Ramp-up of large scale Hydrogen projects at RWE

Hydrogen & P2X 2025

12.06 2025, Copenhagen

RWE

Energy supply company operating in:

- Offshore wind
- Onshore wind & solar
- Batteries & FlexGen
- Hydrogen
- Commercial solutions

Founded in **1898**

Headquarters are **in Essen,**
North Rhine-Westphalia (Germany)

Global presence with offices in Germany, the United Kingdom, Benelux, the USA, China, Japan, and more

~20,135 employees generated a revenue of **€24.2 billion** in 2024

Business model fully aligned with our strategic focus on the energy transition

Core business

Offshore Wind

- Global offshore activities

Onshore Wind/Solar

- Onshore, solar and storage activities in
  - Europe & Australia
  - Americas

Flexible Generation

- Hydro, biomass and gas-fired power plants in Germany, UK, NL
- Hydrogen projects

Supply & Trading

- Trading/origination
- Gas & LNG
- Commodity solutions
- Gas storage

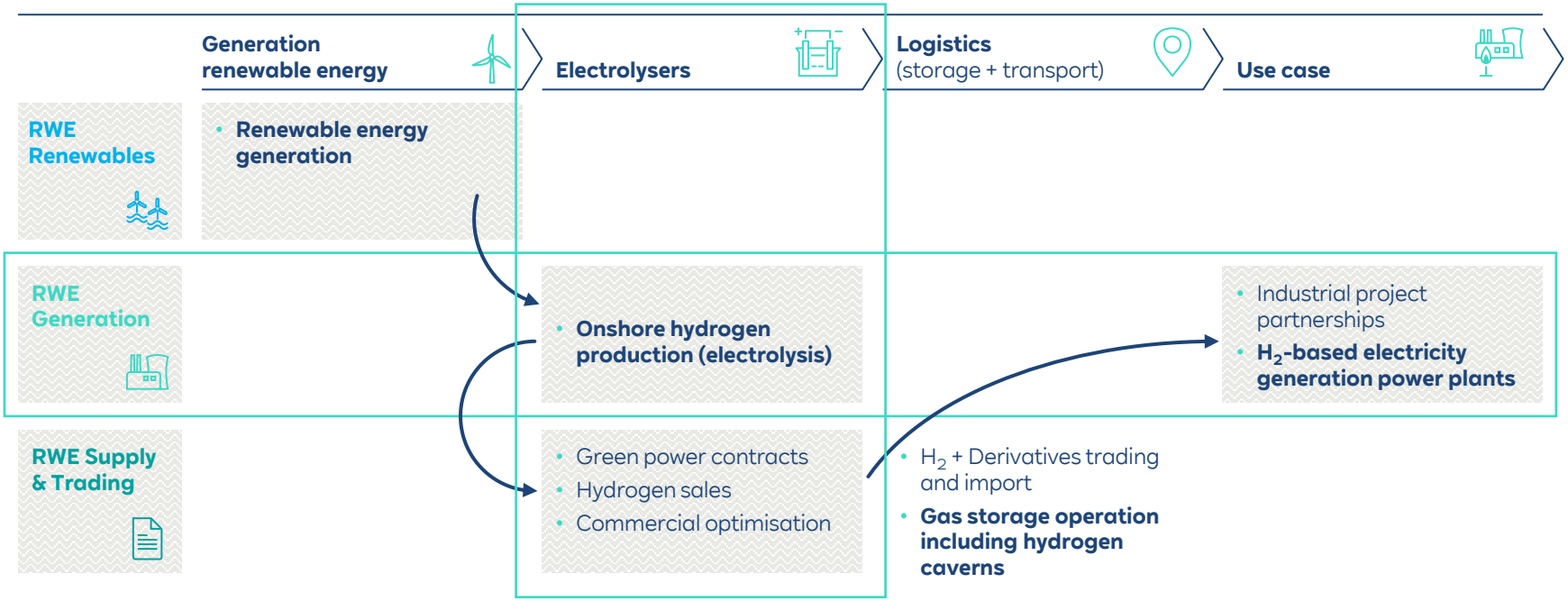
Non-core business

Coal & Nuclear

- German lignite operations (planned exit by 2030)
- German nuclear power plants (exit 04/2023, now dismantling)

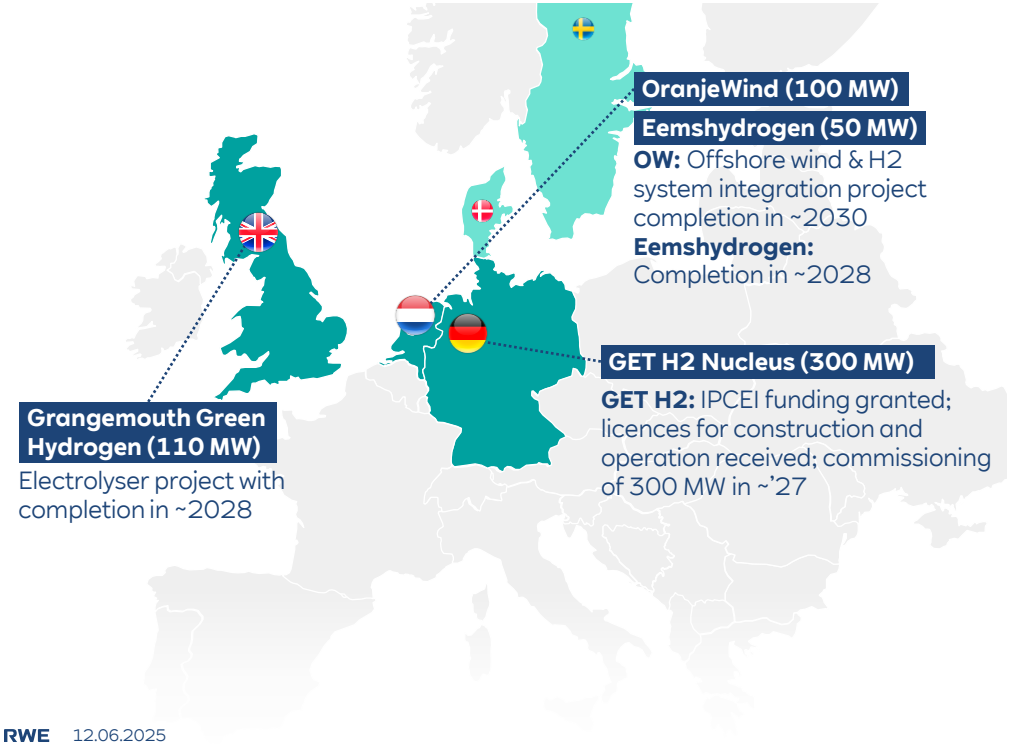
RWE's integrated value chain creates ideal conditions for the development of renewable energy & hydrogen business

Competencies of RWE companies along the green hydrogen value chain



RWE is an early-mover in Europe's H2 economy with lighthouse projects in Germany, the Netherlands and UK

Focus markets and lighthouse projects



OranjeWind (100 MW)

Eemshydrogen (50 MW)

OW: Offshore wind & H2 system integration project completion in ~2030

Eemshydrogen: Completion in ~2028

GET H2 Nucleus (300 MW)

GET H2: IPCEI funding granted; licences for construction and operation received; commissioning of 300 MW in ~'27

Grangemouth Green Hydrogen (110 MW)

Electrolyser project with completion in ~2028

Electrolyser pipeline after project maturity

1) IPCEI = Important Project of Common European Interest
2) COD = Commercial Operation Date

We follow four clear guidelines for our hydrogen production business model

Key elements of RWE's hydrogen strategy

Project development, construction and operation of **plants to produce green hydrogen**
- As an extension of the value chain in the **renewable energy** sector
- **No focus** on **blue/turquoise** hydrogen

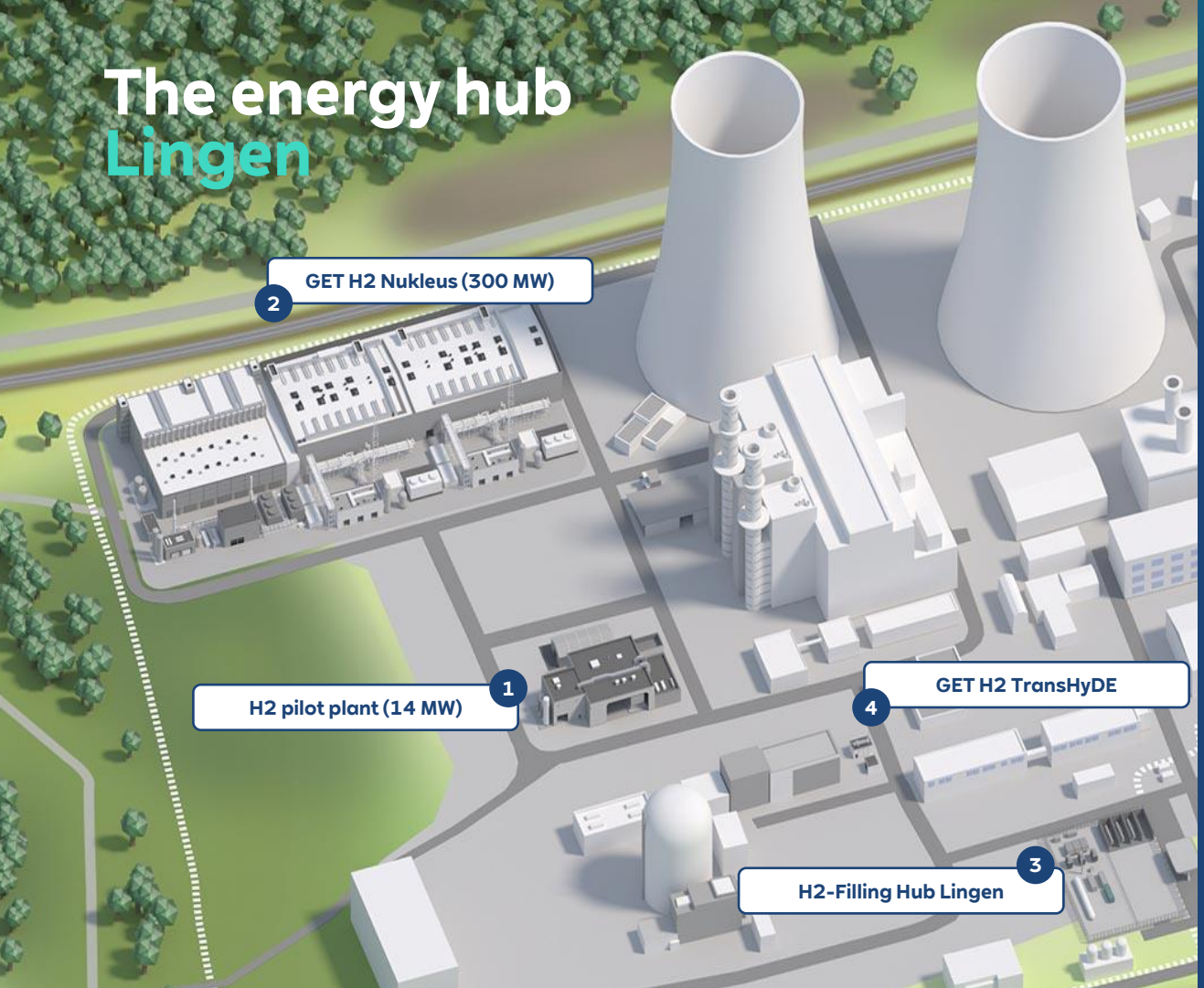
Project development through **partnerships** along the value chain for climate-neutral hydrogen.
Focus on **industrial customers** (especially steel, refineries, chemicals, mobility)

Production of green hydrogen initially in **GER, UK and NL,** in addition to the development of **import options**

Focus on rapid market launch through efficient **site selection** and cost reduction through **scaling and standardization**

RWE Flagship project Lingen

The energy hub Lingen



For 50 years, RWE in the Emsland region has been known for energy and innovation

Emsland in Lower Saxony

- RWEs pioneering hydrogen site
- Supporting development and operation throughout the entire value chain

Hydrogen infrastructure and technology

- Electrolysis plants for industrial-scale hydrogen production
- One of the first gas turbines in Germany capable of running on 100% hydrogen

Contributing to climate goals

- Goal: Green hydrogen throughout the value chain
- Supporting industry and mobility with their climate targets

1 H2 pilot plant (14 MW)

Type of asset

Electrolysis for hydrogen production

Commissioning

08/2024

Quantity

270 kg / hour

Technology

- 10 MW – Pressure alkaline electrolyser by Sunfire
- 4 MW – PEM elektrolyser by ITM Power

Use case

- Asset for various test programs
- Carbon-neutral fuel for turbines in power plants
- Customer from the transport sector and the gas industry via „H2-Filling Hub Lingen“

3 H2-Filling Hub Lingen

Type of asset

H2 Trailer Filling Station (HTFS) and H2 Refuelling Station (HRS)

Completion

2025

Investor & owner

RWE Generation SE

Operator

Westfalen AG

Quantity

110 kg / hour

Technology

- **Hydrogen Refuelling station: 350/700 bar**
  - Used by customers to refuel both light and heavy duty vehicles and cars.
- **Hydrogen Trailer Filling Station: 200/300/380/500 bar**
  - Used by customers to fill trailers for applications in the mobility and industrial sectors where direct hydrogen pipeline connections are not available

RWE Westfalen

Planung und Ausführung durch:

SCHULZ SYSTEMTECHNIK

THEISEN SMART SOLUTIONS

BKW

Unterstützt durch:

H2Region EMSLAND

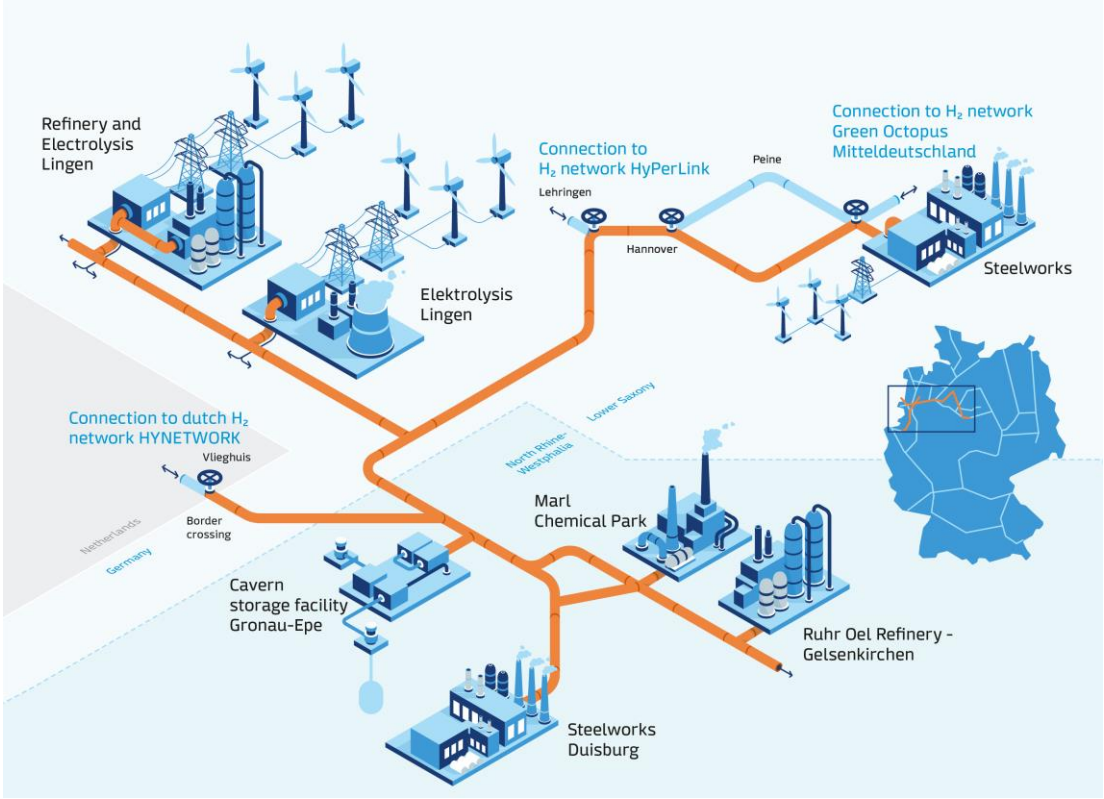
nip

Bundesministerium für Digitales und Verkehr

NOW GMBH

PtJ

2 GET H2 Nukleus



GET H2 Nukleus comprises of an integrated H_2 start grid with individual projects developed and owned by consortium partners to connect Lingen with the Ruhr region in the course of 2025.

Roles of the different partners:

RWE Generation 300 MW electrolyser capacity at RWEG's power plant site in Lingen until 2027 – scaling potential up to 2 GW

RWE Gas Storage West: H2 storage in new built salt caverns in Gronau-Epe

Evonik, Nowega, OGE, Thyssengas
H2 pipelines – mainly repurposed existing natural gas pipelines, some new built segments

2 GET H2 Nukleus at RWE Generation

Type of asset

Electrolysis for hydrogen production

Commissioning

2025-2027 – 100 MW each

Quantity

~ 2 t H2 / hour and 100 MW unit

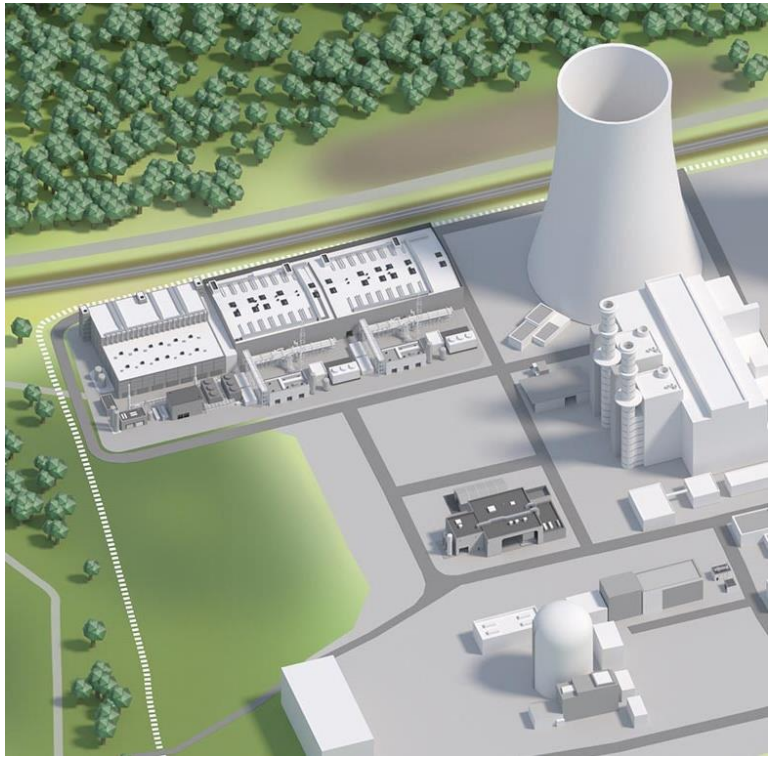
Technology

- 2x 100 MW – PEM electrolyser by Linde/ITM Power
- 100 MW – Pressure alkaline electrolyser by Sunfire und Bilfinger

Status

- IPCEI funding granted
- All permit approvals received (e.g. Federal Immission Control Act, Power Grid Connection, Water).
- FID taken and construction started

Funded by the European Union NextGenerationEU
Supported by: Federal Ministry for Economic Affairs and Climate Action on the basis of a decision by the German Bundestag
Niedersächsisches Ministerium für Wirtschaft, Verkehr, Bauen und Digitalisierung
Niedersächsisches Ministerium für Umwelt, Energie und Klimaschutz



GET H2 Nukleus construction site in May

What is needed for a further green H2 market development?

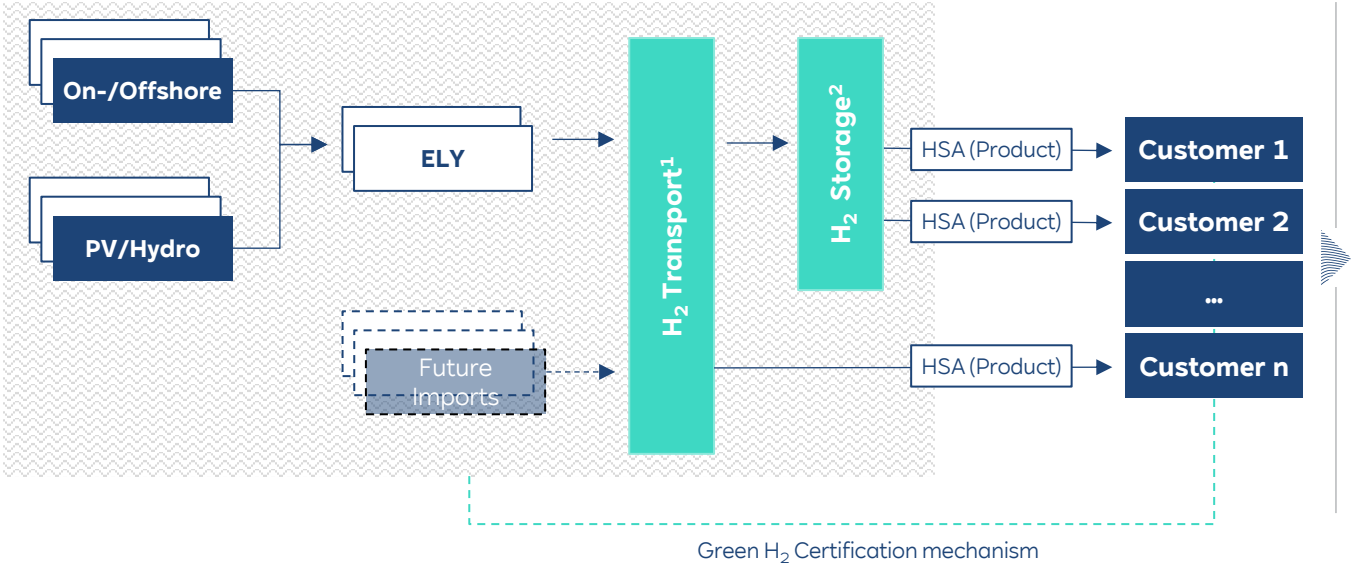
German Hydrogen Core Grid adresses the „chicken and egg“ problem of the hydrogen market ramp-up

- 9,040 kilometers in length, with consisting of approximately 60% repurposed natural gas pipelines and 40% newly to built infrastructure.
- The phased rollout begins in 2025 and full completion is planned for 2032.
- The core network will link key hydrogen hubs, including ports, production sites, and industrial centers. By 2032, the system is expected to have an injection capacity of 101 GW and a withdrawal capacity of 87 GW.
- The total investment is estimated at €18.9 billion. The network will be privately financed and operated, with costs covered by capped transportation fees. To balance initial high costs due to lower user numbers, the German Development Bank KfW provides a €24 billion loan framework (amortization account).
- The German hydrogen core network is part of the European Hydrogen Backbone and will include 13 cross-border points to connect with neighboring countries.

Source: FNB Gas eV.

From power generation to hydrogen consumption; what it needs to make a deal

From power to structured hydrogen supplies

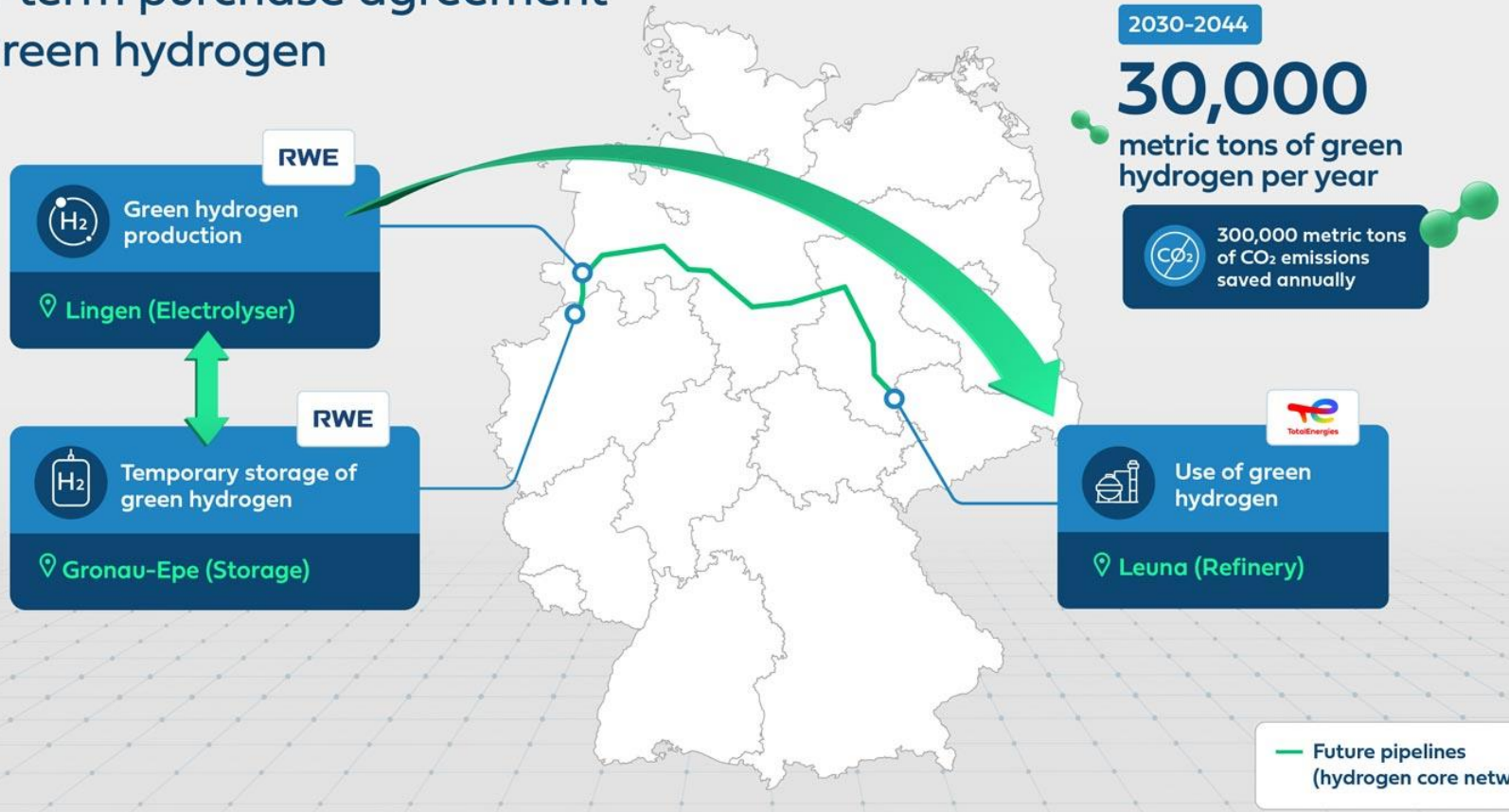


Main questions

- Which customers need hydrogen and have a high willingness to pay
- What supply profiles does the customer need?
- How can supplies be structured (e.g. via PPA and Storage)?
- When can the customer be reached and how much does transportation cost?

[1]Transport via regulated Transmission System Operators with Third Party Access | [2]Storage projects such as RWE's IPCEI Epe Storage or others with third party access | [3]HSA: Hydrogen Supply Agreement

RWE and **TotalEnergies** sign long-term purchase agreement for green hydrogen



12.06.2025

The hydrogen market has been like a rollercoaster-ride and is not over yet due to delays of market ramp-up

Positive Developments

- Hydrogen policies and targets are mostly in place
- Growing relevance of security of supply
- Increasing momentum in potential offtake (via selected first offtake tenders)

Challenges

- Legal enforcement of regulation is lagging behind
- High costs on both production and offtake side require significant cost reductions

Market uncertainties remain:

- Progress and commitment to **further funding** regimes unclear on national and EU level
- **New governments** need to take up work and set priorities
- The **Infrastructure** development is facing delays
- **Insufficient economic incentives on the demand side to switch to and offtake (green) hydrogen**

Success factors for renewable hydrogen economy depend on political actions

Expansion of **renewable energies** and implementation of **H2 EU targets** for industry and transport

Setting a pragmatic **regulatory framework** to **lower H_2 production costs** and create **demand-side incentives** (e.g. DA on production criteria)

Accelerating the approval of projects for renewable energies and hydrogen and **simplifying the approval procedures**

Prioritisation of projects that are **integrated along the value chain**

Early and demand-oriented expansion of the **hydrogen infrastructure**

Focus on **simple funding instruments** and **fast approval** of funding applications for mature projects

Creating the conditions for a **global market** for green energy products

Your questions ?

Your contact:

Nils Weise
Nils.Weise@rwe.com
+49 152 57909310