

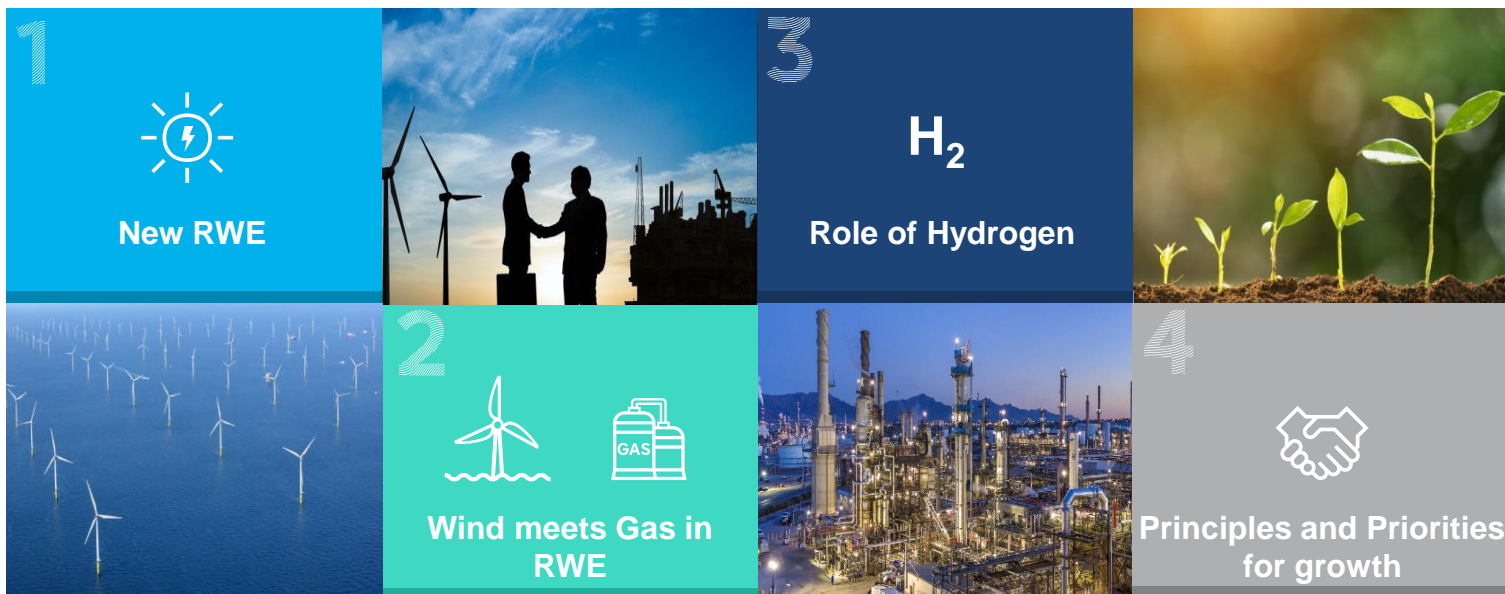


Hydrogen – priorities for growth

Wind meets Gas 2019



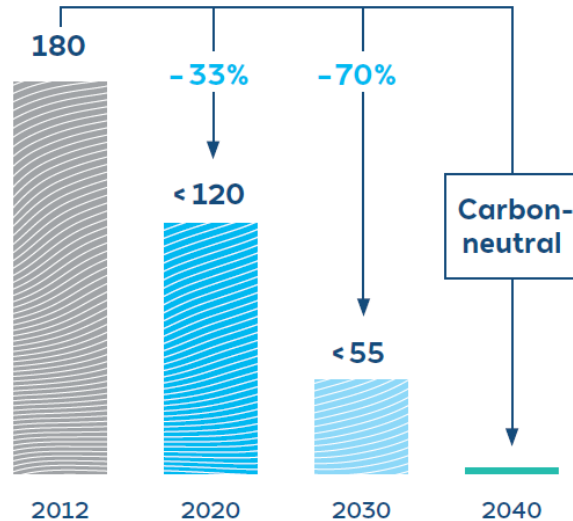
Agenda of my key note on Hydrogen



The new RWE: Our energy for a sustainable life

Clear goal: CO₂ neutral in 2040 and -70% CO₂ in 2030

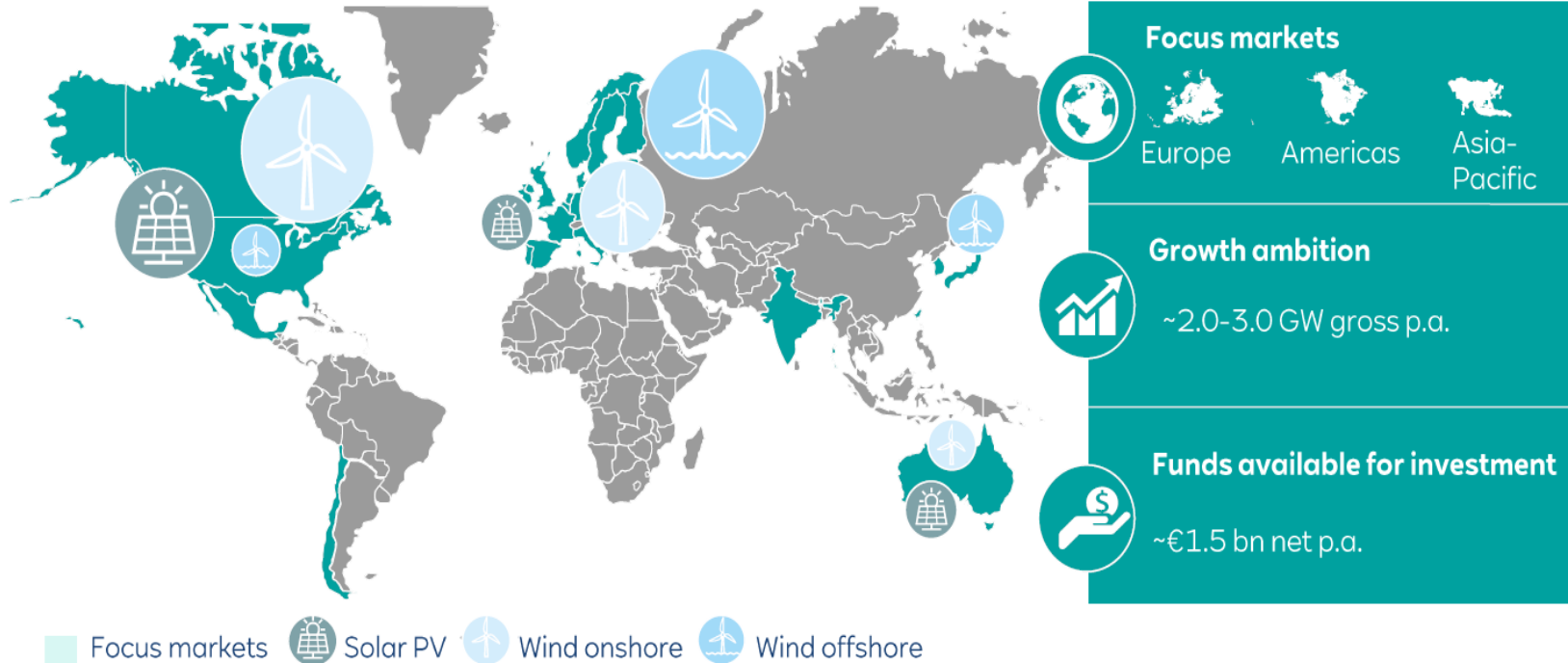
- We consistently reduce our CO₂ emissions in order to be **carbon neutral by 2040**
- We invest heavily in the development of renewable energy: **1.5Mrd€ p.a.**



RWE has a large global presence in renewables

Growth ambition 2 – 3 GW per year with a project pipeline >18 GW

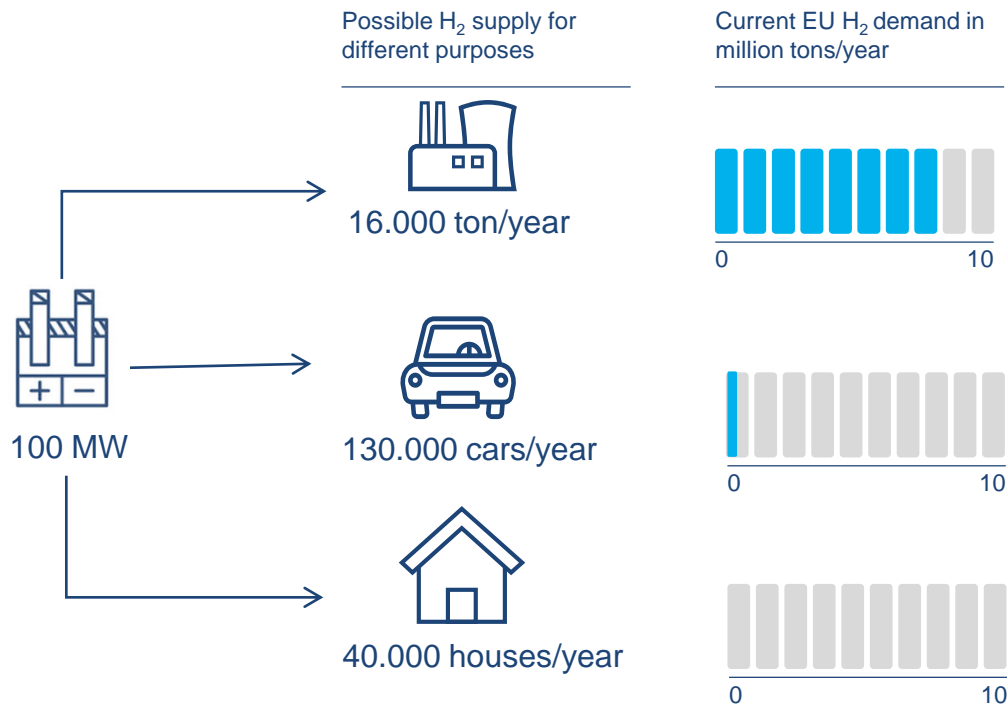
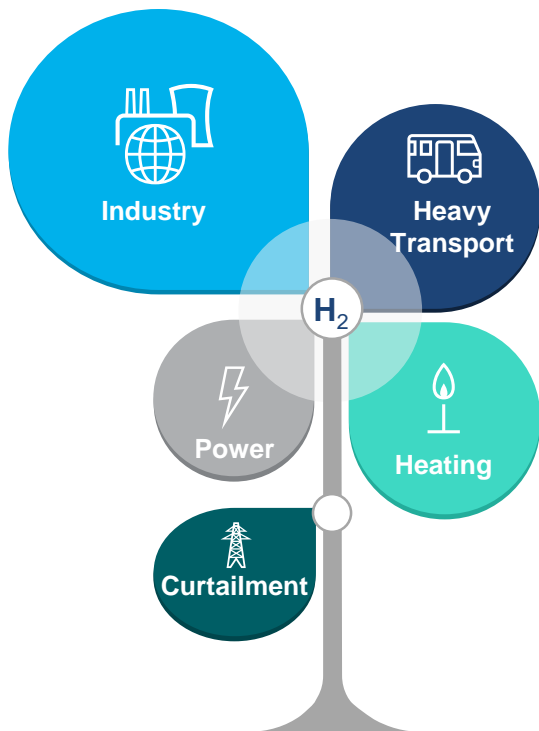
Focus markets¹



¹ Size of bubble indicates current approximate growth ambitions in GW.

Hydrogen can play many roles, but is a vital resource for industry to become CO₂ neutral

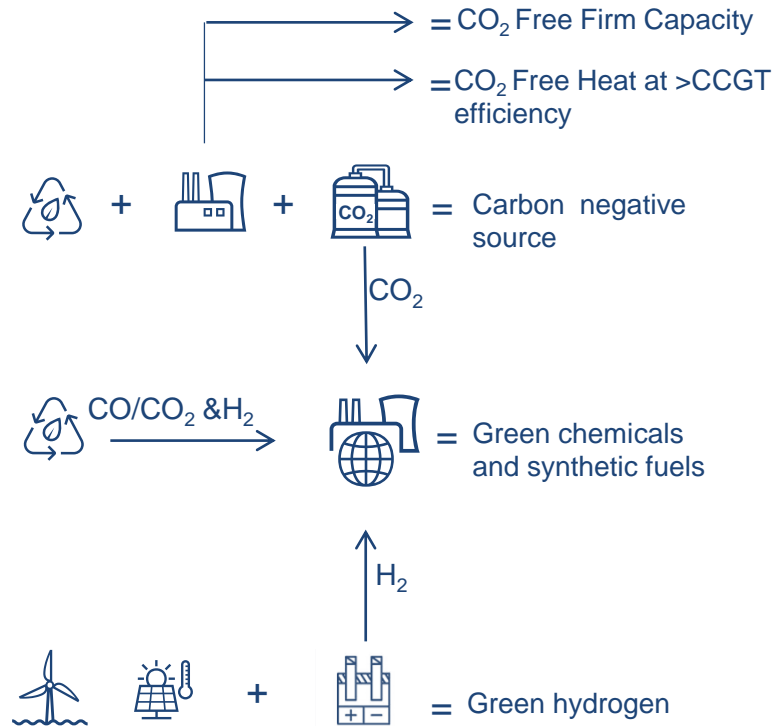
Case study: what can a 100 MW electrolyser deliver



Perspective of hydrogen: huge and more than an energy carrier

The potential scale in industry is massive: if all current grey H₂ will be replaced by green, the amount of renewable power required would be roughly equivalent to the total amount of power currently generated in EU annually (3500 TWh)

Case study: Carbon Usage



RWE has pilot projects in the Netherlands and Germany



Key findings

Project Eemshaven

Goal:

- Discover feasibility of dedicated 100 MW wind park and electrolyser
- Identify synergy and hurdles

1

A 20-50 MW electrolyser at Eemshaven with a direct connection to wind park Westereems (100 MW) has considerable synergies and will produce guaranteed green hydrogen

2

A 100 MW electrolyser would need to have a grid connection: then it is the lowest-cost due to economies of scale

3

All Business cases require subsidy unless the market is willing to pay a premium for green hydrogen



RWE has pilot projects in the Netherlands and Germany



Key findings

1

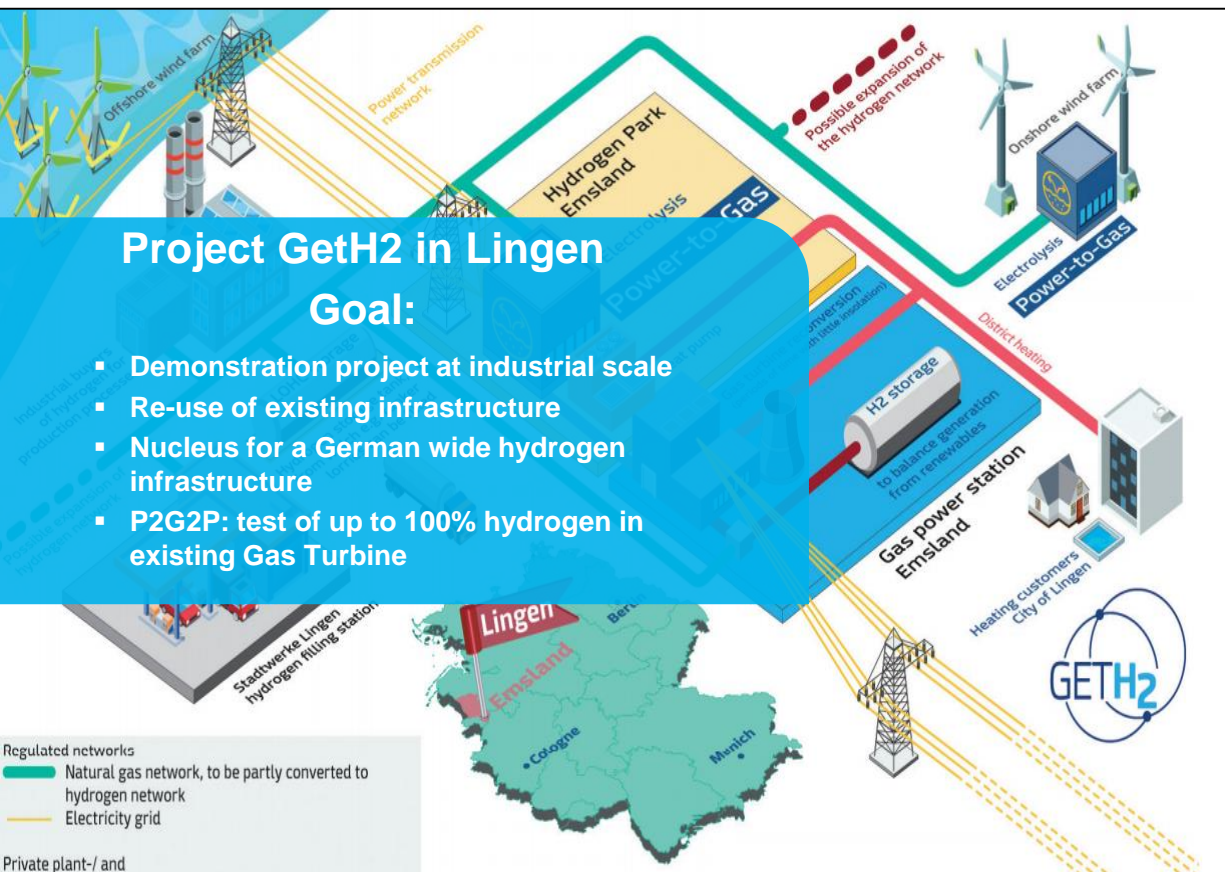
Good electricity and gas infrastructure at site needed for a continuous H₂ production and supply to industrial customer.

2


Positioning in areas of grid curtailment favorable to offer grid services additionally to hydrogen production.

3

Scale is important to start off technology cost reduction – but providers are awaiting large scale orders before responding



We believe that hydrogen can grow fast, but we should adhere to three principles and take decisive action

Principles	Market based	International	Clear roles regulated and commercial domain
Actions 	<ol style="list-style-type: none">1 Create a demand market for carbon neutral H₂ for example through:<ul style="list-style-type: none">▪ Creating an obligation to (virtually) mix in the natural gas system▪ Require the transport or industry sector to use a % of CO₂ neutral H₂2 Cater for an effective and widely (at least EU) recognized certification system for carbon neutral H₂3 Minimise irrational levies and taxes4 Incentivize effective positioning of electrolyzers in the network to avoid curtailment		

The challenge

- ... to think in large volumes
- ... to harmonize internationally
- ... to cooperate actively
- ... based on constructive working relations between government and companies



Our energy for a sustainable life

Thank you very much!

