



**Hydrogen**  
**Europe**

**The Hydrogen Challenge**  
**Jorgo Chatzimarkakis, Secretary General**

**Global ESG Conference, Rome, 11 October 2019**



# Hydrogen has become a hot topic!



The poster features a green-to-blue gradient background. In the top left corner is the European Commission logo. In the top right corner is the hashtag #hydrogen4climate. The main title 'Hydrogen for Climate Action' is centered in large white font. Below it, the subtitle 'How to kick start the EU Hydrogen Industry to achieve the EU climate goals?' is in a smaller white font. The date '9 October 2019 - Brussels' is at the bottom left. A large circular graphic on the right contains various white line-art icons representing different sectors: aviation (airplane), industry (factory), energy (solar panel, wind turbine, battery, lightning bolt), transport (train, truck, car), and nature (trees, leaves). A small circle with 'H<sub>2</sub>' is at the top right of the circle. At the bottom right is the website URL www.hydrogen4climateaction.eu. The Hydrogen Europe logo is in the bottom left corner.

European Commission

## Hydrogen for Climate Action

How to kick start the EU Hydrogen Industry  
to achieve the EU climate goals?

9 October 2019 - Brussels

#hydrogen4climate

$H_2$

www.hydrogen4climateaction.eu





# Why Hydrogen for Climate Action?

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# Hydrogen answers “Climate Megatrends”



## RES INTEGRATION

20% by 2020  
≥ 32% by 2030



## SECTORAL INTEGRATION

Energy  
(electricity, gas, heat)  
Transport  
Industry



## ENERGY EFFICIENCY

20% by 2020  
≥ 32,5% by 2030



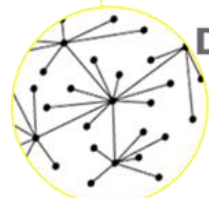
## DECARBONISATION

- 20% by 2020  
- ≥ 40% by 2030  
- 80-95% by 2050



## DIGITALISATION

Industry 4.0  
IoT  
AI  
ICT



## DECENTRALISATION

Energy communities  
Self-consumption  
Prosumers  
Aggregators



## CIRCULAR ECONOMY

Reduce  
Reuse  
Recycle  
Recover  
Landfill

# EC President-elect Ursula von der Leyen

**“I want Europe to become the first climate-neutral continent in the world by 2050. To make this happen (...)**

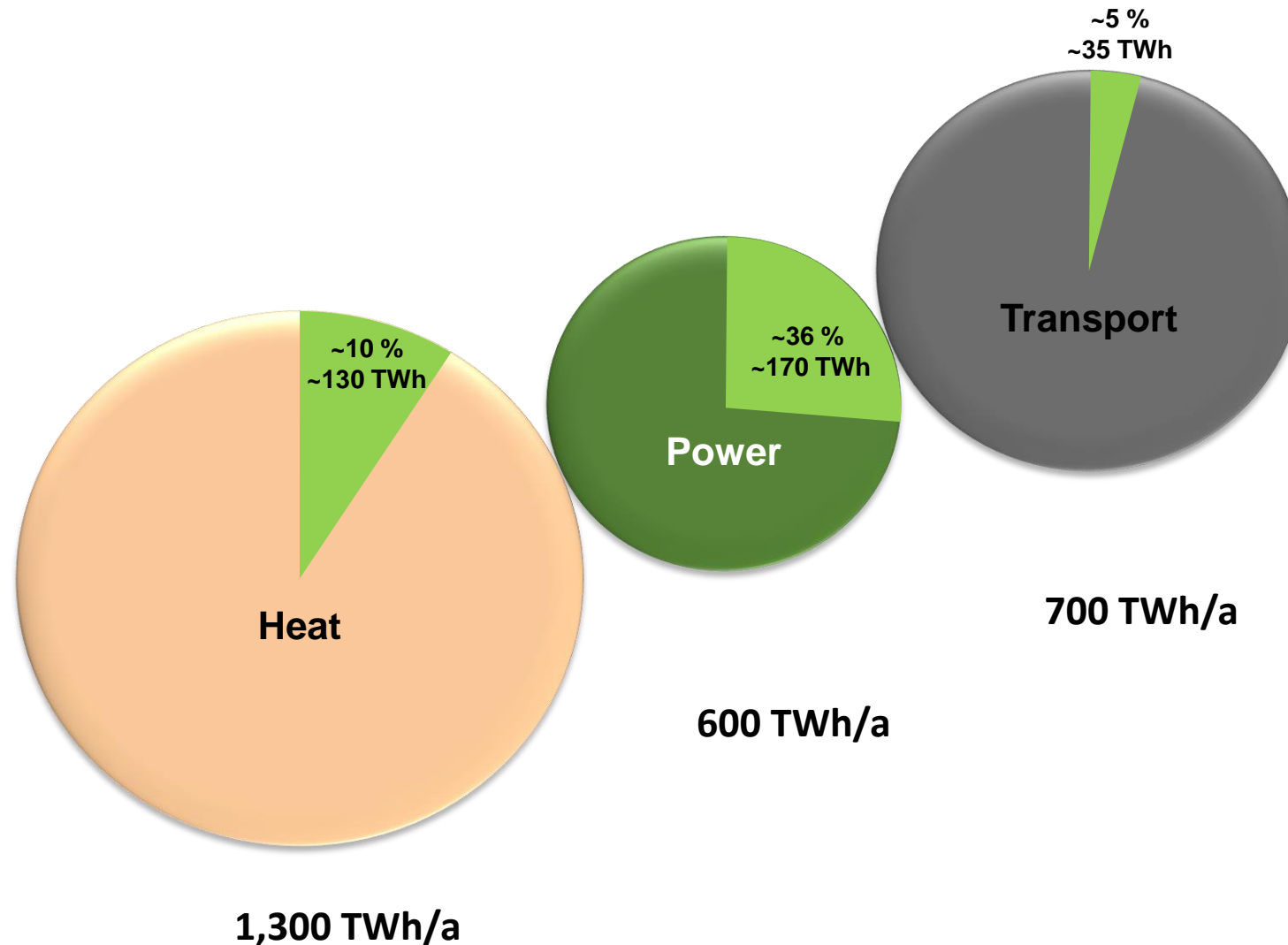
**we must go further. We must strive for more. A two-step approach is needed to reduce CO<sub>2</sub> emissions by 2030 by 50, if not 55%.”**

- **Green Deal for Europe** during first 100 days in office.
- First ever **European Climate Law** which will set the 2050 target into law.



**Statement  
in the European Parliament,  
16.07.2019**

# Renewable shares are too low



# Power grids are efficient – but too small



**Germany decided 10 years ago  
to build new power grid**

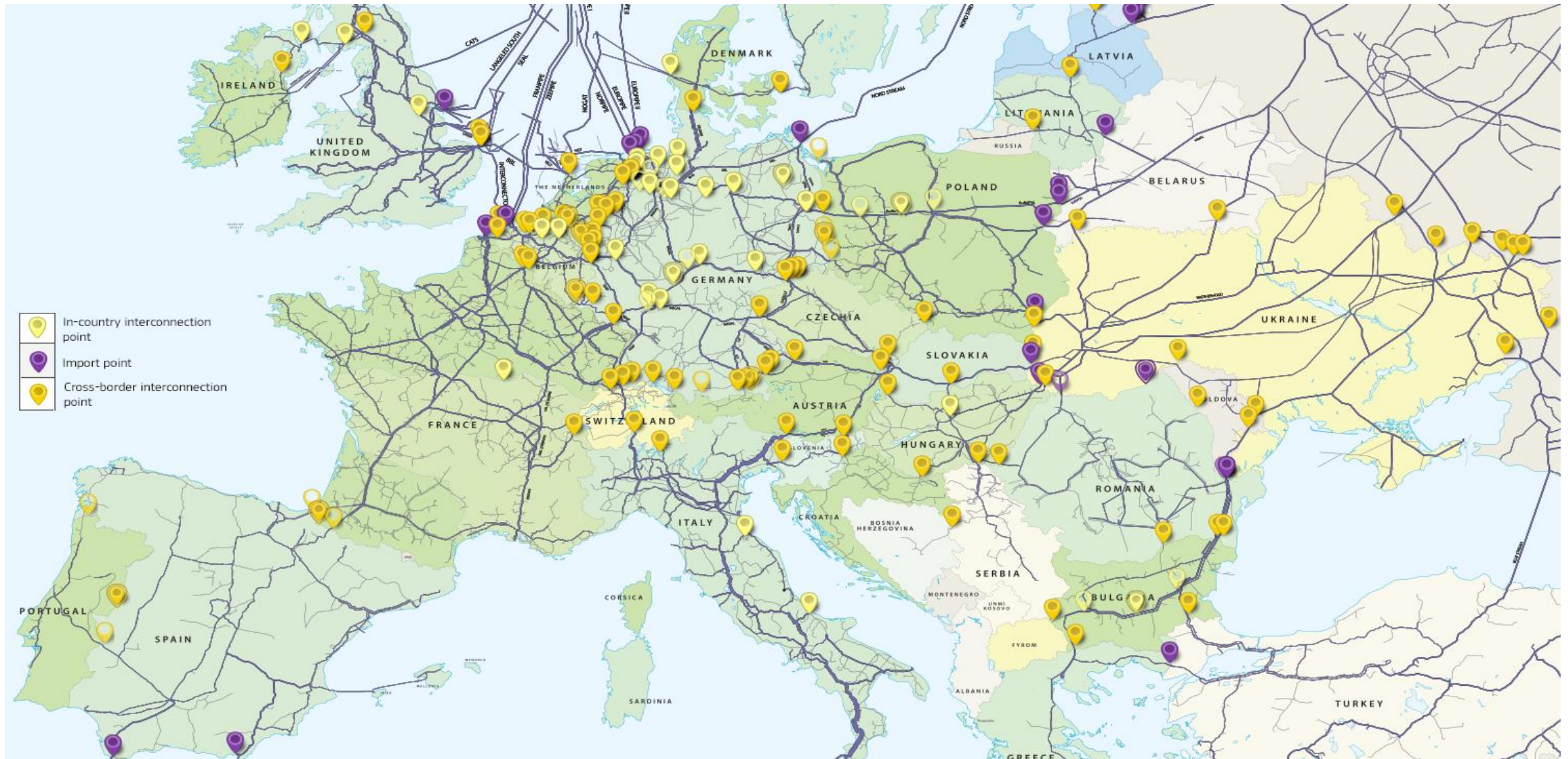
Planned: 7.700 km

Realised: 950 km

Built in 2017: 30 km



# The European Gas Grid – cheap transport of H<sub>2</sub>



# Existing infrastructure

## Energy Transport capacity

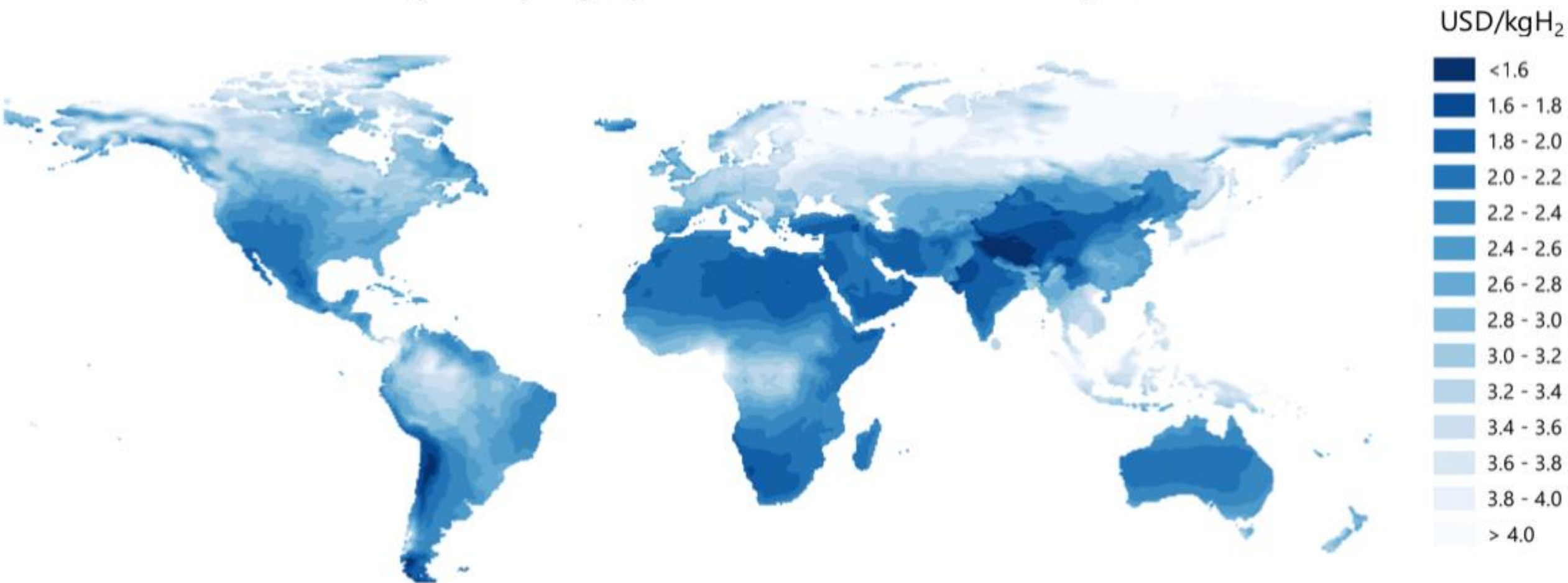


**1** gas pipeline (Ø1,20m) transports as much energy as **8** power pylons (of 3 GW each)

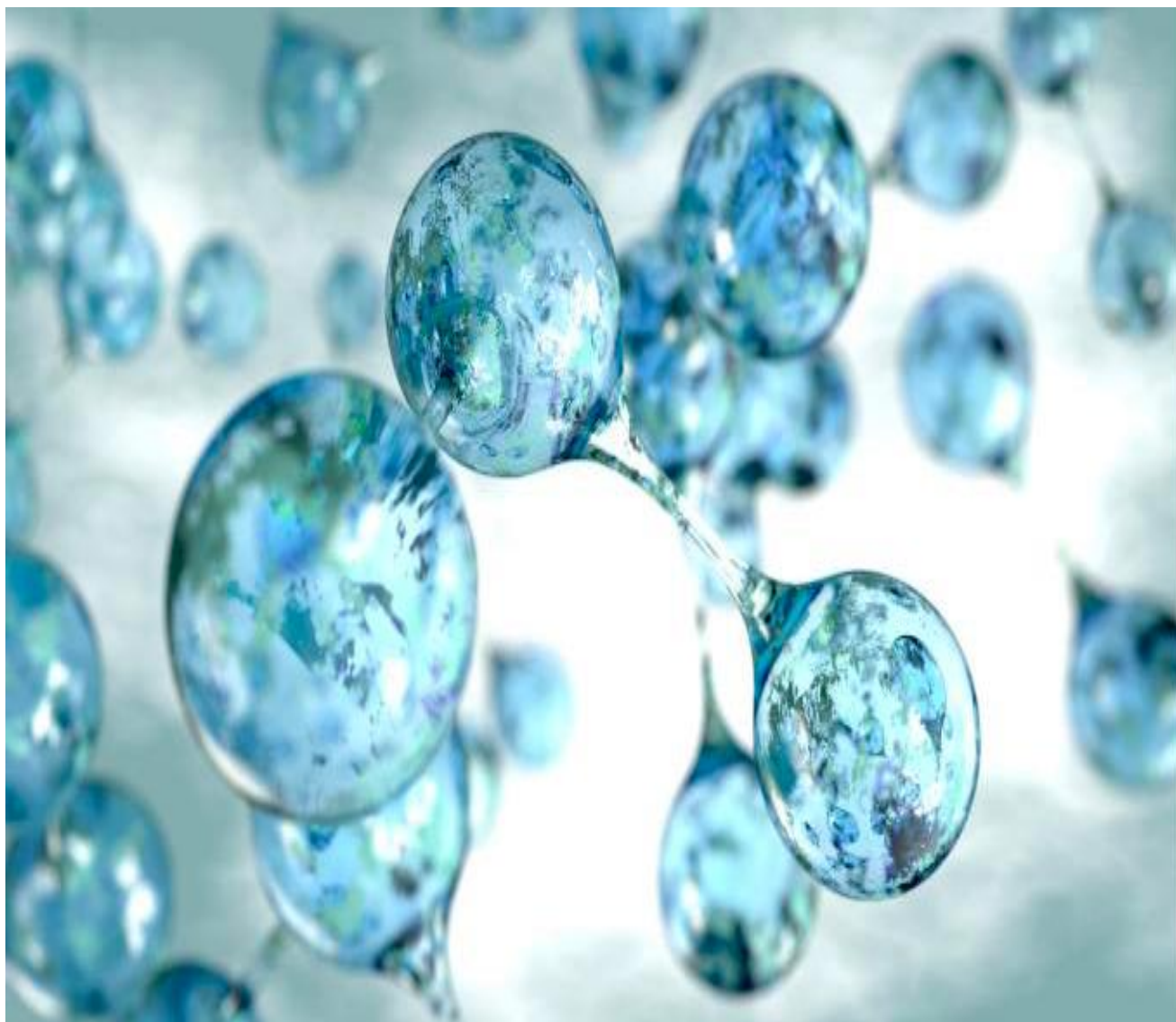


# Global Conditions for Renewable Hydrogen

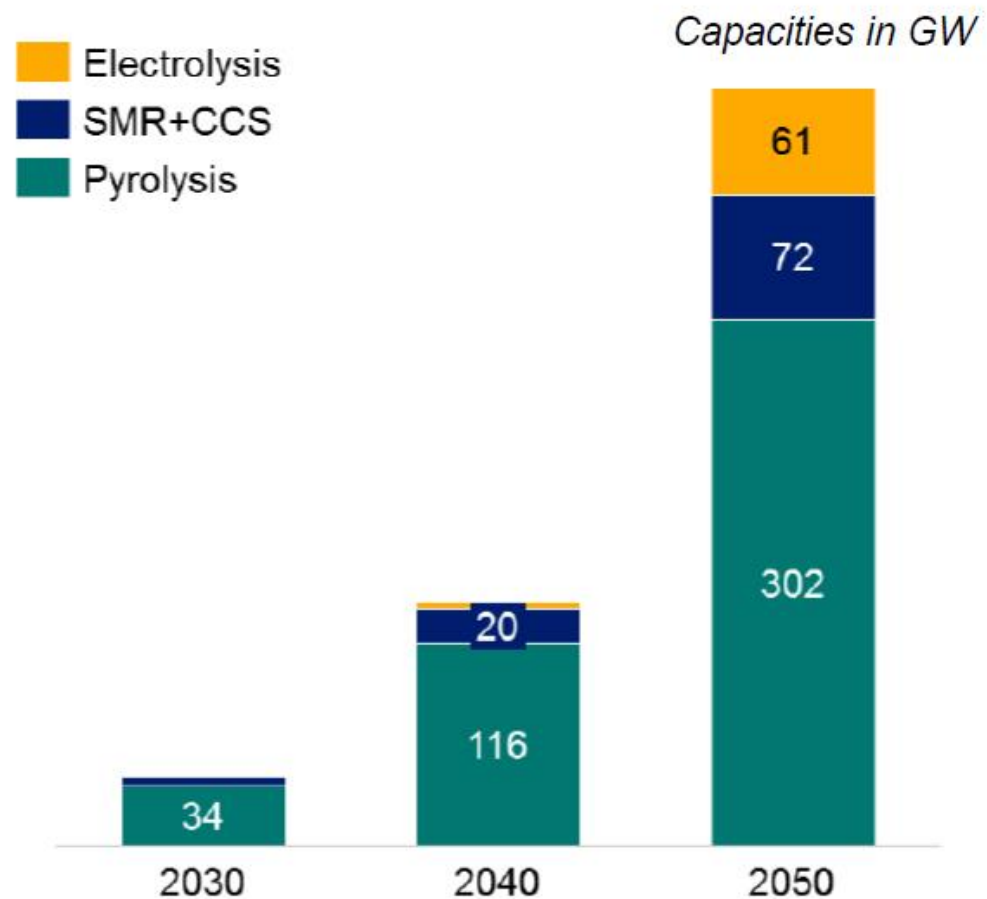
Long-term hydrogen production costs from solar & wind systems



# Only Green Hydrogen?

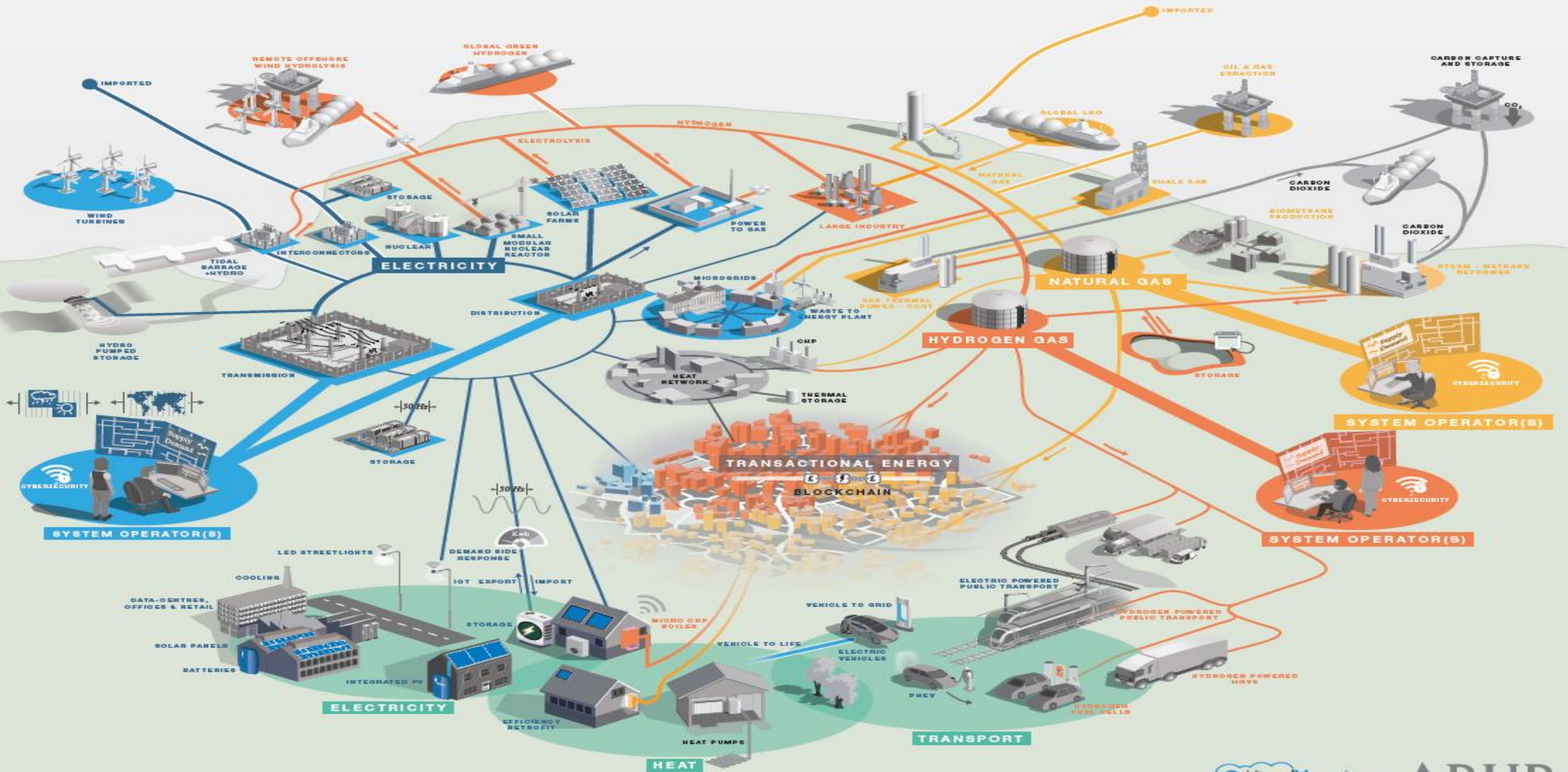


Hydrogen production capacity by fuel type

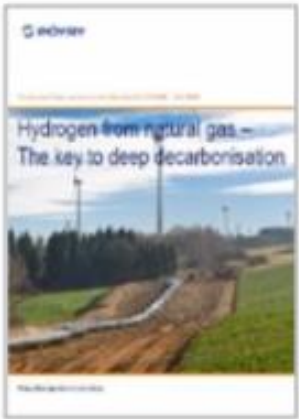




# We need incentives for „System Efficiency“



# Plenty of Studies on H2





# Current CO2 legislation - H2 role

Sector	Requirement	Legislative Tools	Financial Tools	Hydrogen's role
<b>Transport</b>	-CO <sub>2</sub> reduction  -PM/NO <sub>x</sub> /SO <sub>x</sub> reduction  -Integration of RES	<b>1. Renewable Energy Directive (RED2)</b>  <b>2. CO2 emission standards for LDVs/LCVs</b>  <b>3. CO2 emission standards for HDVs</b>  <b>4. Clean vehicle Directive</b>  <b>5. Alternative Fuel Infrastructure Directive</b>	CEF transport/blending	-H2 as a fuel  -H2 made fuels  -Renewable hydrogen for refineries
<b>Energy-intensive industries</b>	Decarbonisation	EU ETS	<b>Modernisation Fund / Innovation Fund</b>	Renewable / low - carbon hydrogen as feedstock switch
<b>Gas/ Heating</b>	Decarbonisation (to remain a player)  Integration of RES	<b>1. Renewable Energy Directive (RED2)</b>  <b>2. <u>Upcoming Gas Regulation (2020-2021)</u></b>	Possibly CEF Energy	Renewable / low - carbon hydrogen as feedstock  Fuel cell as energy converter
<b>Power</b>	Storage / ancillary services  Integration of RES	<b>1. Renewable Energy Directive (RED2)</b>  <b>2. Electricity Market Design</b>		Rapid response electrolyzers + Sectoral Integration

# Shift happens!

Hydrogen enables you.



**Hydrogen**  
Europe

## Contacts

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