

On the left side of the slide, there is a large, light blue circular arc. Below it, there are two molecular models consisting of three spheres connected by lines, one in light blue and one in a darker blue. The background of the slide is a gradient of dark blue to teal, with a series of light blue curved lines on the right side.

Preparing RFNBO Certification for the Energy Hub Lingen in Practice

Dr. Timo Eickelkamp

20. February 2025 – Annual ISCC Global Sustainability Conference

RWE core business enables the way to a green energy world

No. 2

Offshore Wind
worldwide

No. 3

Wind & Solar
UK

No. 4

Wind & Solar
USA & Europe



Offshore-
Wind



Onshore-Wind/Solar



Battery storage and
flexible generation

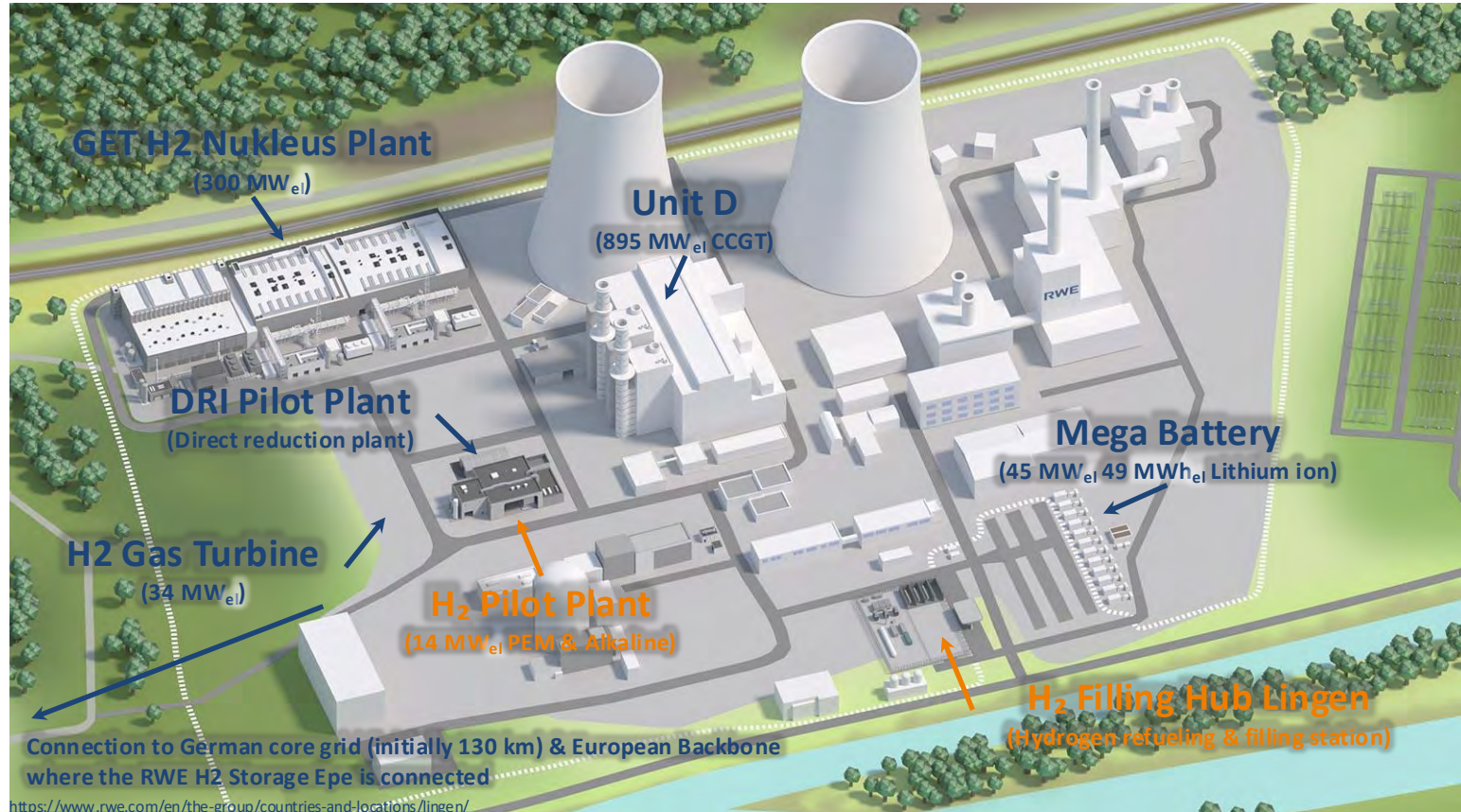


Hydrogen



Energy trading and
customer solutions

Energy Hub Lingen connecting to 2 GW DC Offshore Wind



H2 Pilot Plant Lingen

2x 2 MW PEM & 2x 5 MW Alkaline



H2 Filling Hub Lingen

Trailer Filling & Refueling Station



GET H2 Nukleus Electrolyzer
2x 100 MW PEM & 1x 100 MW Alkaline



During market ramp up flexible business cases are necessary, which contradicts with not applied strict certification system

Challenges within preparation for initial certification

- Complex boundary conditions at site:
 - Different entities (internal & partners) → different certificates
 - Onsite electricity and H2 grids → complex metering
 - Pilot Plant / Nukleus / Batterie & H2 storage → many production & storage assets
 - H2 core grid, refueling & trailer filling station, H2 fired gas turbine → many offtake options

→ Find balance between clarification of large-scale business & initial lean approach to not lose auditor
- Unclearities in / complexity of certification framework:
 - Limited data sets: Renewable share / grid emission values available for outdated single year – unclear imbalance settlement (EnWG § 13k)
 - Not enough standard values: e.g. trailer / refueling / H2 pipeline / H2 storage
 - Flexible operation effect certification (mass balance / GHG calculation) for e.g. switching green vs. grid electricity supply for electrolyzer or balance of plant

→ Closely align project specifics with auditor & early involvement of partners
- Alignment within organization & auditor / coordination of involved teams
 - Stakeholder: On-site Operation / Trading / Hydrogen / Central Asset Management / Auditor (/ Scheme Operator)
 - Setup IT systems for ISCC conform measurement & bookkeeping data processing incl. official databases (e.g. UDB)
 - Limited experience of all stakeholders involved in execution of certification framework

→ Secure internal resources & management support / foster quick alignment between RFNBO schemes

The slide features several decorative elements: a large, light blue arc on the left side; a cluster of three light blue molecular models (two spheres connected by a line) in the upper right; another cluster of three similar molecular models in the lower left; and a series of light blue curved lines forming a grid-like pattern in the bottom right corner.

Thank you for your attention

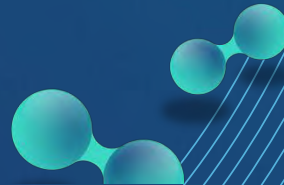
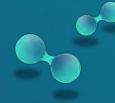
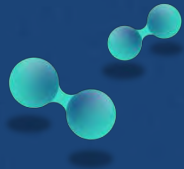
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RWE



Backup



Strategy for transformation of RWE

Growing Green with the target: Net Zero in 2040

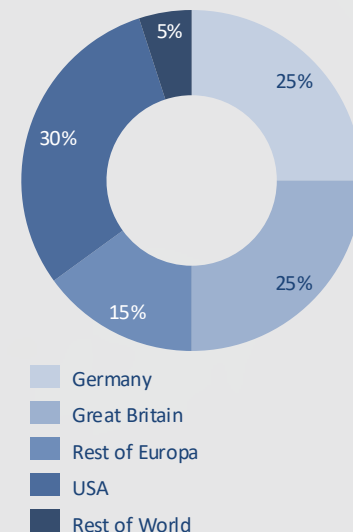
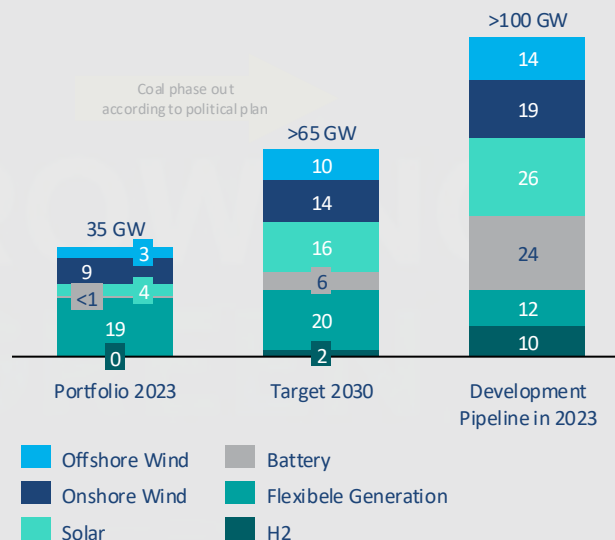
Reached targets since 2021 & Transformation

- 20 Bn. € investments (incl. M&A) with 9 GW capacity extension & ≈7,8 GW *Green Generation* in construction
- >35 GW *Green Generation* Portfolio
- Early coal phase out until 2030
- Shut down of last German nuclear power plant

Targets 2024 to 2030

- 55 Bn. € investments of new capacities 30 GW *Green Generation*
 - for Offshore / Onshore / Solar / Battery
 - ≤2 GW Electrolyzer
 - ≤3 GW (H2-ready/CCS) FlexGen
- >65 GW *Green Generation* Portfolio
- ≈70% Reduction of CO₂-Emissions¹

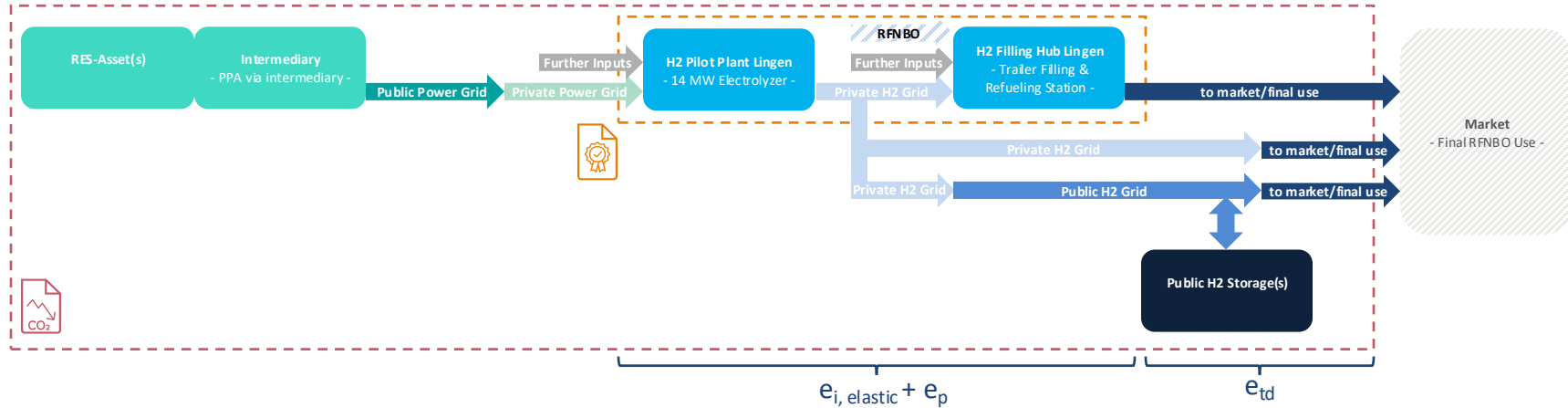
Differentiated Portfolio in 2030



¹ compared to 2022 Baseline related to Scope 1 & 2 emissions & 40% reduction related to Scope 3 emissions

Scope of Certification & GHG Calculation

H2 Pilot Plant Lingen & H2 Filling Hub Lingen



Scope of Plant Certification

Scope of GHG-Calculation

$$E = e_i + e_p + e_{td} + e_u - e_{ccs}$$

$$E = (e_{i, \text{elastic}} + e_{i, \text{rigid}} - e_{\text{ex-use}}) + e_p + e_{td} + e_u - e_{ccs}$$

E : total emissions from the use of the fuel [$\text{g}_{\text{CO}_2\text{-eq}}/\text{MJ}$]
 $e_{i, \text{elastic}}$: emissions from elastic inputs
 $e_{i, \text{rigid}}$: emissions from rigid inputs
 $e_{\text{ex-use}}$: emissions from inputs' existing use or fate
 e_p : emissions from processing
 e_{td} : emissions from transport & distribution
 e_u : emissions from combusting the fuel
 e_{ccs} : emission savings from carbon capture & geological storage

no rigid inputs $\rightarrow e_{i, \text{rigid}} = 0$
 no CO_2 in $\rightarrow e_{\text{ex-use}} = 0$

just H_2O $\rightarrow e_u = 0$
 no CO_2 out $\rightarrow e_{ccs} = 0$