Nordic Energy Days @ Expo 2025 Osaka

16th June 2025

Nordic Circle

Innovation Norway

Business Sweden

BUSINESS FINLAND

ROYAL DANISH EMBASSY Tokyo

Business Iceland

Nordic Council of Ministers

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Introduction

Finn-Kristian Aamot

Commissioner General for Norway at Expo 2025

Welcoming remarks

H.E. Kristin Iglum

Ambassador of Norway to Japan

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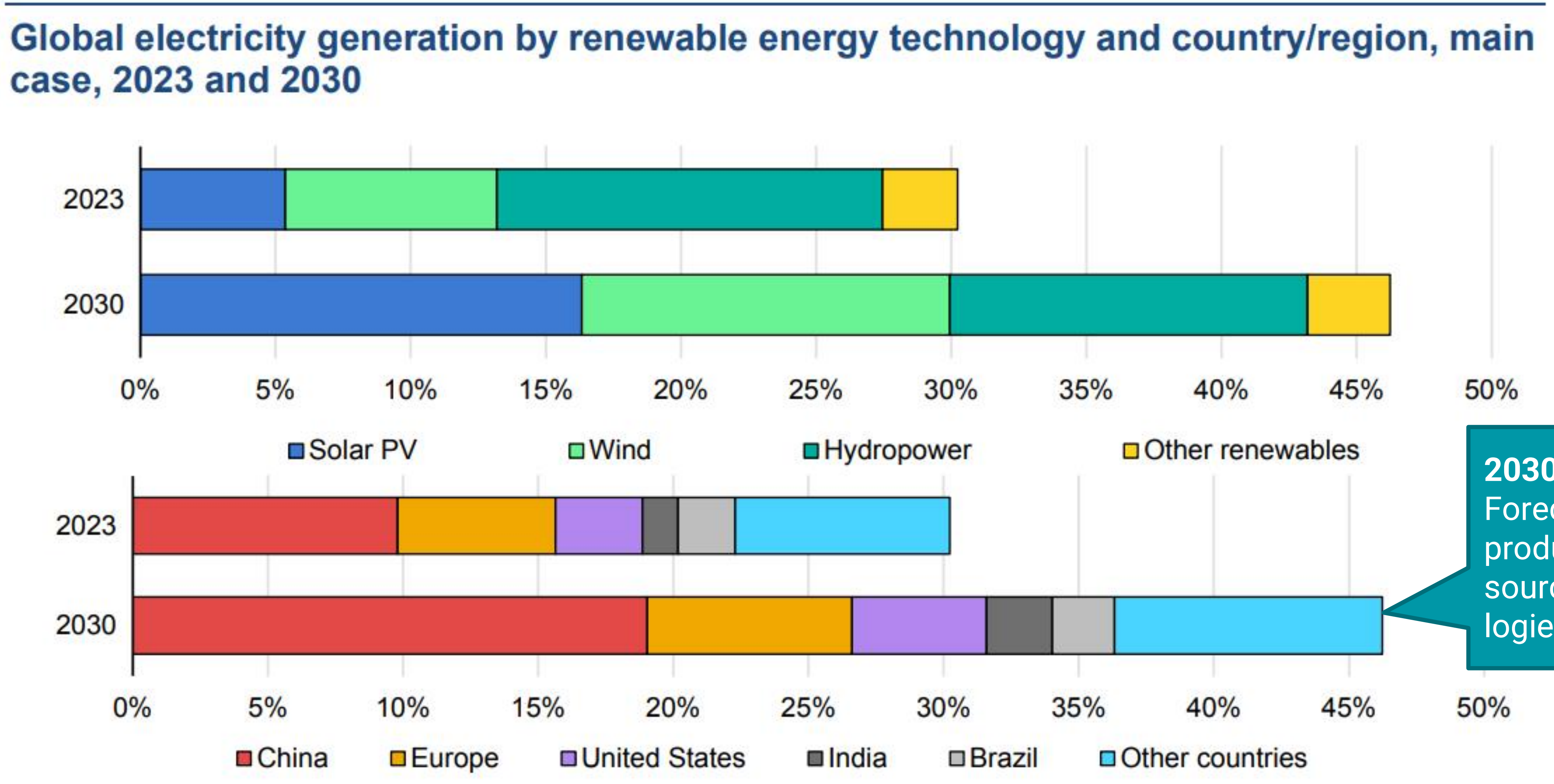
The Role of Offshore Wind in the European and Nordic Energy Transition

Deputy Director-General, Stig Uffe Pedersen

24. juni 2025

Wind Energy – A Key Global Driver for the Green Transition

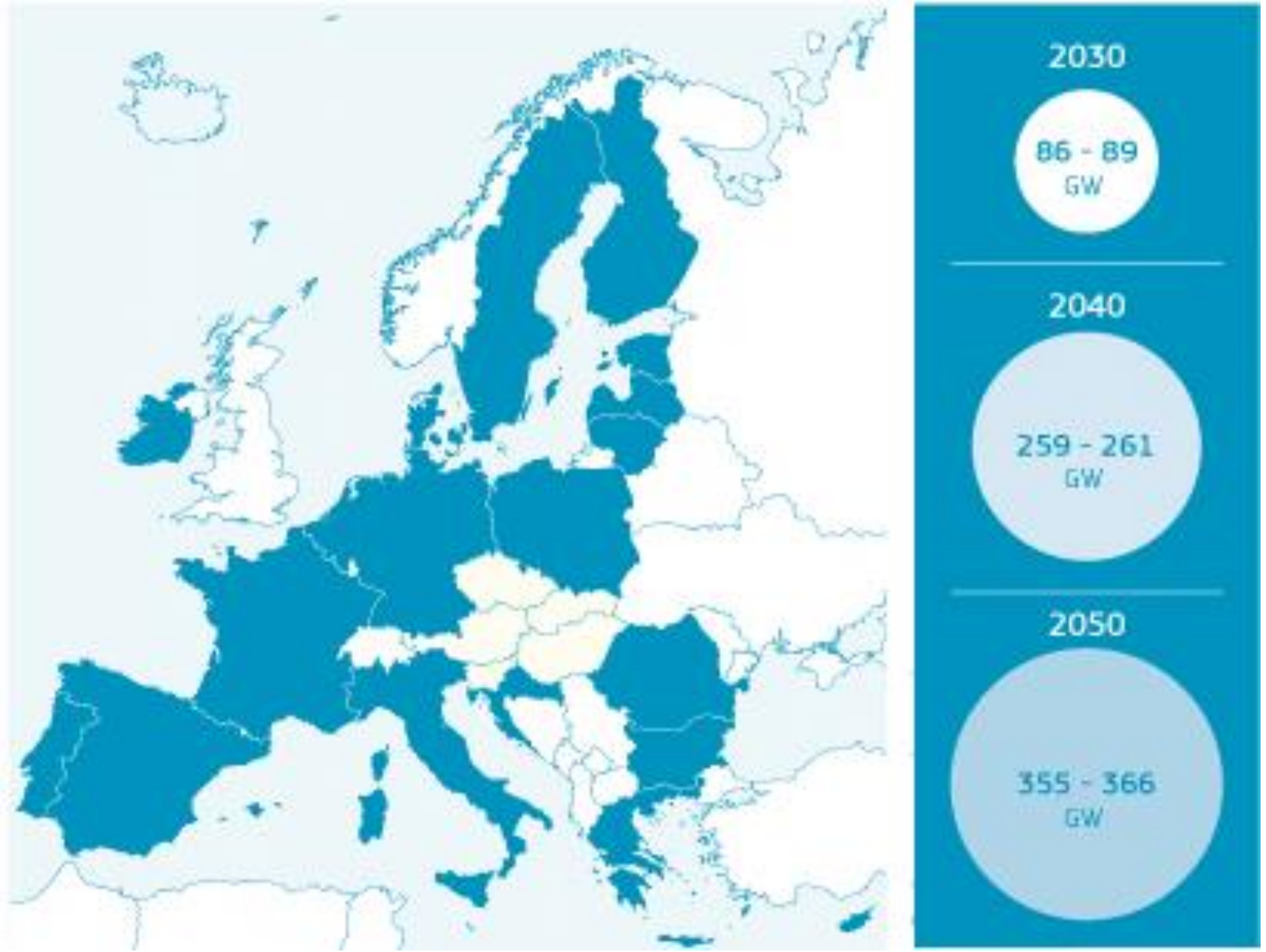


2030:
Forecasted total electricity production from renewable sources (across techno-logies) by country.

Source: IEA 2024, https://iea.blob.core.windows.net/assets/17033b62-07a5-4144-8dd0-651cdb6caa24/Renewables2024.pdf

Europe & The North Sea: The World's Leading Offshore Wind Hub

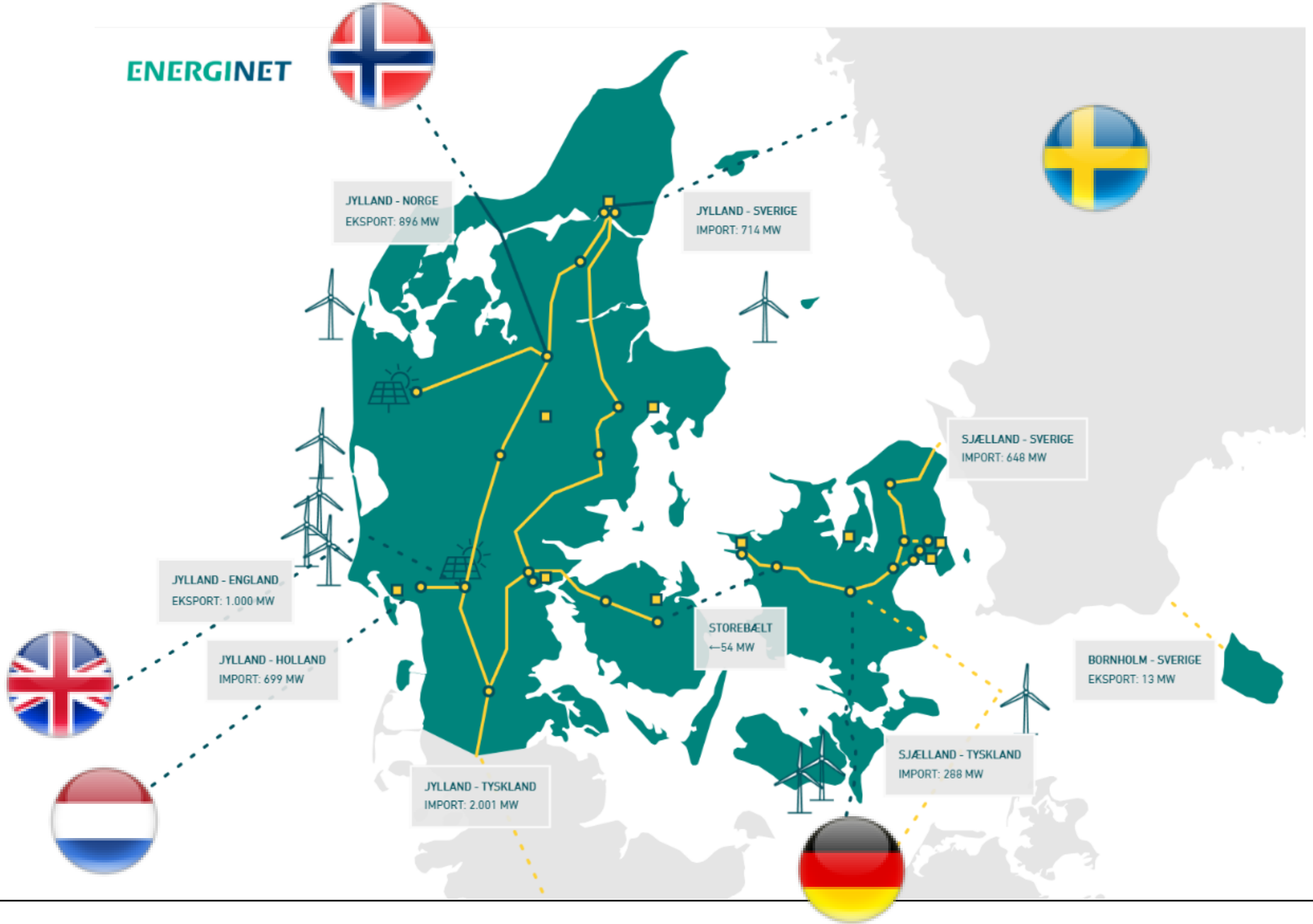
Cumulative offshore wind targets of EU member states



- The North Sea region positions Europe as the primary global offshore wind hub
- EU countries demonstrate ambitious offshore renewable goals, with a significant focus on the North Sea
- This collective European commitment aims to harness vast offshore potential for decarbonization and energy security

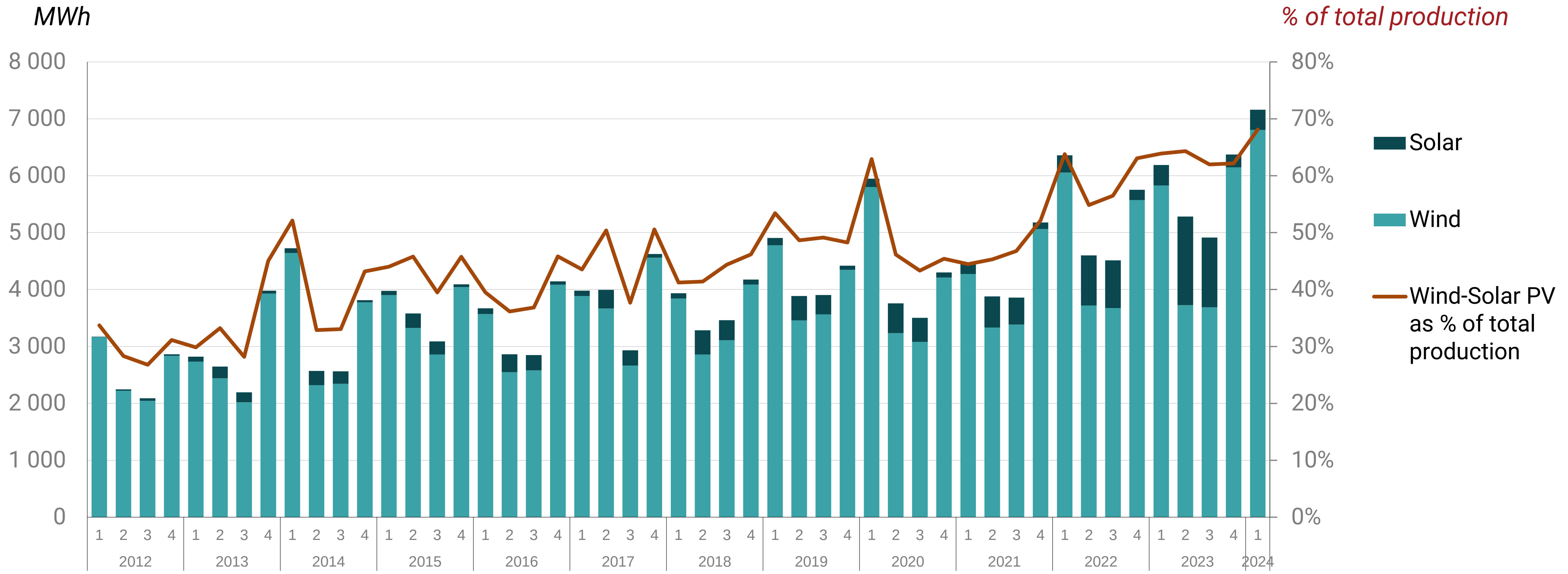
Source: European Commission, https://energy.ec.europa.eu/topics/renewable-energy/offshore-renewable-energy_en

Nordic Synergy: A Regional Powerhouse of Renewables & Integration



Denmark: A Pioneer in Offshore Wind – Continuously increasing penetration of renewables

Quarterly electricity from wind and solar as % of total production



Source: Danish Energy Agency, Energinet

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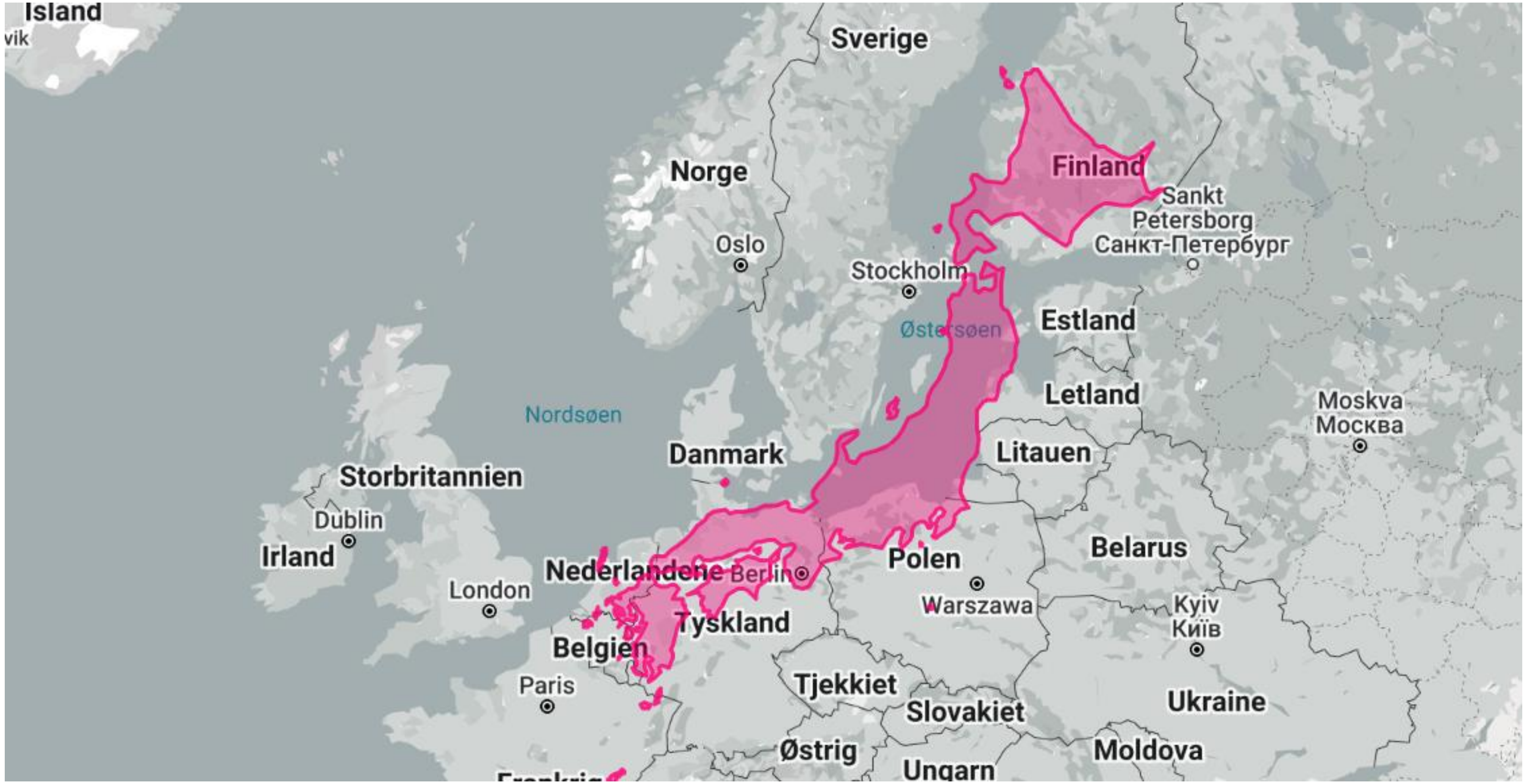
The size of Japan holds great climatic diversity comparable to continental Europe/Nordic region



Source: https://thetruesize.com/

Thank you

Danish Energy Agency

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Global macro update

June 2025

Osaka, Japan

Lars Nitter Havro, Head of Energy Macro Research

RystadEnergy

Agenda

01 Macro overview

02 Progress update for renewables

03 Energy storage outlook

04 Geopolitical constraints

Global presence

World-leading, independent advisory and analysis company with solutions that cover the entire energy value chain.

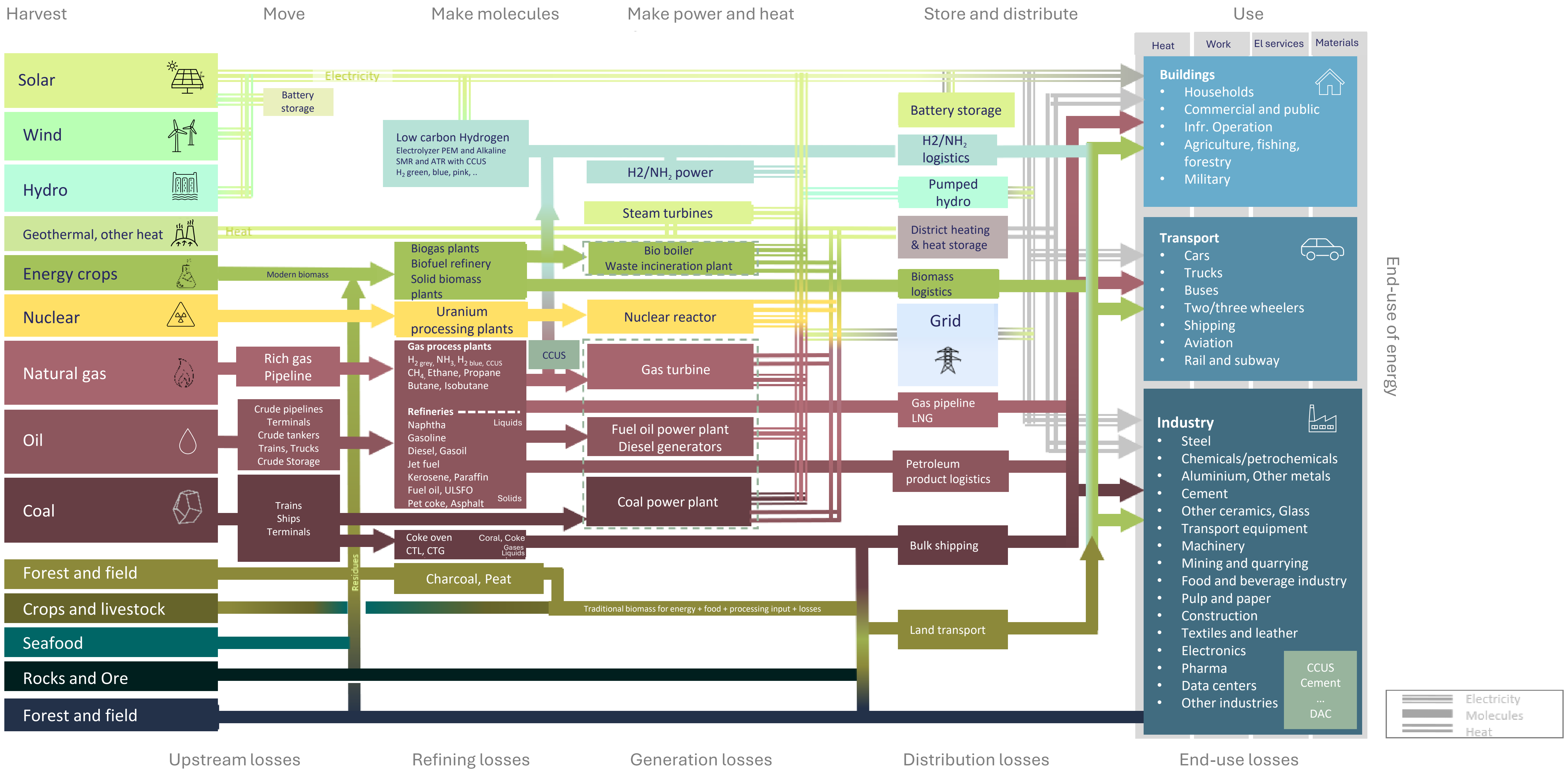
Putting the pieces together

All data is collected at the finest level of detail and then pieced together to form a complete picture.

Global energy assets 2025

Source: Rystad Energy PowerCube, CCUSCube and UCube

Putting the pieces together



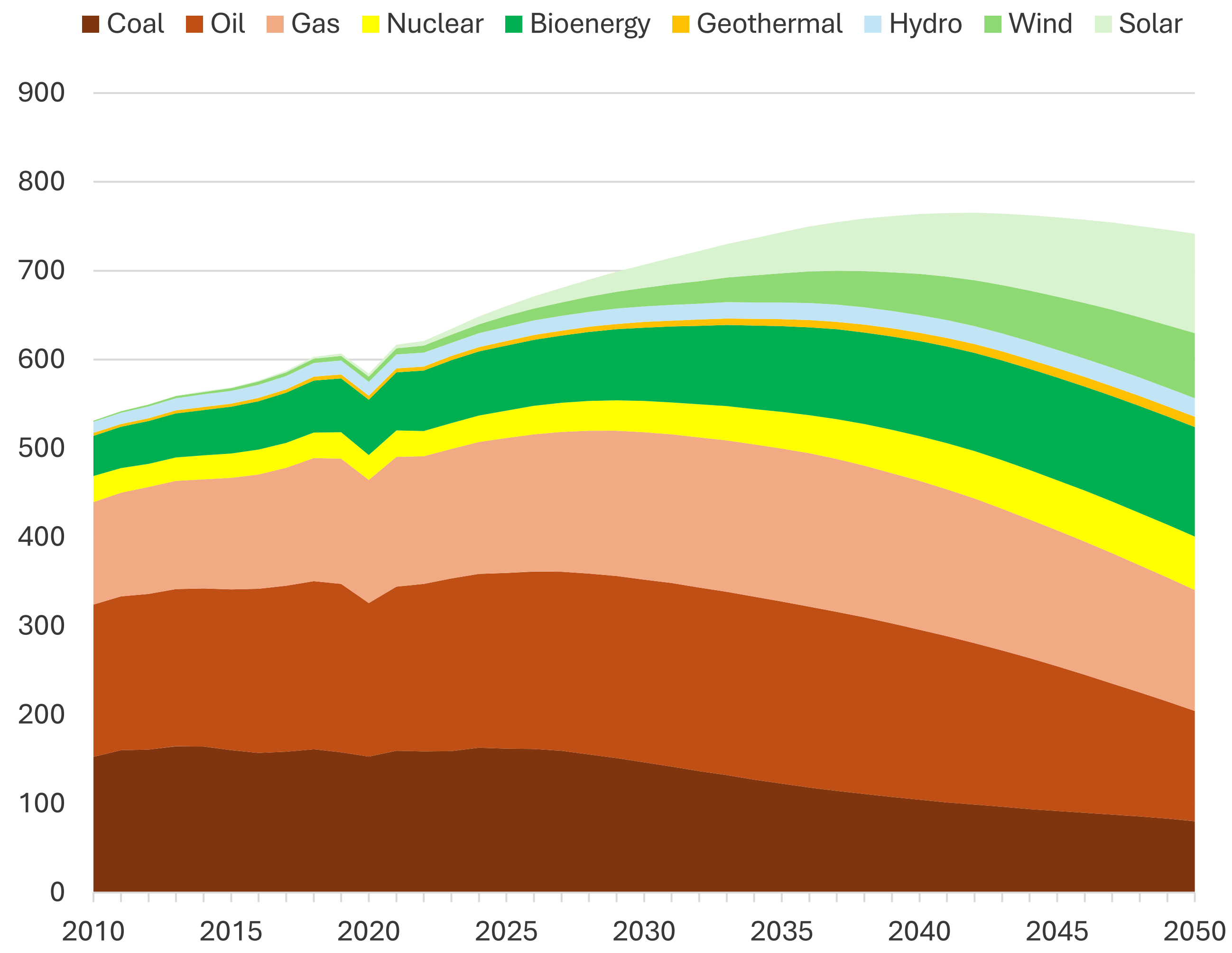
RystadEnergy

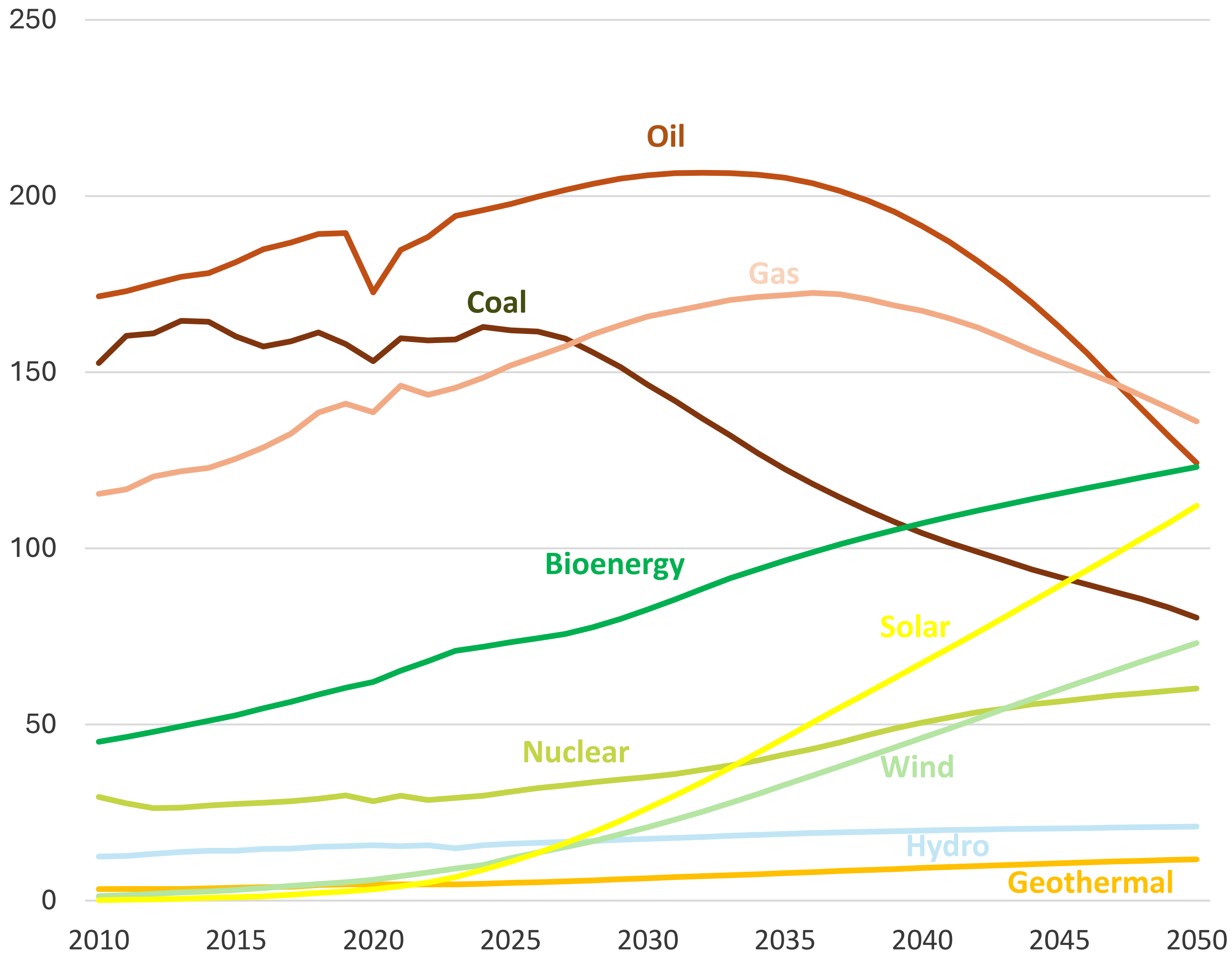
Demand for energy will increase steadily in the next decades

Fossil fuels set to decline as renewables rise to meet new energy demand

Primary Energy Demand

Exajoules





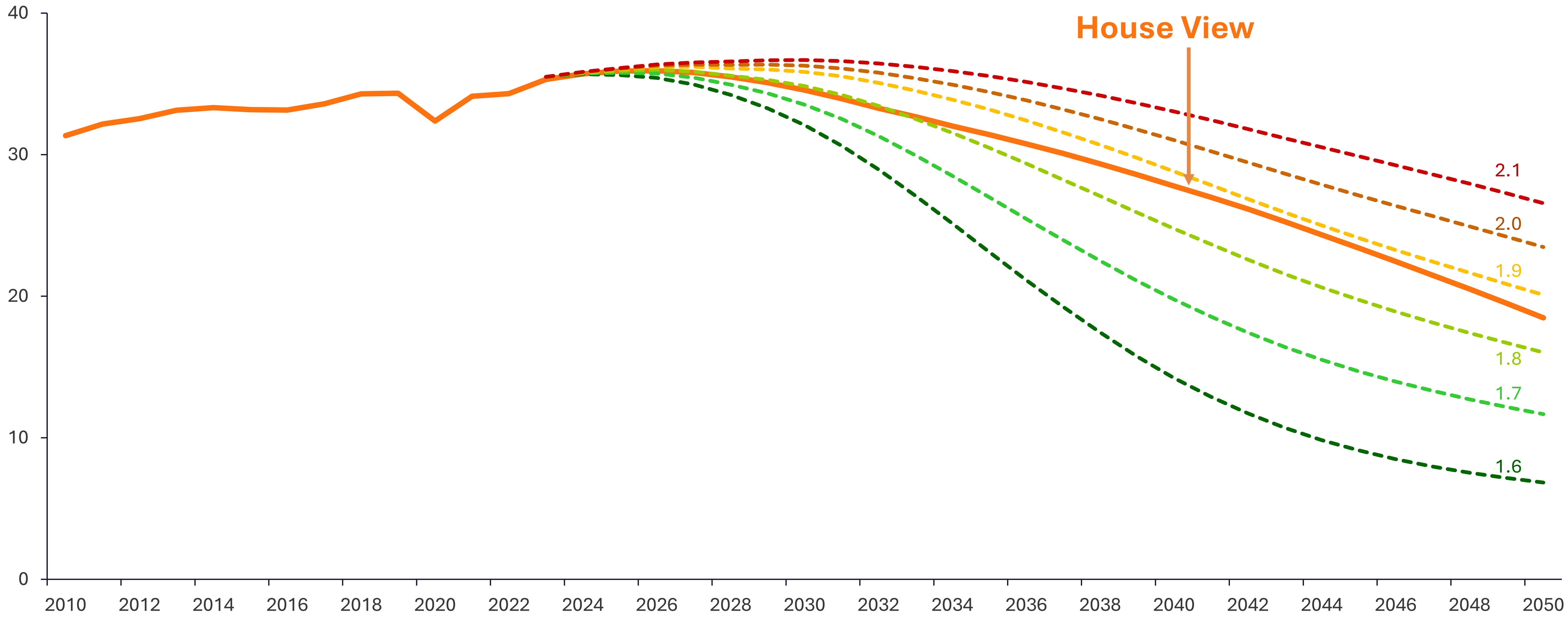
Source: Rystad Energy research and analysis, Rystad Energy Houseview Dashboard, May 2025

Our base case emission pathway is compatible with the 1.85-degree scenario

Contingent on continued growth in key clean energy technologies

CO_2 Emissions by scenarios

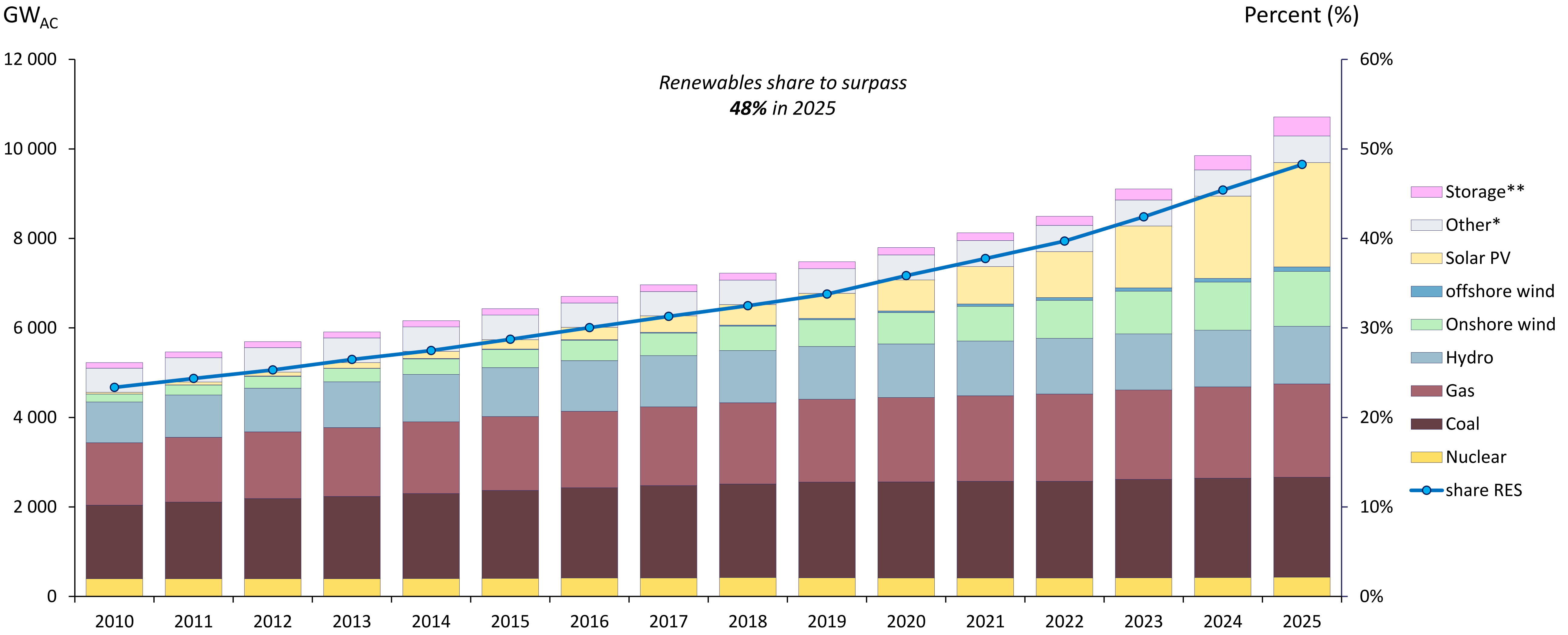
Gt



Source: Rystad Energy research and analysis, June 2025

Global installed capacity closing in on 50% renewable energy...

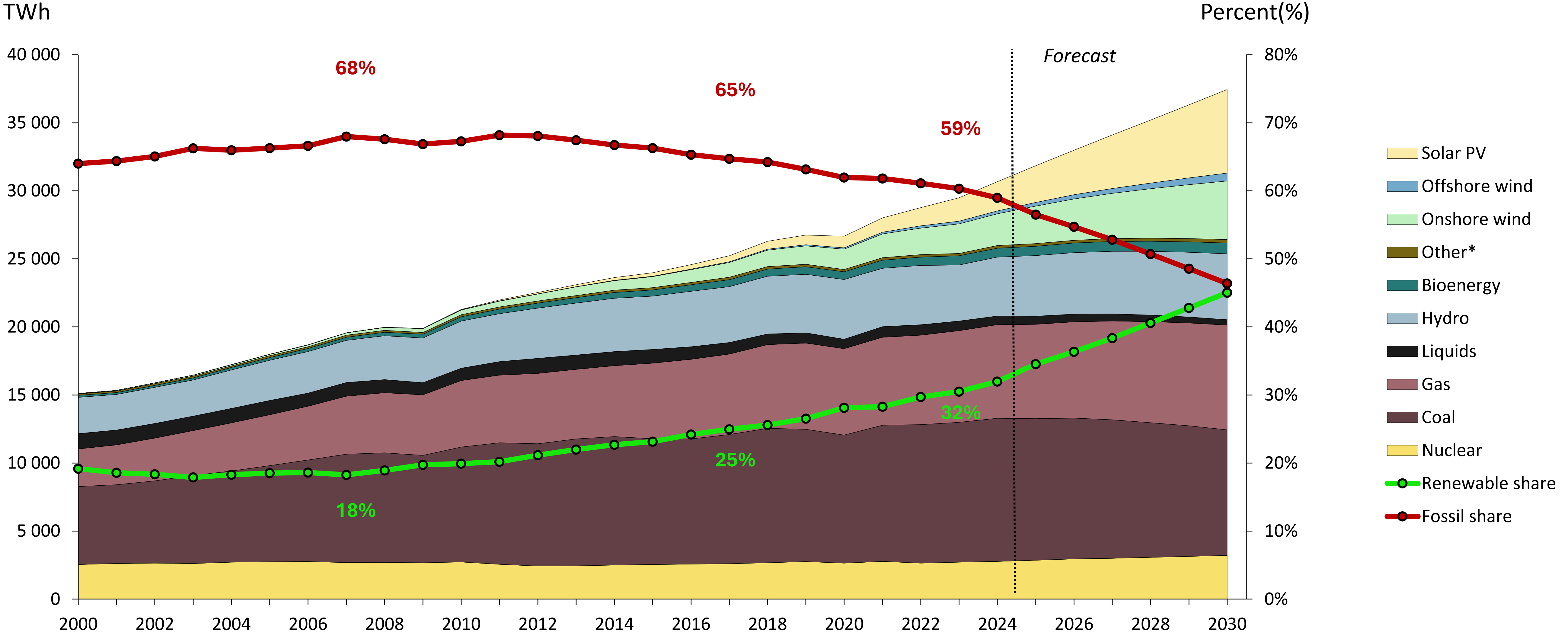
Cumulative installed capacity by energy source (left) and share of renewable energy (right)



*Other contains Bioenergy, Geothermal, Liquids, Marine/Tidal, solar thermal and non-renewable waste. **Storage contains BESS and pumped storage
Source: Rystad Energy Global Powermix Analysis Dashboard, April 2025 release

And generation is climbing steadily, surpassing a third of global generation by end of 2025

Global power generation mix (left) and share of renewables and fossil (right)



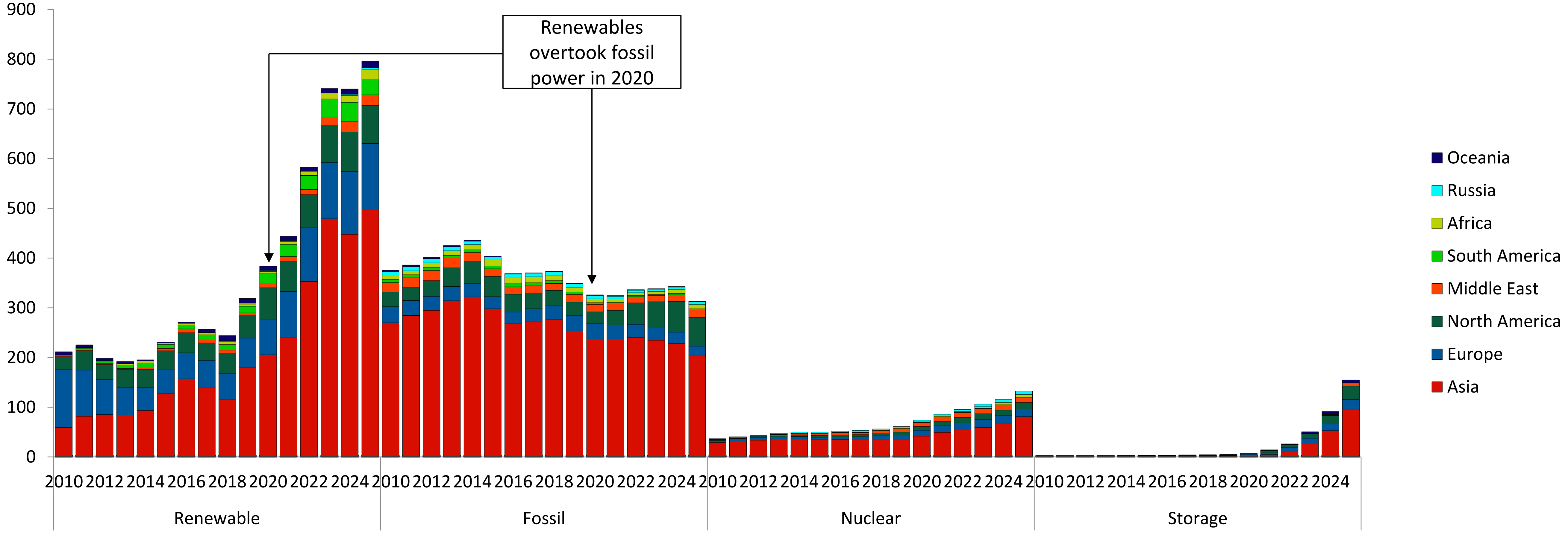
* Other contains Bioenergy, Geothermal, Liquids, Marine/Tidal, solar thermal and non-renewable waste

Source: Rystad Energy Global Power Mix Analysis Dashboard

Investments in renewable energy overtook fossil-fueled power in 2020

Capex in the power sector by energy type – historical*

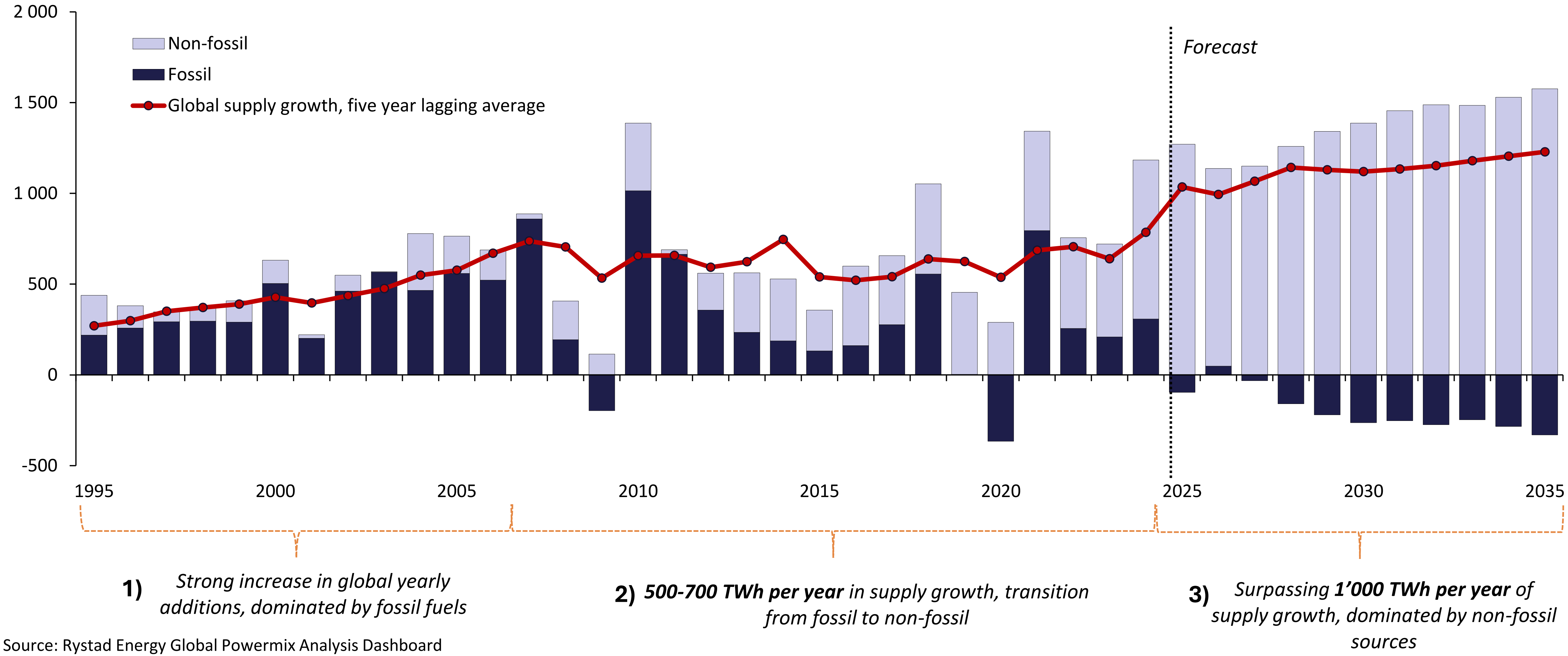
Billion USD



Source: Rystad Energy PowerCube

Global peak fossil fuel for power is imminent within the next 12-32 months

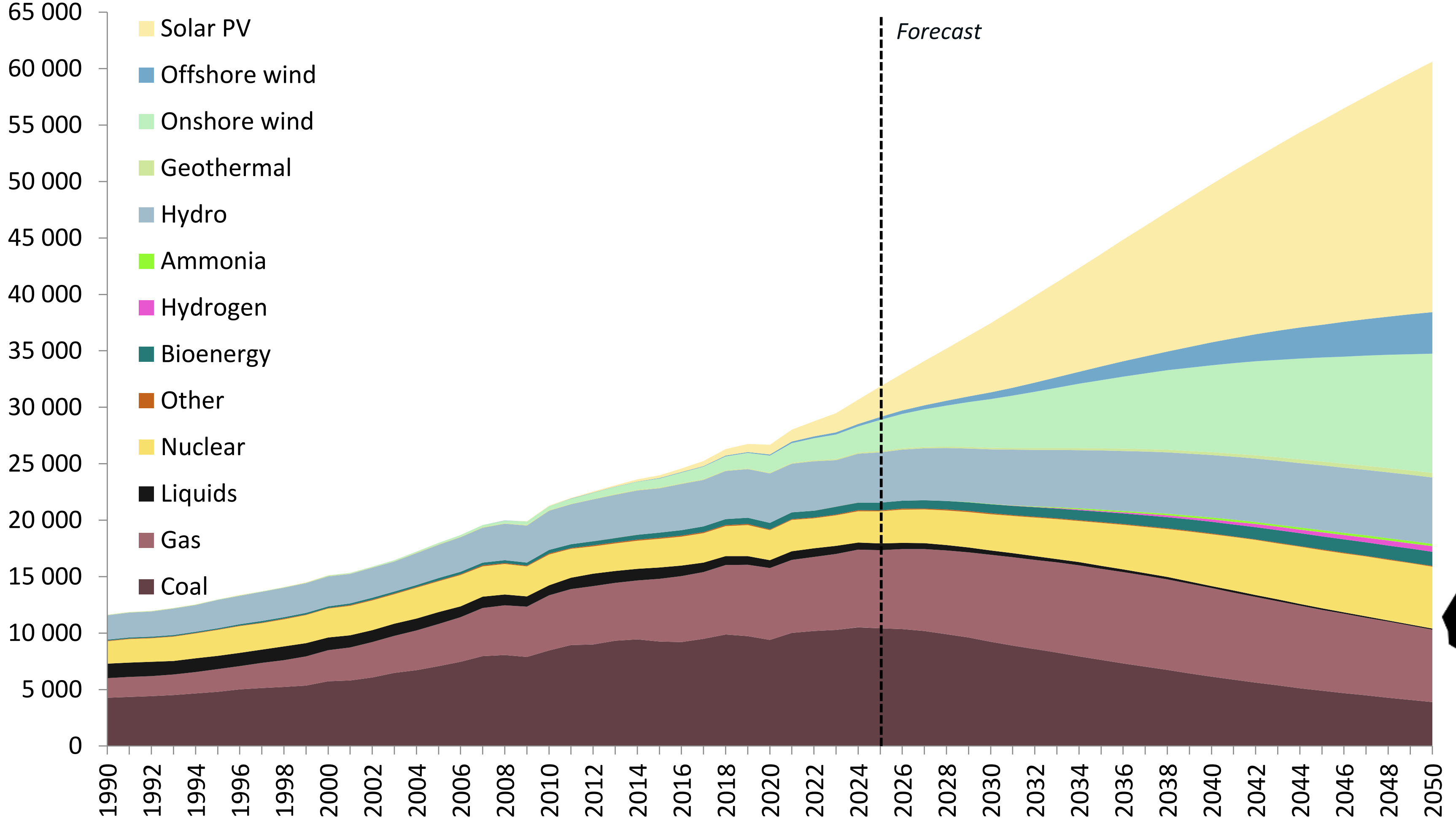
Global YOY change in power generation, fossil vs non-fossil
TWh

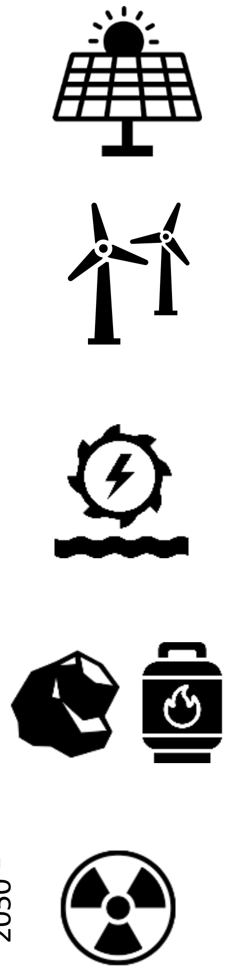


Source: Rystad Energy Global Powermix Analysis Dashboard

Our long-term generation outlook shows renewables dominating as fossils structurally declines

Global gross power generation by energy source, Rystad Energy base case forecast
TWh





Solar: stronger growth than any other energy source, by far the cheapest technology in most regions

Wind: to be surpassed by solar as second largest RES source in 2026, more modest growth rate expected. Strong growth in offshore wind from 2030 onwards

Hydropower: Already fully developed across most regions, majority of remaining growth to come in Asia and Africa.

Gas: to peak mid-2030s, sustained by growth in Asia and North America, demand across most other regions due to flexibility requirements
Coal: Global peak coal-for-power imminent, with almost all demand globally being in Asia from 2030 onwards.

Nuclear: Strong global growth expected, but very long development timelines and costly option in most regions, requiring substantial government support

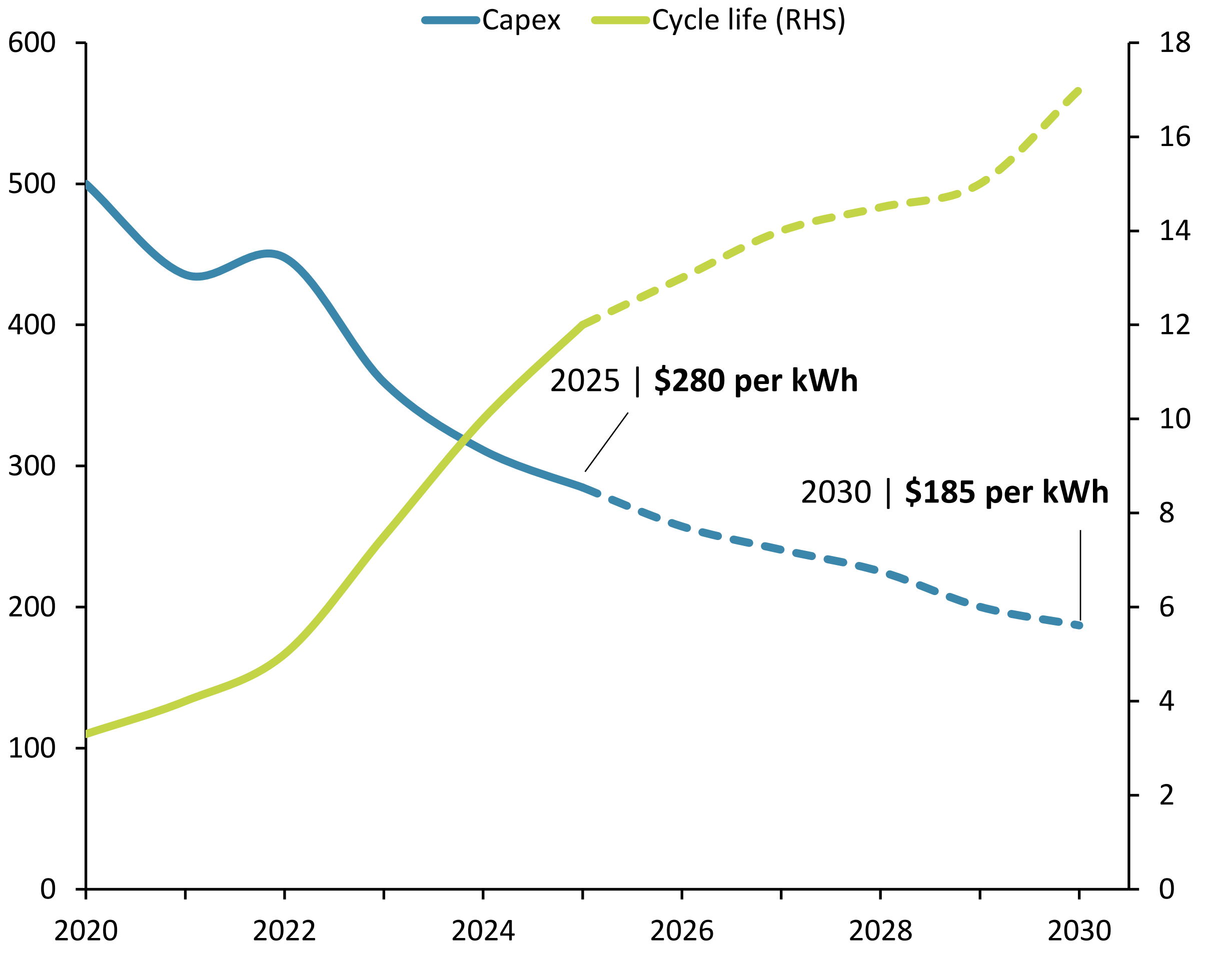
Source: Rystad Energy Global Power Mix Analysis Dashboard April 2025

BESS capex keeps dropping – set for another 20% decrease in 2025

Cell prices at all time lows help make energy storage more affordable than ever

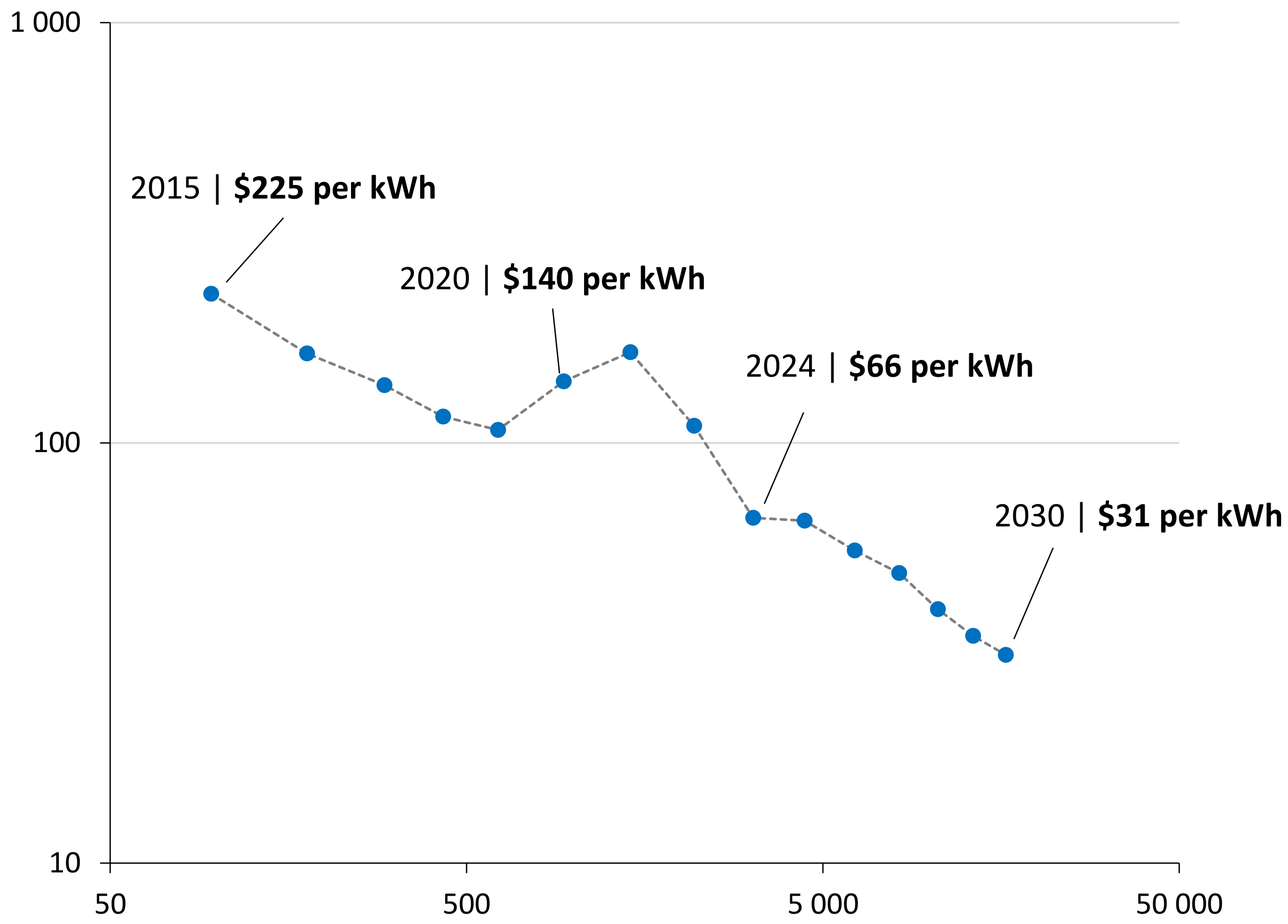
Global average BESS capex cost and cycle life developments

USD per kilowatt-hours ($/kWh)



Battery cell prices over demand, 2015-2030

USD per kWh

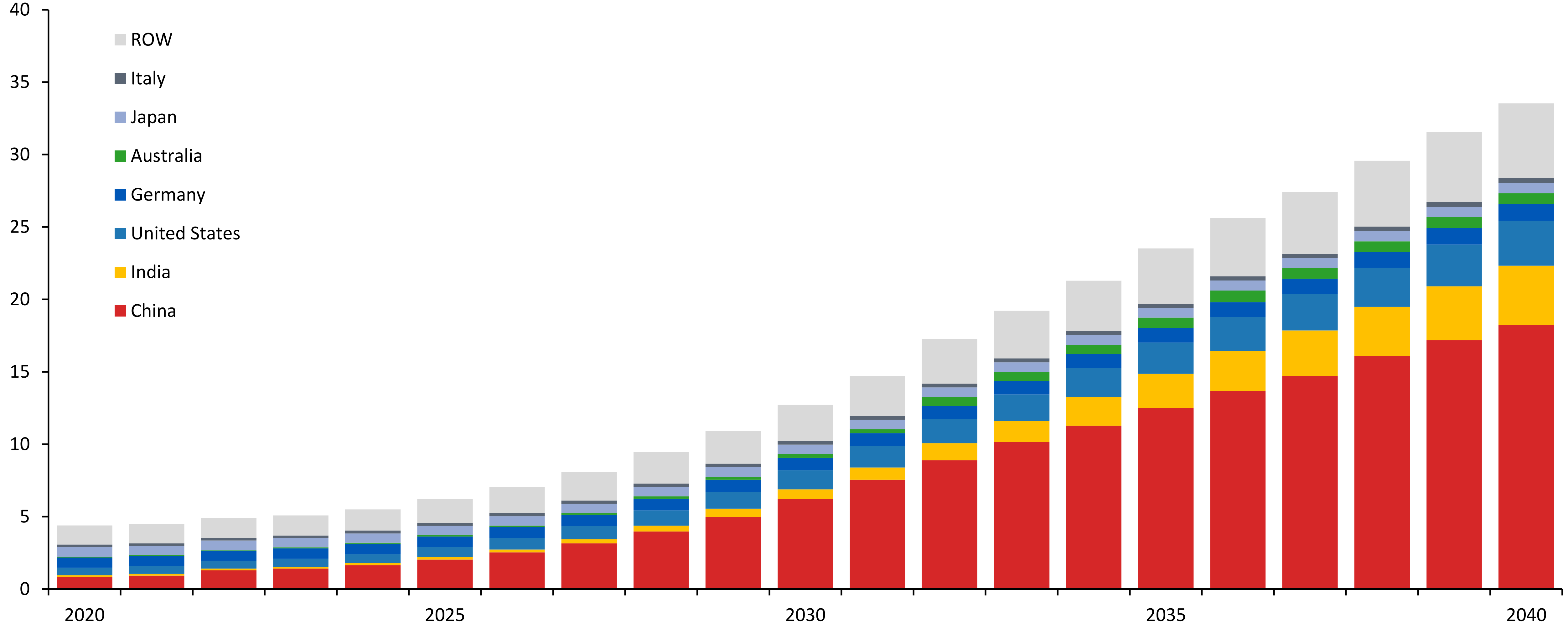


** Lifespan of 20 years. 95% round-trip efficiency, 90% depth of discharge, and 1% annual degradation is included in calculation. 1% of capex cost is considered as annual opex cost.

Source: Rystad Energy EnergyStorage solution

Global energy storage growth set to surge by over 5x towards 2040

Global installed energy storage by country
Terawatt-hours (TWh)

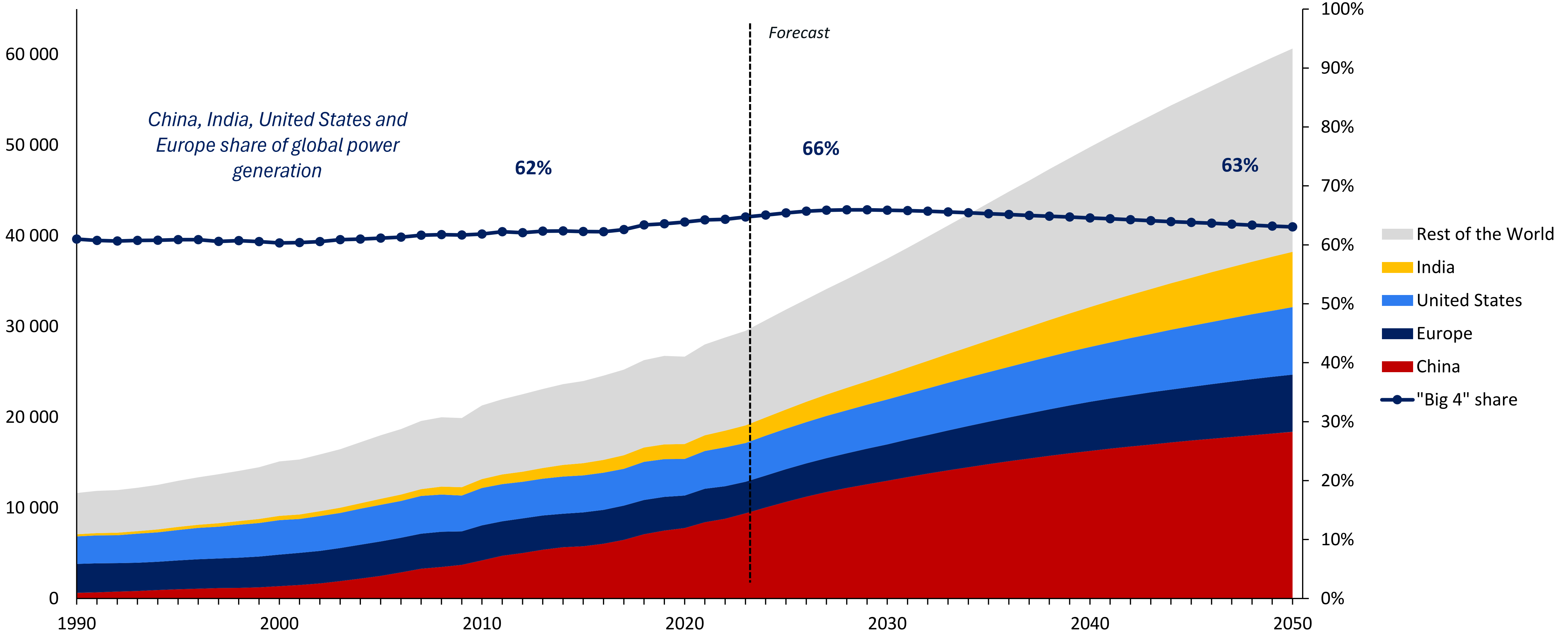


Source: Rystad Energy EnergyStorage solution

RystadEnergy

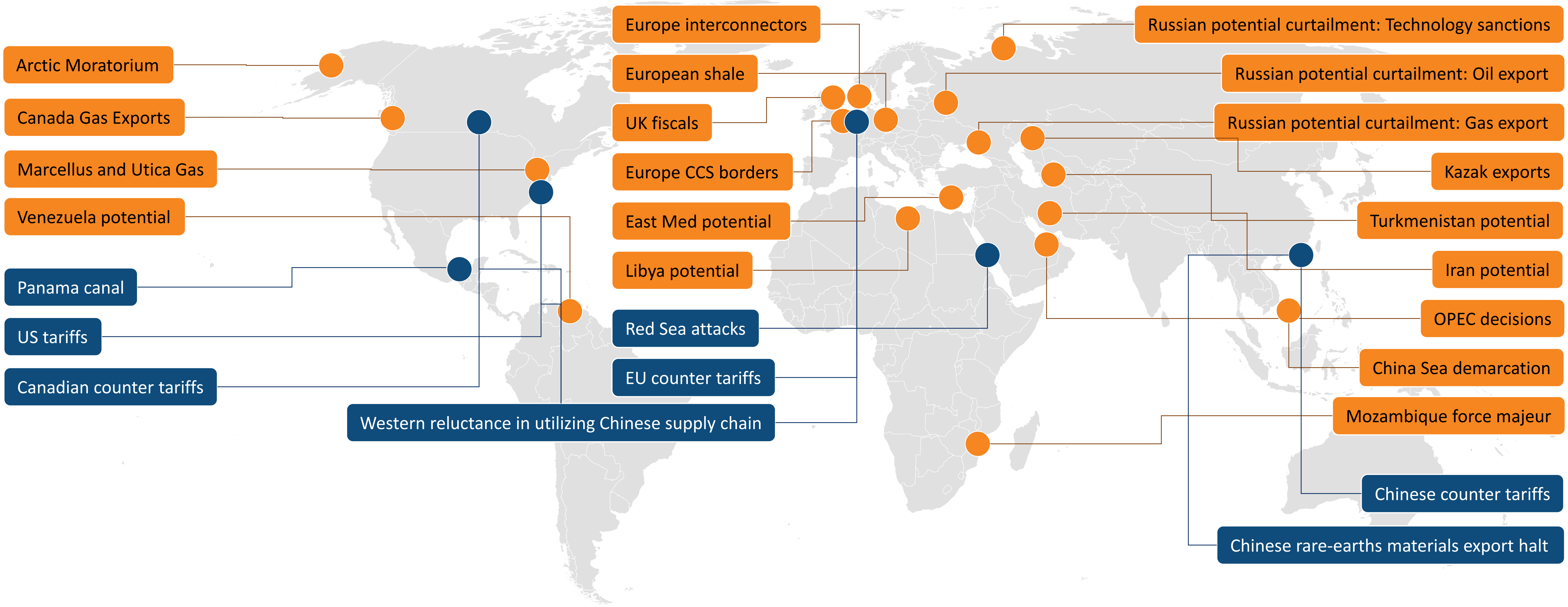
China, India, US and Europe are driving over 60% of the demand

Global gross power generation by region
TWh per year



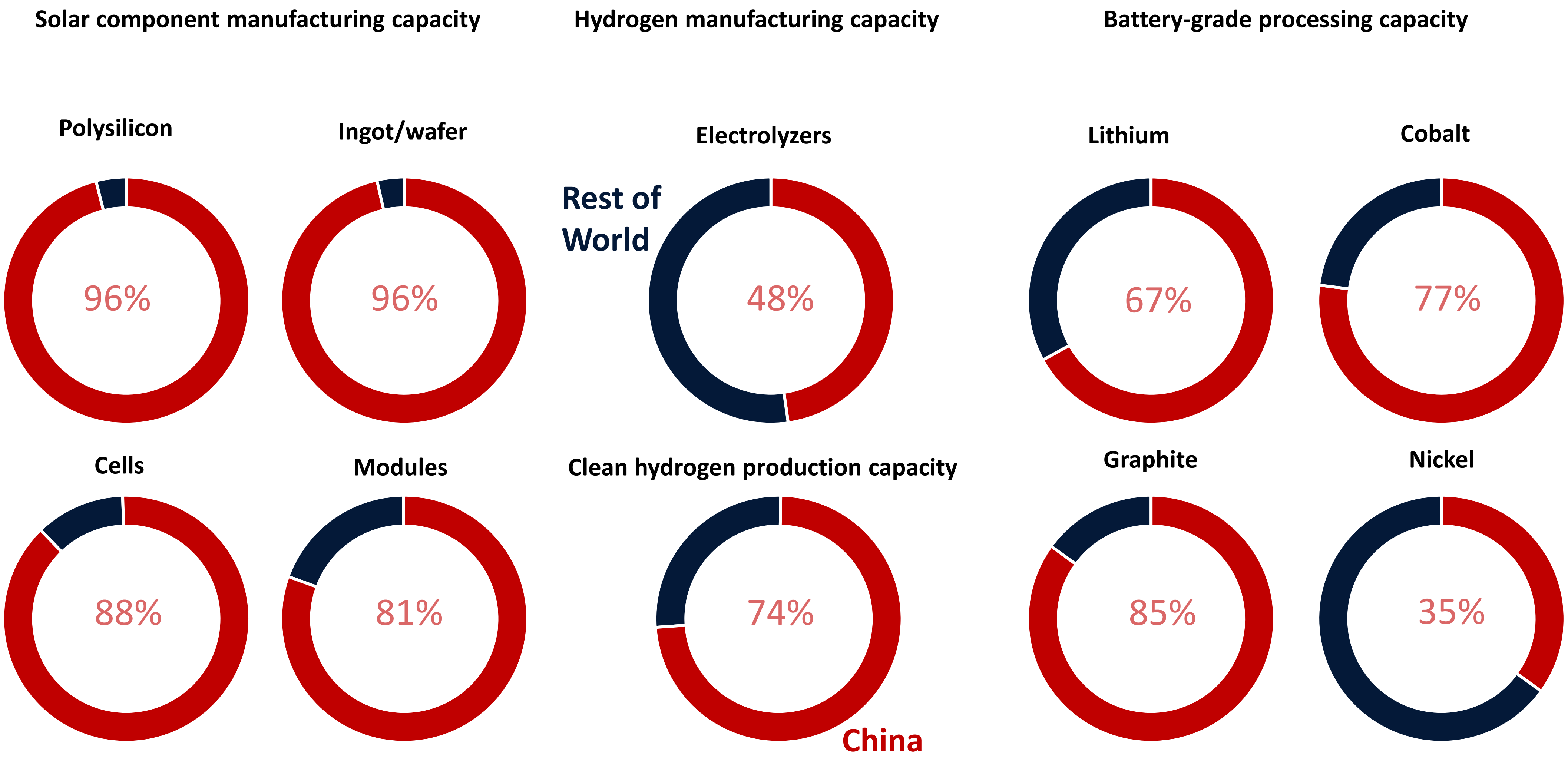
Source: Rystad Energy Renewables & Power Solution

Geopolitics are constraining optimal use of the world's resources



Source: Rystad Energy research and analysis

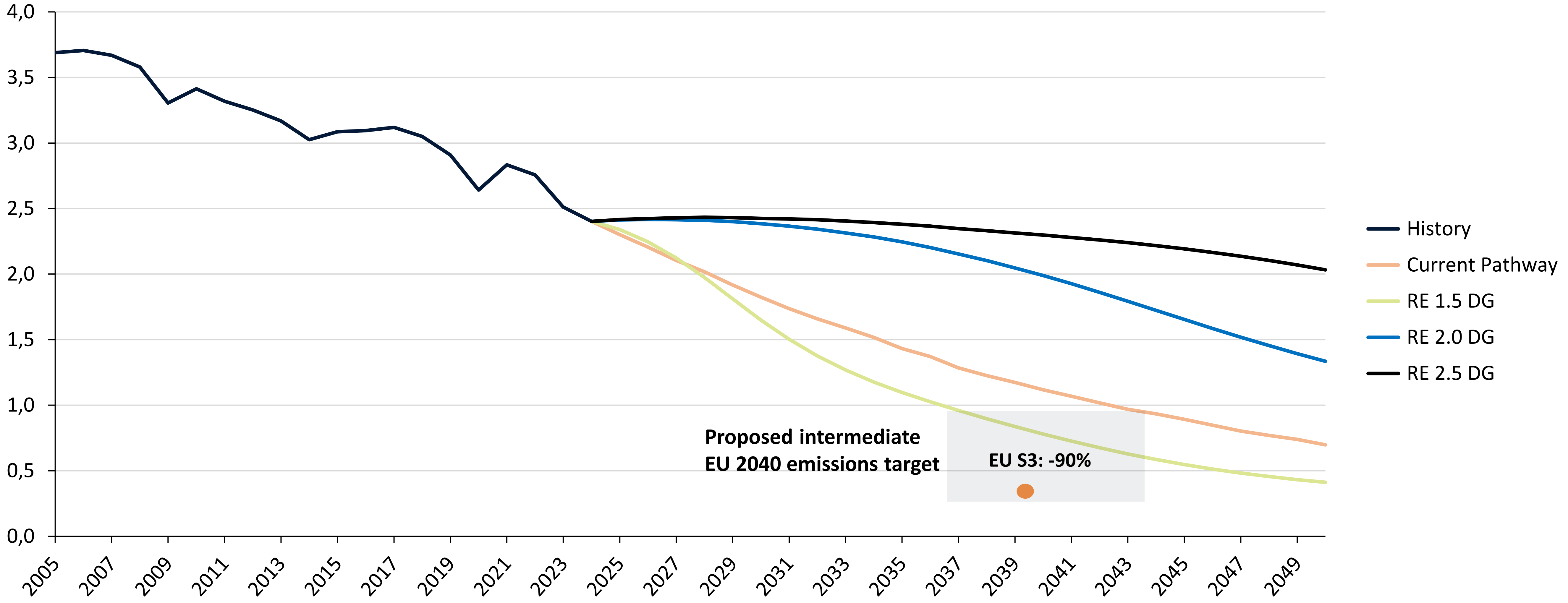
China's head start and governance structure has given them cleantech supply chain dominance



Source: Rystad Energy research and analysis

European challenge: decarbonize but remain competitive

EU27 fossil CO_2 emissions scenarios versus proposed target
Gigatonnes



Source: Rystad Energy research and analysis

'The One, Big Beautiful Bill' – House-passed version

Clean Power (45Y, 48E)	• New eligibility rules: 1) Construction date within 60 days from enactment 2) In-service by the end of 2028 • Exception is made for nuclear with the cosntruction start deadline set to 2028 • No changes to transferability
Clean Vehicles (30D, 30C)	• Old termination date – end of 2023 • New termination date – end of 2025 • No changes to transferability (credits cannot be transferred)
CCUS & Hydrogen (45Q, 45V)	• 45Q transferability is terminated if the construction starts in more than 2 years after the enactment • 45V is terminated from 2026 (old termination date was end of 2023) • No changes to 45V transferability (irrelevant amid nearly immediate termination)
Advanced Manufacturing (45X)	• Termination date – end of 2031 • Termination date for wind power components - end of 2027 • No transferability after 2027
Clean Fuels (45Z)	• Old termination date – end of 2027, new termination date – end of 2031 • No transferability after 2027 • No indirect land use impact in lifecycle GHG assessment for 45Z purposes

Source: Rystad Energy research and analysis

Navigating the future of energy

We are an independent research and energy intelligence company, equipping clients with data, insights and education that power better decision-making.

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Session 1

13:35 – 14:55

Power systems in transition – Renewable energy, Adaptable Power Grids and Storage

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Power Grids with Renewable Energy Transitional Challenges

June 16th, 2025
Kenji Kitao
Deputy Senior General Manager
Transmission & Distribution Systems Div.
Mitsubishi Electric Corporation

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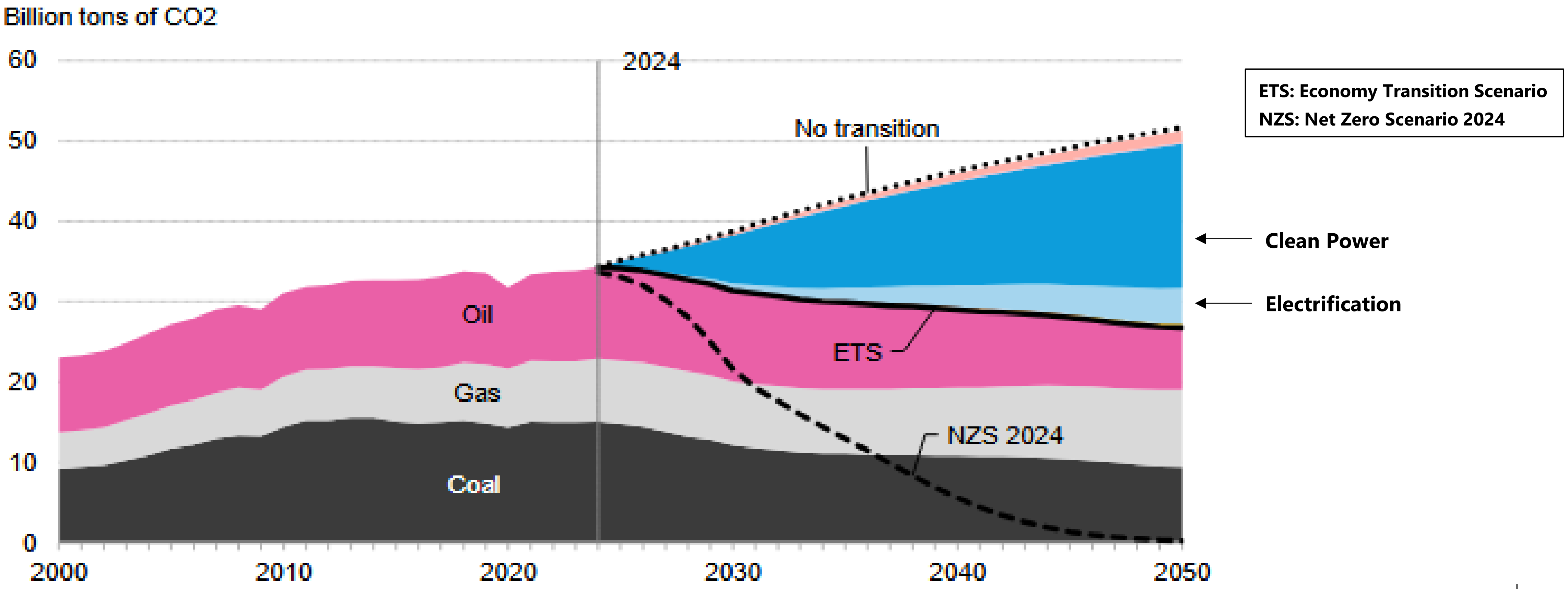
Global Energy Market Trend

Electrification and Clean Power are not an option: both in an economy transition scenario and net zero scenario electrification and consequent increase of renewable power generation are fundamental to achieve the indispensable reduction of CO2 emission.

As more energy end uses become electrified, the share of electricity in total final energy consumption will increases from 20% in 2022 to over 27% in 2030.



Source: BNEF The Global Energy Transition: Where Are We?

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Electrification Benefits and Challenges

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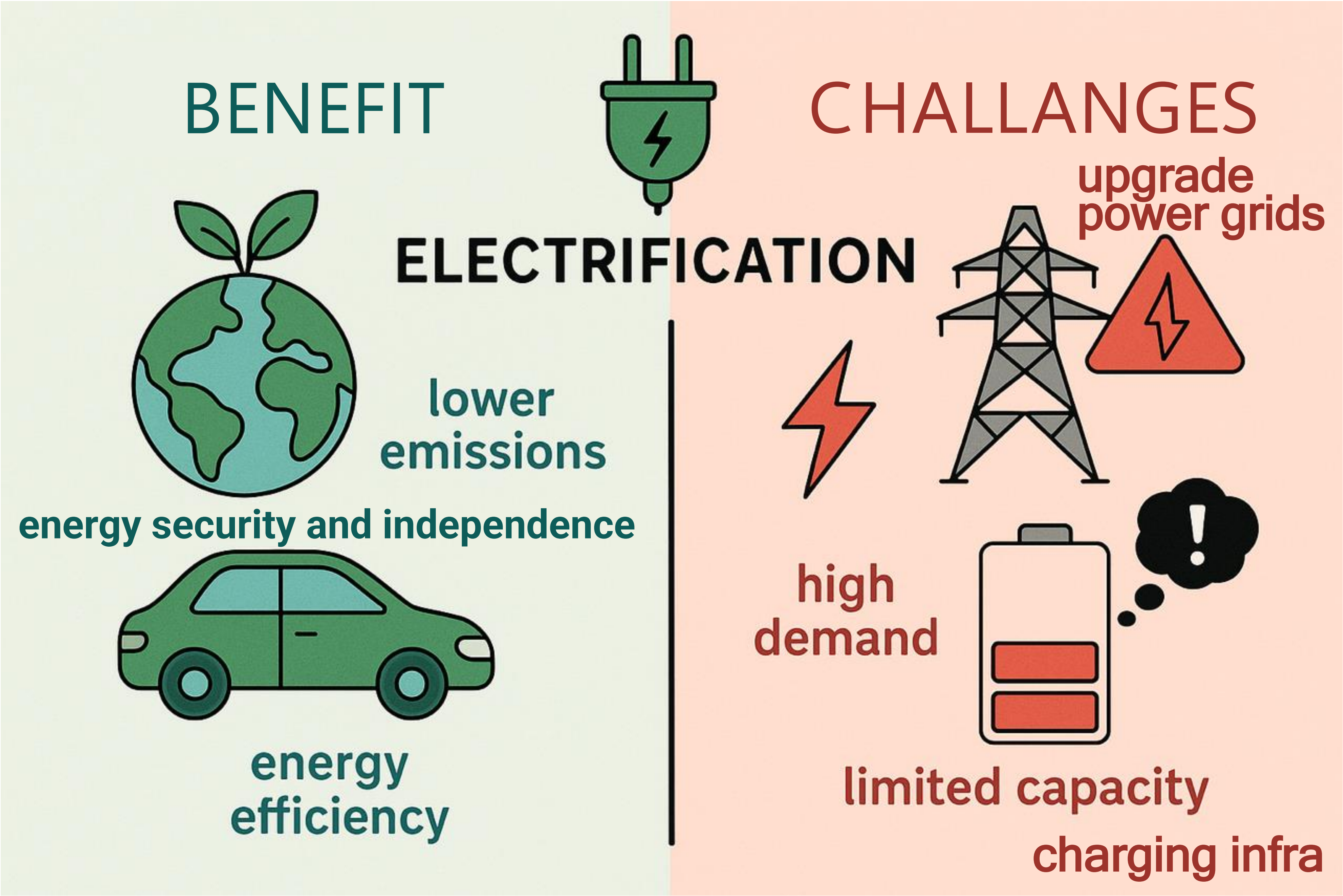

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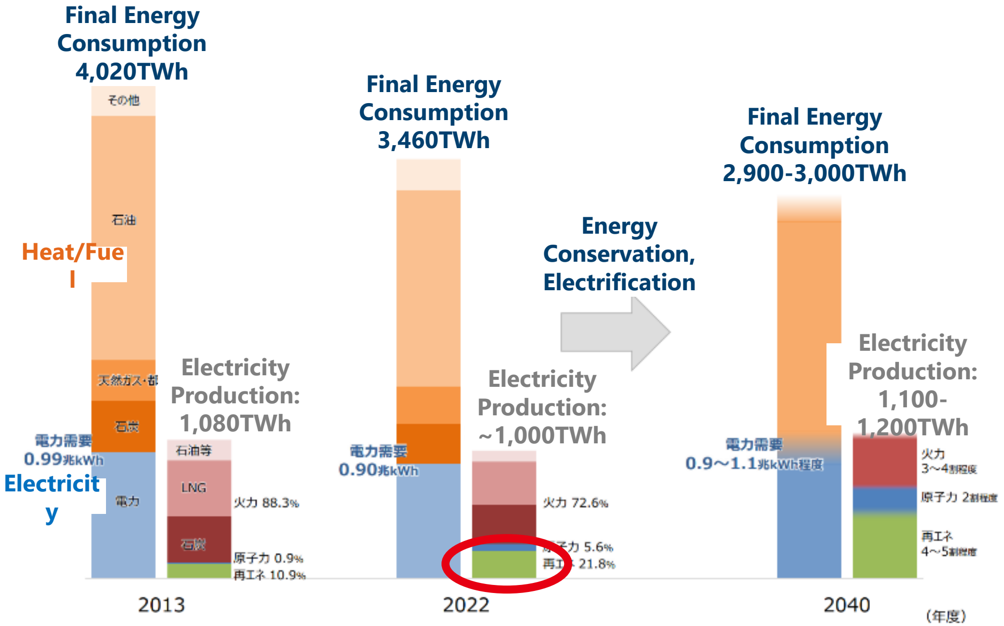
Situation in Japan

- Slight increase in electricity consumption, driven by data centers and electrification mainly, is forecasted in the next 15 years.
- ~10-20% increase of consumption in 2040 compared to 2022
- Capacity demand will also increase from 157GW of 2024 to 165GW in 2034
- Renewable production target will increase from 21.6% of 2022 to 35-38% of 2030 to 40-50% by 2040.



	FY2022			FY2030		
	%	TWh	GW	%	TWh	GW
Solar	9.2	92.6	73	15	130	110
Wind	0.9	9.3	5.6	5	51	23.8
Hydro	7.6	76.9	9.9	11	98	10.4
GeoThermal	0.2	3	0.6	0.3	11	1.5
Biomass	3.7	37.1	7.4	5	47	8
Total	21.6%	218.9	96.5	36.3%	337	153.7

Data Source: METI https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saisei_kano/pdf/063_s01_00.pdf

Japan is facing and will face challenges in integrating a large amount of renewables. Reenforcing infrastructures including the utilization of storage systems is one of the multiple approaches. No-wire approaches such as control and curtailment are also effective solutions.

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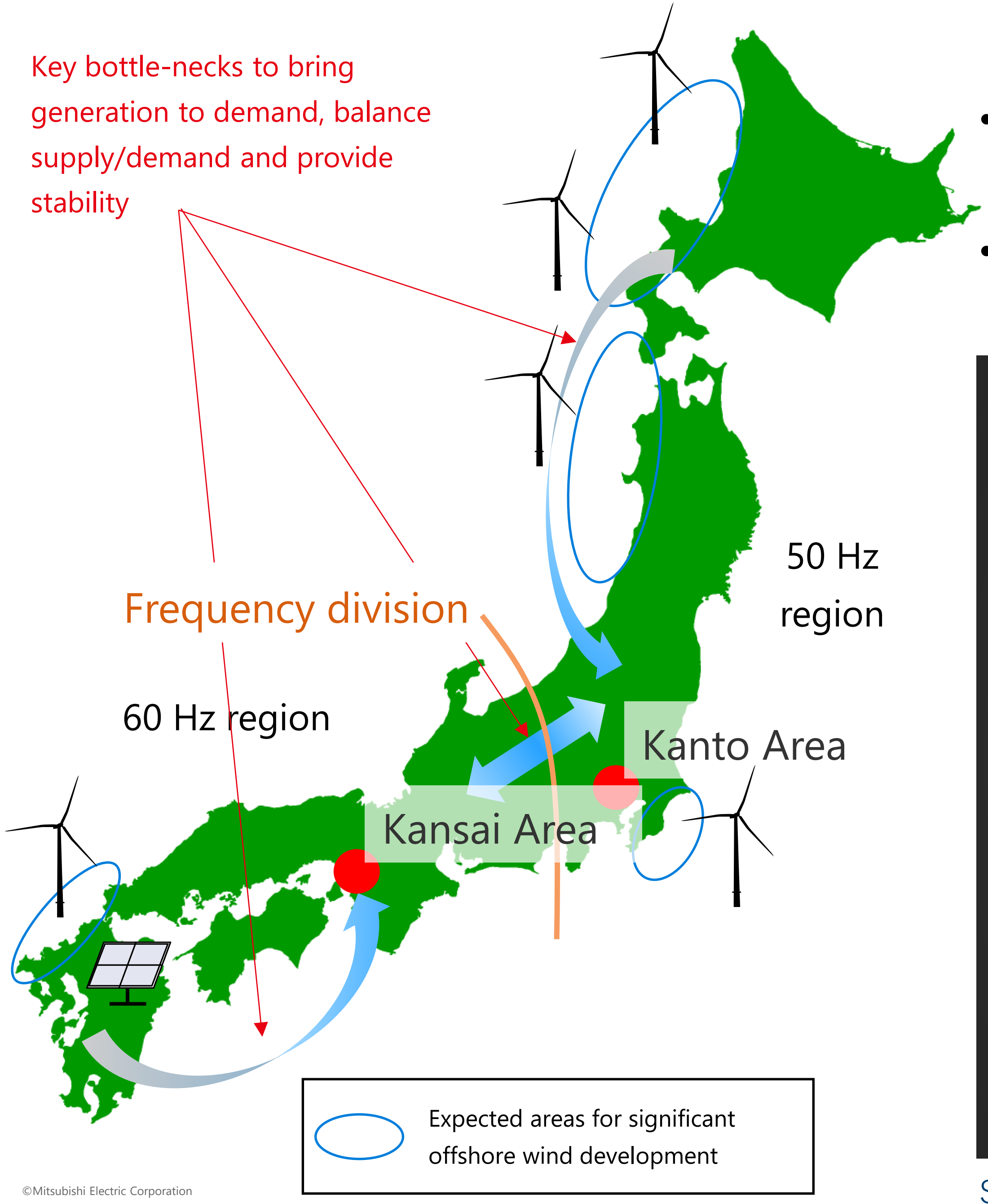
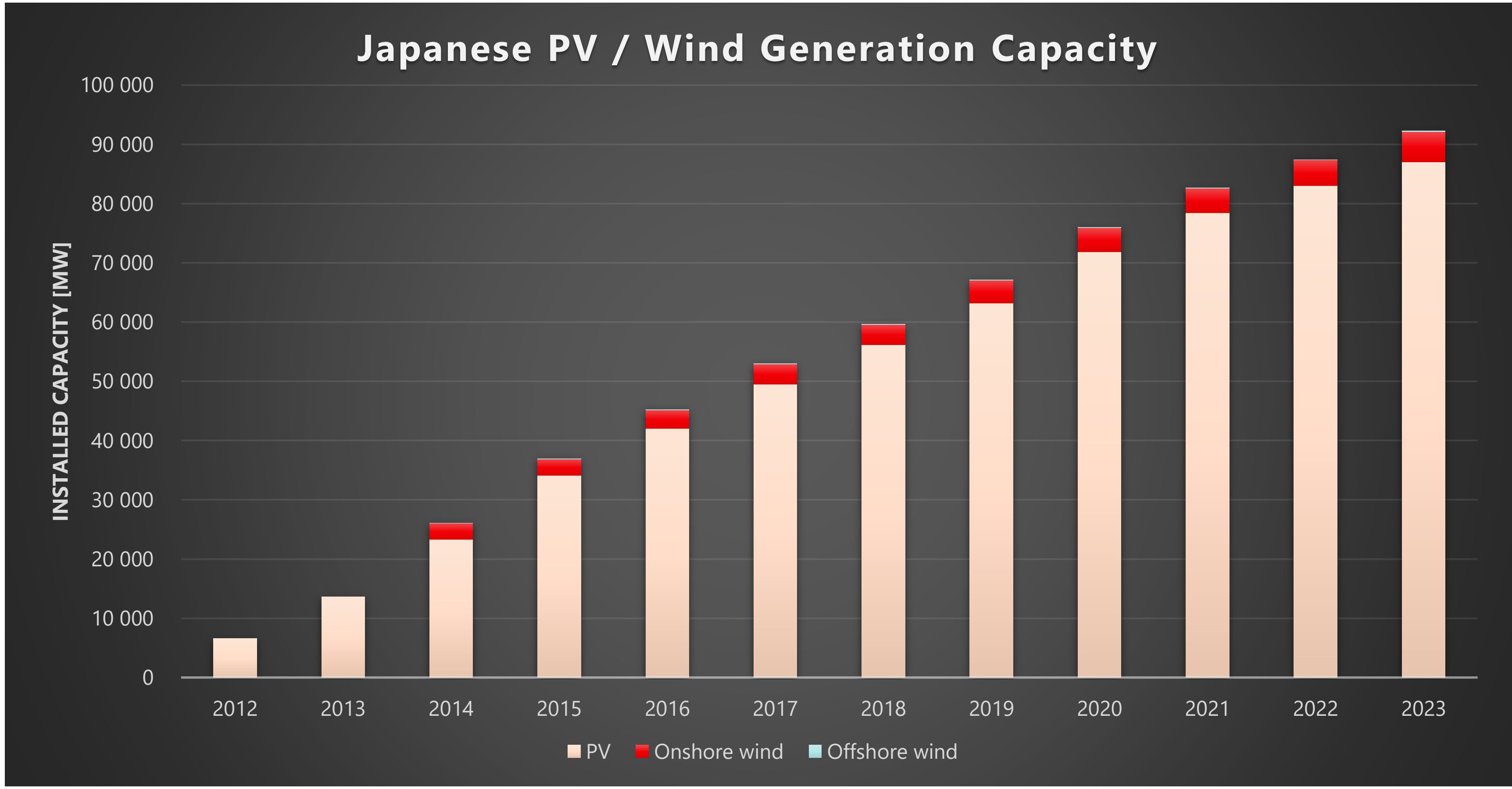
Renewable energy integration



- Japan has seen a dramatic increase in solar PV installed capacity over the last decade, with almost 90 GW currently.
- Offshore wind is expected to grow similarly rapidly, with targets of 30 - 45 GW by 2040.
- In both cases power generation is becoming less concentrated than before, causing significant issues for both the ***transmission*** and ***distribution*** systems



Source: Renewable Energy Capacity Statistics 2024

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Transmission System: High Voltage DC

To cope with the bulk large-scale deployment of renewable generation, the bulk power transmission system will need significant upgrades.

High Voltage DC (HVDC) systems are increasingly being used to help deliver bulk-power from remote areas to demand centres, due to their flexibility compared to traditional ac systems (e.g. long-distance submarine cable connections, or interfaces between asynchronous regions)

Multi-terminal HVDC grids are the next evolution and are expected to become the backbone for large-capacity renewable generation, connecting multiple geographical areas together in a low-loss transmission system.

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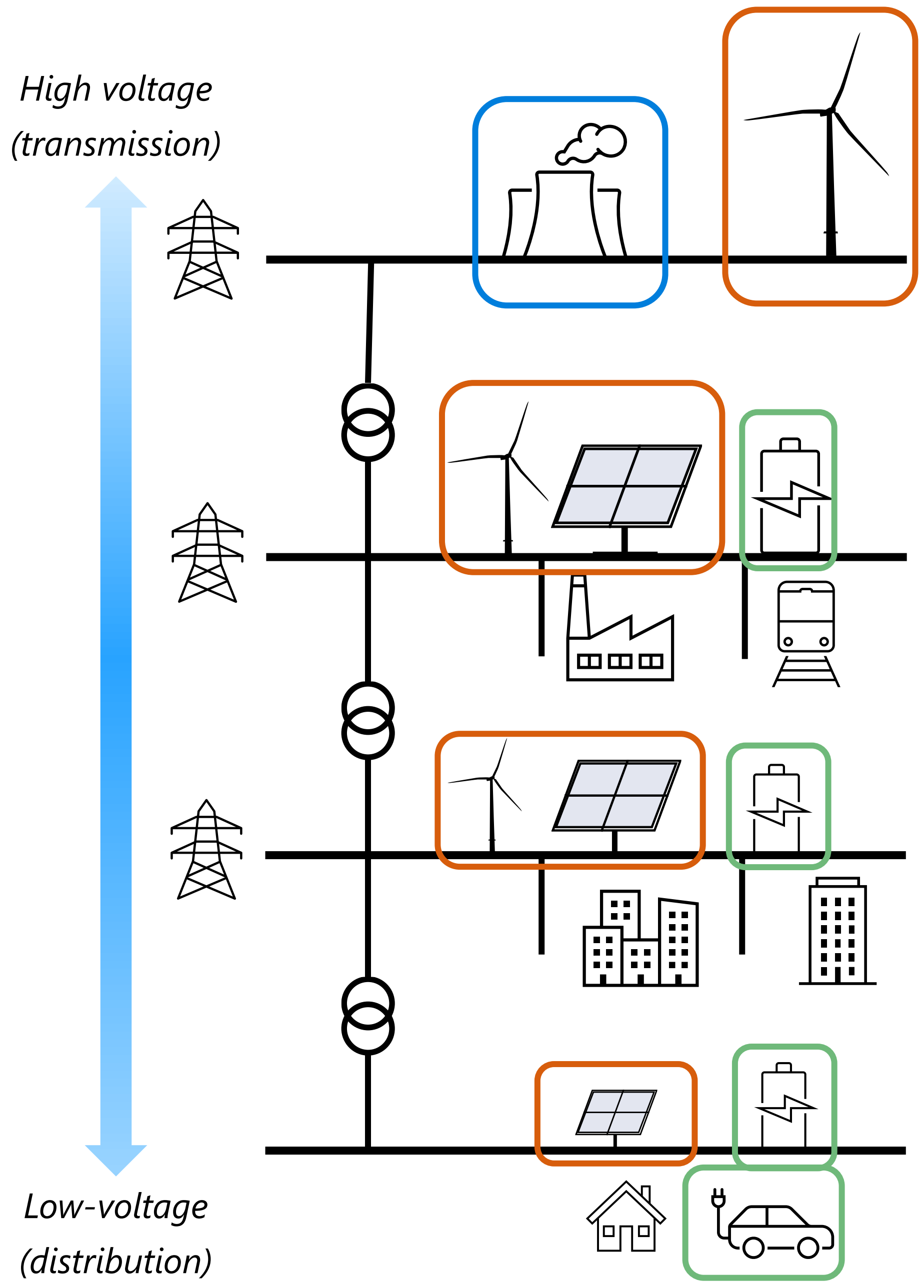
Transmission & Distribution Systems



Large-capacity thermal power plants are being retired

New forms of generation coming online in all areas if the power transmission system, resulting in irregular power flows

Energy storage, both industrial-scale and residential-scale, is being deployed

DERMS: Distributed Energy Management System

DERMS software platforms are increasingly deployed by utilities and grid operators to manage and optimize distributed energy resources (DERs) such as solar panels, wind turbines, battery storage systems, electric vehicles, and other decentralized power sources.

Key functions include:

- Monitoring and control: providing real-time visibility and control over DERs to ensure they are operating efficiently and contributing to grid stability.
- Optimisation: balances supply and demand by optimising the use of DERs, reducing energy costs, and improving reliability.
- Integration: Facilitates the integration of renewable energy sources into the grid, helping to meet sustainability goals.
- Grid services: enable DERs to provide ancillary services like voltage regulation, frequency control, and peak shaving.

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INTEGRATION OF OFFSHORE WIND TODAY AND IN THE FUTURE

16 June 2025

Peter Markussen, Senior Director, Energinet System Operation

VISION

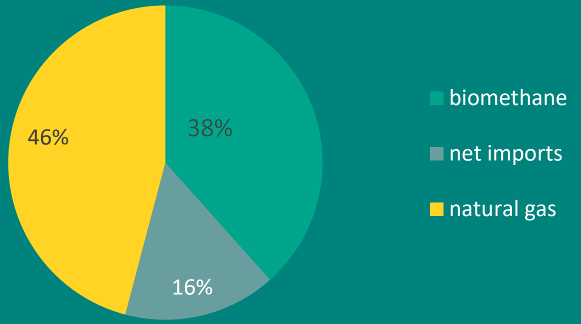
GREEN ENERGY FOR A

BETTER WORLD

ENERGINET

WE BALANCE, OPERATE, DEVELOP AND OWN THE DANISH ELECTRICITY AND GAS TRANSMISSION GRID

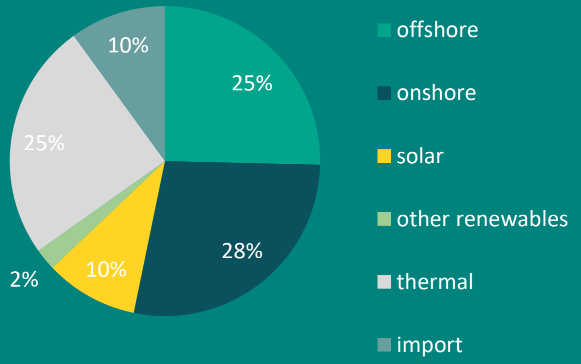
Danish gas balance, 2024 (76 PJ)



100% sec. of supply

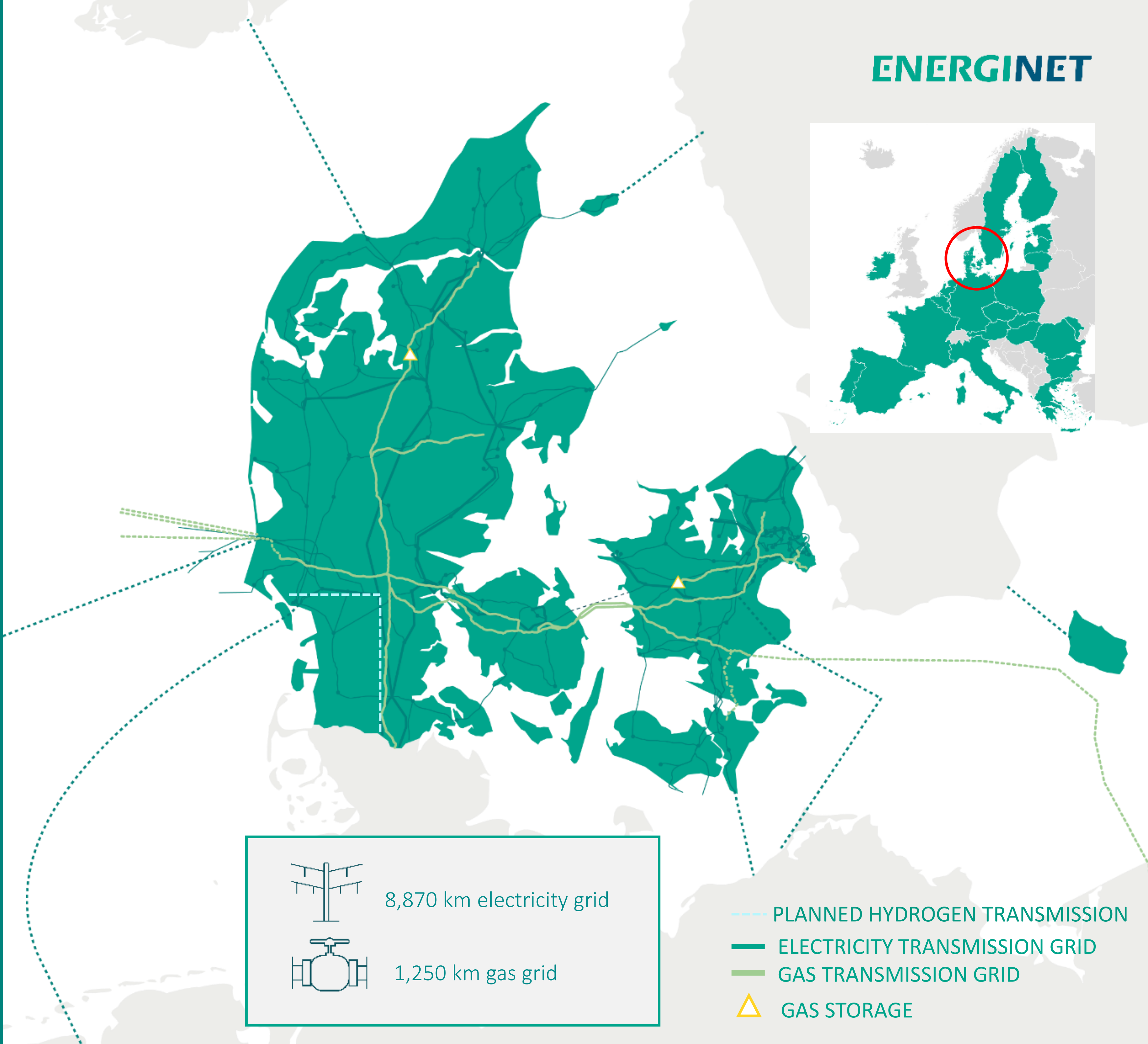
38% green gas

Danish electricity balance, 2024 (37 TWh)



99.99% sec. of supply (2023)

63% solar+wind



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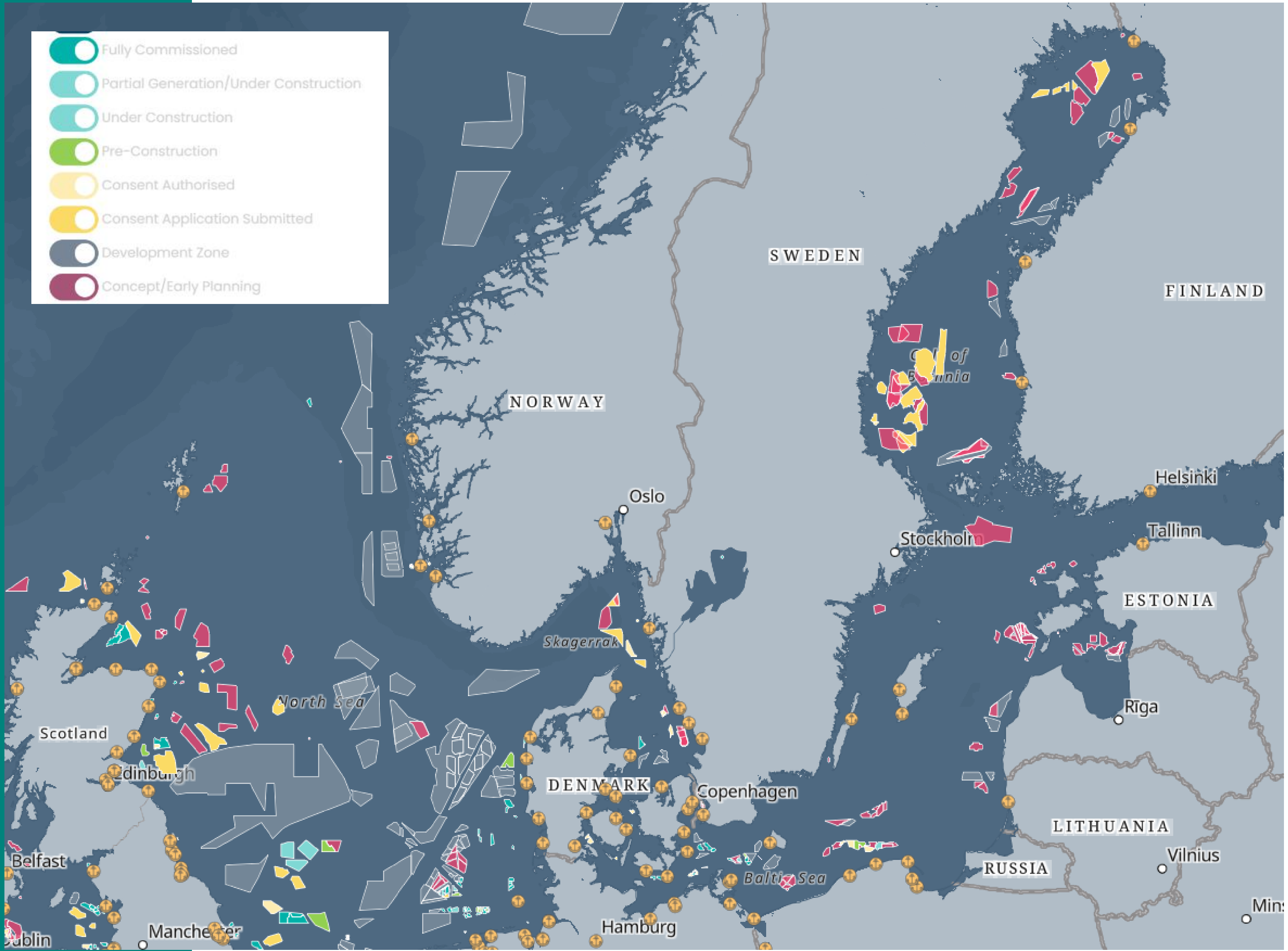
OFFSHORE WIND AS KEY ENABLER FOR GREEN TRANSITION

North Sea ambitions (Oostend Declaration - 2022):

- Today: 30 GW
- 2030: 120 GW

Baltic sea ambitions (Marienborg Declaration - 2022):

- Today : 2.3 GW
- 2030: 30 GW



Global Offshore Renewables Map | 4C Offshore

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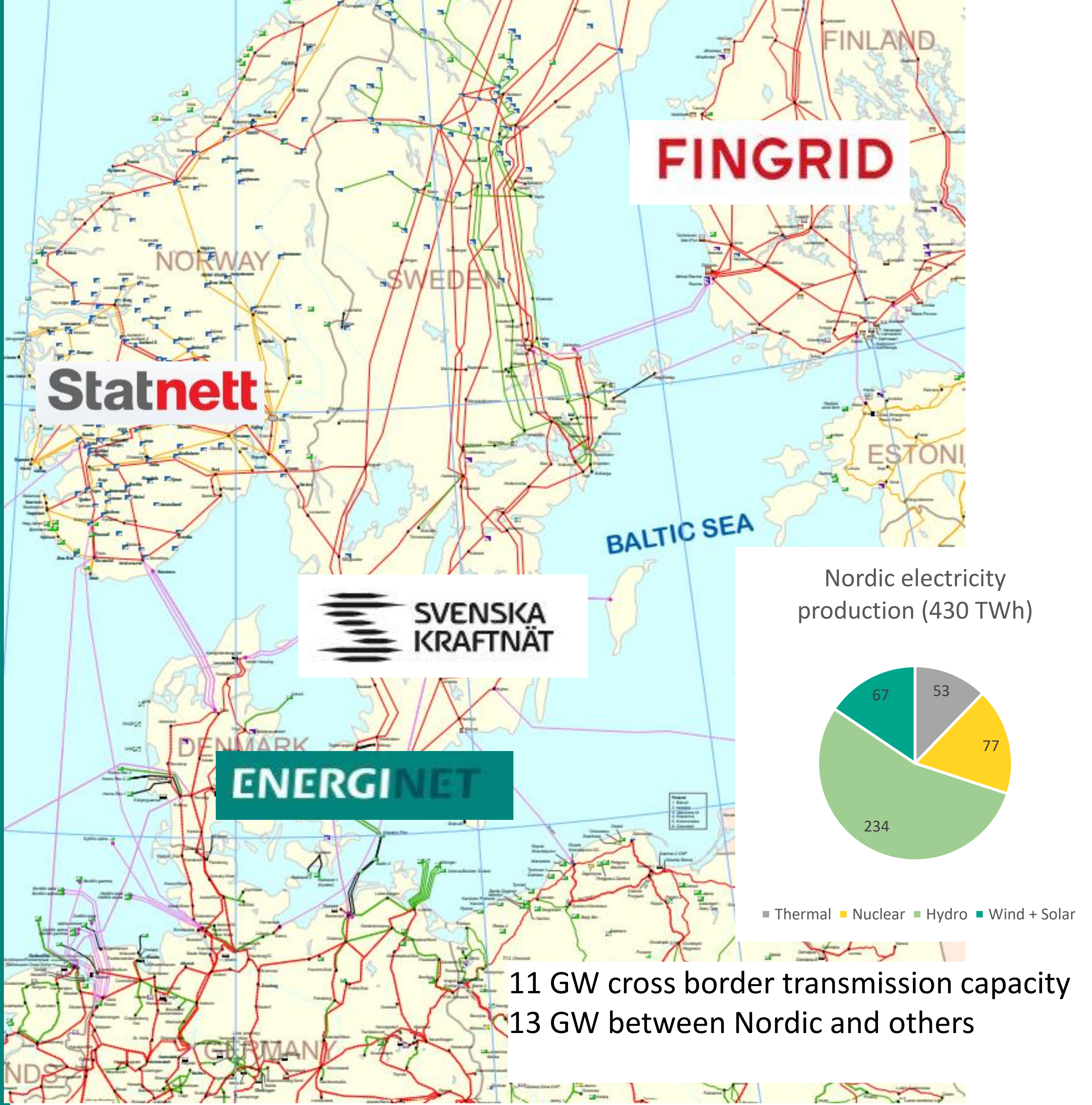
CONTINUED INTEGRATION OF OFFSHORE WIND

- Long term political offshore wind ambition and development of mature supply chain
- Integrated grid and offshore wind development
- Harmonised electricity markets and system operation
- Use of interconnectors for flexibility



11 GW cross border transmission capacity
13 GW between Nordic and others

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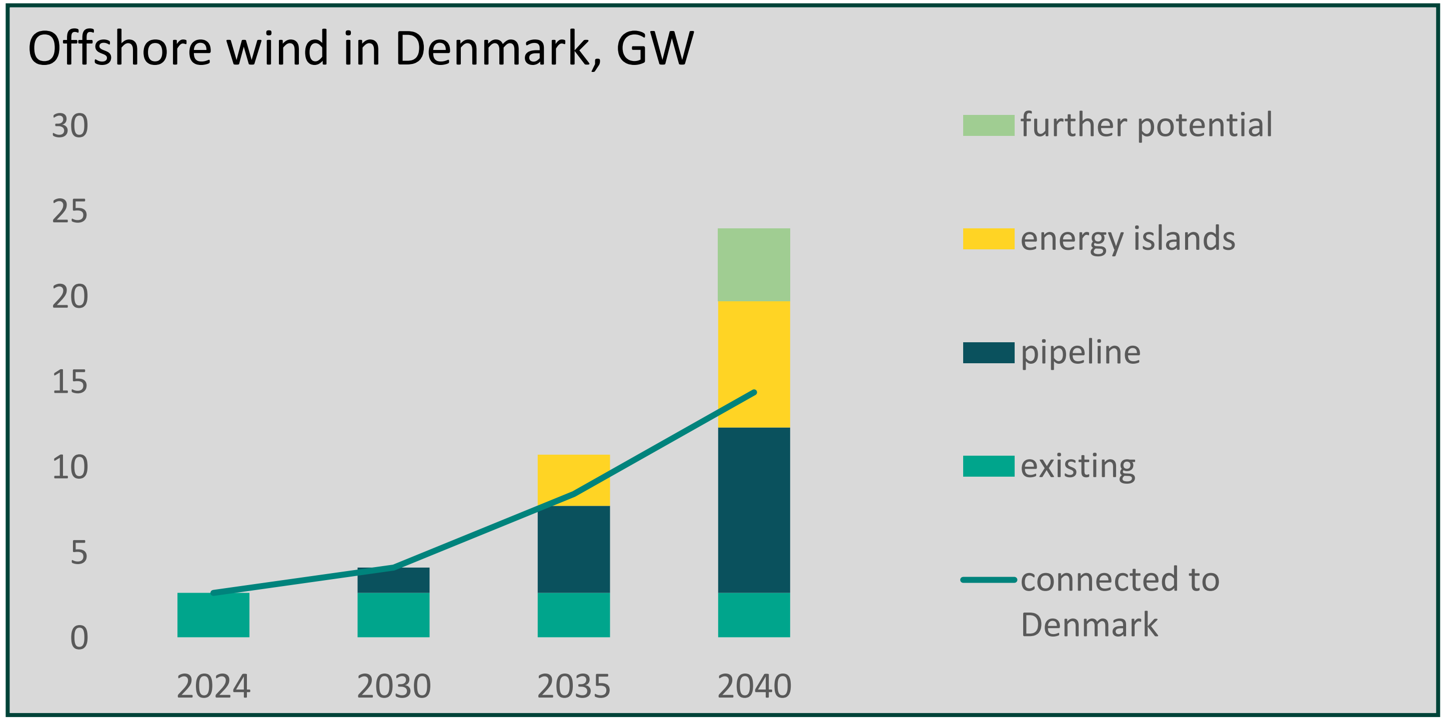
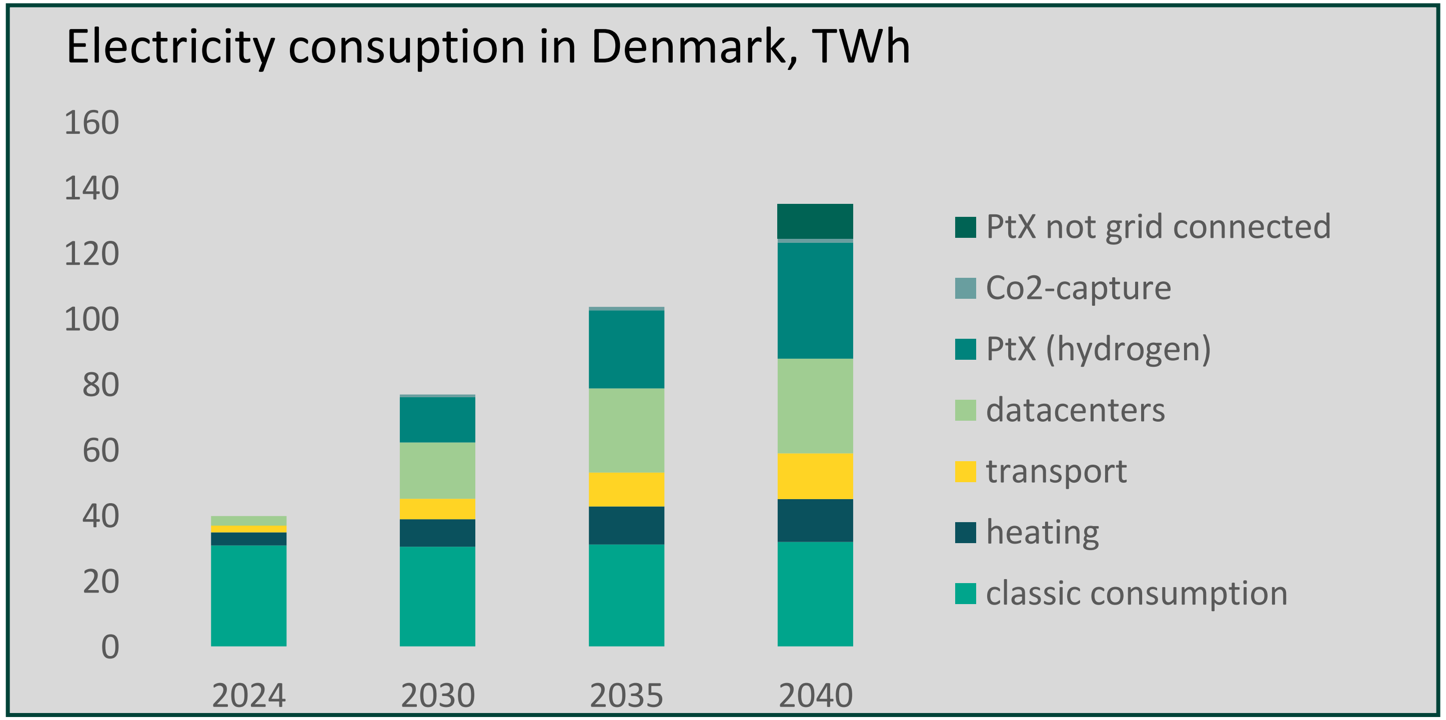
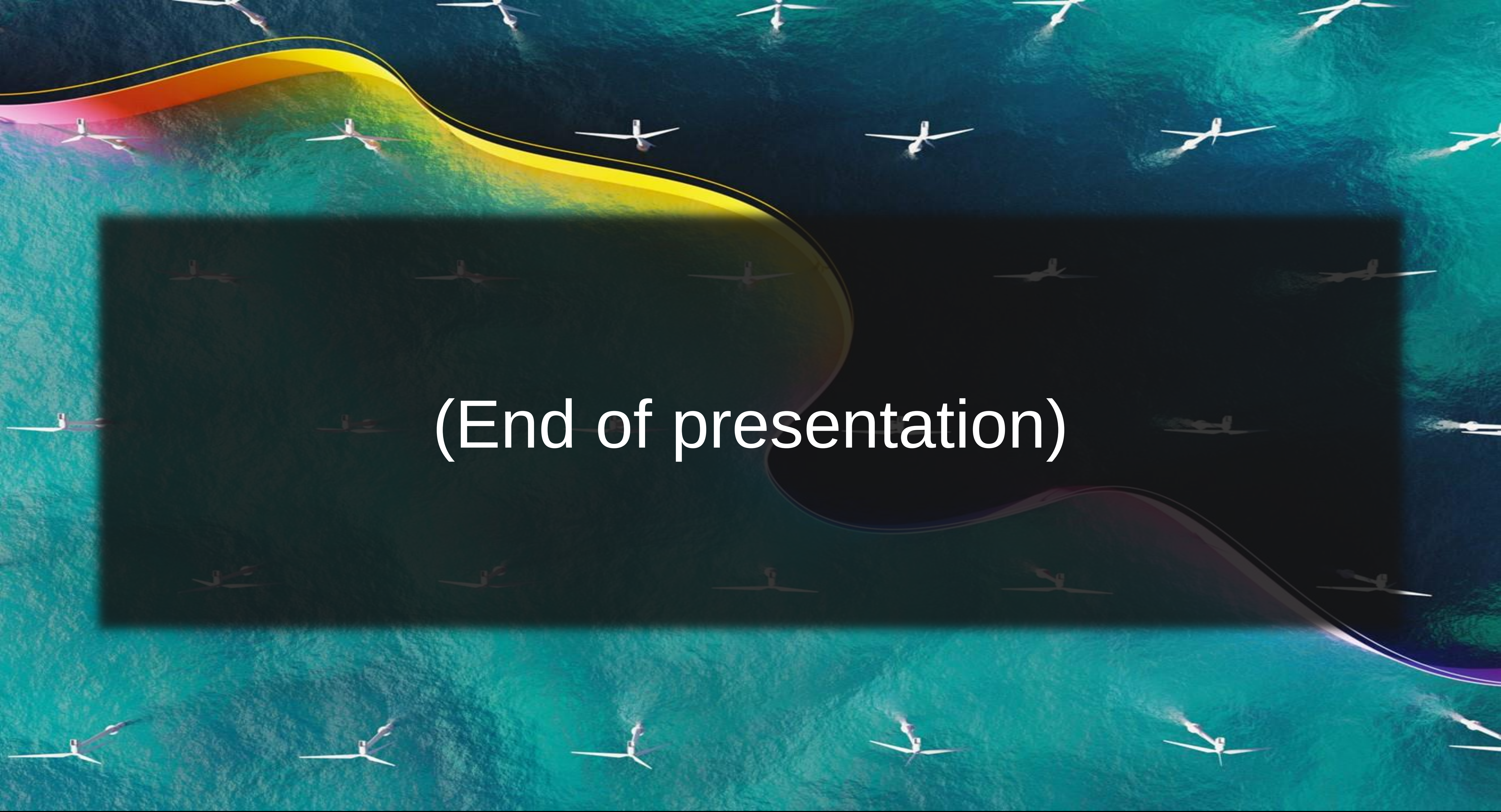
FUTURE INTEGRATION OF OFFSHORE WIND

- Cross border political cooperation and coordination
- Integrated sector coupling and flexibility from electrification of heating, transport and green hydrogen
- Offshore wind active contribution to system balancing and robustness
- System transparency and price signals (energidataservice.dk)



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ノルウェー起点のエネルギートランジション

Energy Transition started from Norway

Kenichi Matsumoto
Chairman, Volue GK (Japan)

ボリュー合同会社
会長　松本健一

本日の議題～ Today's Agenda

1. ノルウェー生まれの電力市場は全欧・日本に拡大した
   Norwegian Power Market expanded to EU/Japan
2. 温暖化ガスの増加と、再エネ電源の更なる拡大見通し
   Foreseen continuous increase in GHG (Green House Gas) and REN (Renewable Energy)
3. 気象依存の高い再エネによる供給変動と不確実性の拡大
   Increasing power supply volatility and uncertainty caused by weather dependent Renewable power
4. 新たなエネルギーミックス時代の電力システム安定施策
   Multiple solutions to balance the power stability in the transformed Energy Mix

1.1 ノルウェーから始まった電力市場は、今日までに全欧州に拡大
Power market borne in Norway has expanded to Pan-Europe

1991
電力
自由化
Norwegian power market deregulated

1993
The Norwegian power exchange is established as 'Statnett Marked'

1996
Nord Pool誕生
Norway and Sweden join, this is the world's first international power market – called Nord Pool

1998
Finland joins Nord Pool

1999
世界初の
時間前市場
（イントラデイ）
The first international intraday market is established

2000
The Nordic market becomes fully integrated as **Denmark** joins
北欧統一
市場

2010
UK and **Estonia** join Nord Pool

2013
Baltic completed – Lithuania and Latvia join Nord Pool

2014
地域横断
カップリング
North-western European power markets are coupled through the Price Coupling of Regions (PCR) project

2015
Nord Pool appointed NEMO in 15 countries

2016
Together with IBEX Nord Pool opens the **Bulgarian** power market - and with CROPEX the **Croatian** power market

2018
European intraday market go-live
欧州時間前
イントラデイ

2019
Nord Pool opens day-ahead markets in **Germany, Luxembourg, France, Austria, Belgium and Netherlands**

2020
Euronext acquires Nord Pool

Nord Pool opens intraday market in Poland

Opening of the **Georgian** power

2021
Day-ahead trading in **Poland** launched

North Sea Link commence into operation

2023
30周年記念
Nord Pool celebrates 30 year of powering the market

Nord Pool and Elma agree to launch **Iceland**'s power market

2024
Opening of the **Romanian** power market together with BRM

Opening of the **Georgian** power market

NORD POOL
A EURONEXT COMPANY

1.2 日本の電力取引所（JEPX）も、Nord Poolをモデルにした

Japanese power exchange (JEPX) adopted Nord Pool model

電力
自由化

Norwegian power market deregulated

1991

Nord Pool誕生

Norway and Sweden join, this is the world's first international power market – called Nord Pool

1996

世界初の
時間前市場
（イントラデイ）

The first international intraday market is established

1999

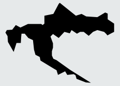
UK and **Estonia** join Nord Pool

2010

地域横断
カップリング

North-western European power markets are coupled through the Price Coupling of Regions (PCR) project

2014



Together with IBEX Nord Pool opens the **Bulgarian** power market - and with CROPEX the **Croatian** power market

2016

Nord Pool opens day-ahead markets in **Germany, Luxembourg, France, Austria, Belgium and Netherlands**

2019

Day-ahead trading in **Poland** launched

North Sea Link commence into operation

2021

Opening of the **Romanian** power market together with BRM

Opening of the **Georgian** power market

2024

日本における
電力システム改革

2016

電力小売の
全面自由化
Japan Power Market fully liberalized

2020

送配電の
法的分離
T&D Legal Unbundling

2024

容量市場
需給調整市場
全面運用開始
Balancing & Capacity Market

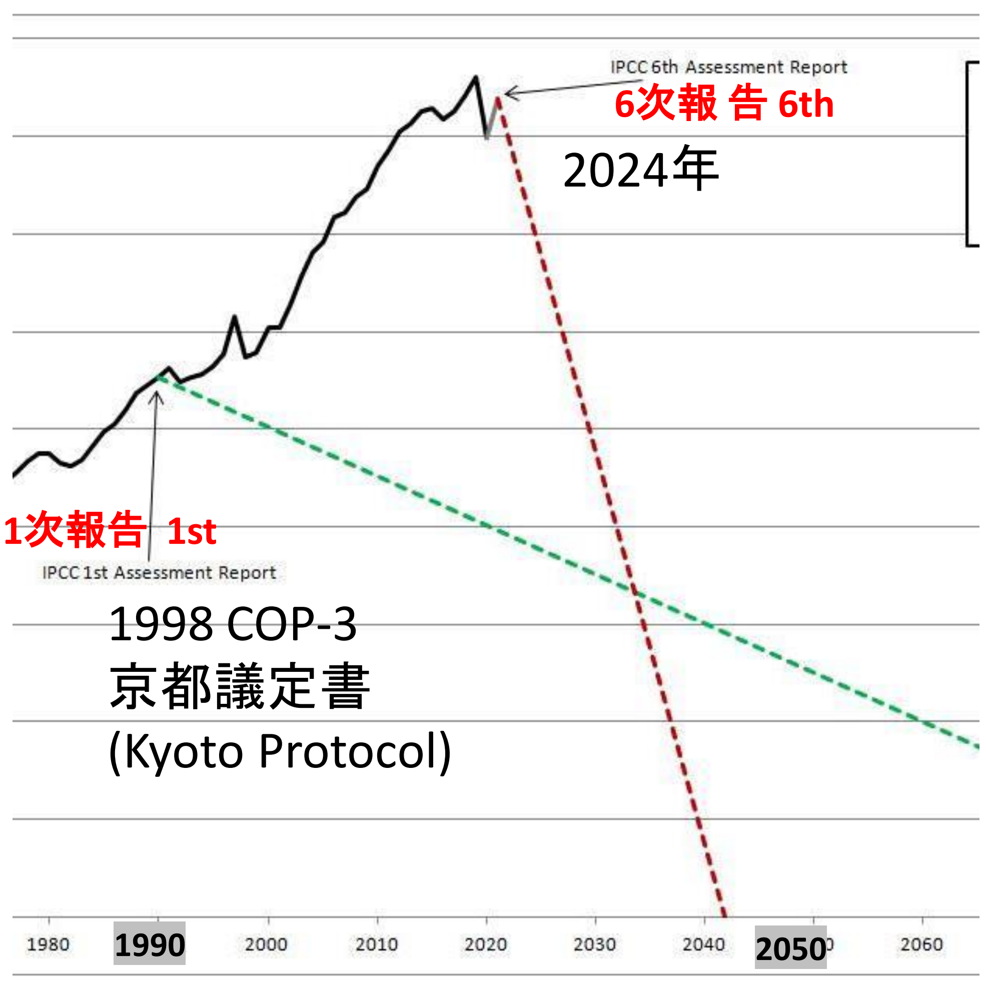
NORD POOL
A EURONEXT COMPANY

２．温暖化ガスの増加と、再エネ電源の更なる拡大見通し

vοlue

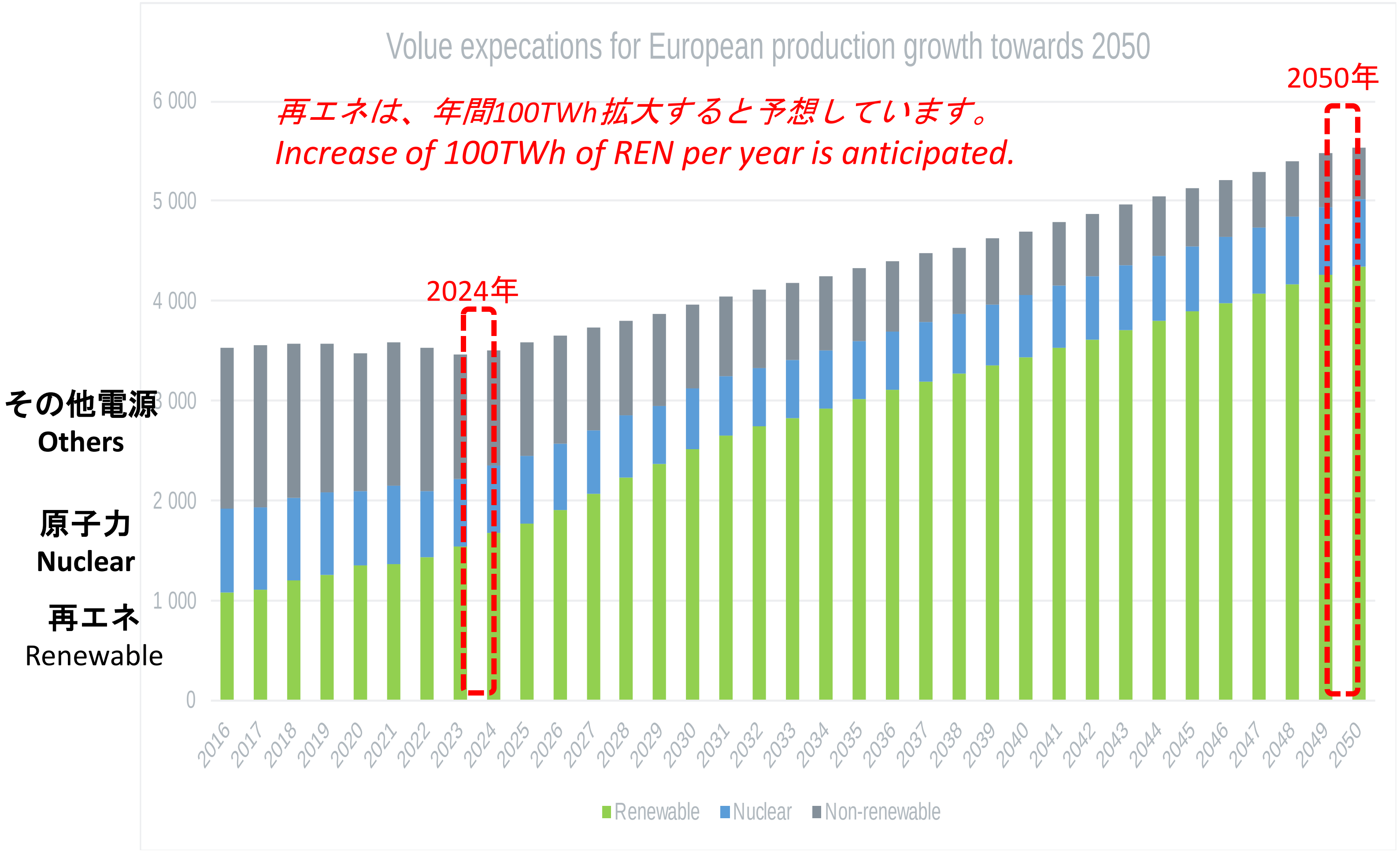
Continuous increase in GHG and expected growth of REN

IPCC* 温暖化ガス排出量報告(1次報告と6次報告）
GHG Emission Report (1st & 6th)



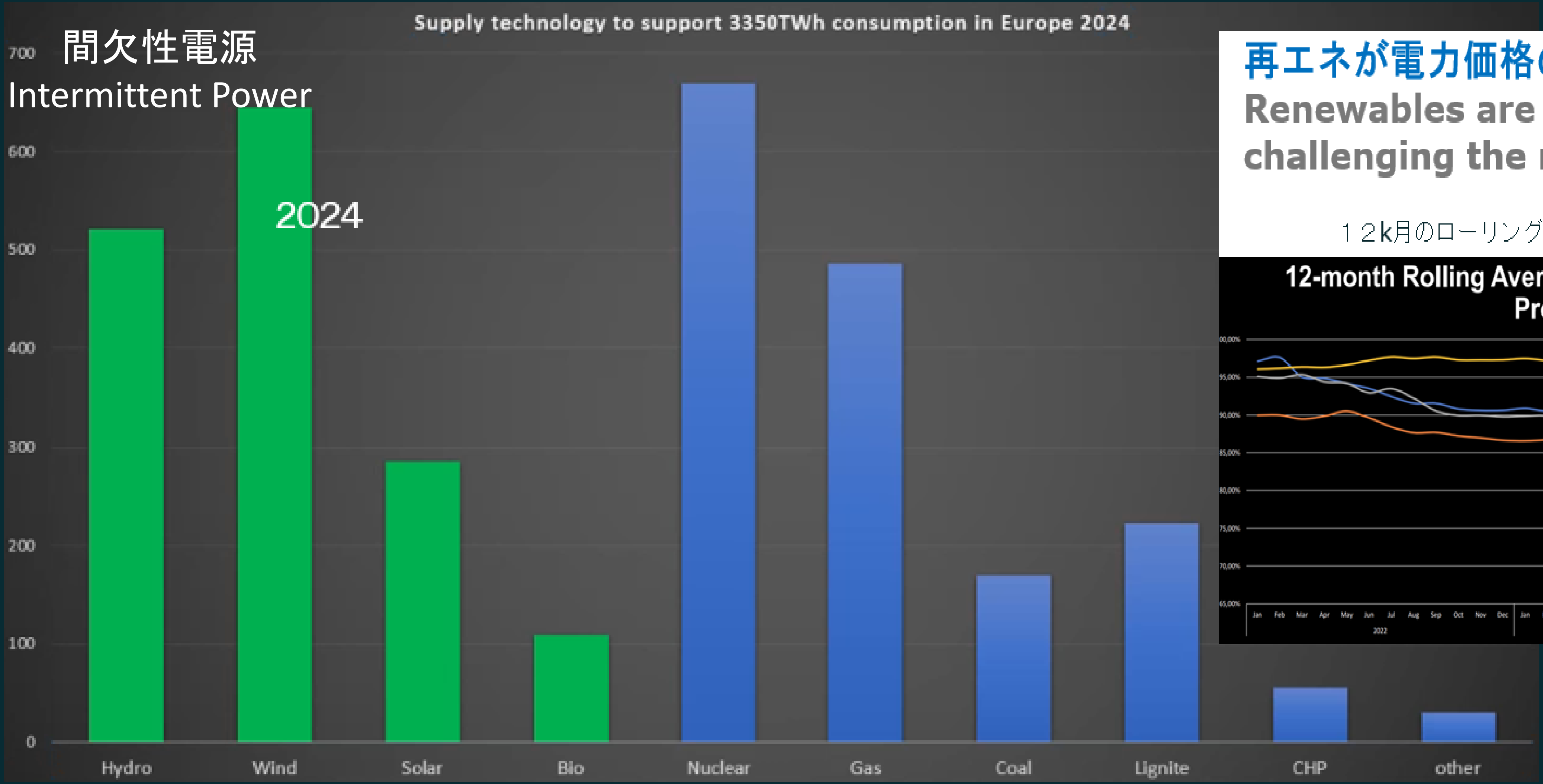
*IPCC: 政府間気候変動パネル）

欧州での発電量推移（弊社見通し）
Volue's expectation of power production growth

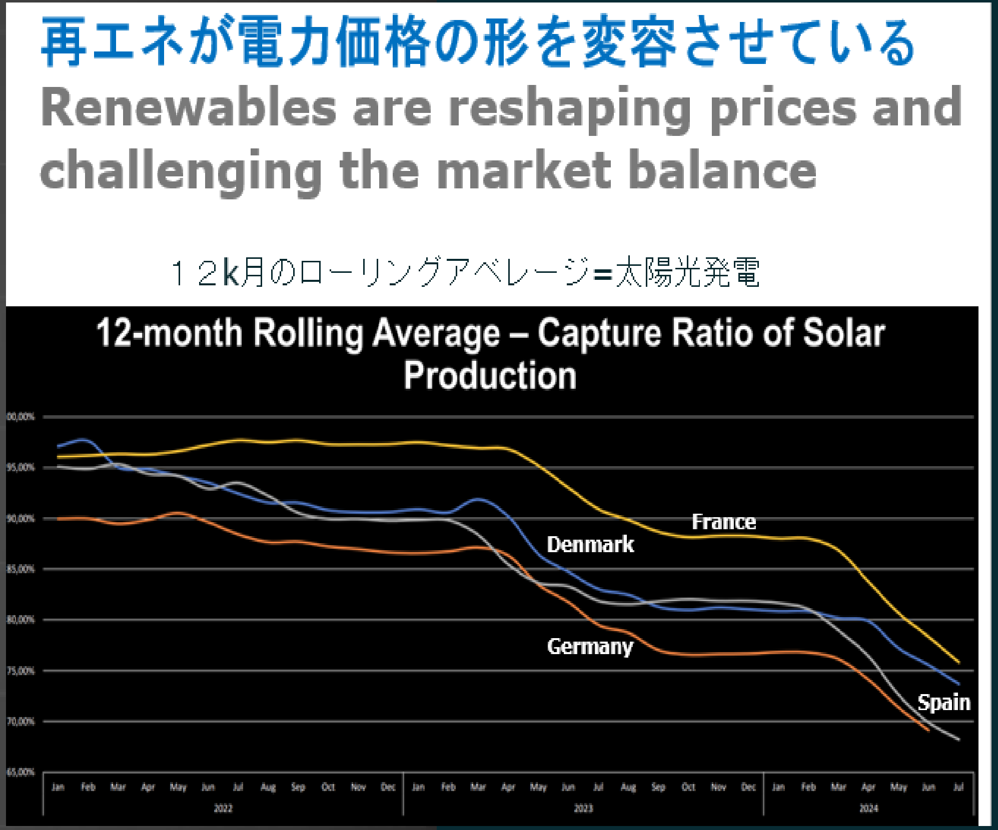


3.1 気象依存度が高い再エネによる変動性と不確実性の拡大

Increasing power supply volatility and uncertainty caused by introduction of more weather dependent renewable power

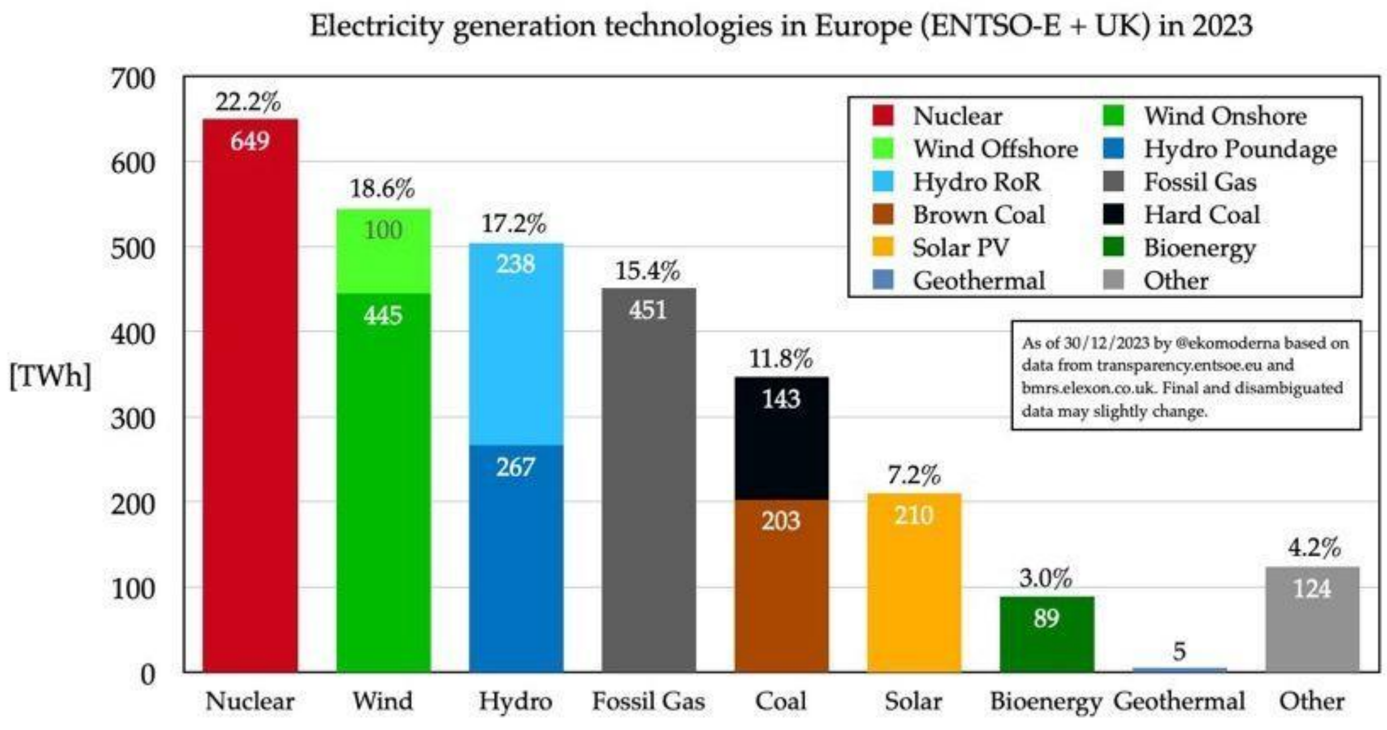


水力 風力 太陽光 バイオ 原発 ガス 石炭 褐炭 CHP その他



volue

3.2 再エネの拡大がエネルギーミックの変更を加速
Increase of REN will accelerate the transition of EN Mix



原発 風力 水力 ガス 石炭 太陽光 バイオマス 地熱 その他

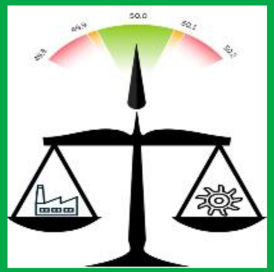
Source: Ekomoderna.blogspot.com (by ENTSO-E open data set)

2024年の欧州のえねえルギーミック
Energy Mix in Europe/UK as of 2024

Europe + UK : ~ 3000 TWh

原発	1	Nuclear - 649 TWh
風力	2	Wind - 545 TWh
水力	3	Hydro - 505 TWh
ガス	**4.**	**Gas - 451 TWh**
石炭	**5.**	**Coal - 346 TWh**
太陽光	6.	Solar - 210 TWh
バイオ	7.	Bioenergy - 89 TWh
地熱	8.	Geothermal - 5 TWh
その他	9.	Other sources – 124 TWh

電力の需給バランスをどう担保するか
How to balance the power Demand-Supply



4．新たなエネルギーミックス時代の電力システムの複数安定施策

Multiple solutions to balance the power stability in the transformed Energy Mix

柔軟性電備
Flexible generation

需給調整力市場 他

Balancing Market etc.

電力ストレージ
Energy storage

揚水発電（Pump Hydro）

蓄電池 (Battery Storage)

水電解による水素貯蔵

H2 Strage by Electrolizer

広域送電網の実現
Wide Area Grid

CAPEX Investment

（送電網投資）

Congestion Mgt Solution

（混雑緩和施策）

電力需要柔軟対応性
Flexible demand Mgt

デマンドレスポンス

Demand Response

スマートメーター

Smart Meter

まとめ：再エネの継続拡大により動的に変化するエネルギーミックスの安定運用のためには、電源技術・市場活用・需要管理の複合施策が不可欠

Conclusion: To cope with changing Energy Mix caused by growth of REN Power, combined use of Power Technology, Market Usage and Demand Control is indispensable.

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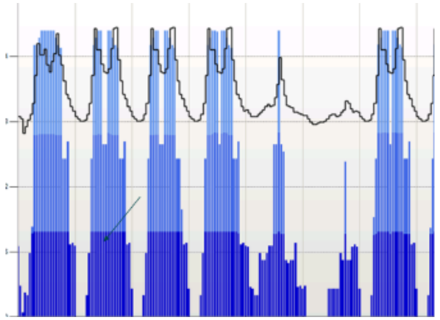

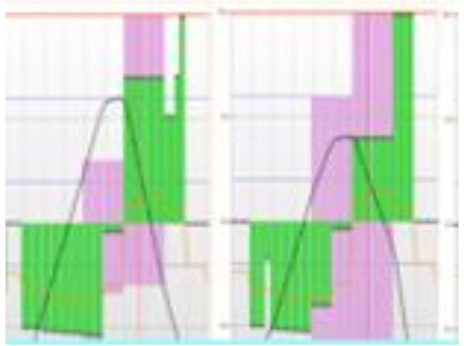

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volue

アグリゲーター

Aggregator

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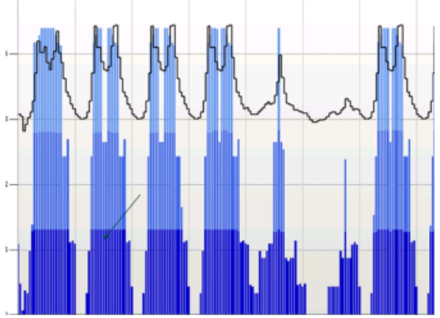

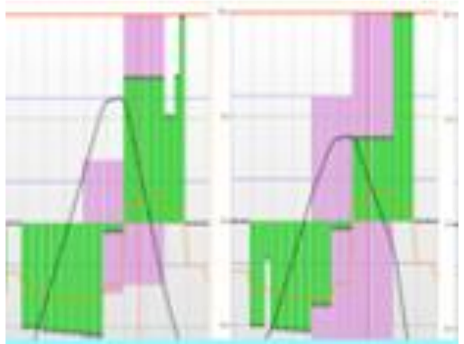

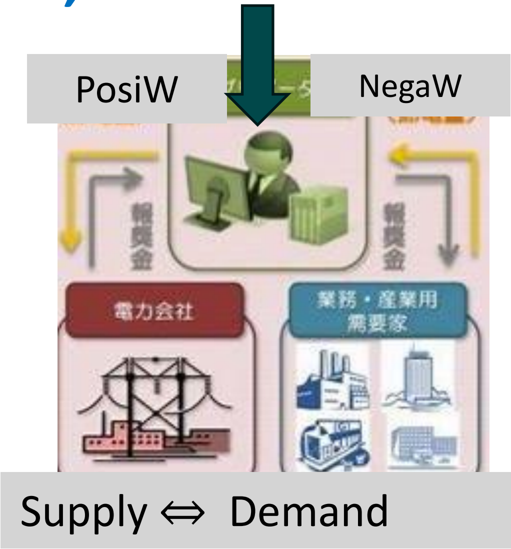

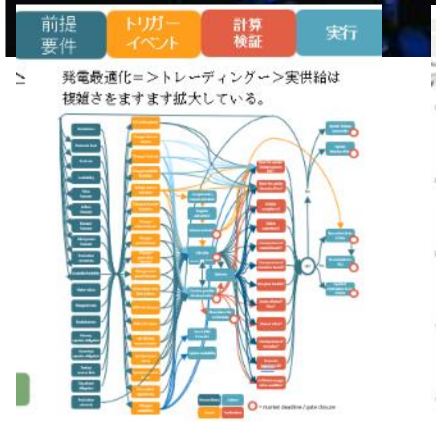

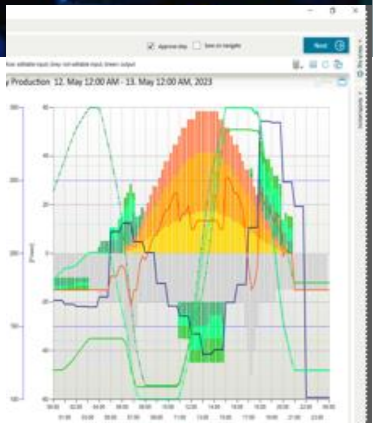

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volue

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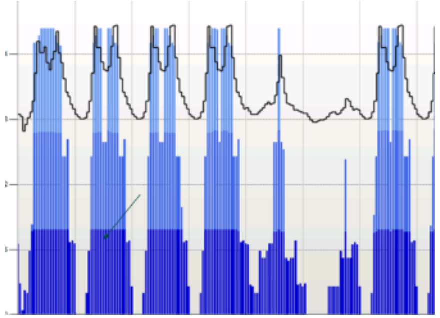
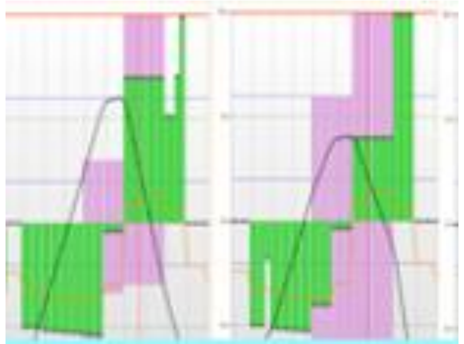
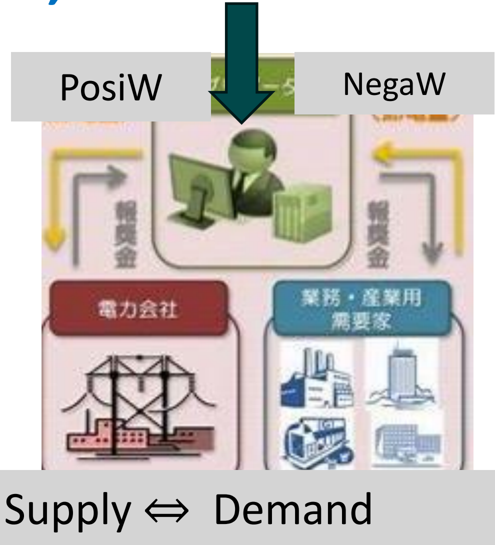
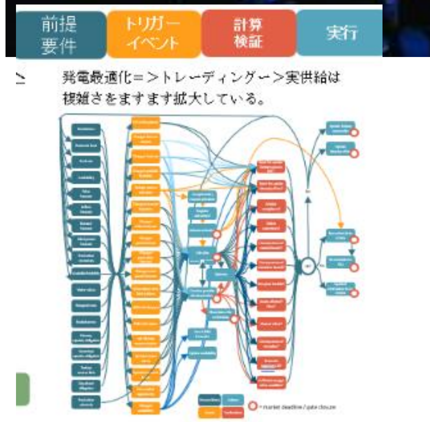
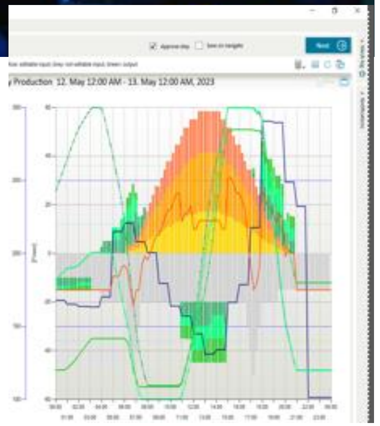


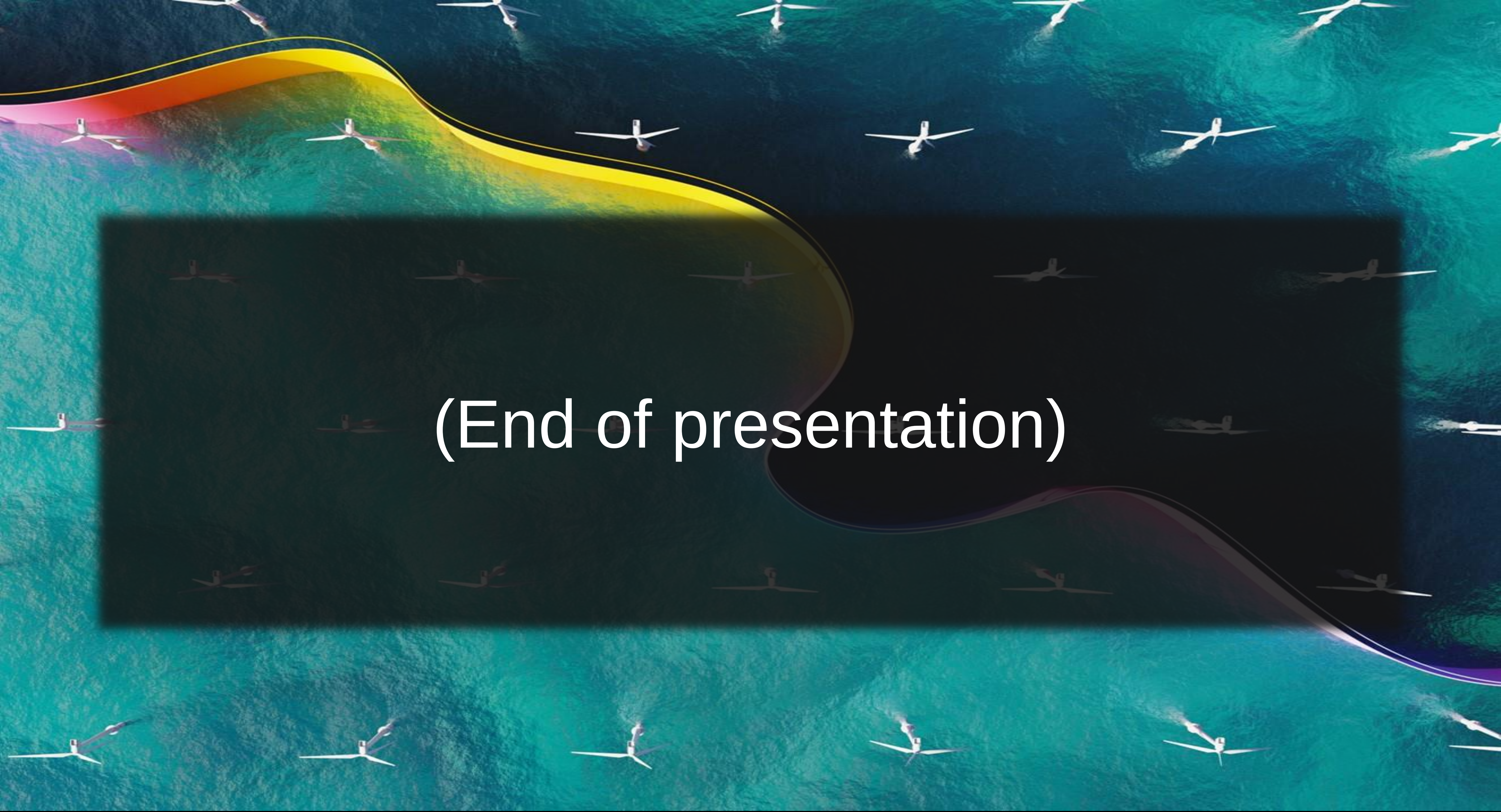




- Green energy transition　グリーン電源トランジション
- Shift from coal to gas　石炭からガスへの転換
- Grid congestion management　系統混雑緩和施策
- Unlocking consumption flexibility　電力需要側柔軟対応
- Storage (Battery, Pumping Hydro)　電力貯蔵（蓄電池・揚水）
- Power to X (Hydrogen)　Power to X の活用 (水電解水素)
- Interconnector Investment and Advanced Optimization
  送配電網への投資と高度最適化
- Weather data and forecast quality continuous improvement
  気象データと予測品質の継続的改善





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Balancing Power Plants: Transitioning to Japan's Energy Future

Nicolas Leong
Energy Business Director
North & South East Asia
Wärtsilä Energy

16 June 2025

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We are a global leader in technology and services

Serving our customers wherever they are in the world

Of the 110,000 large vessels out at sea 1/3

carry Wärtsilä solutions on board

In 180 countries

Wärtsilä energy installations provide reliable power

© WÄRTSILÄ
Public

Wärtsilä Energy: towards a 100% renewable energy future

Our technologies provide reliable power and balancing to support the growth of renewables.

Engine power plants

Energy storage and optimisation

Services

© WÄRTSILÄ
Public

Our track record in 180 countries around the world

Americas

Power plants delivered:
19.7 GW

Operational plants under service agreement:
32 %

Energy storage*:
13 GWh+

Europe

Power plants delivered:
10.9 GW

Operational plants under service agreement:
18 %

Energy storage*:
2.2 GWh+

Africa

Power plants delivered:
7.6 GW

Operational plants under service agreement:
42 %

Energy storage:
18 MWh

Middle East & Asia

Power plants delivered:
40.8 GW

Operational plants under service agreement:
38 %

Energy storage*:
6.7 GWh+

*contracted, under construction, operational

© WÄRTSILÄ

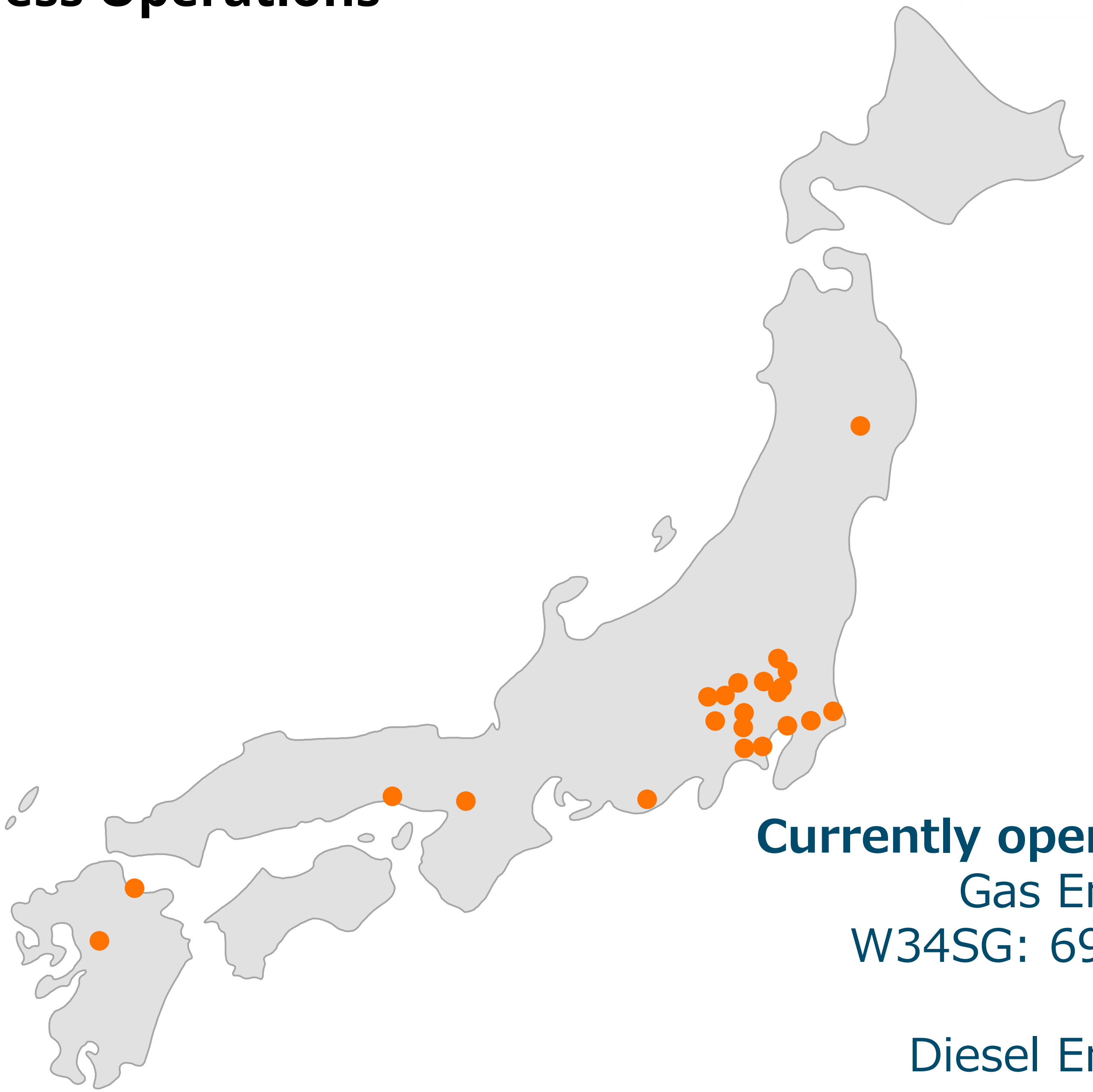
Wärtsilä in Japan: Decades of Trusted Business Operations

WÄRTSILÄ

511 MW
Total Output

115
Number of Engines

8 Sites
LTSA (Long Term Service Agreement)



Currently operating
Gas Engines
W34SG: 69 units

Diesel Engines
W32: 17 units

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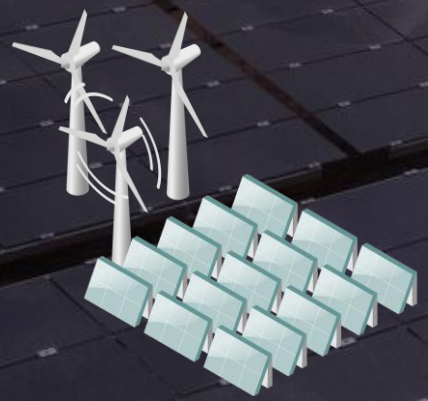
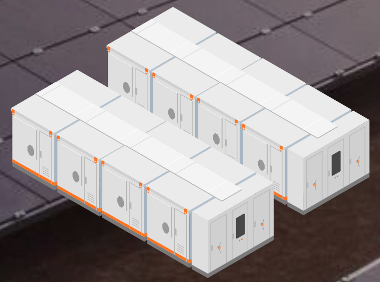
Choosing the right flexible technologies for power systems

Ensuring a continuous supply of electricity is a constant balancing act, where every second counts. When balancing becomes key to ensuring a stable and reliable supply of electricity, it is important to use flexible technologies.



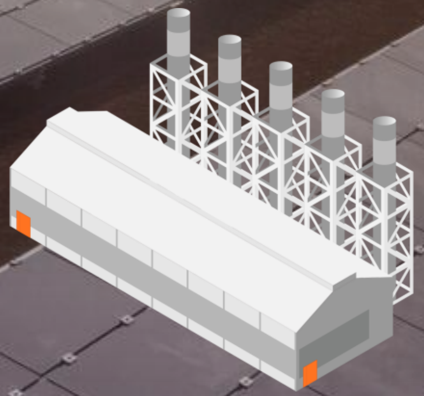
Renewables

need to be balanced by



Energy storage

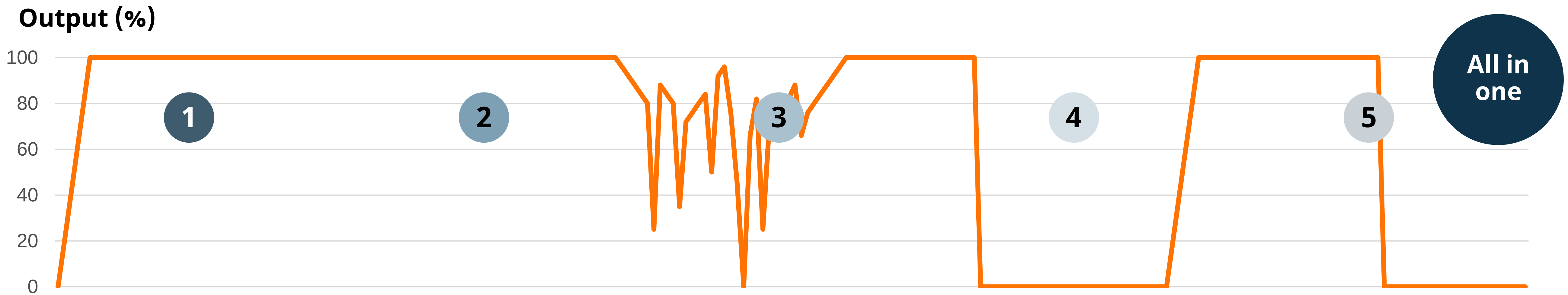
+



Flexible engine power plants

© WÄRTSILÄ

Why engines are most suitable to be paired with renewables



1. Fast start

Value
- Grid stability support
- Ancillary Service market

Features
- Power to grid in 30s
- 2-5 min to full power
- Start-up efficiency

2. Grid capacity balancing

Value
- Competitive life cycle generation cost
- Any output, same generation cost

Features
- Highest simple cycle efficiency
- Multi-unit, high firm capacity

3. Load following

Value
- Wind and solar balancing
- Ancillary service market

Features
- Part load efficiency unaffected
- No EOH cost for cycling

4. Low-load operation

Value
- ”low load” = No load
- Not running when no revenue

Features
- 1 min shutdown
- No minimum down time
- Zero fuel cost
- Zero emissions

5. Fast stop

Value
- Not running when no revenue
- PV enabler

Features
- 1 min shutdown
- No minimum up time
- No EOH calculation

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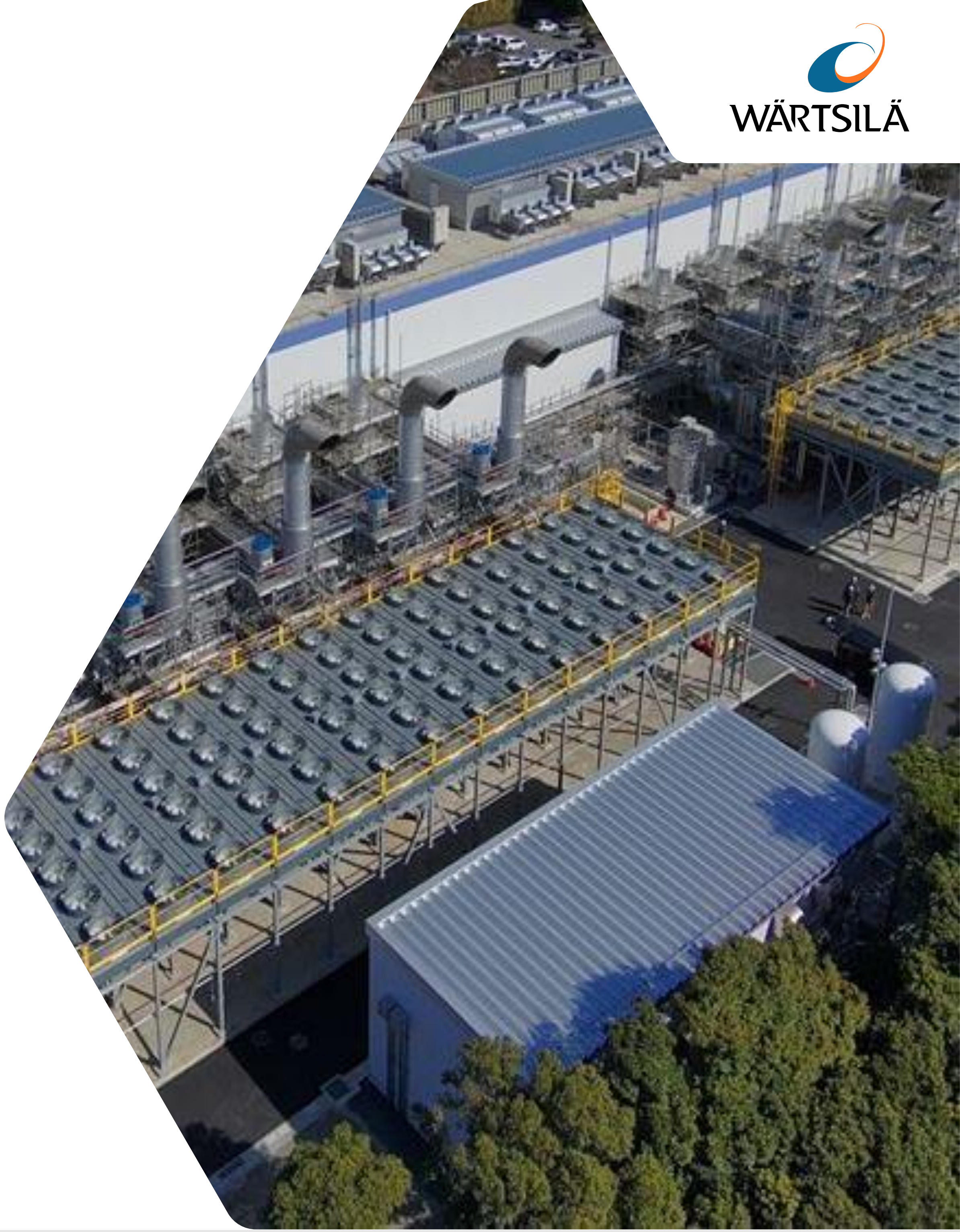
Tokyo Gas Engineering Solutions (TGES) – Japan

Wärtsilä power plant boosts Japan's transition to renewable energy.



Japan is working toward a major shift in its power mix, looking at achieving 40-50% renewable energy by 2040.

Wärtsilä supplied gas engines for TGES' 100 MW power plant in Sodegaura, Japan, which provide the needed flexibility to enable critical grid balancing as the country strives to increase its share of renewable energy.

The main purpose of the utility-scale plant is to hedge market price fluctuations. The plant will also enable participation in the recently launched cross-regional balancing market, that bridges the gap between energy demand and supply during times when much variable renewable energy is being introduced into the system.

The new plant operates with ten Wärtsilä 34SG gas engines, replacing a 100 MW combined cycle gas turbine formerly located on the project site.

The Wärtsilä engine technology delivers the flexibility needed to compensate for fluctuations in the supply from wind and solar.

© WÄRTSILÄ

How can a Gas Power Producer and Supplier in Japan (Example: Tokyo Gas) optimize their JEPX procurement and own generation with a flexible engine?

buy from JEPX	run the FLEXIBLE engine
when JEPX prices are low	when JEPX prices are high

© WÄRTSILÄ

Flexible and Profitable: The Case for Engine Power Plants in Japan

Engine power plants can participate and earn revenues from several markets:

- JEPX Day-Ahead and Intraday Markets
- Balancing Markets
- Capacity Auctions – OCCTO and Long-Term Decarbonisation Auction (LTDA).

Engine power plants provide the following benefits to the integrated generator-retailer:

✓ **Flexible asset that fully supports renewable power** and purchases of JEPX when it is cheap.

✓ **Supply regular and reliable peaking and seasonal power** for retail demand and wholesale market.

✓ **Protect against high JEPX prices and avoid imbalance charges** during periods of tight supply.

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Pioneering New Technologies

24 June 2025

Classified by Alfa Laval as: Business

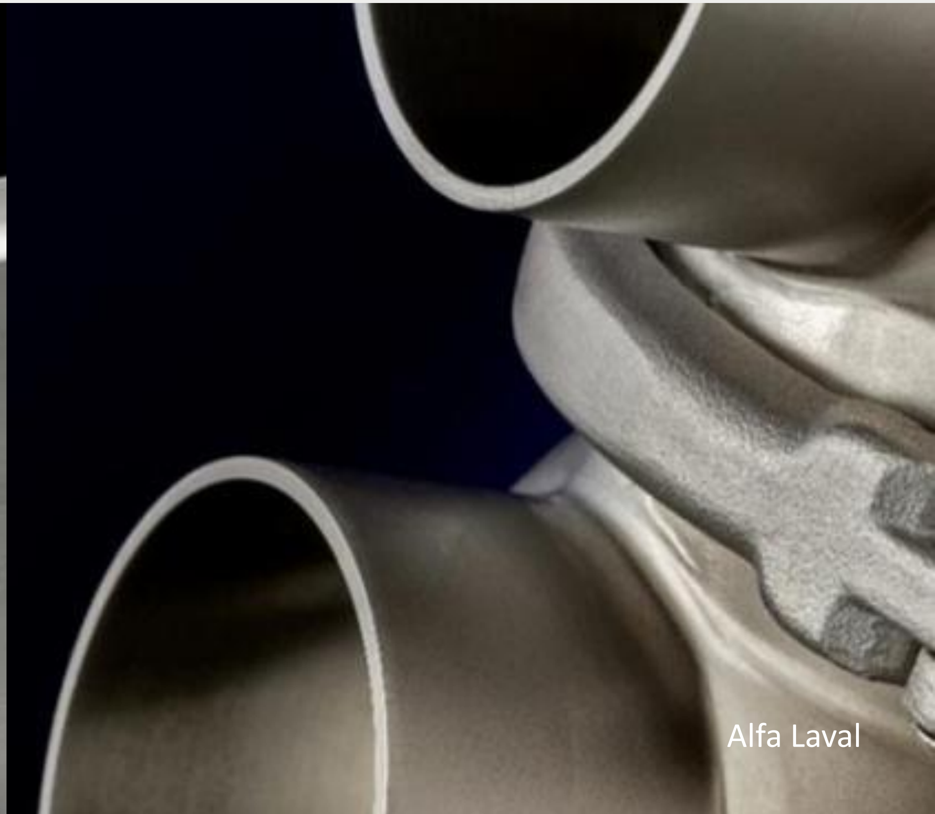
Alfa Laval at a glance

- 140 years of experience in engineering and innovation
- Operating in over 100 countries with 22.000+ employees
- Continuous investment in R&D with 4.200+ patents

Heat transfer

Separation

Fluid handling



Energy efficiency

Green Hydrogen

Power–to-X

Energy storage

Carbon capture utilization and storage
(CCU/S)

Biofuels

E-PowerPack
Waste heat recovery

Wind propulsion

Plant based

Upcycling protein

Revos™ concentration technology

Sustainable water supply

Alfa Laval

Classified by Alfa Laval as: Business

A revolutionary way to store renewable energy

Alfa Laval as investor and technology partner to Malta Inc.

Malta Inc. is developing a thermal energy storage solution that draws electricity from the grid and stores it for hours or days before putting it back on the grid. In charge mode, the system operates as a heat pump, storing electricity as heat in molten salt. In discharge mode, the system operates as a heat engine, using the stored heat to produce electricity. Alfa Laval's innovative heat transfer technology is a critical component for making it possible.

Energy savings

Emission savings

Cost savings

Read more →

Waste heat recovery for sustainable data center operations

Waste heat recovery for sustainable data center operations

One of the world's most sustainable data centers recovers waste heat from servers. An industrial heat pump, powered by renewables, provides hot water for a district heating network.

Alfa Laval's efficient plate heat exchangers ensure optimal performance of the heat pump.

Energy savings

100,000 MWh

Emission savings

Heating of:

6,900 homes

Read more →

Alfa Laval

Pioneering game-changing solutions

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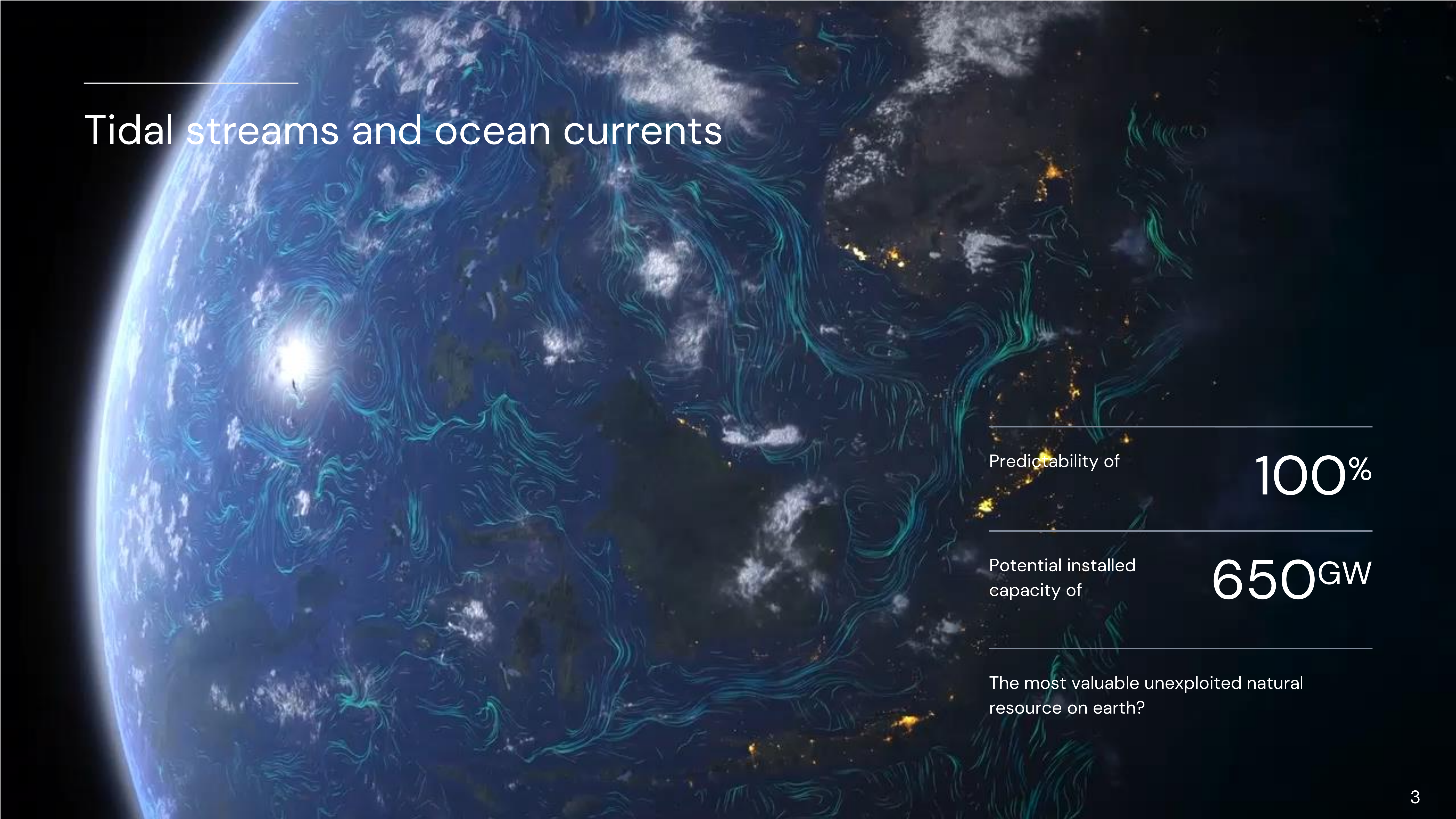
The world’s leading ocean renewable energy technology

Nordic-Kansai Clean Energy Forum, Osaka EXPO

Dr Martin Edlund, CEO of Minesto

16 June 2025

Dragons – born in Sweden, raised in the Faroe Islands



Tidal streams and ocean currents

Predictability of **100%**

Potential installed capacity of **650GW**

The most valuable unexploited natural resource on earth?


Minesto

A verified and well-protected technology

Achievements

> Electricity 2019 (first generation)

> Electricity to grid 2020 (second generation)

> Electricity to grid with Dragon Class 2022 (third generation, first product)

Service and maintenance concept demonstrated and verified

> Transport, onshore handling, towing, installation and recovery

Installation of megawatt scale system (1.2 MW) completed in early 2024

PPA (Power Purchase Agreement) with utility customer SEV in-place

Tidal park infrastructure designed (cabling, transformation, sea-bed anchoring etc.)

91 patents in 10 patent portfolios covering all relevant markets

> Main principle

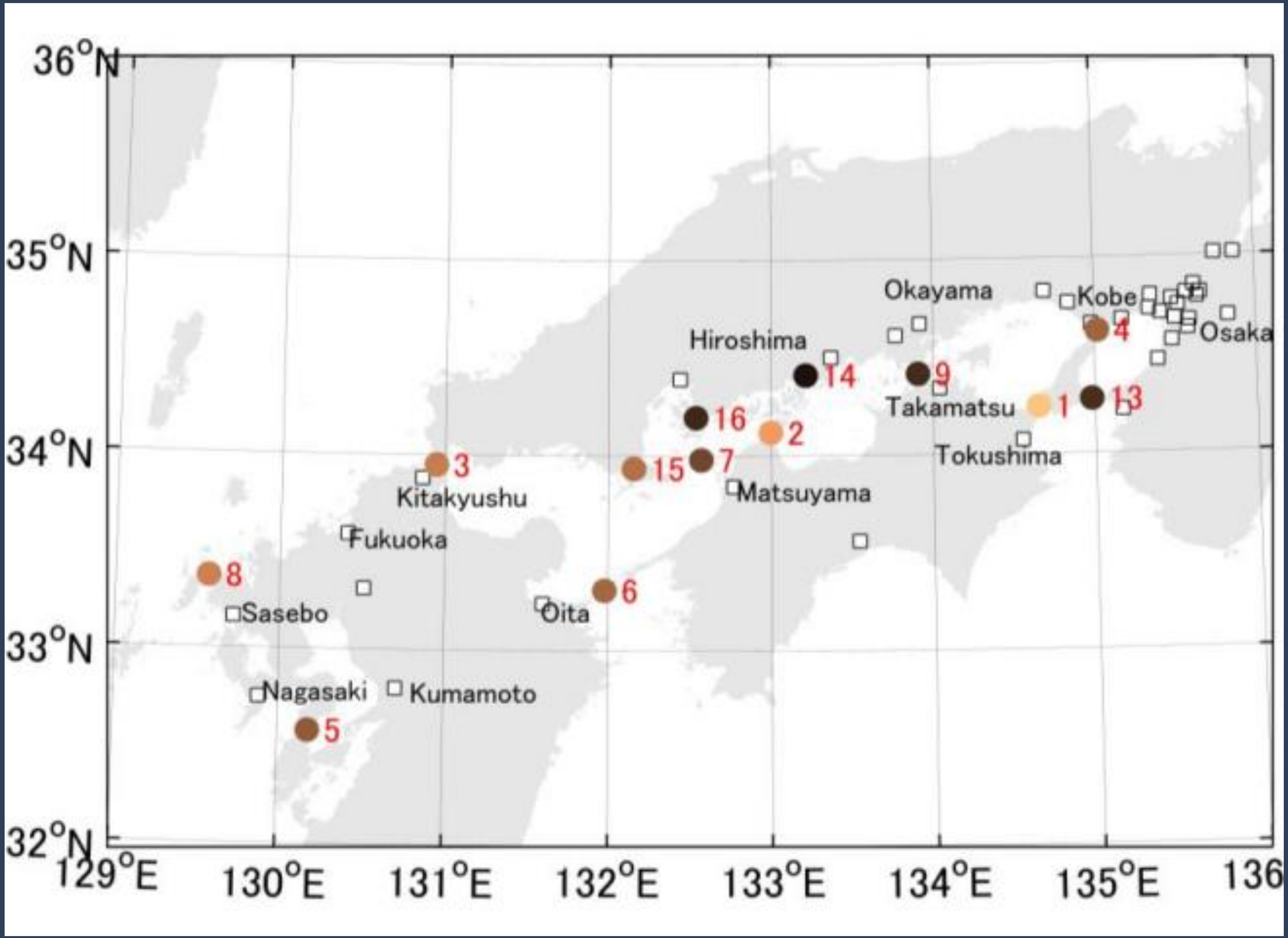
> Supporting functions

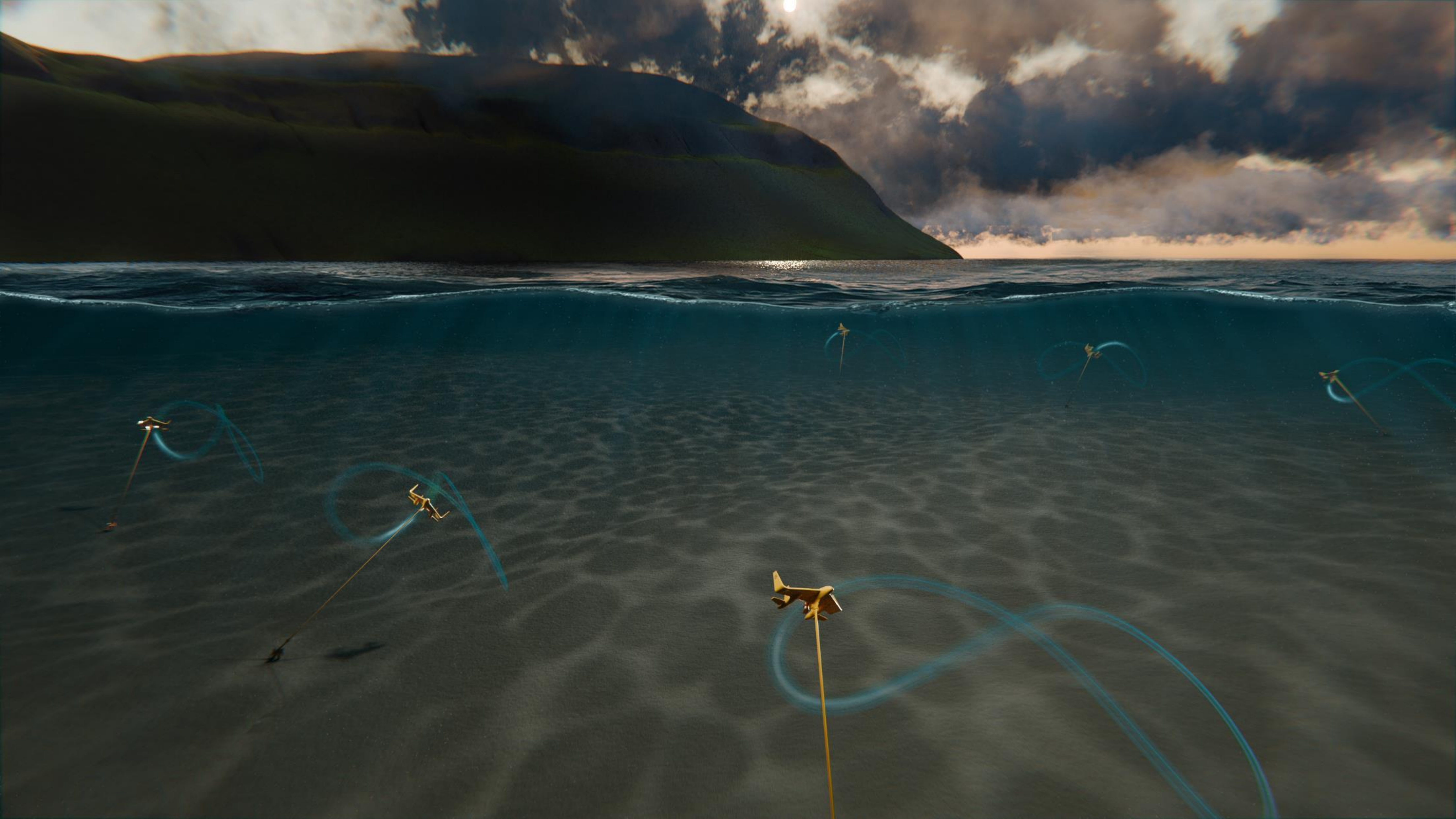
> Operations processes

A Set-up for Manufacturing at scale

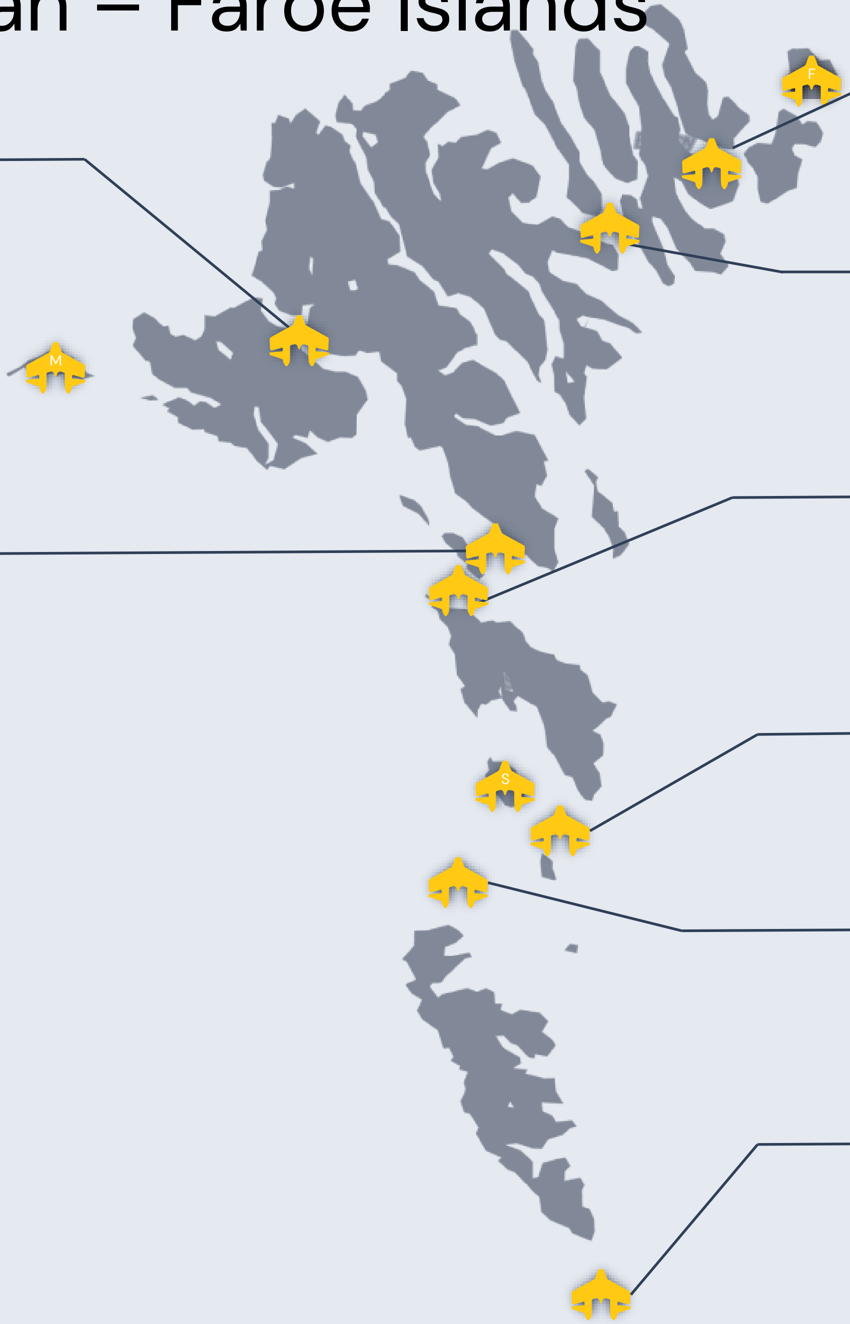
- Partners on-board
- Location selected in Sweden
- A model-factory concept

Examples of identified Minesto tidal sites in Japan





200 MW growth plan – Faroe Islands



Vestmannasund

2 x 100kW
1 x 1.2MW
Demo installation

Hestfjord
- Phase 1: 10MW
- Phase 2: 23MW

33MW
Array installation

Non grid-connected islands
- Mykines
- Fugloy
- Skúvoy

Svinoyarfjord	18MW	Array installation
Leirviksfjord	36MW	Array installation
Skopunarfjord	38.5MW	Array installation
Dimunarfjord	24.75MW	Array installation
Suduroyarfjord	15.75MW	Array installation
South of Akraberg	33.75MW	Array installation


Gamlarætt
Hestfjord
Total capacity
10 MW + 22.75 MW
(Phase 1)
(Phase 2)

In harmony with nature

Environmental impact analysis in six site areas conducted

Mammal observers since 2012 (Portaferry, HHD, Vestmanna)

- Bird life studies show no risks
- Seabed analysis ok
- Seals and dolphins have a verified "avoidance behavior" to stay safe

Conclusions

0 Zero incidents since first operation in 2012

% Low risk profile assessed by marine biologists

Comparative low risks because of large clearance depth and spacing between units


Minesto

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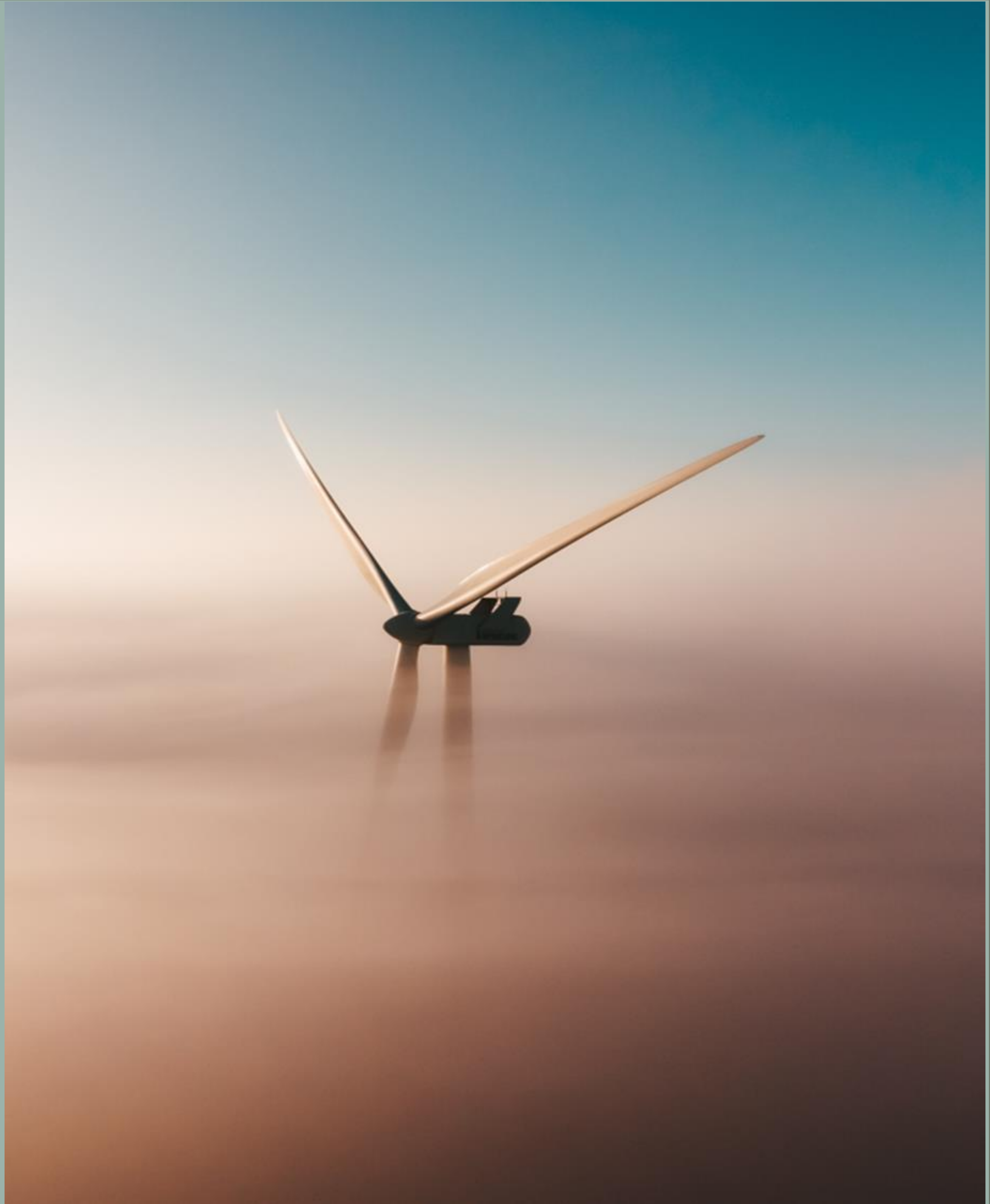
MINISTRY OF FOREIGN AFFAIRS
OF DENMARK
Invest in Denmark

WHY DENMARK

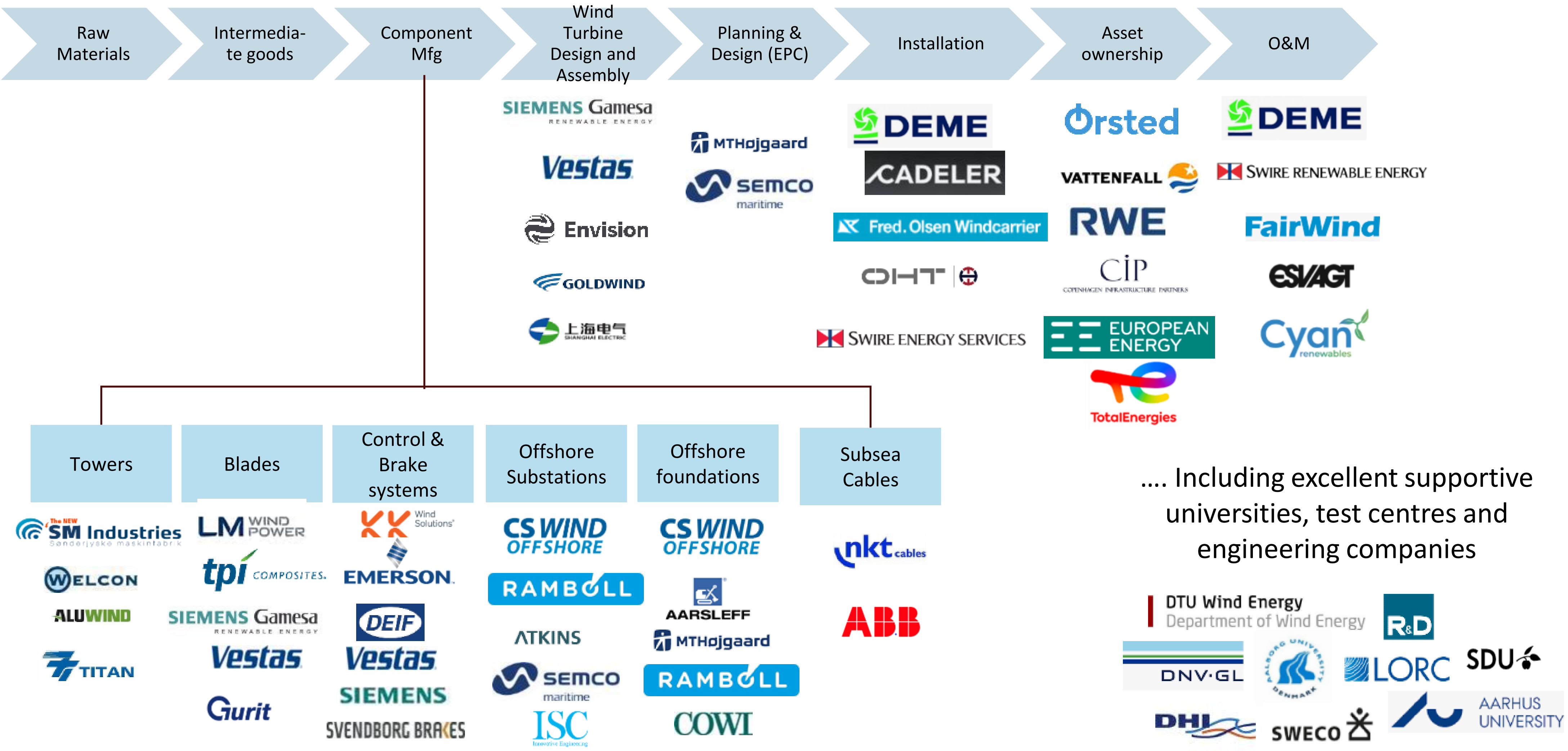
- People
- Partners
- Projects



June 2025

The Danish Offshore Wind Power Industry

– Knowledge, Experience and dedication supported by excellent R&D centres



Potential Offshore Wind Park Tenders in the coming years

Nordsøen I (, A2, A3) Havvindmøllepark
Capacity: min. 2GW (2x1GW)
Tender is published in the autum of 2025.
Application deadline is expected in spring 2026 (A2 = middle)
Expected to be commissioned: end of 2032 (A2)
Application deadline is expected in autumn 2027 (A3 =south)
Expected to be commissioned: end of 2033 (A3)
Nordsøen I (A1, A2, A3) Havvindmøllepark | Energistyrelsen (ens.dk)

Hesselø Havvindmøllepark
Capacity: 0,8- 1,2 GW, depending on the concession winner's final project.
The tender is published in the autumn of 2025.
Application deadline is expected in spring 2026.
Expected to be commissioned: end of 2032
Hesselø Havvindmøllepark | Energistyrelsen (ens.dk)

Nordsøen I (A1) Havvindmøllepark
Capacity: min 1GW
Nordsøen I (A1, A2, A3) Havvindmøllepark | Energistyrelsen (ens.dk)

Kriegers Flak II Havvindmøllepark
Capacity: min. 1 GW
Kriegers Flak II Havvindmøllepark | Energistyrelsen (ens.dk)

Kattegat Havvindmøllepark
Capacity: min. 1 GW
Kattegat Havvindmøllepark | Energistyrelsen (ens.dk)

Energiø Bornholm Havvindmøllepark
Capacity: 3 GW
Energy Island Bornholm | The Danish Energy Agency (ens.dk)

Japanese investments in the Danish Renewable energy ecosystem

European Energy A/S and Mitsubishi HC Capital Inc. finalize EUR 700 million equity transaction

Summitomo Corporation and Skovgaard Energy will produce E- SAF

Mitsui & Co and European Energy open Kassø e-methanol facility

MINISTRY OF FOREIGN AFFAIRS
OF DENMARK
Invest in Denmark

Thank you for your attention

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Coffee Break

Nordic Circle
Innovation Norway
BUSINESS SWEDEN
BUSINESS FINLAND
ROYAL DANISH EMBASSY Tokyo
Business Iceland

Session 2

15:15 – 16:10

Cost-efficient and Low-Carbon Value Chains for Hydrogen, Ammonia and CO_2

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Nordic Energy Days
at Expo 2025

Daigas Group

Daigasグループ による GXに関する取り組み
エネルギートランジション2050

2025年6月16日

大阪ガス株式会社

山本唯史

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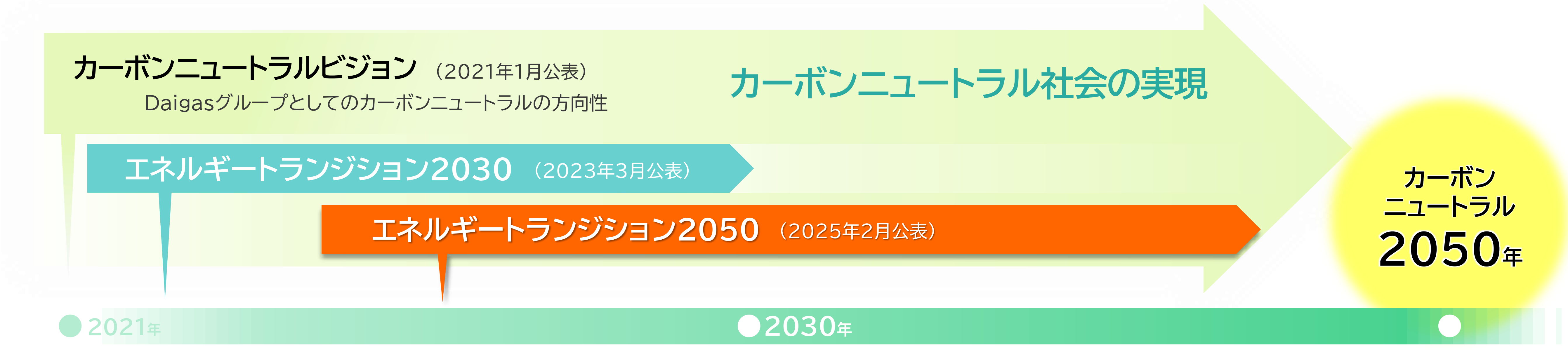
Daigas グループ エネルギートランジション2050 （2025年2月27日 公表）

- Daigasグループは、**カーボンニュートラルビジョン** や **エネルギートランジション2030** の公表を通じ、2050年のカーボンニュートラル実現への挑戦、2030年までのエネルギートランジションの方策を提示してきた

- 未来に向けた活動の加速や事業環境の変化を踏まえ、2050年のカーボンニュートラル実現に向けたトランジションのロードマップをより明確にすると共に、皆さまとミライ価値を共創していくためのソリューションをまとめた **エネルギートランジション2050** を第7次エネルギー基本計画の公表に合わせてタイムリーに策定した



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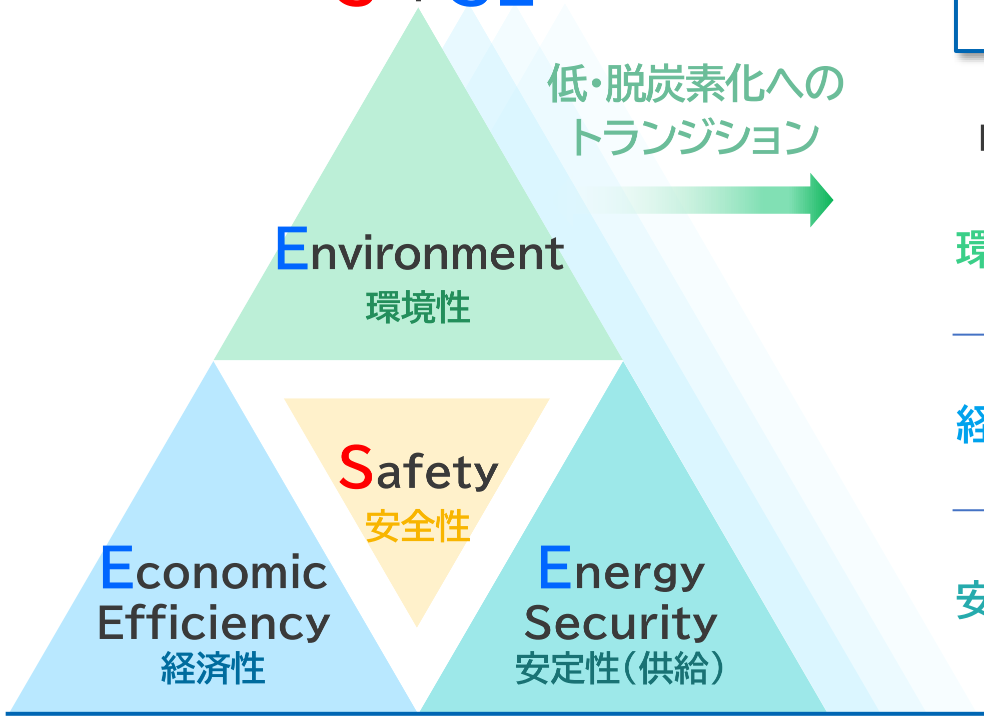
Daigas グループの基本方針　～ エネルギー供給 ～

Daigasグループ基本方針

安全性を大前提とし、厳冬・酷暑や自然災害でもエネルギー供給を停止させない供給安定性を最も重要視しつつ
時代によって変化するお客さまのニーズに合わせて環境性・経済性の様々な選択肢をお客さまにご提案する

エネルギー供給の基本的な考え方

S＋3E



エネルギー供給に関する　3Eのトリレンマ

Daigasグループは3つの E を同時に満たすことに挑戦

環境性⬆	経済性⬇（CNエネルギーは高コスト） 安定性⬇（CNエネルギー生産は特定地域に偏在）
経済性⬆	環境性⬇（従来エネルギーの方が低コスト・CO_2排出量多） 安定性⬇（従来エネルギーの方が安定的に供給）
安定性⬆	経済性⬇（多重化・分散化によるコスト上昇） 環境性⬇（再生可能エネルギーは天候により変動）

エネルギー供給で考慮すべきリスク

- 国際情勢リスク
- 地政学リスク
- 自然災害リスク（地震・台風）
- パンデミックリスク
- 規制リスク（カーボンプライス）
- 為替リスク（円安）

日本のエネルギー自給率は 12.6%
→ 海外からのエネルギー輸入に依存

- CNエネルギーの普及・拡大には技術革新による低コスト化・大量生産の複数拠点化が不可欠
- エネルギー供給に関する3Eのトリレンマを踏まえると、CNエネルギーへのトランジションには多様な選択肢が必要

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エネルギーのカーボンニュートラル化の全体像

・エネルギーのS+3E を踏まえながら熱・電気のカーボンニュートラル化、ネガティブエミッションの取り組みを加速

電気エネルギーの カーボンニュートラル化

- 再生可能エネルギーの更なる普及拡大
- 蓄電池による安定供給への貢献
- 火力電源のゼロ・エミッション化

Daigas Group

カーボンニュートラル 実現

ネガティブエミッションの 取り組み

- 工場等から排出されるCO_2を回収し地下貯留地でのCCSにより直接削減
- 森林開発・管理によるCO_2の直接除去
- カーボンクレジット活用

熱エネルギーの カーボンニュートラル化

- 天然ガスによる安定供給・低炭素化への貢献
- 天然ガスからe-メタンへのシームレスな移行による脱炭素化
- 将来のSOECメタネーション技術革新によるe-メタン普及加速

Safety 安全性

＋

Energy Security 安定性(供給)

Environment 環境性

Economic Efficiency 経済性

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天然ガスシフト・e-メタン利用によるトランジション

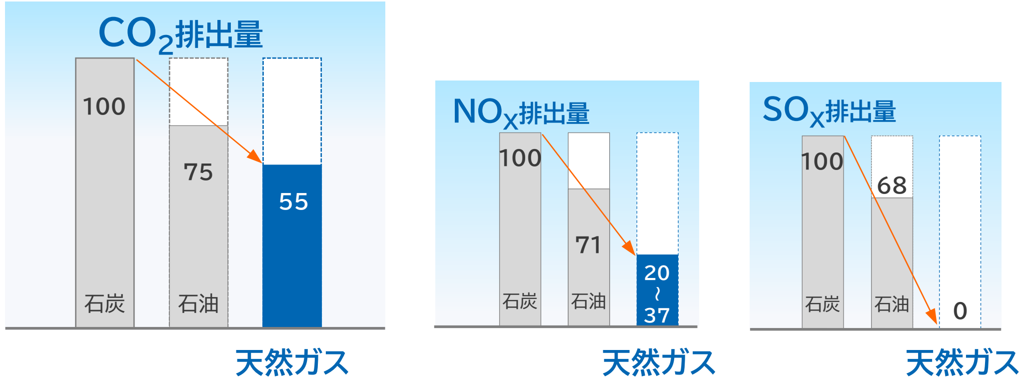
- 石炭・石油から天然ガスへの燃料転換による大幅な低炭素化と共に、NOx・SOxの排出量削減による環境負荷低減も実現
- 天然ガスからe-メタンへのシームレスな移行による脱炭素化が可能 → 経済性や供給安定性を高い次元で両立

石炭・石油 → 天然ガス → e-メタン

天然ガス

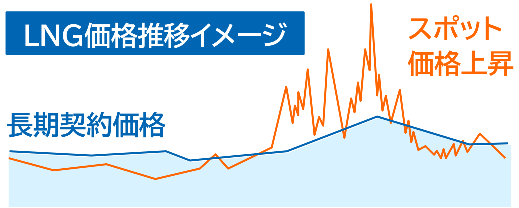
環境性

- 石炭・石油から天然ガスへの燃料転換 → 大幅なCO_2削減
- コージェネによる高効率省エネ機器導入 → 更なるCO_2削減
- SOx排出量ゼロ、NOx排出量 大幅削減 → 環境負荷低減



経済性 / 安定性

- 天然ガスの長期契約 → 供給安定性の実現、価格変動を抑制



スポット契約による調達価格は大きく変動する一方、長期契約による調達価格は安定的

e-メタン

環境性

- CO_2リサイクル → e-メタン燃焼時のCO_2排出計上ゼロ
- 天然ガス火力発電の燃料をe-メタンに → 脱炭素化が可能
- クリーンガス証書制度 → 環境価値の認証や移転

経済性

- 天然ガスと同じ成分、お客さまの燃焼機器を交換する必要無し
  → シームレスな移行、燃料転換による社会コストを低減

安定性

- 天然ガスとe-メタンを同時に供給可能
  → 高い供給安定性を確保

家庭用コンロによるe-メタンの燃焼状況

→ 天然ガス燃焼時と同じe-メタンの炎

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e-メタンのサプライチェーン構築に向けた挑戦

- 2030年1%導入を起点に、2050年に向けた導入拡大を通じてe-メタンサプライチェーン構築を実現
- グローバルにe-メタン製造プロジェクトを推進しつつ、e-NG Coalition への参画を通じてe-メタンの普及拡大を主導

産ガス国の新たなエネルギー産業 ／ 日本の脱炭素化・エネルギー安全保障 ／ アジアのe-メタン利用による脱炭素化

国内外のe-メタンサプライチェーン構築

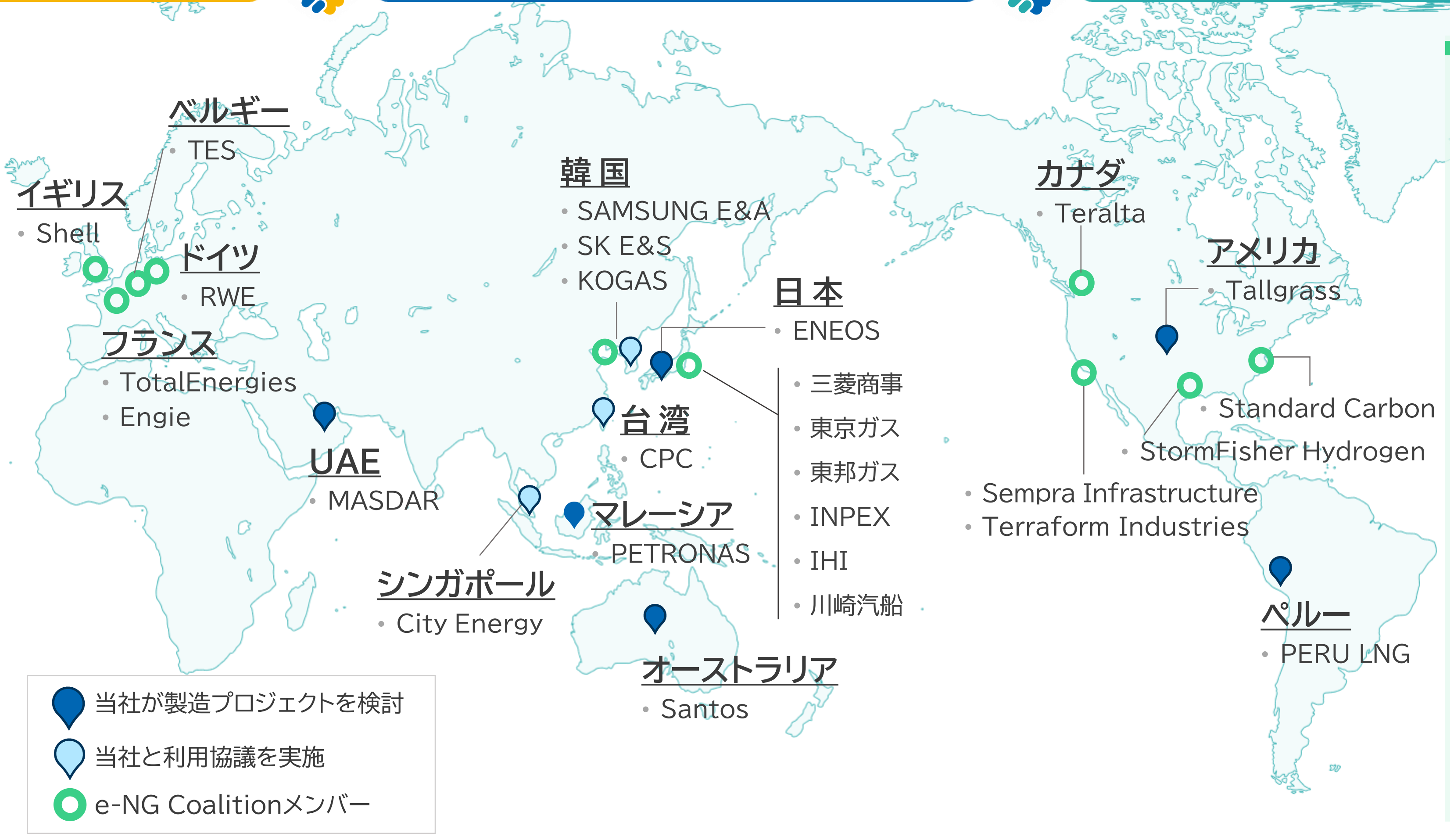
●エネルギーセキュリティ向上

・既存天然ガス・LNG出荷設備を利用可能

・国内外の複数拠点化により地政学リスクを低減し、安定供給に寄与

●アジアでの普及拡大

・e-メタン利活用に向けて海外のエネルギー事業者との協議を実施



国際市場形成への取り組み

e-NG COALITION

- e-メタン等の国際市場形成を目指す団体を設立し、**日米欧の19社が参画**
- 団体への参画・協賛企業を増やし、e-メタン等の国際的認知度向上、取引・環境制度形成へ取り組む

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再生可能エネルギー普及拡大の取り組み

- 2050年のカーボンニュートラル社会実現とエネルギーの安定供給の両立が必要であり、
  今後も洋上風力発電や蓄電池事業を推進することで、再生可能エネルギーの拡大と電力系統の安定化の双方を実現

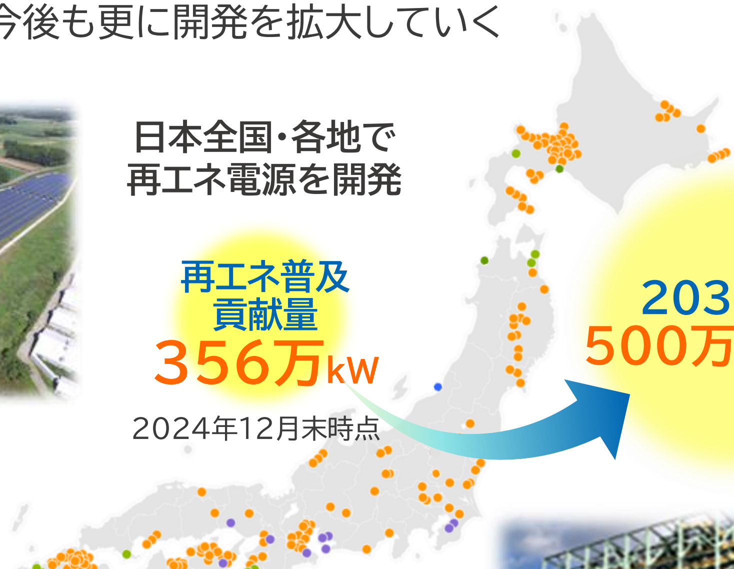
全国での再生可能エネルギー開発を推進

- 2004年の再生可能エネルギー事業参入以来、
  400件以上の太陽光・バイオマス・陸上/洋上風力を開発・保有
- 自社単独だけではなく、パートナーとの
  連携も含めて今後も更に開発を拡大していく

日本全国・各地で
再エネ電源を開発

再エネ普及
貢献量
356万kW
2024年12月末時点

2030年度
500万kWを目指す




バイオマス発電所

洋上風力発電への挑戦

- 新潟県村上市及び胎内市沖(着床式、約68万kW)、
  長崎県五島市沖(浮体式、約1.7万kW)を開発中
- 引き続き、国内で導入ポテンシャルの大きい
  洋上風力への取り組みを拡大し、
  再生可能エネルギーの普及拡大を加速する

蓄電池事業への参入

- 系統電力のピークシフトニーズ増大に伴い、
  2023年度より系統用蓄電事業に参入
  (千里蓄電所、武雄蓄電所)
- 今後は、太陽光発電などの
  “再エネ電源併設型”の蓄電池に参入
  再エネ普及拡大と電力系統安定化に貢献

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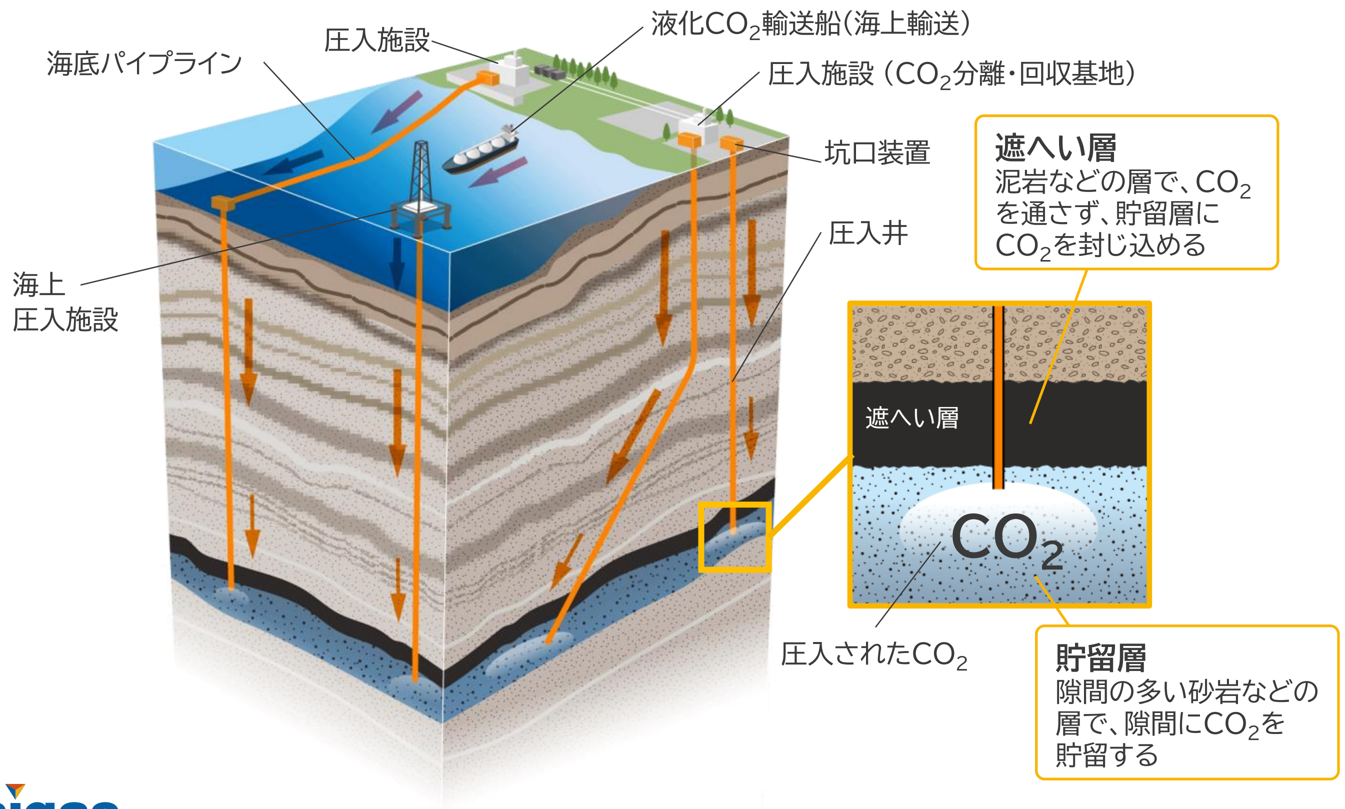
ネガティブエミッションに向けた取り組み

- エネルギーのカーボンニュートラル化だけでなく、Hard-to-Aabate 産業等から排出される大量のCO_2に対して、CCSや森林吸収のネガティブエミッションに取り組み、お客さまのCO_2排出量の削減と国内産業の持続的な成長を支える

CCSの取り組み

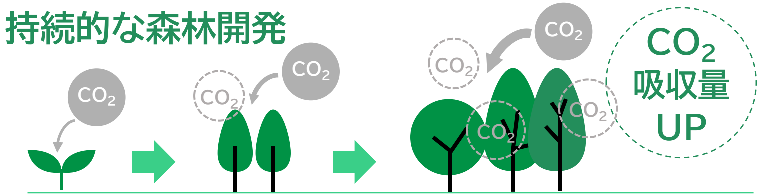
- 工場や火力発電所等から排出されるCO_2をお客さまと連携して回収し集積
- 回収したCO_2は、CO_2パイプラインや液化CO_2輸送船で輸送し、CCSとして国内外における地下の安定した地層へ貯留することにより、CO_2削減を目指す



森林吸収／カーボンクレジット活用の取り組み

- 森林ファンドによる森林開発・管理により、CO_2吸収・炭素固定の機能強化

持続的な森林開発



CO_2を直接除去

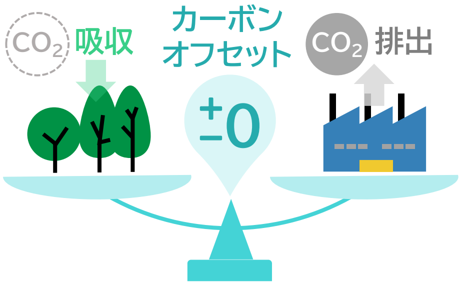
カーボンクレジットを創出

住友林業グループ組成ファンドへの参画
Eastwood Climate Smart Forestry Fund Ⅰ

クレジット創出例

- AIカーボン社との豪州における原生林再生プロジェクト
- フィリピンにおける、水田由来クレジット創出事業（JCM初認定）

世界に先駆けて構築した生成AIによるカーボンクレジット品質評価システム活用



- ニーズに合わせたカーボンクレジットの活用（カーボン・オフセット都市ガスの供給等）により、ステークホルダーの皆さまの脱炭素化実現に寄与

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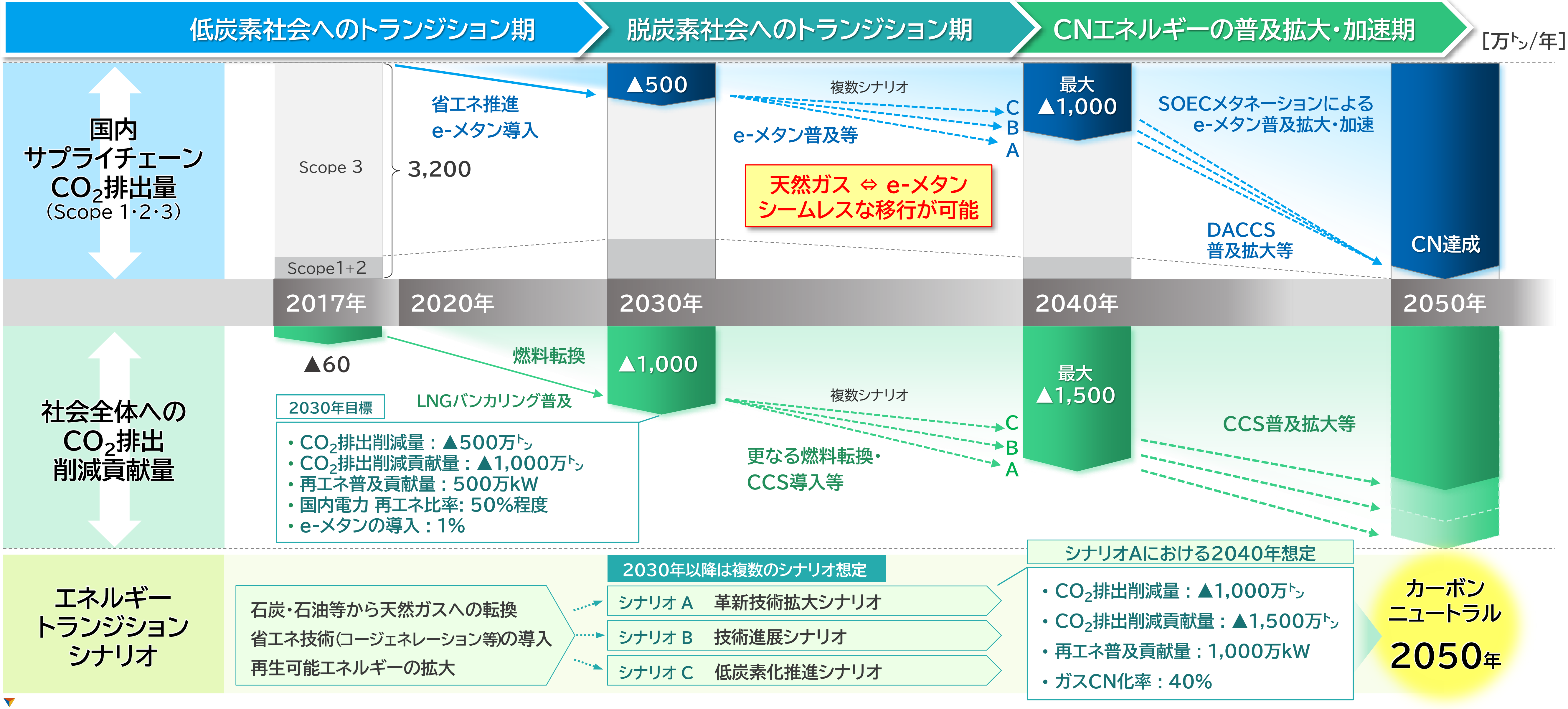
Daigas グループ CO_2削減ロードマップ

・中長期の事業環境には様々な不確実性が存在することから、Daigasグループとして複数シナリオを想定



Daigas Group

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総 括

- 国が第7次エネルギー基本計画を公表し、2040年のエネルギー需給見通しが複数シナリオとして示されるなど、2050年のカーボンニュートラル化に向けた選択肢は多様化しています。

- このような中、長期安定的に天然ガスを調達しながら、事業環境の変化やお客様のニーズに合わせて低炭素な天然ガスから脱炭素なe-メタンへシームレスに移行していくことが、Daigasグループの重要なトランジション戦略の1つであり、現実解であると考えています。

- Daigasグループは、今年120周年を迎える中、1905年のガス供給開始（第1の創業）、1975年の天然ガス転換（第2の創業）に続き、2030年はe-メタンの導入による第3の創業を目指して、着実にトランジションを進めてまいります。

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WHEN TRUST MATTERS

Opportunities & Challenges for CCS Value Chains

James Laybourn

16 June 2025

DNV in the Hydrogen & CCUS Segments

15,500 experts

across the Maritime, O&G, Renewables & Power markets providing local access to global best practice

161 years

serving the maritime & energy industries, including early engagement in the oil and gas, wind and solar, hydrogen & CCUS sectors

5%

total revenue invested in R&D each year to support the development of next generation technologies

170+

industry standards, guidelines and recommended practices

30+

joint industry projects per year collaborating with industry and our customers to develop the next generation of standards

24

laboratories and test centres including the World's first full-scale hydrogen testing facility supporting safety, infrastructure and policy

500+

carbon capture and utilisation projects delivered in the past 10 years including development of the first international standards

400+

hydrogen and PtX projects delivered in the past 4 years spanning production, transportation, utilisation and policy


DNV
WHEN TRUST MATTERS
ENERGY TRANSITION OUTLOOK
CCS TO 2050
Carbon capture and storage: from turning point in 2025 to scale by mid-century
Download from: www.dnv.com/energy-transition-outlook

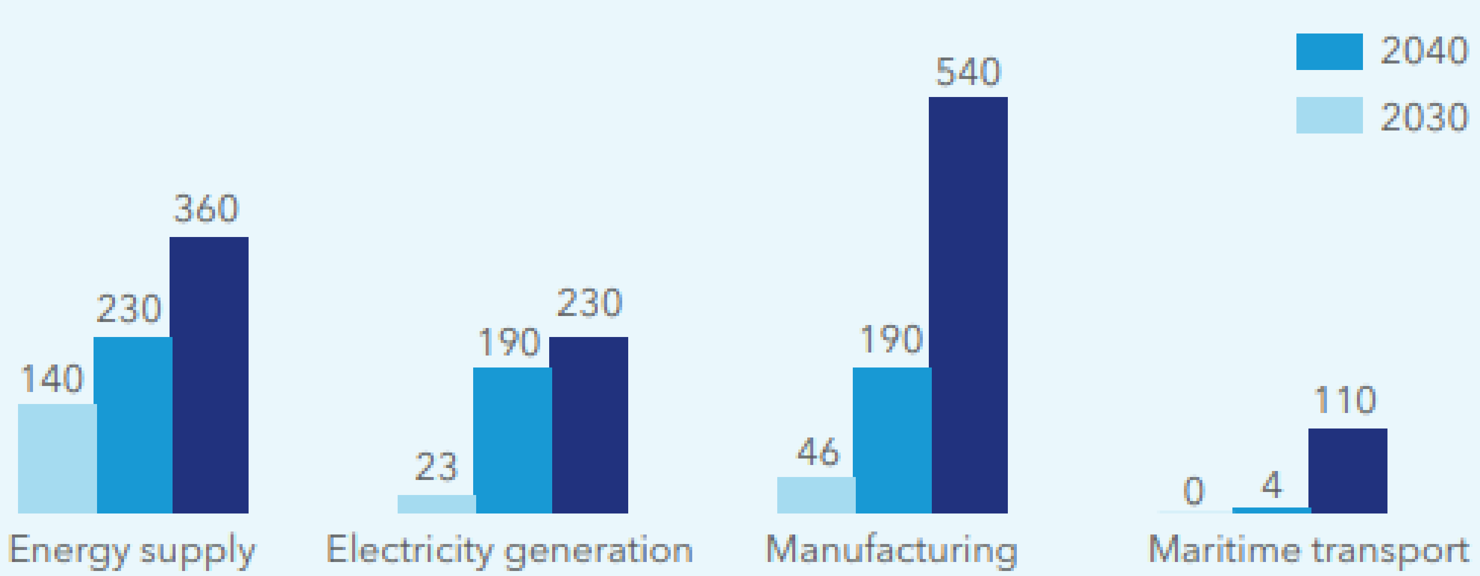
CCS Forecast out to 2050

CCS grows to more than a gigatonne per year by 2050

Carbon capture and storage ($MtCO_2$/yr)

Timelines differ across sectors

CO_2 capture in selected sectors ($MtCO_2$/yr)



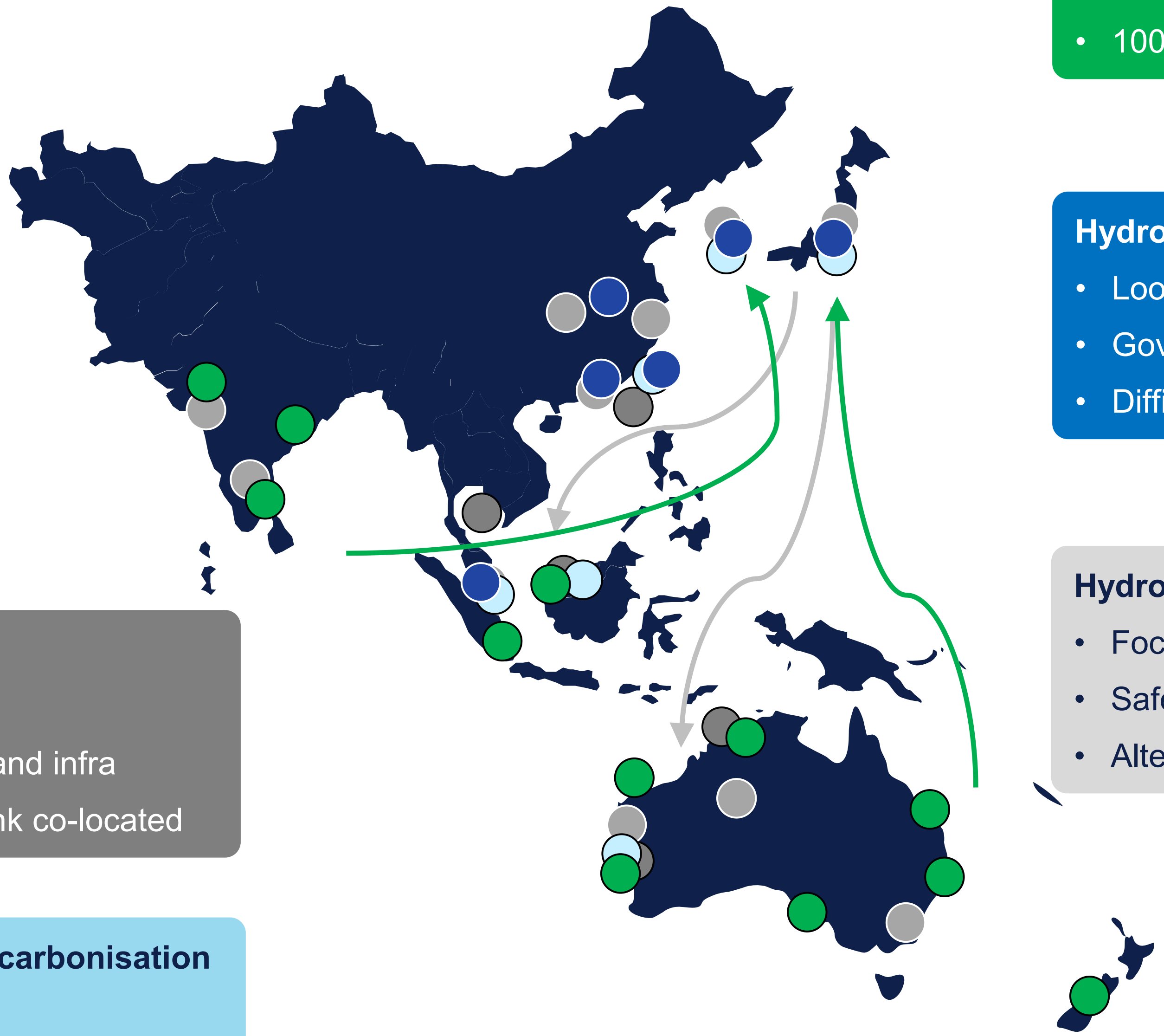
H_2 and CCUS Market in Asia

Hydrogen Production

- Closely linked to renewables and PG
- Viable opportunity for stranded renewables
- 100s of projects with limited commercialisation

Hydrogen Importers

- Looking at demand drivers
- Government strategies and subsidies
- Difficult technical challenges (import/transmission)



Hydrogen Users

- Focus on commercial / regulatory considerations
- Safety focus as bringing H2 close to population
- Alternative fuel needs / bunkering / etc

CCS linked to high CO_2 Gas Fields

- Clear business case
- Repurposing of existing expertise and infra
- Single operator with source and sink co-located

New CO2 value chains linked to decarbonisation

- Challenging commercial models
- Need for a lot of collaboration
- Commercial push needed from exporting markets

DNV

The Business Case for CCUS

Commercial CCUS Projects move ahead when

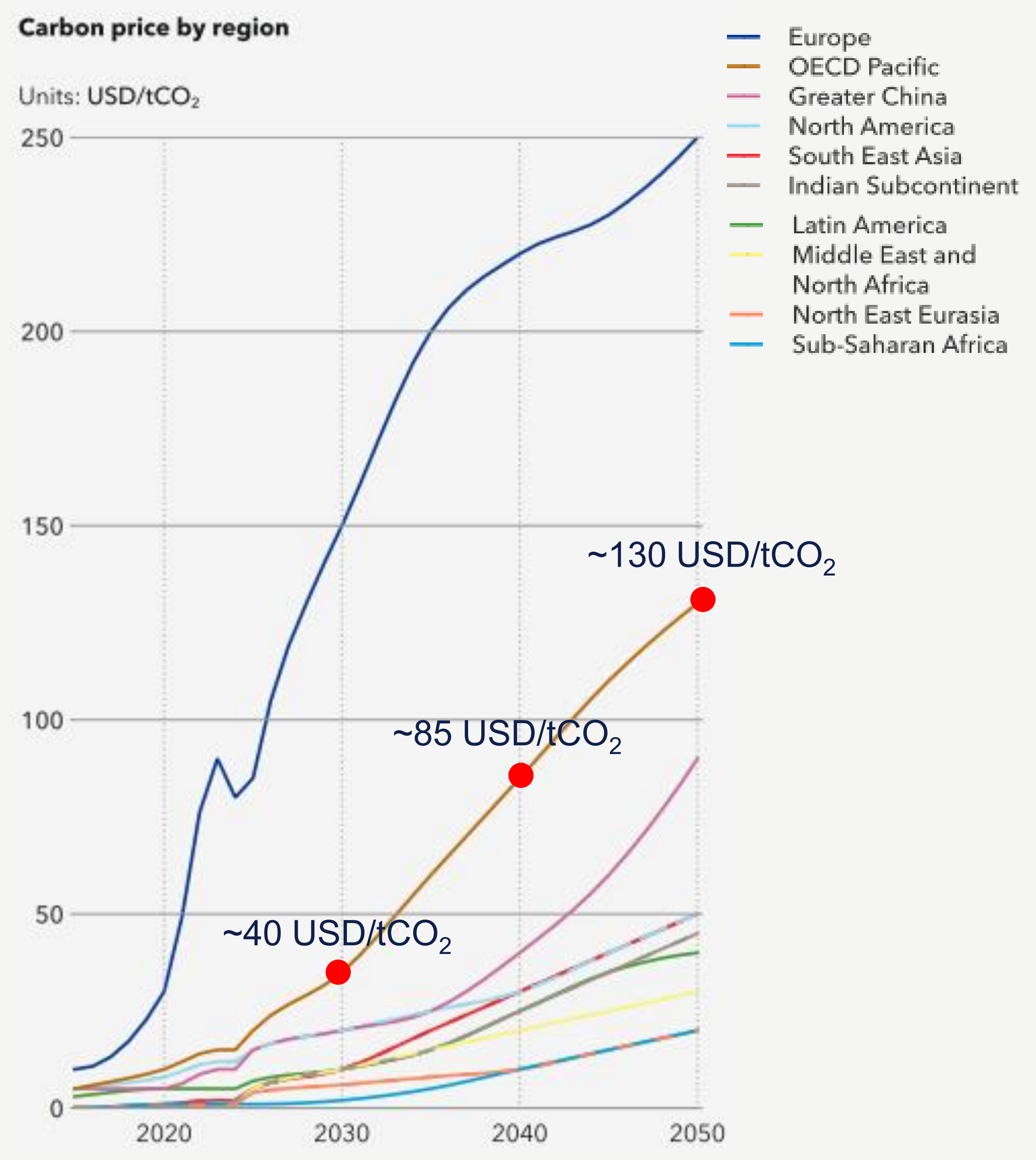
Cost of emitting CO_2 > Cost of capturing and storing/utilising CO_2

- Carbon taxes
- Regulatory requirements
- ESG ratings

- Cost of capturing CO_2
  - Dependent on source concentration
- Infrastructure costs
  - Transport and storage
  - Economies of scale
- Sources of revenue
  - CCS – Policy support
  - CCU – Sale of CO_2 derived products

CCUS in Japan

- Japan has announced commitments to reducing emissions by 46% by 2030 relative to 2013 peak (1395 $MtCO_2e$)
- Power Generation and Industrial Sectors together account for ~70% of emissions
- GX Promotion Act supports various carbon pricing and emissions trading schemes to provide economic support for the net zero ambitions
- JOGMEC Advanced CCS Projects aims to start 6-12 MTPA of CCS operations by 2030
- Key opportunities for CCUS :
  1. **Industrial Clustering** supported by high industrial concentration
  2. **CO_2 Utilisation** supported by maritime/aviation and chemical industries
  3. **CO_2 transport & storage** supported by high concentration CO_2 sources, increasing carbon pricing and local & Regional CCS sites



Potential for CCS Shipping Value Chains

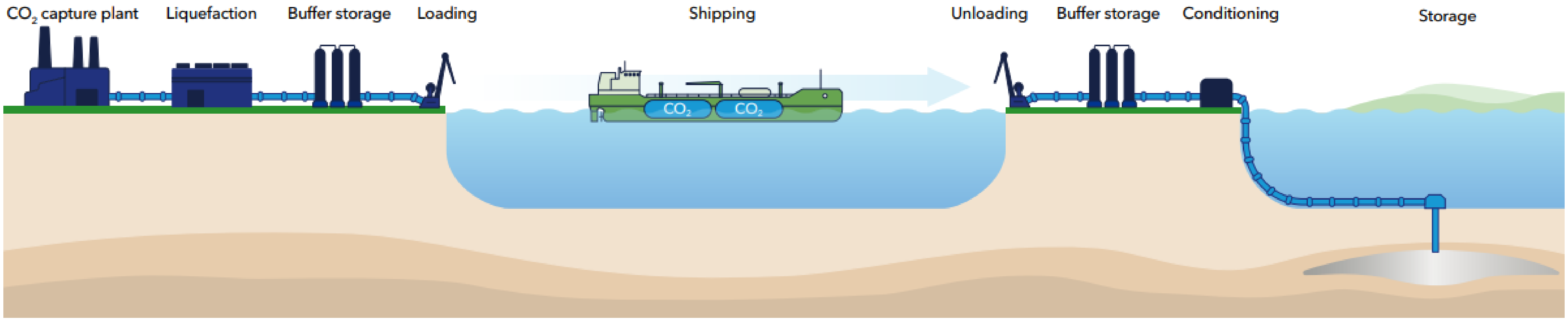
Opportunities:

- Shared costs – can support milk run model with multiple smaller CO_2 sources all accessing centralised project economics
- Flexibility – ability to change storage location removes dependence risk on single storage project
- Improved site selection – reduced geographical constraints enable selection of lower risk storage sites

Challenges:

- Technology – Large scale sequestration sites are normally located far from population and industrial clusters necessitating new transportation technologies
- Economics – Carbon price levels in Asia are unlikely to be sufficient to support full cost of sequestration
- Regulation – Regulatory regimes to support cross border CO_2 trade are slow to be established

Shipping value chain (shore-to-shore configuration)



Regional CCS Potential

- Multiple sequestration projects under development within SEA and Australia (6-10 days sailing) providing high flexibility
- Storage Viability – high potential sites with large capacity and lower risk profile (e.g. seismic)
- Lower cost – commercialisation of sequestration site and infrastructure financed by high CO_2 gas fields
- Existing Infrastructure – most of the proposed CCS sites are close to existing maritime infrastructure (LNG terminals)

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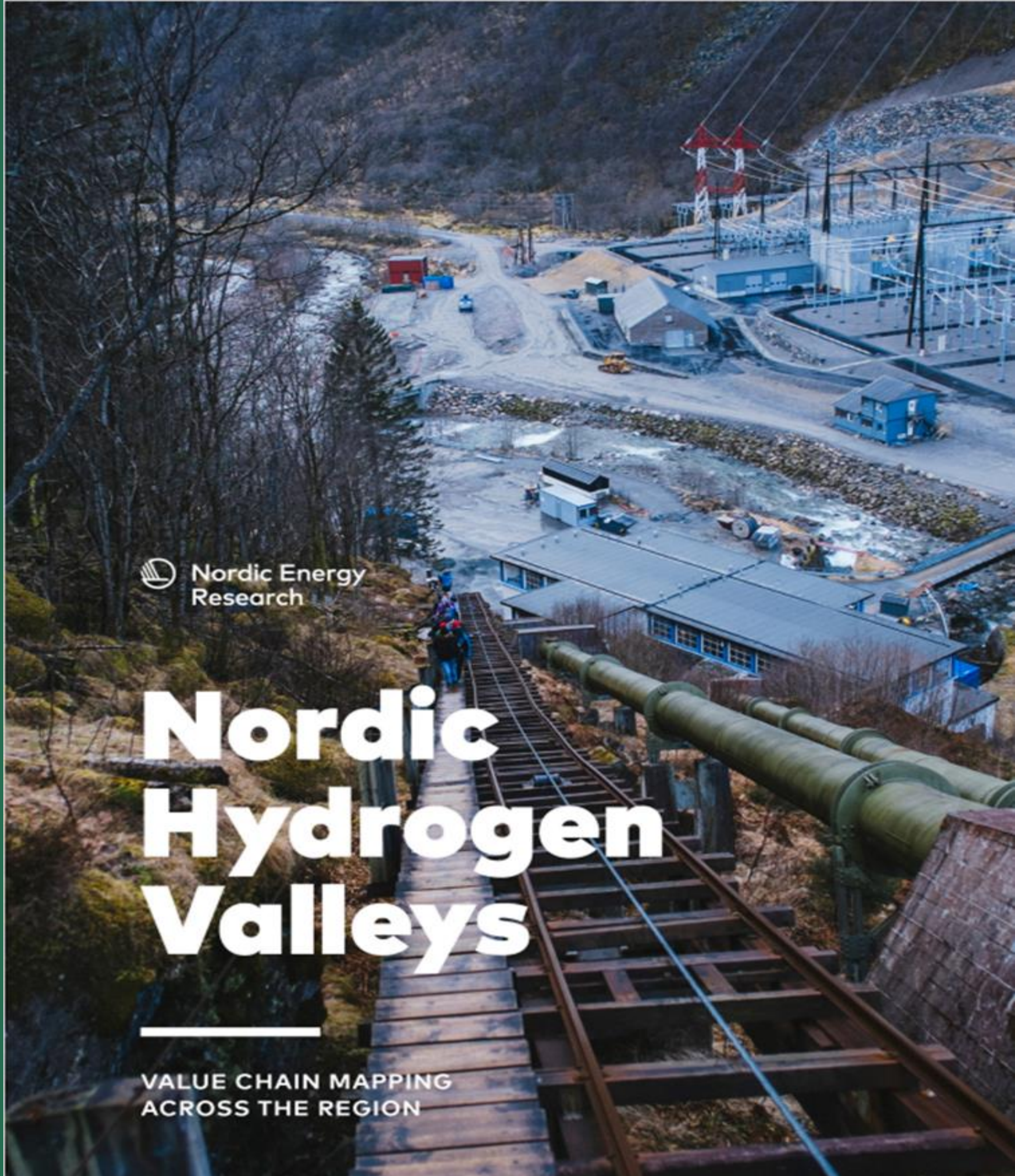
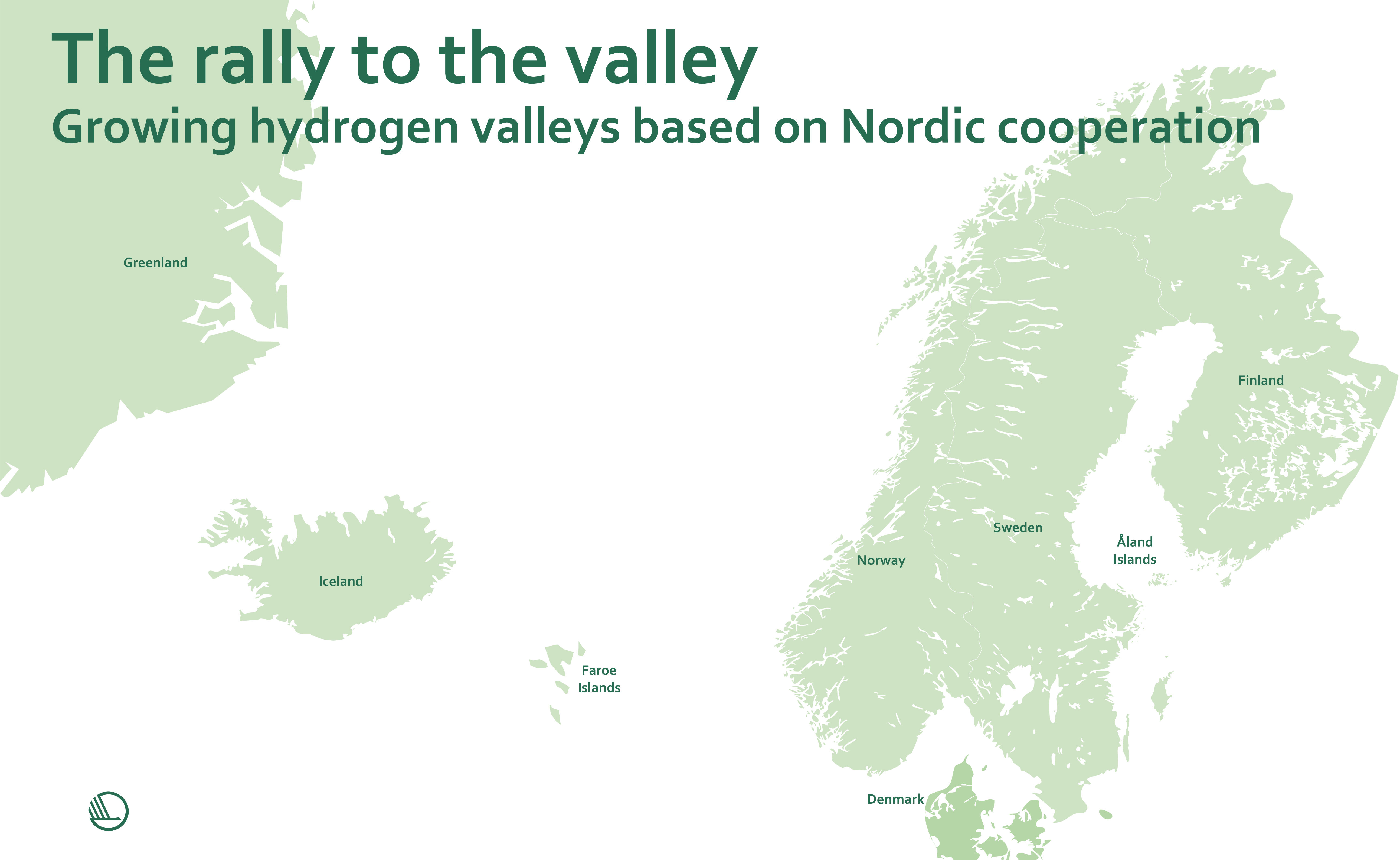
Klaus Skytte
CEO, PhD



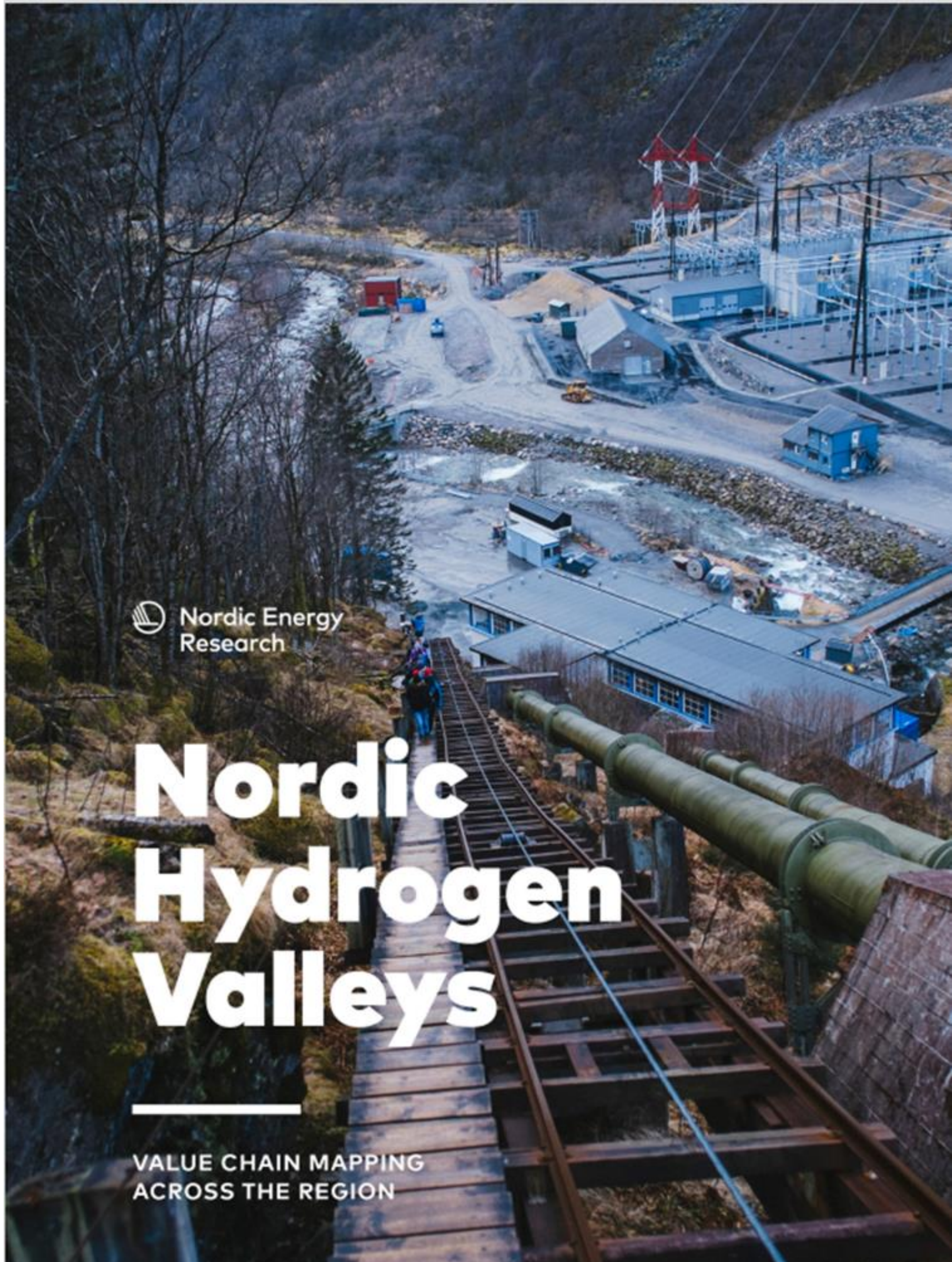
The rally to the valley

Growing hydrogen valleys based on Nordic cooperation



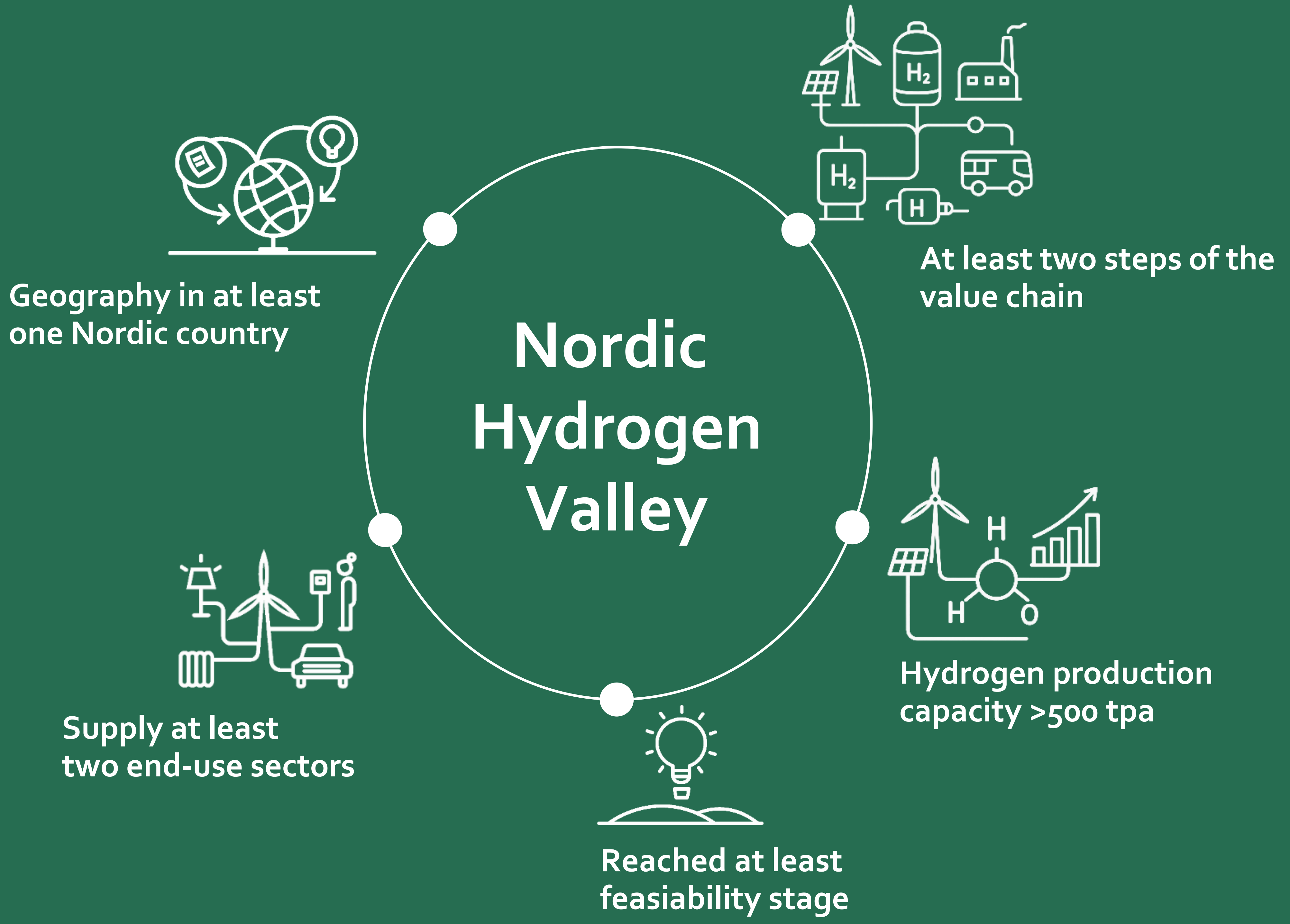
Objectives

- Create Nordic overview
- Support industries, authorities and decision-makers in development of hydrogen valleys
- Promote and enhance Nordic strengths
- Illustrate ongoing Nordic development



Approach

- H2 — Define and map Nordic hydrogen valleys
- Create a prototype digital tool for mapping
- Analyse hydrogen potential in Arctic maritime transport
- Identify drivers and barriers for Nordic hydrogen valleys



Nordic Hydrogen Valley
Geography in at least one Nordic country
At least two steps of the value chain
Hydrogen production capacity >500 tpa
Reached at least feasiability stage
Supply at least two end-use sectors

Create a prototype digital tool for mapping

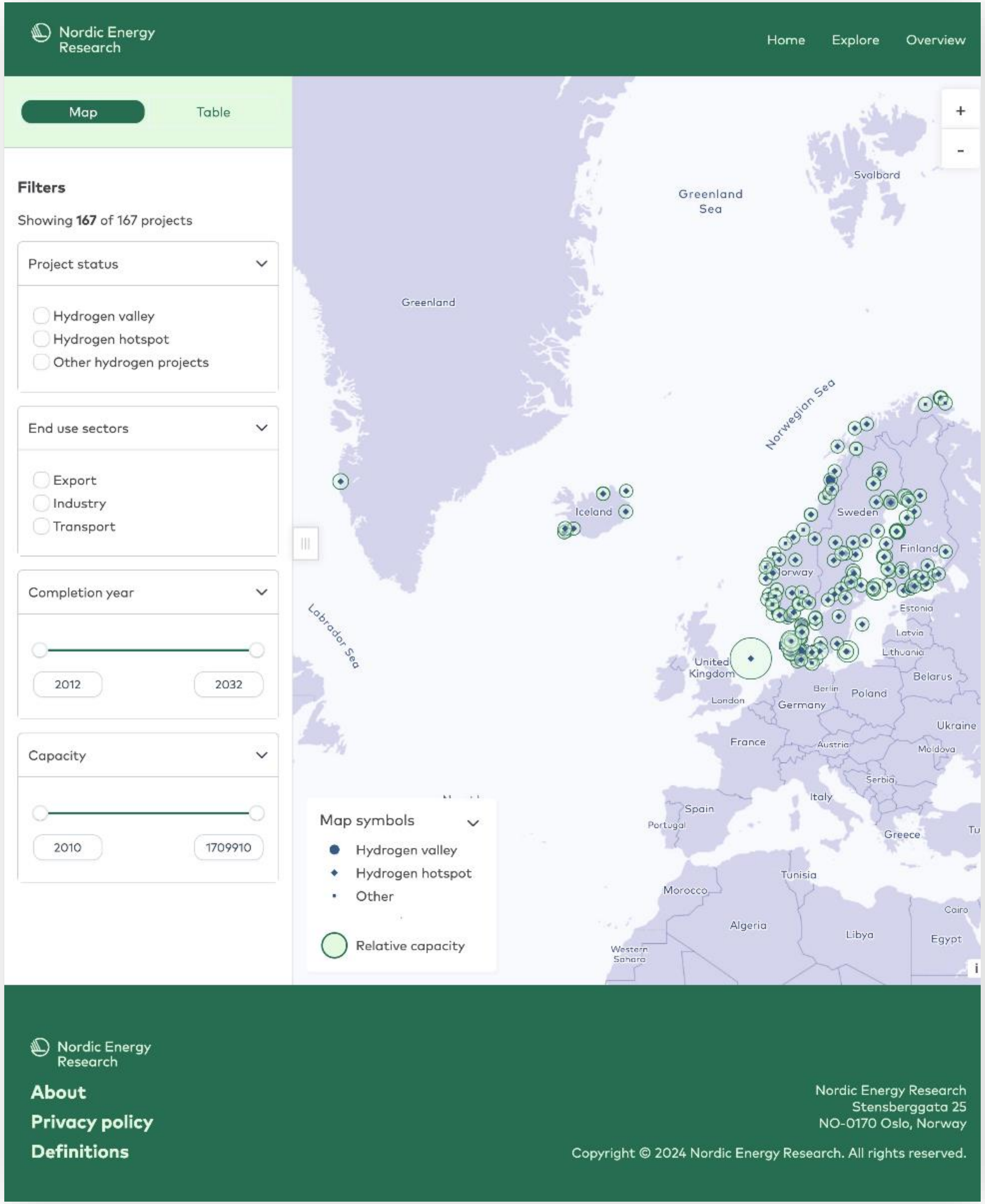
Design principles

A Nordic perspective

Let the information shine

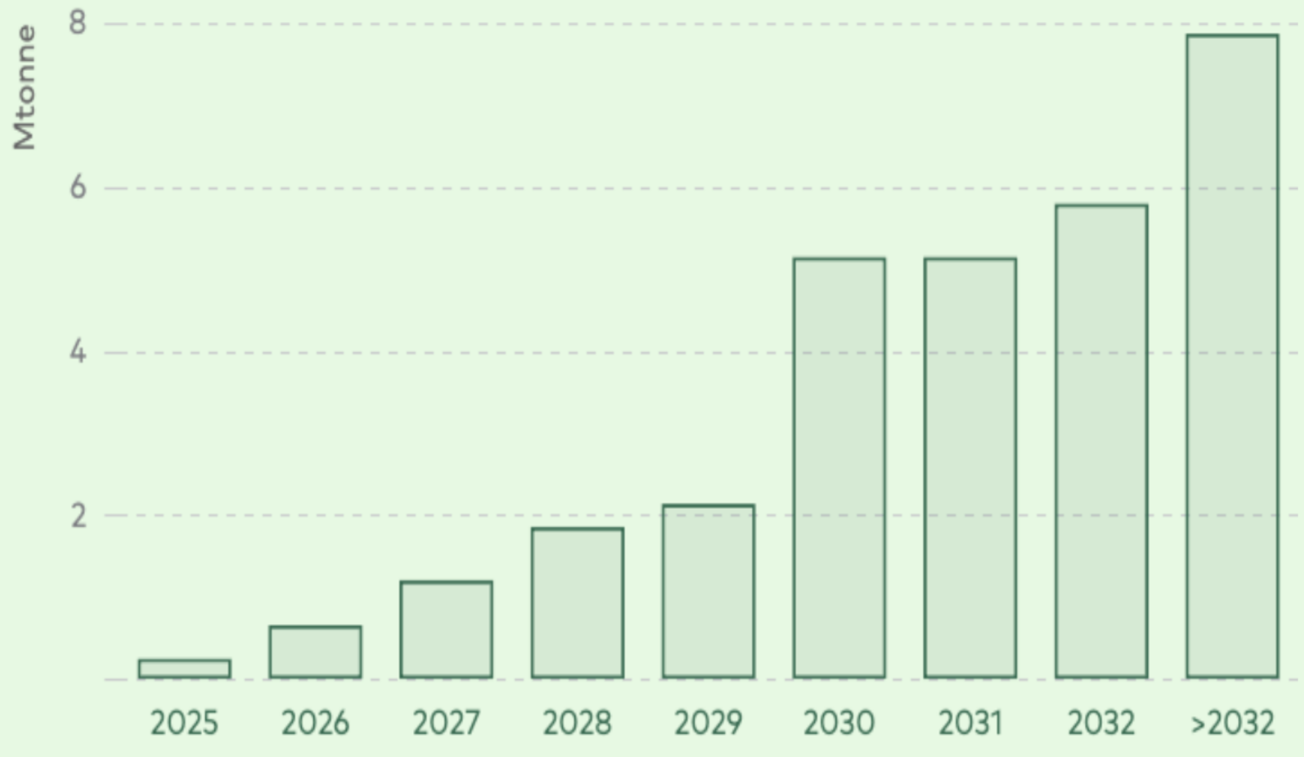
Show what we know

https://nordich2valleys.org/



Country	Potential capacity	Valleys	Hotspots	Other
Denmark	3.748.482 tonnes/year	5	18	6
Faroe Islands	0 tonnes/year	0	0	0
Finland	1.126.105 tonnes/year	1	35	0
Greenland	153.000 tonnes/year	0	1	0
Iceland	112.270 tonnes/year	0	9	0
Norway	711.162 tonnes/year	2	24	24
Sweden	1.524.052 tonnes/year	1	37	0
Åland	513.486 tonnes/year	0	4	0

Cumulative potential capacity in the Nordics



Current capacity (Mtonnes/year)

0.02

Total number of hydrogen projects

167

Nordic Hydrogen Valleys

- High level of activity/plans in all Nordic countries.
- The combined capacity = approx. 8 Mt, or 270 TWh, of hydrogen per year.
- Double the amount estimated to achieve a carbon-neutral region by 2050.
  - Could become a H_2-hub for rest of EU
- Approximately 0.2% of this capacity is in operation.
- About 1% is currently under establishment.
- Large synergy gains in Nordic cooperation.

Key drivers and barriers – in the Nordics

+

Access to renewable energy production

Policy support (general level)

Industry presence and ambitions

–

Project business case (economy)

Regulatory environment (e.g. permits, safety)

Access to skills, materials and workforce

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Head of Business Development
Skellefteå Municipality

Patrik Sundberg
Head of Energy Solutions
Skellefteå Kraft

SKELL
EFTEA

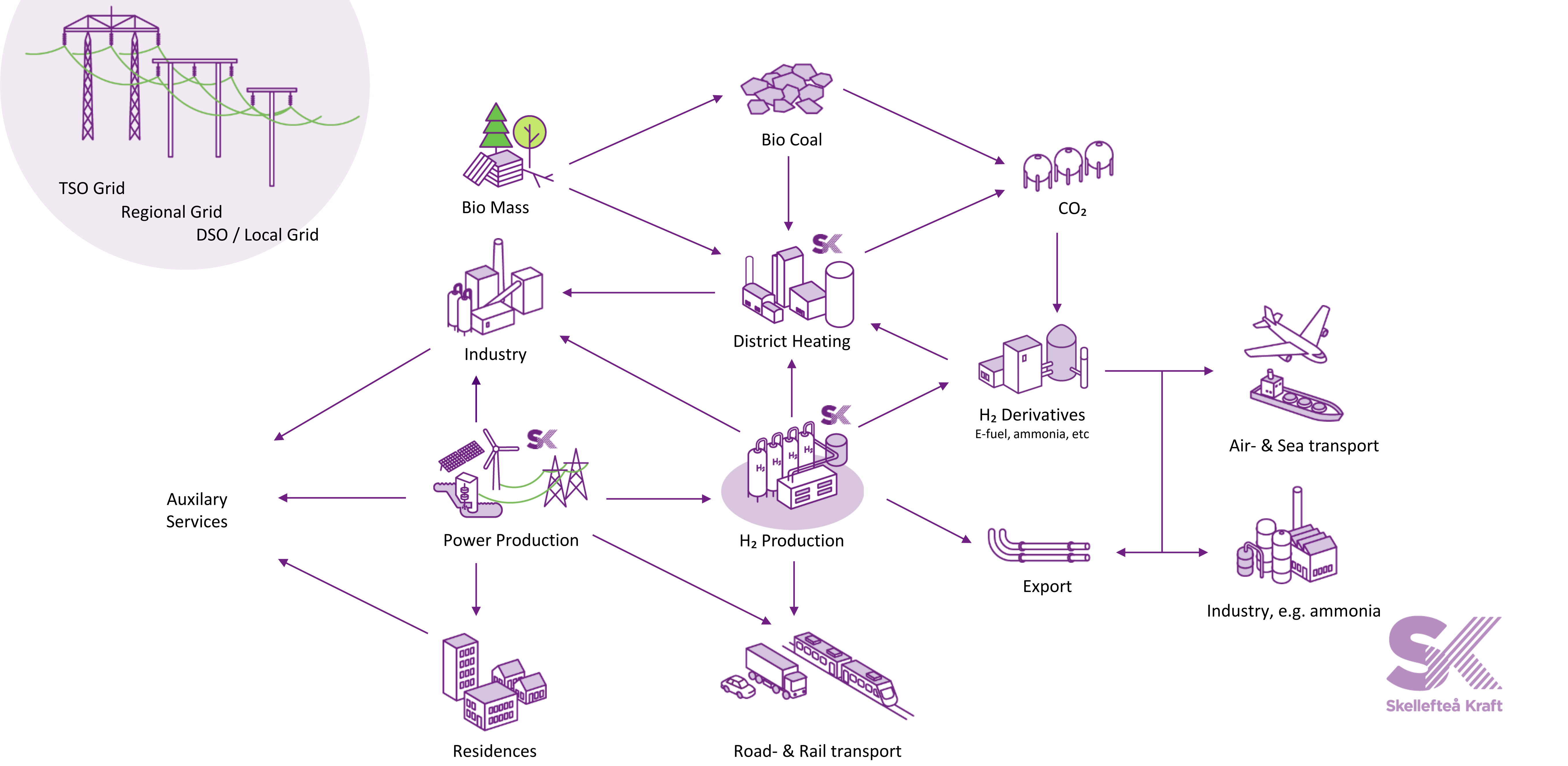

THE WOOD HOTEL



Skellefteå's position



The emerging (H_2) ecosystem



NORDIC HYDROGEN ROUTE

NORDION ENERGI


SKELL
EFTEÅ
Skellefteå Kraft

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VIREON

Next Wave

Next Wave – 北欧地域におけるゼロエミッショントレードラインの実現を可能にする

ノルディック・イノベーションの支援を受けた、北欧における長期的な複数関係者による連携プロジェクト

大型車両向け水素インフラのリーダー

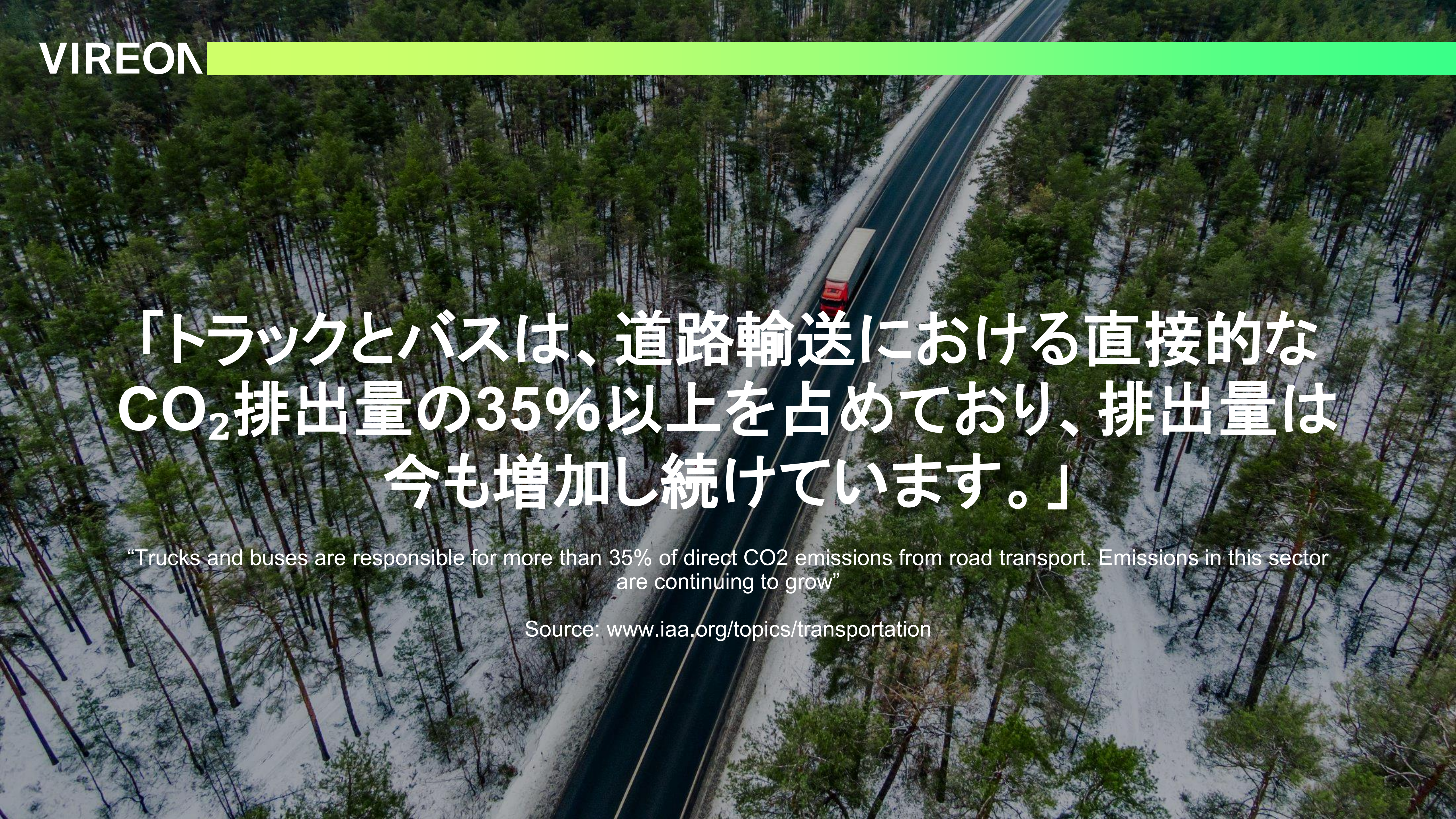
Vireonは北欧の水素エネルギー企業であり、
水素の製造および燃料補給ステーションの
構築を行っています。

Vireon’s mission is to establish an effective network of hydrogen refueling infrastructure for heavy duty vehicles across the entire Nordic region.

主要株主一覧

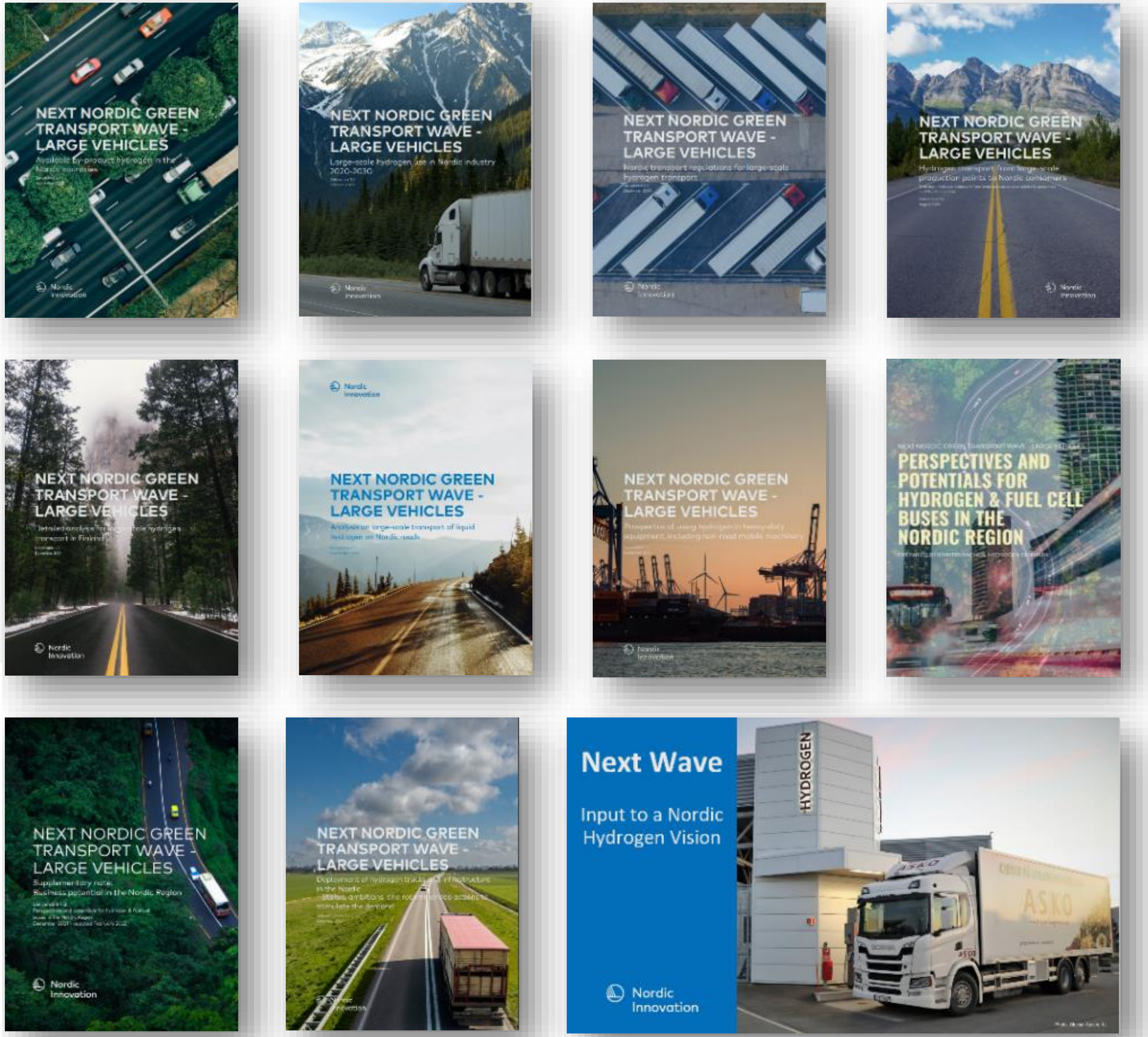
FLAKK GROUP	18.4%	MITSUI&CO.	11.6%
HEXAGON PURUS	12.5%	HOFSETH	11.6%
Fortescue	12.3%	TAFJORD	9.2%

The first Vireon refueling station at Hellesylt Hydrogen Hub


VIREON
「トラックとバスは、道路輸送における直接的なCO_2排出量の35%以上を占めており、排出量は今も増加し続けています。」
“Trucks and buses are responsible for more than 35% of direct CO2 emissions from road transport. Emissions in this sector are continuing to grow”
Source: www.iaa.org/topics/transportation

Next Wave I and II –
A Unique Nordic Overview

Next Waveプロジェクトから得られた主な知見と成果は一般に公開されています。
北欧地域における長年の連携により、独自の包括的な視点が得られました。
このプロジェクトは**2019**年に開始され、現在も継続中です。
私から皆さんへの重要なメッセージの一つは、「新たなバリューチェーンを構築するためには長期的な取り組みが不可欠である」ということです。



すべてのレポートはここからダウンロードできます

Next Wave III - 陸と海 ― 手を取り合って

港は、船舶とトラックの両方にインフラを提供する上で重要な役割を果たしています。陸上輸送と海上輸送の両方に同時に注力することで、最小限の実用的なインフラをより迅速に整備することが可能になります。

Ports play a vital role in providing infrastructure - for both ships and trucks. By focusing on land transportation and maritime transportation at the same time we can develop a minimum viable infrastructure faster.

Next Wave IV - 障壁の削減と取り組みの強化

- 北欧全域での水素トラックとステーションの導入を加速する。
- 北欧と欧州大陸間のゼロエミッショントレードライン実現に向けた障壁を取り除く。
- ゼロエミッション輸送の促進に向けて、北欧諸国間の連携強化の必要性を政治家に訴え続ける。
- Strengthen the efforts to deploy hydrogen trucks and stations throughout all Nordic countries.
- Reduce the barriers to achieve zero-emission tradelines between the Nordics and the continent.
- Continue to inform politicians about the need for a stronger cooperation between the Nordic countries to foster zero-emission transport.

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VIREON®

Enabling Zero Emissions

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Next Wave Project

すべてのレポートはここからダウンロードできます。

Nordic Innovation

ノルディック・イノベーションは、北欧閣僚理事会の下部組織であり、「Next Waveプロジェクト」を支援しています

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