Copenhagen Infrastructure Partners

Agenda

1. CIP - Introduction, H2 portfolio 3
2. CIP's vision for a European energy system 2050 11
3. Germany - a major market for H2 offtake 16
4. Development of H2 projects 20

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Introduction to Copenhagen Infrastructure Partners (“CIP”)

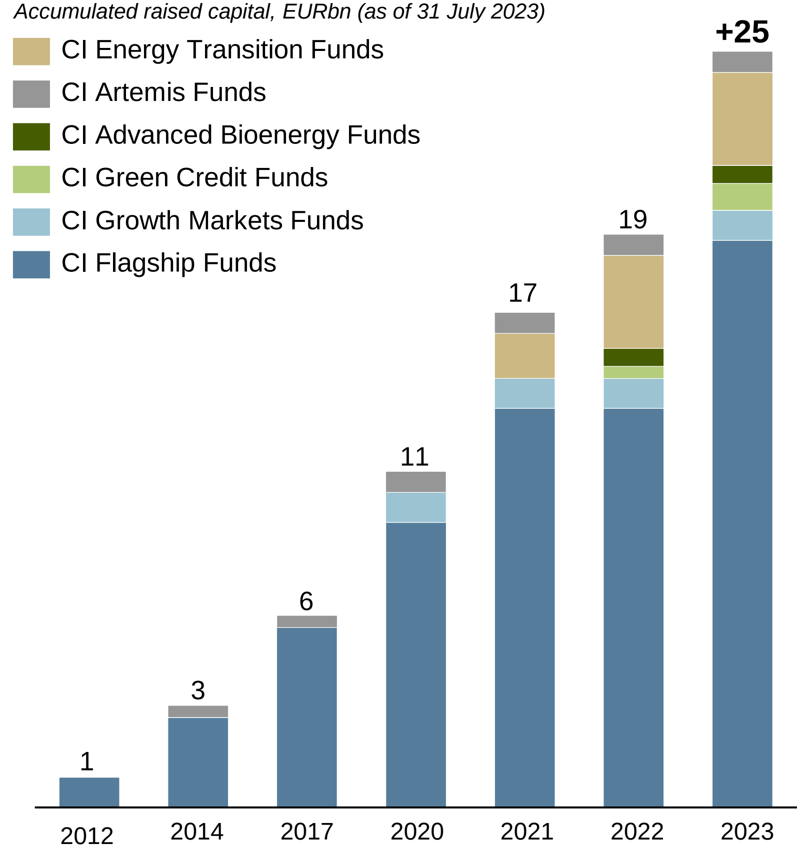
Aiming for EUR 100 billion in renewable energy investments by 2030

Copenhagen Infrastructure Partners

- **EUR ~32bn AUM** from ~180 investors across 12 funds since establishment of CIP in 2012
- Specialised in investing in large and complex greenfield renewable energy infrastructure projects, with a market leading renewables **pipeline of more than 120 GW**[1]
- One of the largest and most developed PtX pipelines with **>10 GW power-to-X projects** under development
- **Dedicated climate impact profile** with all funds classified as **Dark Green** (SFDR Article 9)[2]
- Fully integrated and scalable platform with **+1,200**[3] **CIP professionals** across the world
- Focus on **capturing attractive greenfield** premium through experienced project de-risking and **industrial value creation**

CIP has raised >25 EURbn to date

Accumulated raised capital, EURbn (as of 31 July 2023)

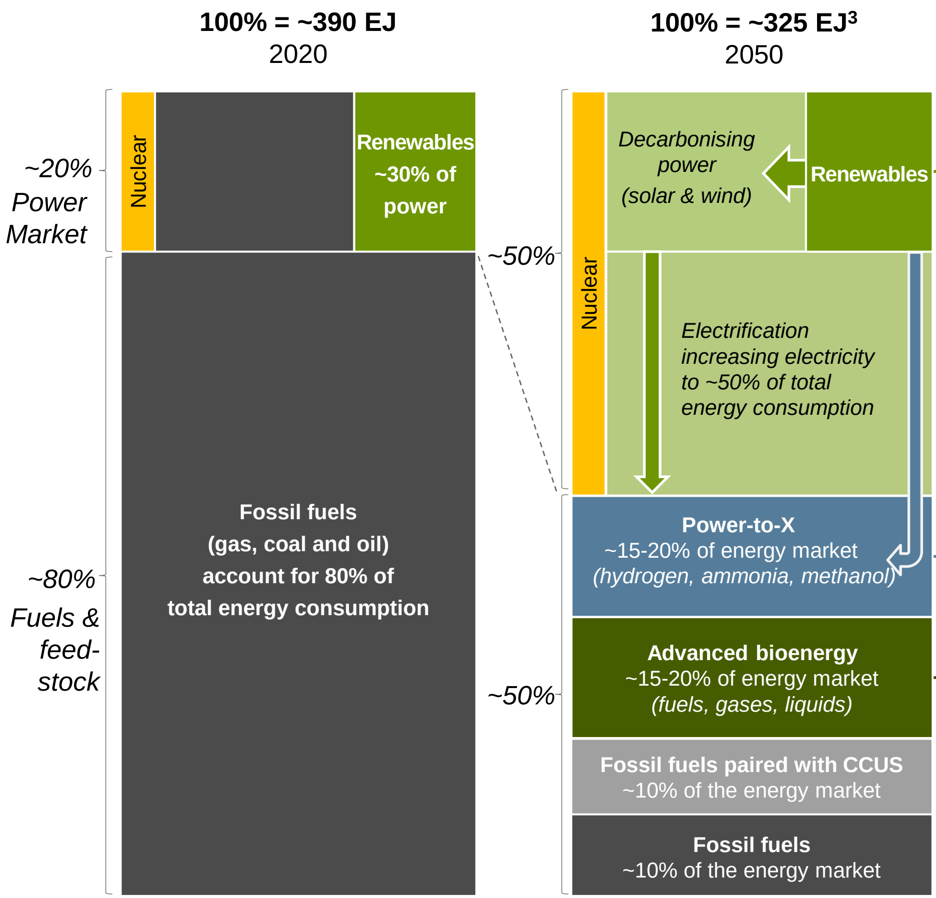


1 — **Institutional investors globally** → **~150**

Notes: 1)) Including projects where CIP has established entity or partnership. Capacity is gross including partnership share (where CIP is not 100% owner). Does not include CI ABF I pipeline of greenfield advanced bioenergy projects; 3) All CI Funds marketed after 10 March 2021 (CI IV, CI ETF I, CI GCF I, CI ABF I) 3) Including CISC, COP, and employees related to CI Fund projects

CIP manages six distinct fund strategies which contribute to the energy transition

The energy transition to net zero from 2020 to 2050 (EJ)[1]



CIP fund strategies and primary focus *(non-exhaustive)*

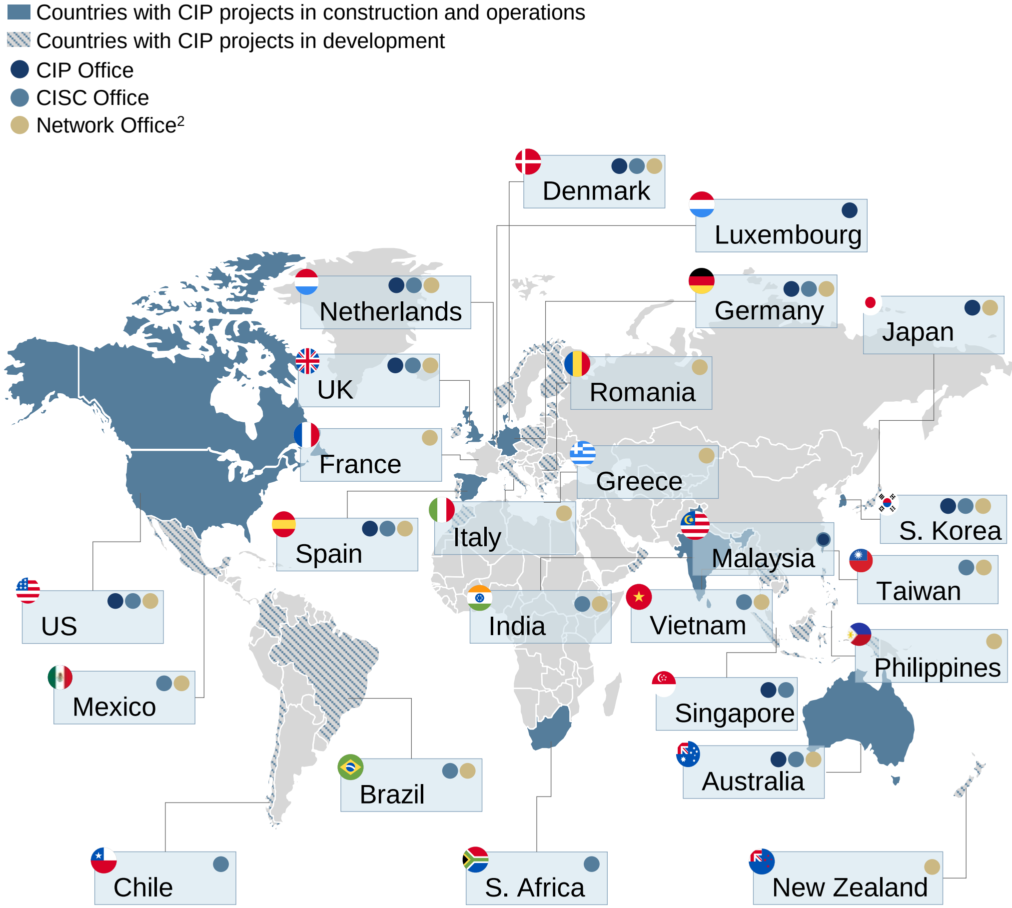
Fund strategy	Geography	Technology	Equity/Debt
CI Flagship Funds	High income OECD countries	Offshore wind, onshore wind, solar PV, battery storage, and other	Equity
Growth Markets Funds	15 selected high growth middle income countries		
Green Credit Funds	High income OECD countries		Debt
Regulated Energy Grids		Transmission / Distribution	Equity
Energy Transition Funds	High income OECD + selected non-OECD[2]	Power-to-X	
Advanced Bioenergy Funds	High income OECD countries	Biogas and biofuels	

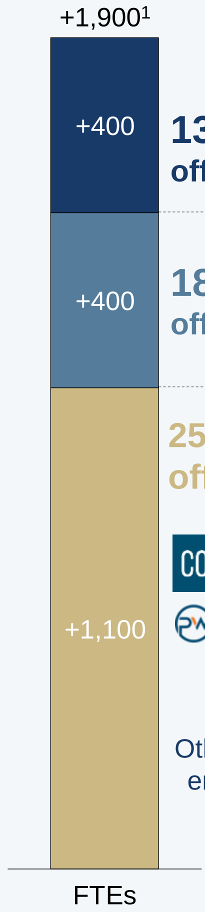
Important information: There is no guarantee that the Fund will successfully execute its strategies.

Notes: **1)** CIP's illustration of the energy transition based on IEA Net Zero by 2050 published in 2021; **2)** ETF primarily engages in projects in OECD, but also have a minority of projects in non-OECD countries (max 20%); **3)** Reduction in energy consumption driven by efficiency measures and behavioral change.

CIP platform has +1,900 people across offices in all key markets

Overview of global CIP, CISC and project offices





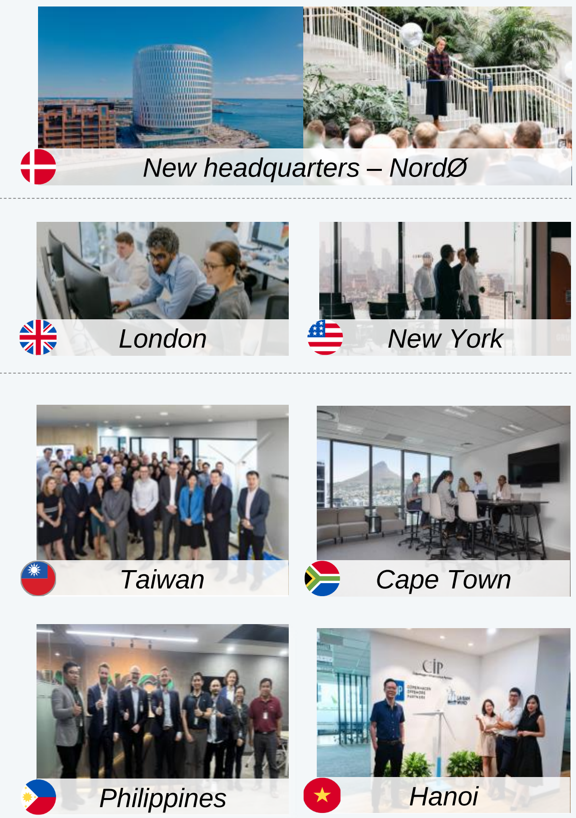
13 CIP offices

18 CISC offices

25 network offices

COP | BLUE POWER PARTNERS | PEAK Wind

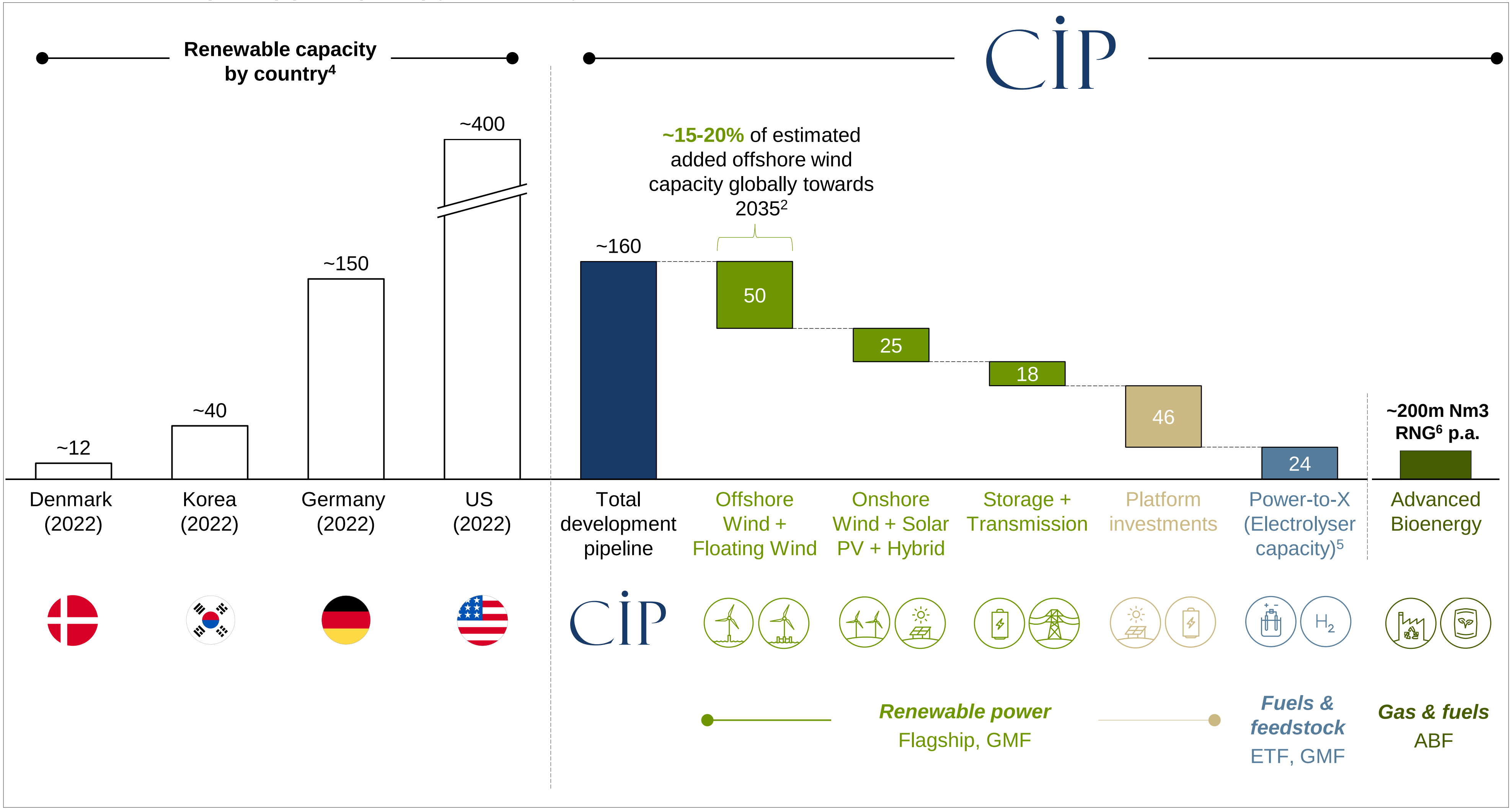
Other project employees



Important information: As of June, 2024. Loss of key staff members and industrial specialist partners could have an adverse effect on the Fund. Please see the Important Information and Legal Disclaimers for additional important information. The inclusion of any third-party firm and/or company names, brands and/or logos does not imply any affiliation with these firms or companies. None of these firms or companies have endorsed CIP, a Fund or any associated entities or personnel.
Notes: 1) As of June 2024 for CIP and CISC FTE. As of January 2024 for Project FTEs; **2)** Offices for COP, Blue Power Partners and/or PEAK Wind.

We are developing a large and diversified renewables pipeline of ~160 GW

Attractive CIP development pipeline (in GW) (not exhaustive)[1]

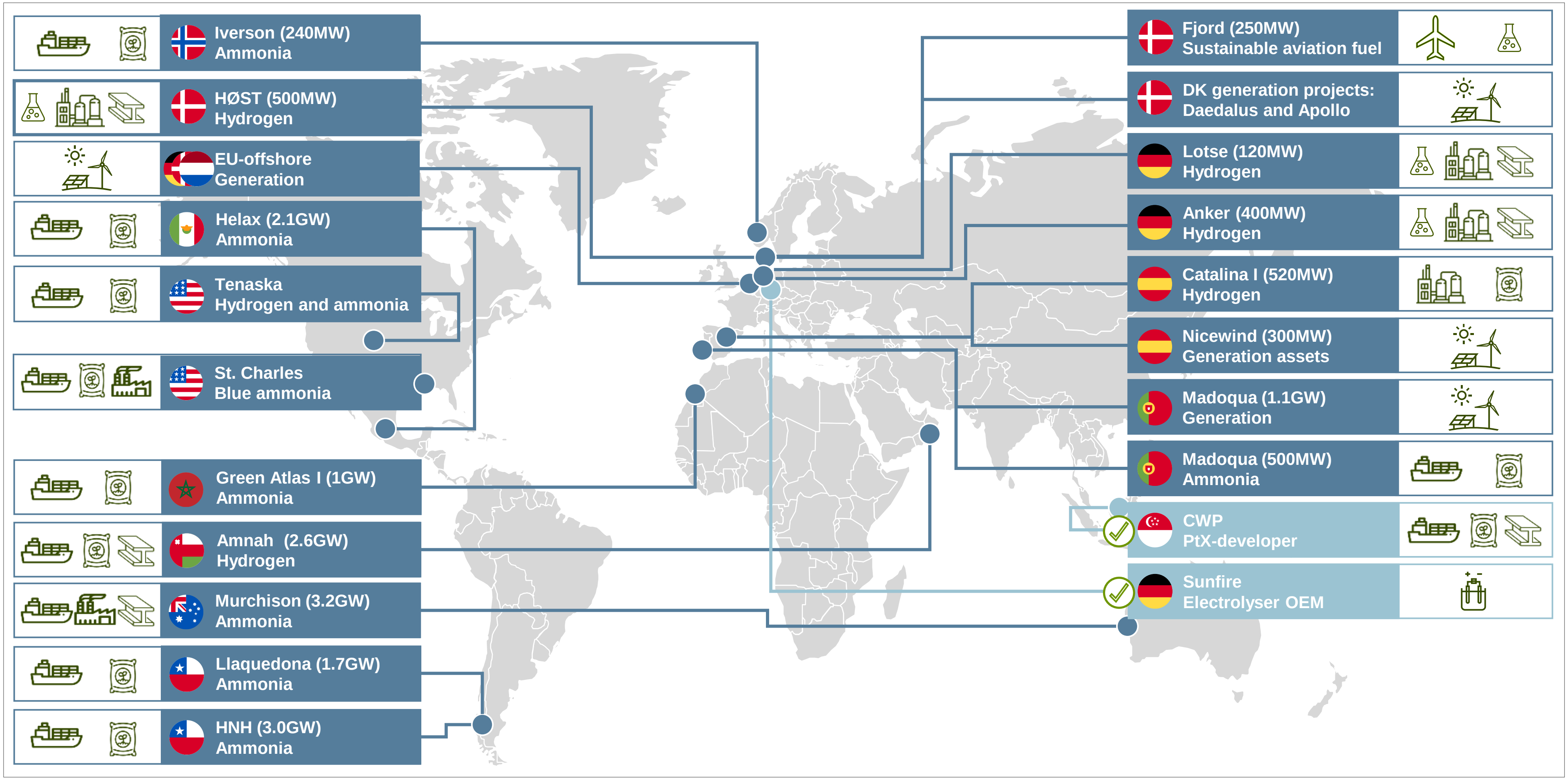


Important information: There can be no assurance that potential investments will be consummated. **Notes: 1)** Including only projects with site applications, land rights, exclusivity or ownership (or similar rights). Capacity is gross GW including partnership share (where CIP is not 100% owner). CI ABF I pipeline of greenfield advanced bioenergy projects shown seperately, as capacity is measured in Nm3 RNG instead of GW; **2)** CIP develops 50 GW of offshore and floating wind (gross capacity incl. partnership share) which equals ~15-20% of expected capacity added by 2035 excl. China according to BNEF 1H 2022 Offshore Wind Market Outlook (Jun 2022); **3)** BNEF 2H 2022 Hydrogen Market Outlook, forecast of 180 GW electrolyser capacity by 2030 excluding China; **4)** BNEF; **5)** Does not include associated power generation; **6)** Nm3 RNG = Normal cubic meter of Renewable Natural Gas.

CIP PtX-Projects: Global leading portfolio with strong geographical distribution

Global portfolio of PtX Projects addressing future key markets

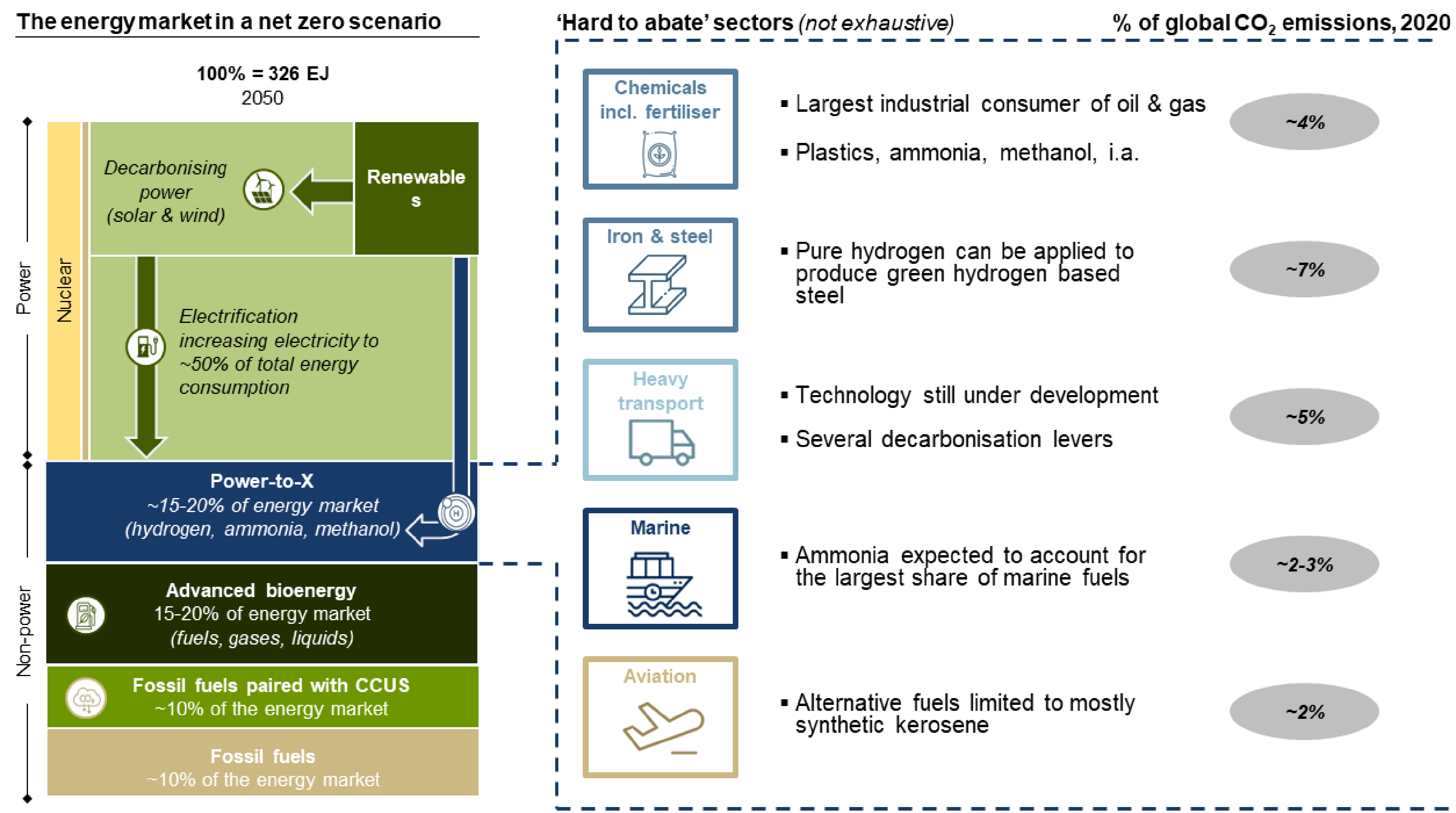
Under development | Corporate equity investments | FID taken



Potential Offtake Market: Fertilizers | Marine fuels | Power plants | Iron & steel | Refineries | Chemical | Aviation | Power generation

Hydrogen is critical in the transition of hard to abate sectors

Decarbonisation of industry, heavy transportation, and buildings is dependent on hydrogen as fuel and feedstock

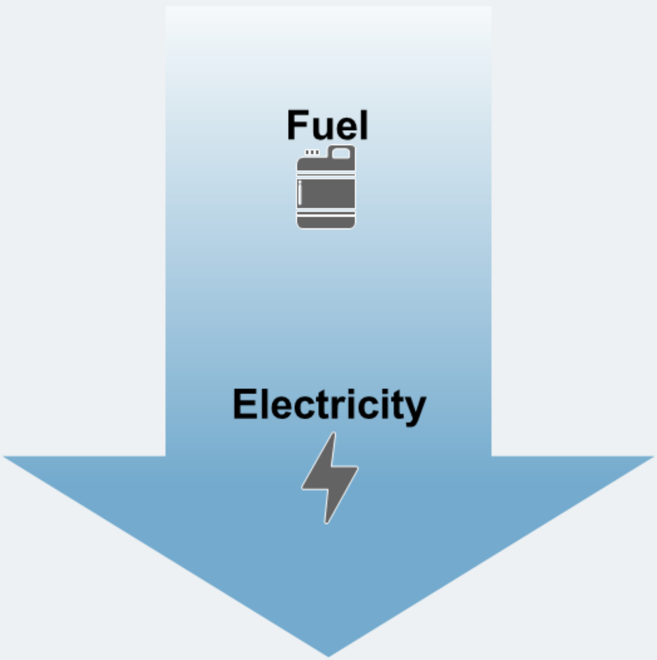


Source: IEA Net-Zero by 2050

Electricity - from premium product to raw material

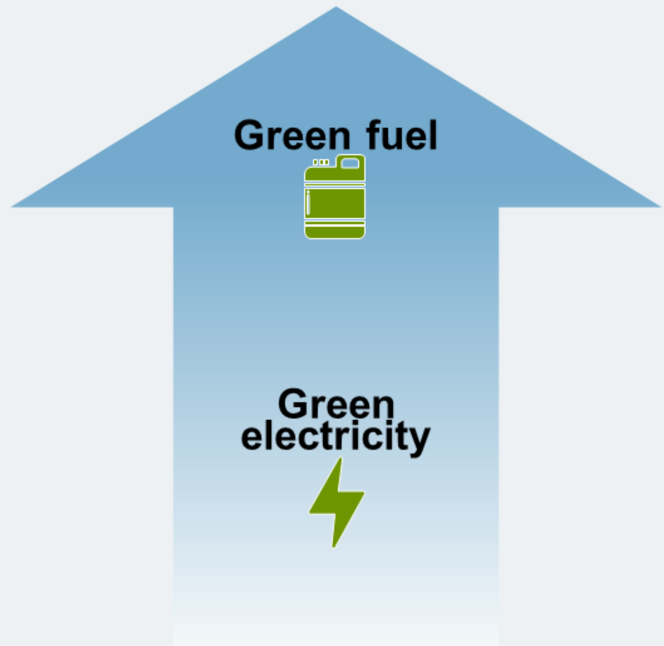
TODAY

Today electricity is a premium product producered mainly by use of fossil fuels



IN THE FUTURE

In the future electricity will primarily be a raw material which can be used for production of refined green products



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Solving the triple challenge: Achieving clean, affordable and resilient European energy system by demystifiyng complexities

Challenges

Sense of urgency

for a green energy transition due to physical climate risk and energy security issues

Clean energy transition *aiming for Net Zero by 2050*

Energy resilience *following Ukraine War calling for sovereignty an diversification*

Socioeconomics benefits

Potential for significant socioeconomic benefits in terms of growth or job creation

Affordable clean energy *with most cost competitive energy sources ensuring European competitiveness*

Political Ambitions

Delayed implementation

Global Policy Objectives	**Paris Accord** *(December 2015)*
European Policy Objectives	**RePowerEU** *(May 2022)*
	EU Solar Power Strategy *(May 2022)*
	Marienborg Declaration *(August 2022)*
	EU Green Industrial Plan *(February 2023)*
	Ostend Declaration *(April 2023)*
Global Industry Competition	**Inflation Reduction Act** *(July 2022)*

Complexities

CIP aims to demystify the complexities

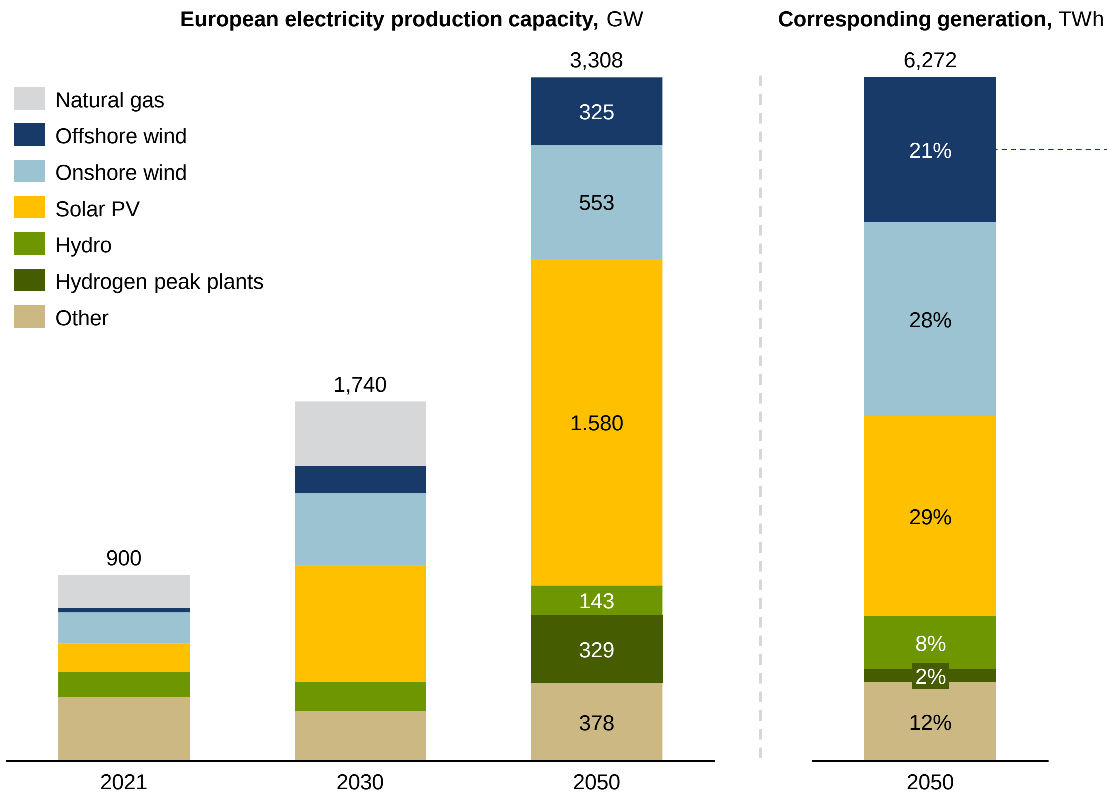
of the European clean transition and provide insights to capture the opportunities driven by the transition

1. **How much renewable power capacity is needed to reach Net Zero by 2050?**
2. **To what extent can a clean transition achieve an affordable and resilient energy system?**
3. **What role would clean hydrogen play in the future energy system?**
4. **To what extent will Europe be dependent on hydrogen imports in the future?**

Europe's clean transition to be delivered by renewables at a competitive cost, with offshore wind supplying ~21% of 2050 electricity

Power production capacity buildout and resulting energy generation

Power capacity (GW) **and electricity generation** (TWh) **mix for the Net Zero Scenario in Europe,** 2021-2050



Key renewables conclusions

80% of Europe's 2050 power supply can be delivered by wind and solar

Capacity to grow, 2021-50:

- 11x solar PV
- 4x onshore wind
- 16x offshore wind
- 511 GW Power-to-X

Affordable energy

In the Net Zero scenario, electricity costs in 2050 are 18 % lower than of we rely on fossil energy sources.

Offshore wind has an important role

325 GW of offshore wind can supply ~21% of total electricity generation in 2050

Important Information: The model-based insights presented are based on historical data and current market trends and are intended for informational purposes only. They should not be construed as financial advice or a guarantee of future market performance. **Source:** Projections based on the Balmorel model which is an economic optimization model for power system capacity expansion, with the purpose of meeting electricity demand with the least cost with a set of tech-economical inputs and system operation constraints (e.g. max grid build-out per year), while achieving the net zero target by 2050. The model analysis is conducted in collaboration with Energi-Analyse.

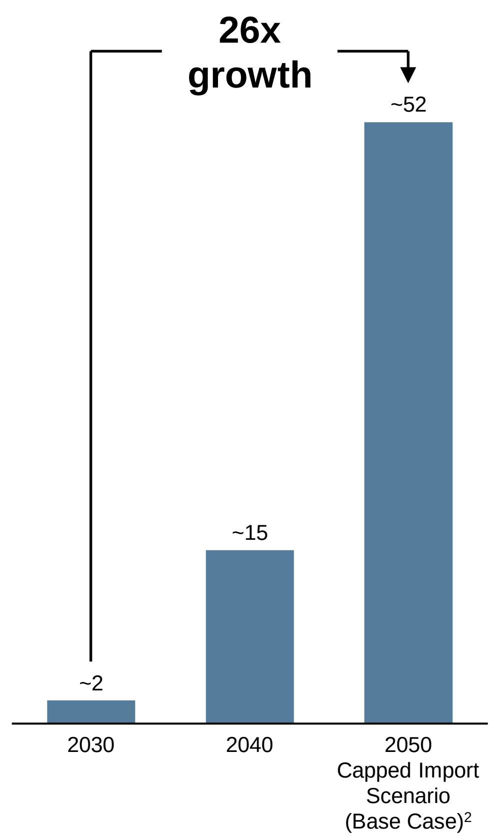
Europe can meet a substantial portion of its own green hydrogen demand, delivered via production in the North Sea, Baltic Sea, and the Iberian Peninsula

European green hydrogen producers to meet growing demand for Europe

European hydrogen production, 2050

Clean hydrogen demand, Europe

(mtpa hydrogen-equivalent)



Key green hydrogen conclusions

Clean hydrogen is critical to decarbonize hard-to-electrify sectors with projected demand of 52 million tons by 2050[1], equivalent to 511GW electrolysis capacity.

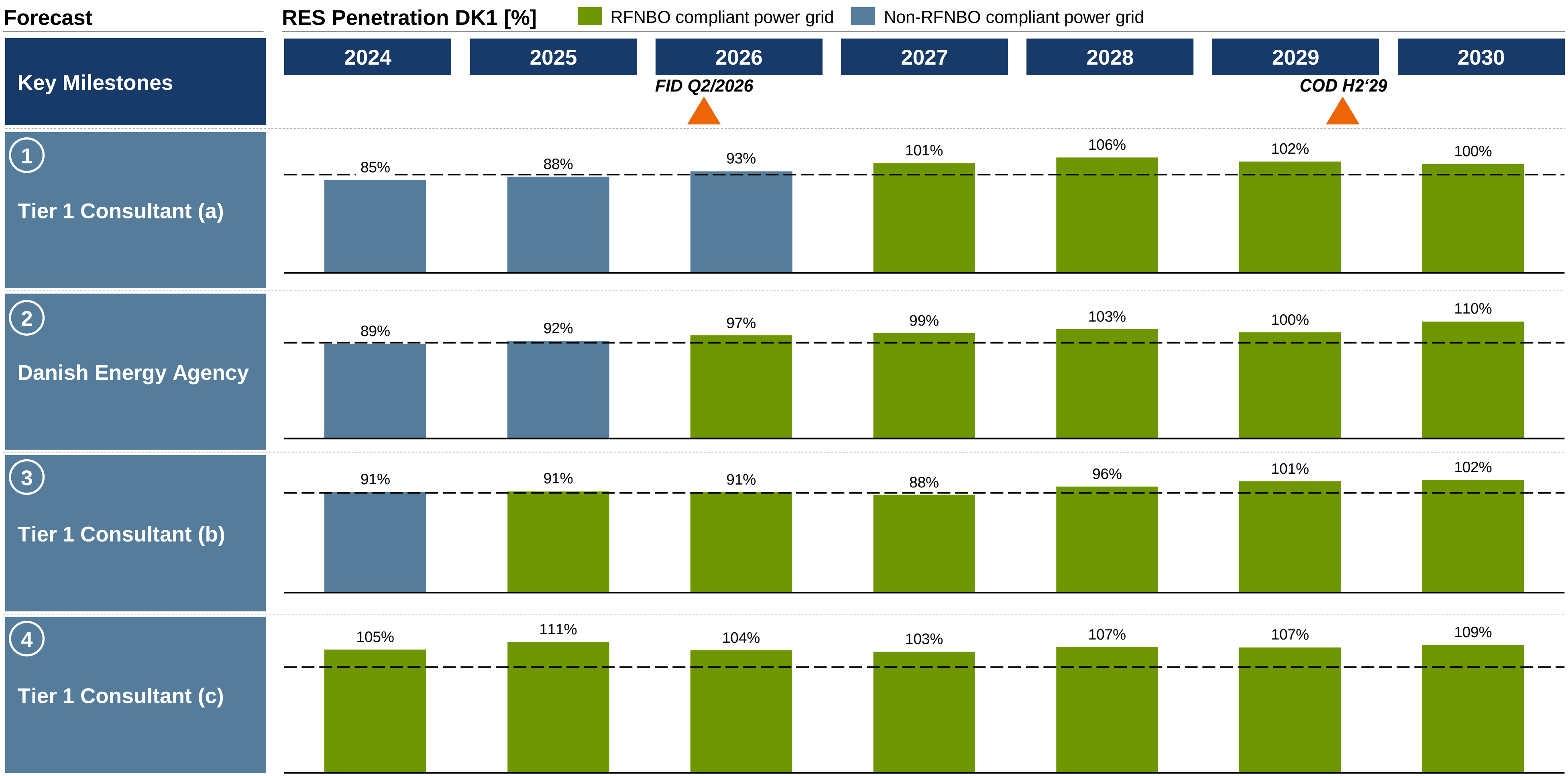
Building the an interconnected hydrogen infrastructure is vital for an integrated energy system

EUR ~45 billion cumulative investments required for the hydrogen network buildout from 2025-2050, with private capital playing a pivotal role

Notes: 1) Largely based on European Union Fit for 55 mix scenario including modification for EU commission staff IA report February 2024; **2)** European import hydrogen at competitive prices from North Africa expected to be capped by political motives such as energy dependency or industry policies – in this case capped at 10 mtpa hydrogen from 2040 forward;

Denmark to achieve >90% renewable energy share of electricity, subject to RED II exemptions

When DK1 achieves 90% RES penetration, 100% of HØST production is RFNBO even if power is sourced directly from the grid

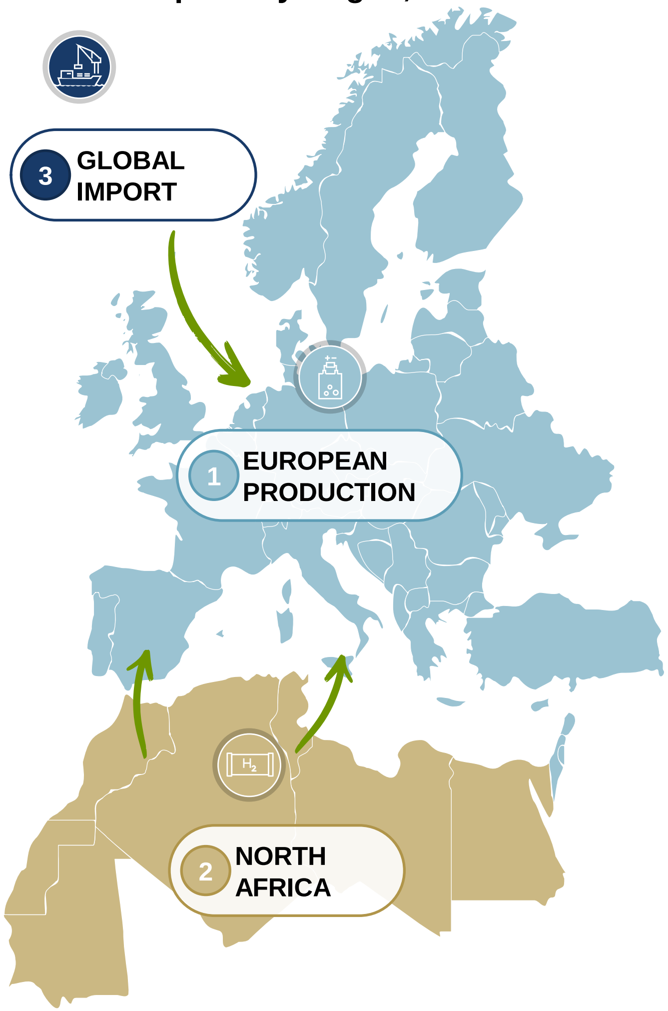


90% RES-E share in DK1 allows HOST to source power directly from the grid and deliver a baseload-like H2 supply

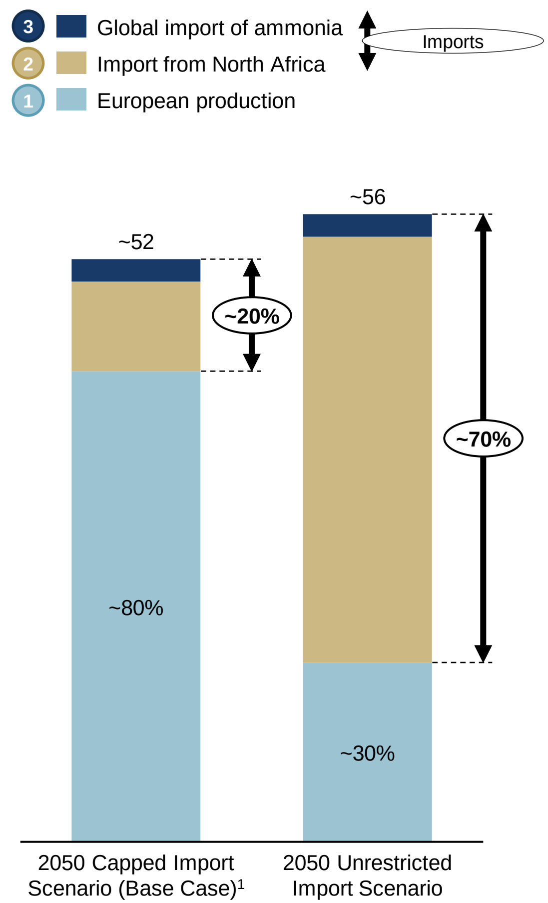
Challenge 1: Optimizing hydrogen imports balancing clean energy resilience and affordability

European hydrogen supply mix depends on whether imports are capped, 2050

Source of European hydrogen, 2050



European clean hydrogen supply mix in 2050, per import scenario, (mtpa hydrogen-equivalent)



Key conclusions

Europe can improve resilience and cost effectiveness in its hydrogen supply by strategically combining domestic production with imports

Depending on import cap scenario, **Europe could import ~20-70% of its hydrogen supply** to meet its projected 2050 demand

Ultimately, **Europe's dependency on clean hydrogen imports will be determined by** European policy (e.g. energy security considerations, import caps), the pace of renewable energy build-out, industrial policy, and energy affordability

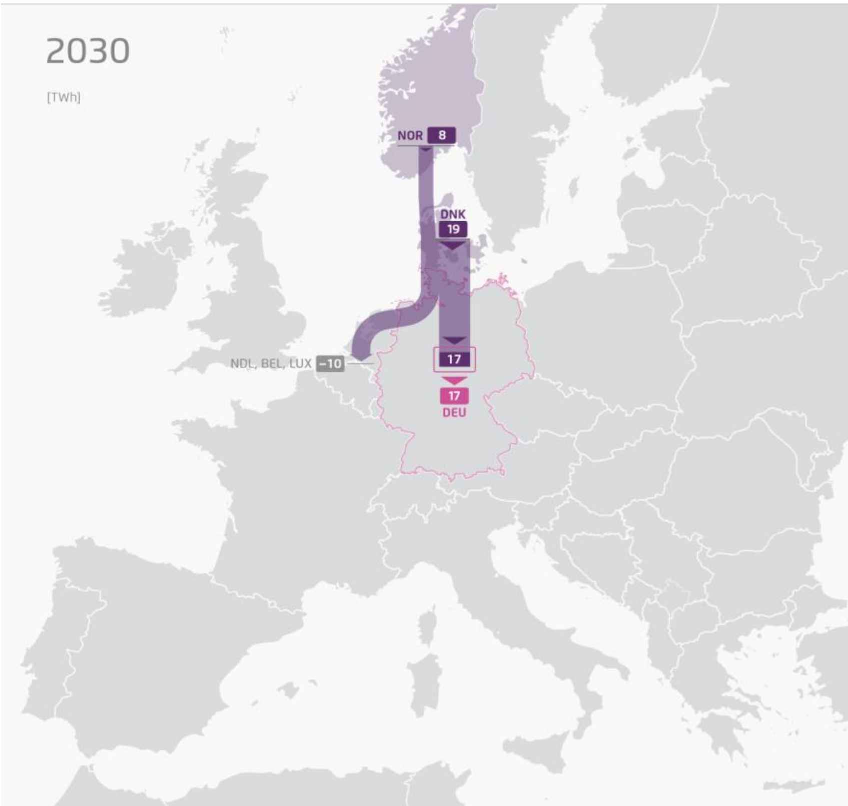
Source: Projections based on the Balmore model which is an economic optimization model for power system capacity expansion, with the purpose of meeting electricity demand with the least cost with a set of tech-economical inputs and system operation constraints (e.g. max grid build-out per year), while achieving the net zero target by 2050. The model analysis is conducted in collaboration with Energi-Analyse

Notes: 1) European import hydrogen at competitive prices from North Africa expected to be capped by political motives such as energy dependency or industry policies – in this case capped at 10 mtpa hydrogen from 2040 forward

Possible H2 pipeline import routes to Germany

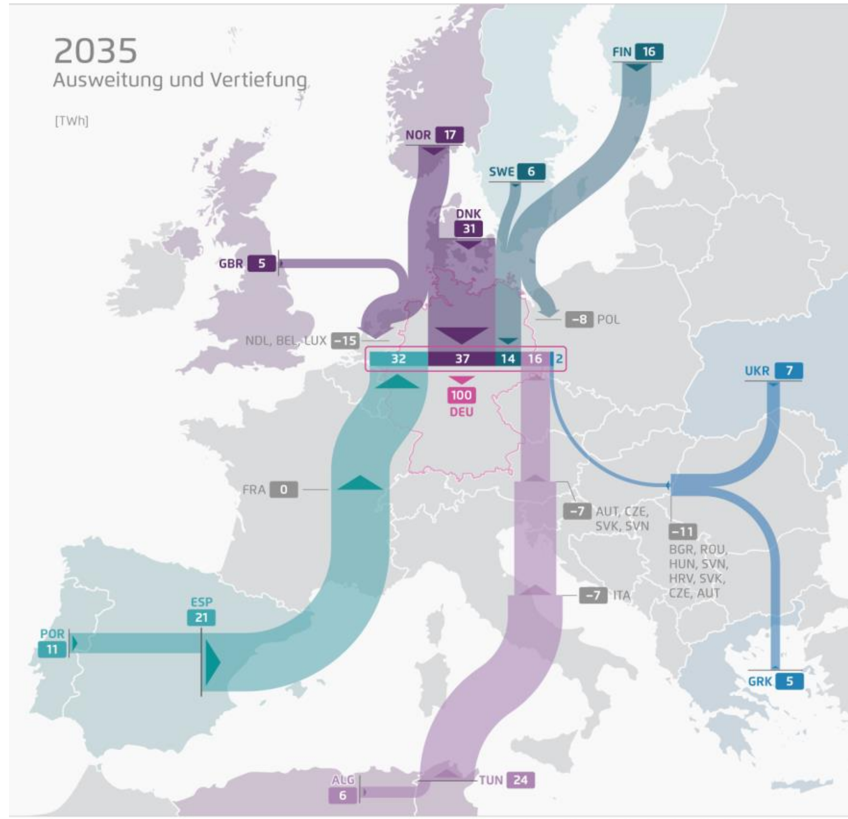
Findings of Agora Energiewende study „Wasserstoffimporte Deutschlands“ (2024)

Mögliche Importe Deutschlands an erneuerbarem Wasserstoff per Pipeline im Jahr 2030 → Abb. 1



Agora Energiewende und Guidehouse (2024). Anmerkungen: Schematische Darstellung der Korridorverläufe. Rundungsbedingte Abweichungen sind möglich. Keine Betrachtung der zu erwartenden künftigen Rolle Deutschlands als Transitland für europäische Wasserstoffflüsse. Einige Korridore können auch für kohlenstoffarmen Wasserstoff genutzt werden.

Mögliche Importe Deutschlands an erneuerbarem Wasserstoff per Pipeline im Jahr 2035 (Szenario *Ausweitung und Vertiefung*) → Abb. 3



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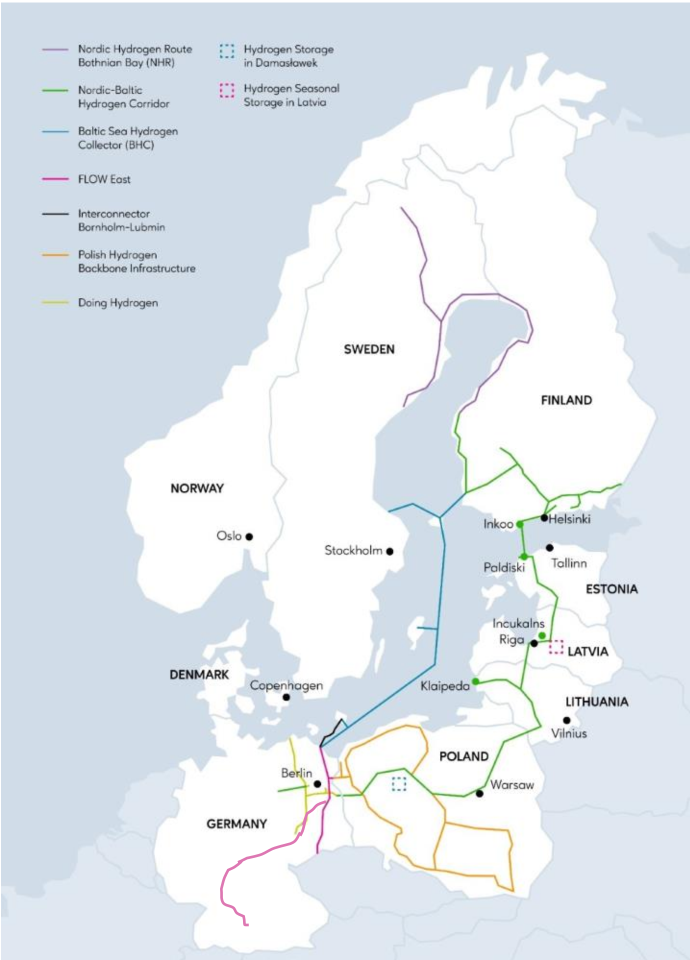
Roles and synergies between planned hydrogen projects in the BEMIP region



Baltic Sea Hydrogen Collector (BHC)

- New build pipeline system for transmission of green hydrogen from Finland and Sweden to Germany and Central Europe
- To be connected to Åland, Gotland and potentially also Bornholm
- Unlocks the significant renewable potential in the Nordic and Baltic Sea region

Nordic Hydrogen Route - Bothnian Bay (NHR)

- New build onshore bidirectional pipeline along the Bothnian Bay dedicated for green hydrogen transmission

Nordic-Baltic Hydrogen Corridor (NBHC)

- New build and repurposed transportation corridor to unlock the potential of H2 production in the Nordic and Baltic regions

Doing Hydrogen

- Hydrogen infrastructure in East Germany directly linked to the Nord-Baltic Hydrogen Corridor at the Polish border

Hydrogen storage in Damasławek

- Hydrogen storage services for the purpose of hydrogen transmission along the NBHC and the Polish Hydrogen Backbone

Project Flow

- Distribution of hydrogen produced on- and offshore in the Lubmin region and Baltic Sea
- Conversion of existing infrastructure

Polish Hydrogen Backbone Infrastructure

- Distribution of hydrogen delivered via the NBHC
- Nation-wide hydrogen grid. The backbone is expected to be implemented following market signals

Hydrogen seasonal storage in Latvia

- Underground hydrogen storage in aquifer reservoir to serve hydrogen transmission along the Nordic-Baltic Hydrogen Corridor as well as regional domestic consumption

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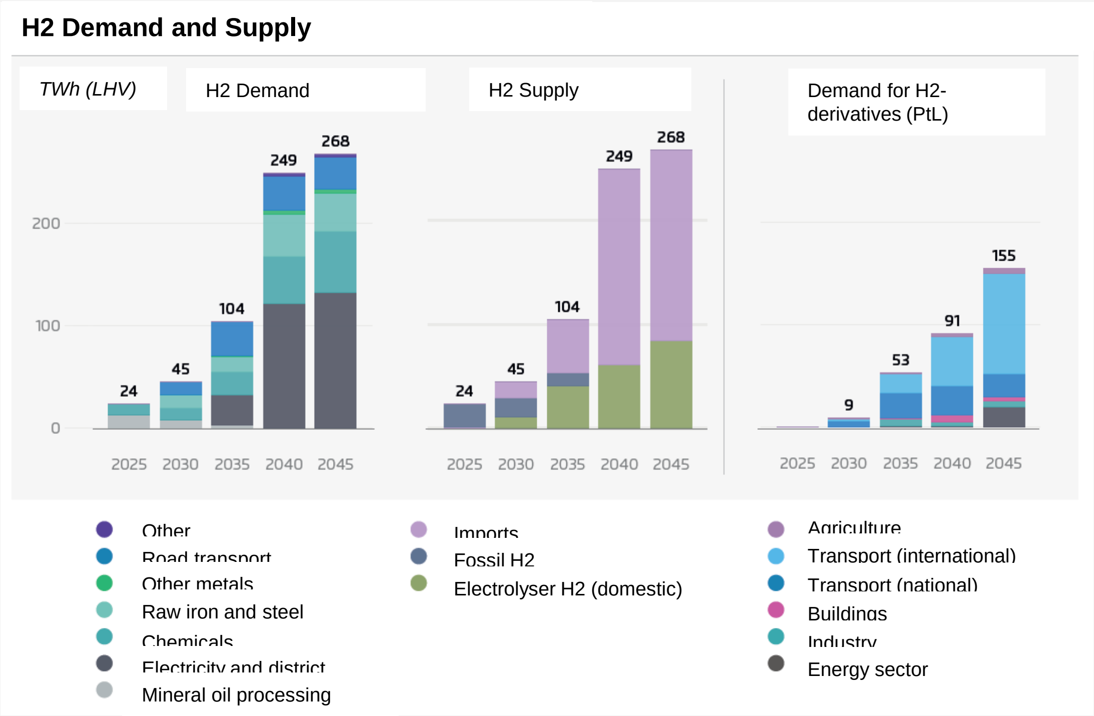
Germany: Agora expect power and heat to account nearly half the H2 demand by 2045



Source: Agora Energiewende KNDE (2024)

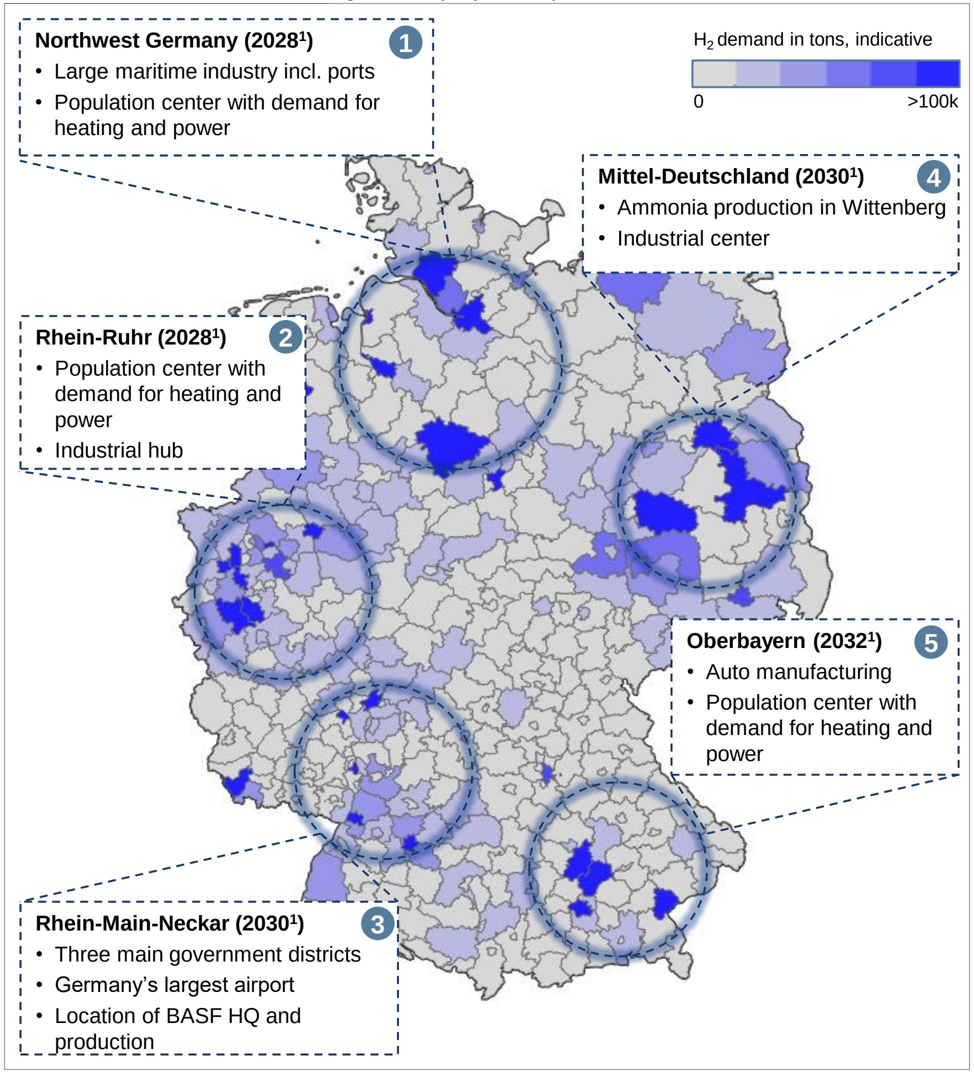
- The modelled power and heat demand in 2045 stems from dispatchable **H2-power plants** as well as **H2-CHP plants**
- The second largest demand driver is the **industry** where **steel** production using the DRI pathway is ramped up next to H2 demand from the **chemicals** industry
- Around **two-thirds** of the total H2 demand in 2045 is assumed to be met by **imports**
- Another 155 TWh of H2 derivative demand is expected in 2045 stemming mostly from the **transport sector**, including international maritime and aviation traffic

- **KNDE 2024 vs KNDE 2021**
  - Lower demand in 2030 (-28%) and 2035 (-24%)
  - Higher demand in 2045 (+11.5%)
  - H2 use in the power sector is delayed from 2030 to 2035, overall volumes are lower.

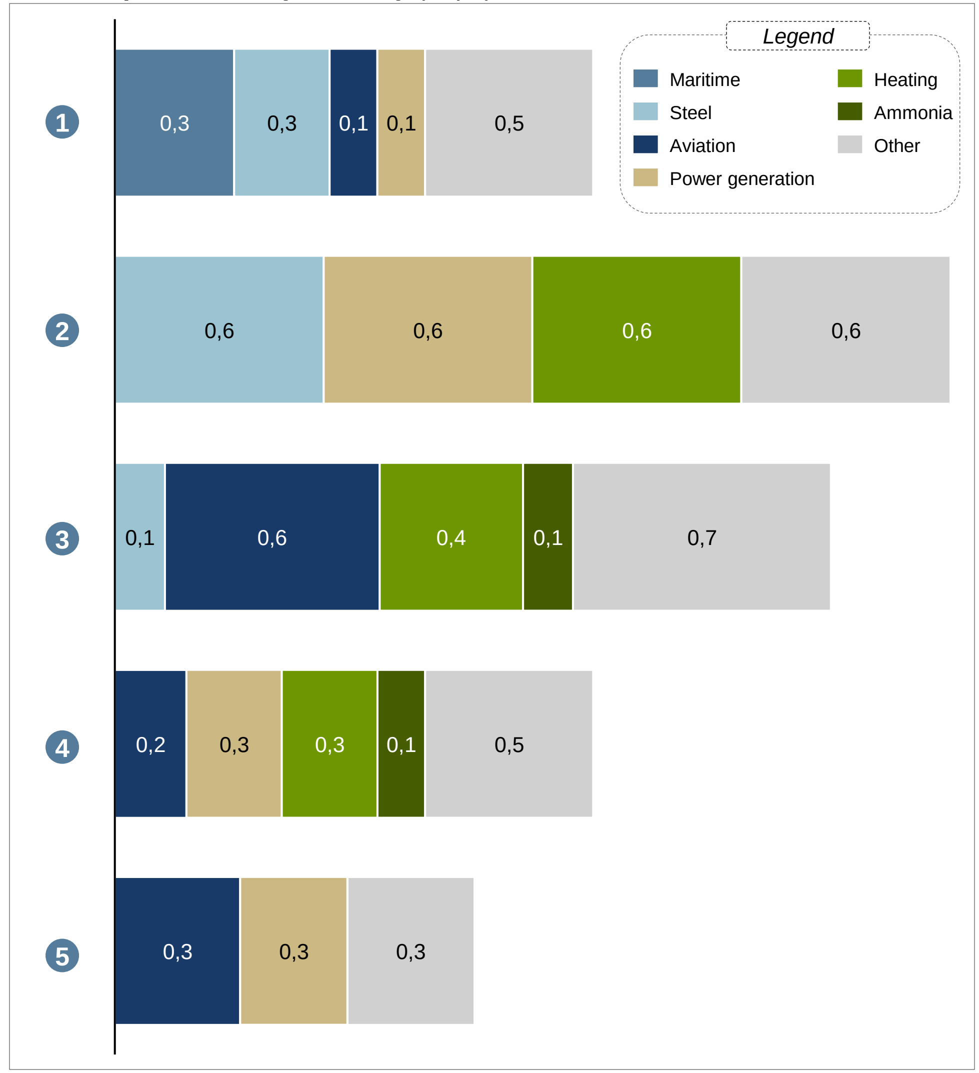
German H2 demand is concentrated in 5 clusters, accounting for ~80% of total demand

Overview of German H2 demand clusters and breakdown by industry

German demand clusters by 2050 (expected)



Demand per cluster by industry (mtpa)



Note: 1) Expected year from when Uniper can supply hydrogen to this region through the pipeline

Sources: McKinsey analysis

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Visualization of the HØST project site

Land, grid connection, and water supply secured. Permits expected within months

General overview of project site

Land

- Land acquired for 26 ha project perimeter (1GW ELZ capacity)
- 18ha extension option (potential for adding up to 1.5GW additional ELZ capacity)

Grid

- 1.2GW grid connection secured
- Station Endrup net-connection signed with DK TSO Energinet

Permits

- EIA permits expected finalised Q4'2024.
- 2nd public consultation recently ended with few responses considered harmless

Water

- Access to wastewater from 1.3 million m3 water supply nearby
- Supply agreement signed with local utility company

360° Developer risk profile

Within own control

Financial risk
How to make a project bankable?

Technology and construction risk
Performance guarantees on electrolysis and EPC strategy

Market challenges
How to distribute the green premium across the value chain?

Operational risk
O&M costs

Project risk
Permitting, district plan, and local communities

Hard to influence

Geopolitical risk
Supply chain issues, raw materials availability

Renewable power
Build-out of offshore wind

Regulatory risks
RED, LCH DA, ETS/CBAM, NZIA

Infrastructure
Hydrogen infrastructure (cross border)

Society needs to store renewable energy

PtX is the perfect partner for optimum usage of renewable energy