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HYDROGEN FROM NATURAL GAS

BLUE HYDROGEN

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CHALLENGES OF THE ENERGY TRANSITION

Decarbonisation

- Ambitious targets for 2030 and 2050
- Limit on extending Renewable Energy Sources

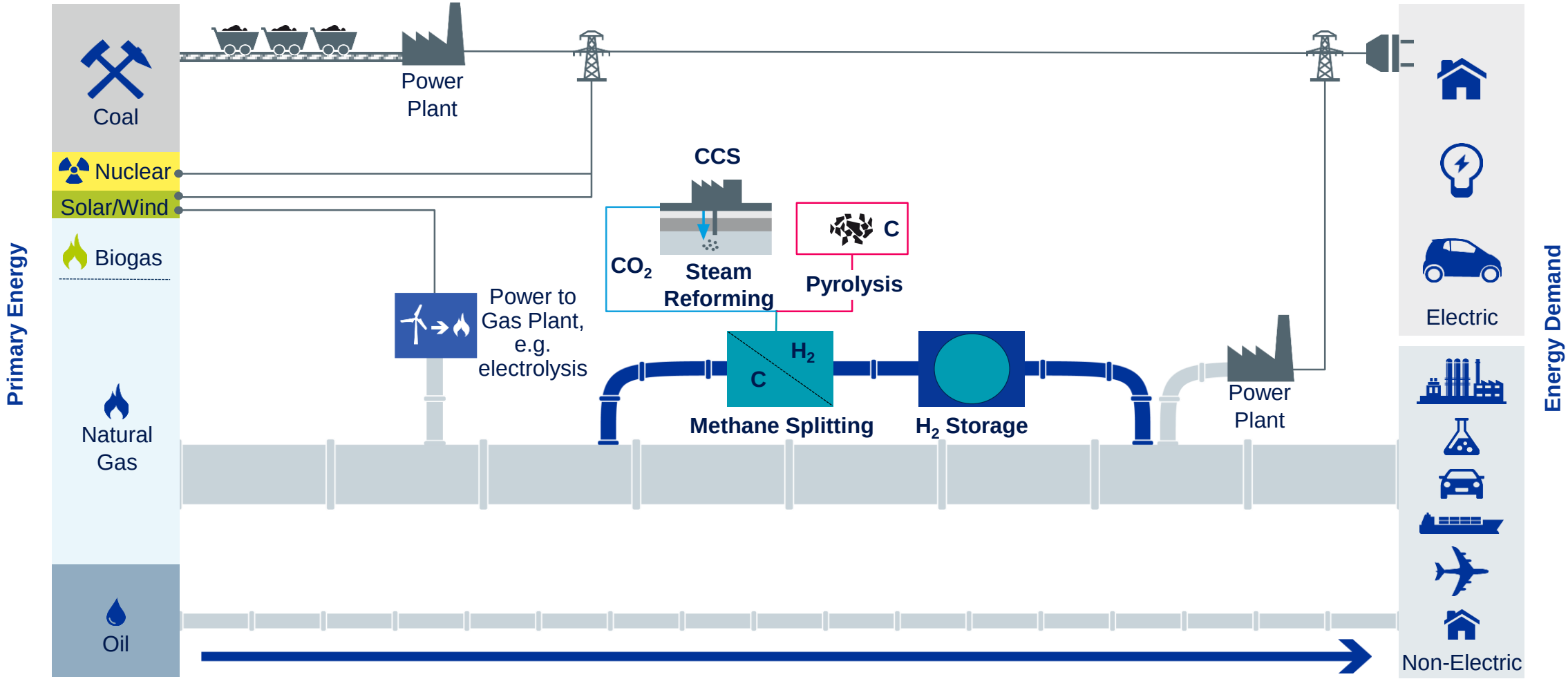
Costs

- 175-290 bn EUR additional investments needed per year
- Additional social costs

Volatility

- Intermittent production of Renewable Energy Sources
- Balancing energy supply, short-term and long-term

HYDROGEN: A VERSATILE ENERGY CARRIER



STEAM REFORMING

Description

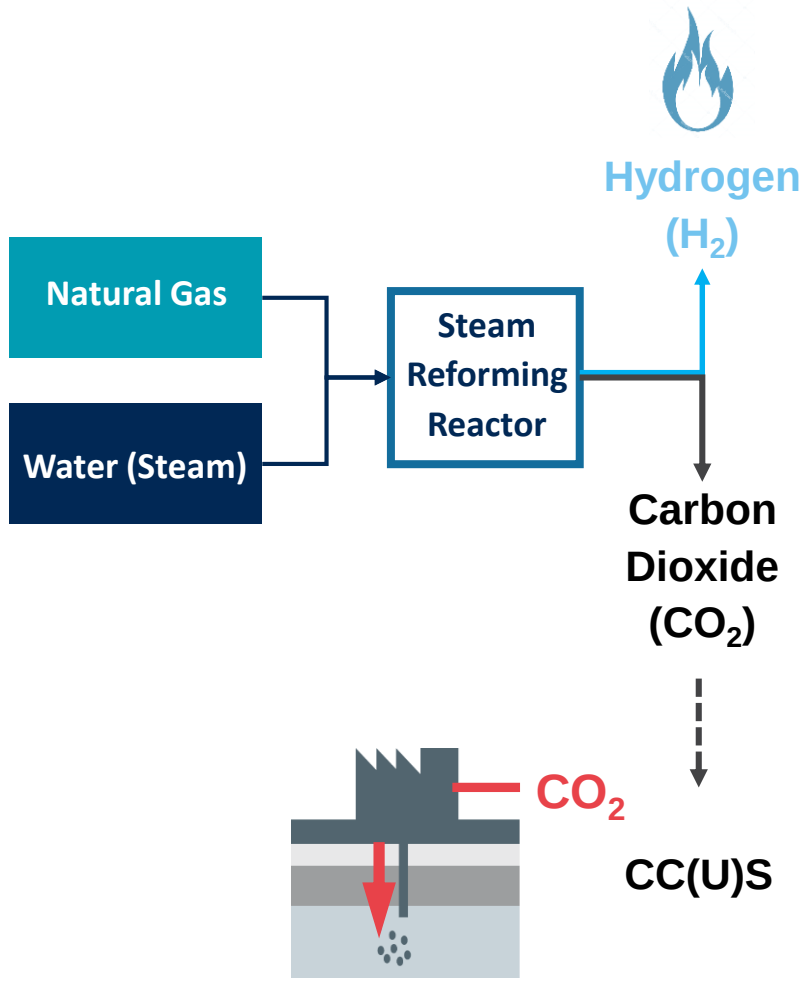
- Conversion of natural gas and water into Hydrogen and Carbon Dioxide (CO_2)

Pro's

- Mature technology
- Widely applied and readily available
- Energy efficient- using entire energy content of natural gas
- Large scale

Con's

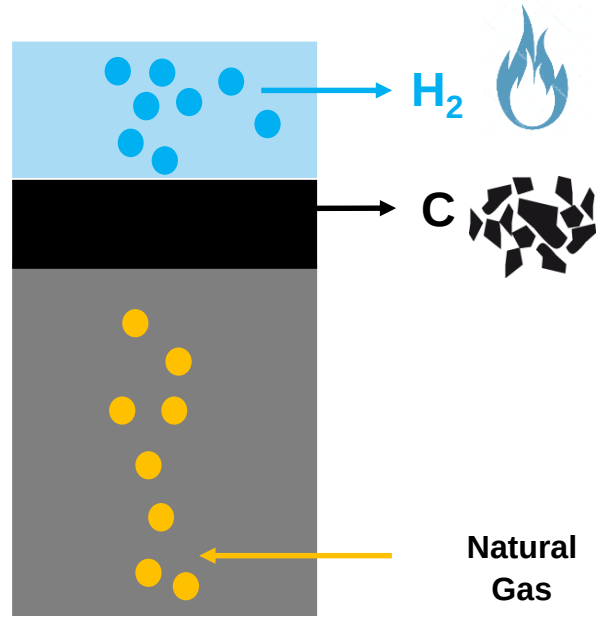
- Releases gaseous CO_2 that needs to be captured and stored or used CC(U)S



METHANE PYROLYSIS

Description

- Splitting of natural gas into its components Hydrogen and solid Carbon at very high temperature (>800°C)



Pro's

- Carbon is separated in solid state – easier to handle compared to CO_2
- Valuable by-product carbon – properties can be adjusted
- More energy efficient than electrolysis
- Expected to be cost-equal to steam reforming and cheaper than Power-to-Gas

Con's

- In advanced research stage, commercial only after 2025

WHY BLUE HYDROGEN FROM NATURAL GAS?

- Electricity can neither be easily stored nor transported
- Renewables require enormous amount of land space which is limited
- Hydrogen from natural gas is available in large quantities – mind the scale!
- Consider geopolitical consequences if well-established natural gas supply – demand relations of Europe with supply countries are distorted
- Competitiveness of Europe must be ensured – overarching target is a reduction of carbon footprint using best social-economic solution – no technology discrimination!

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THANK YOU!