						
E-fuels*						

H2Global

Recommendations

H2Global

Making use of existing infrastructure

Terminals & last-mile transport for LOHC, SNG, methanol & e-fuels

Policymakers

- Regularly **monitor import and distribution capacities**

Industry

- Create **exchange platforms** between fossil-based and clean hydrogen importers to manage substitution dynamics and build partnerships
- Conduct **feasibility studies** on expanding methanol port capacities to reduce lead times

H2Global

Accelerating ammonia infrastructure

Ammonia terminals, cracking, last-mile transport

Policymakers

- **Support large-scale ammonia cracking demonstrations** to advance technology, improve efficiency, and ensure timely availability

Policymakers and industry

- **Monitor ammonia transport capacities**, with priority given to safer transport modes such as rail and shipping
- Actively **address public risk perceptions** around ammonia handling and transport.

Industry

- **Facilitate ammonia terminal** projects and reserve expansion space for future demand

H2Global

Supporting complementary hydrogen import pathways

LH2 terminals, LOHC dehydrogenation, SNG reforming and methanol reforming

Policymakers

- Maintain a **technology-neutral stance** to avoid premature lock-in of a single pathway
- Support **proof-of-concept value chains** (e.g., LOHC, LH2) to de-risk investments

Policymakers and industry

- Leverage Japan's strategic focus on LH2 imports **through international knowledge exchange** to facilitate technology transfer and accelerate cost reductions

Industry

- Regularly **track TRLs and project pipelines**
- Japan: Closely monitor the 2026 support scheme for hydrogen supply chain development to guide future investment decisions

Region-specific last-mile solutions

gH2 pipelines; rail, trailer & inland ships for LH2, gH2, methanol and ammonia

Policymakers

- Northwestern Europe: Maintain **strong commitment to the Hydrogen Backbone** rollout and systematically monitor progress to prevent delays.
- Develop a **“transport-as-a-service” model** to enable flexible and transparent last-mile distribution

Policymakers and industry

- Establish a **public database** of existing last-mile transport units to improve transparency and anticipate future needs

Industry

- Japan and South Korea: Continue **co-locating industrial offtakers near import hubs** and initiate alternative transport solutions for hinterland consumers early

H2Global

Navigating uncertainty

For all derivatives from ports to offtakers

Policymakers

- Establish stable policy frameworks and support **willingness-to-pay to create clear demand signals**
- Deploy **targeted financial support instruments** (e.g., CfDs, anchor capacity bookings, H2Global auctions) to de-risk first movers and ensure open-access infrastructure

Industry

- **Track project pipelines** and committed offtake agreements to enhance market transparency
- Implement **business development strategies** (e.g., shared infrastructure) to maximize and safeguard infrastructure utilization.

H2Global

Follow us on LinkedIn

@H2Global Foundation

@HINT.CO GmbH

Hanna Graul
H2Global Stiftung
Research Associate

Trostbrücke 1
20457 Hamburg
+49 40 36197 500
hanna.graul@h2-global.org

Julian Reul
H2Global Stiftung
Program Lead

Trostbrücke 1
20457 Hamburg
+49 40 36197 500
julian.reul@h2-global.org