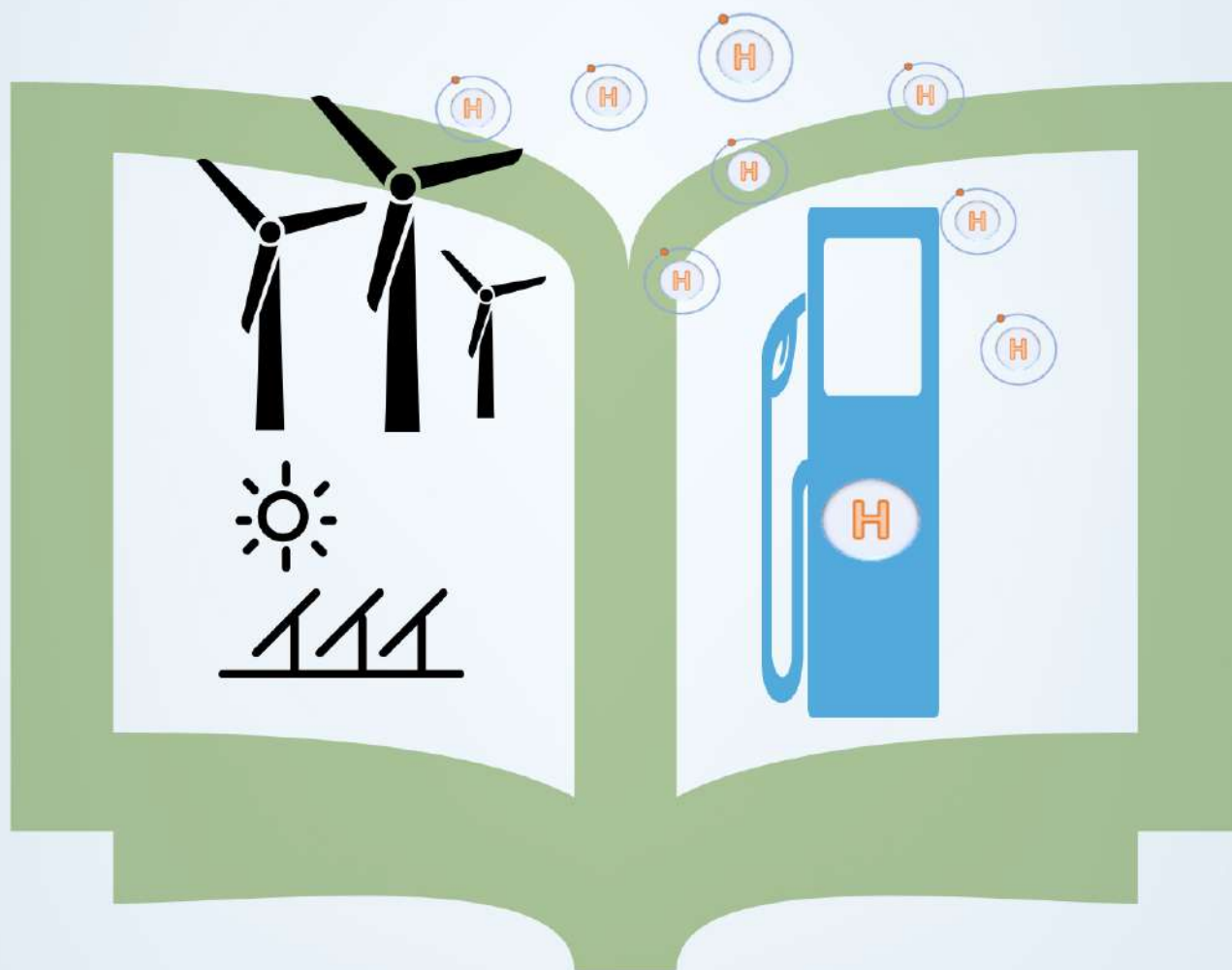


C I R O PROJECT



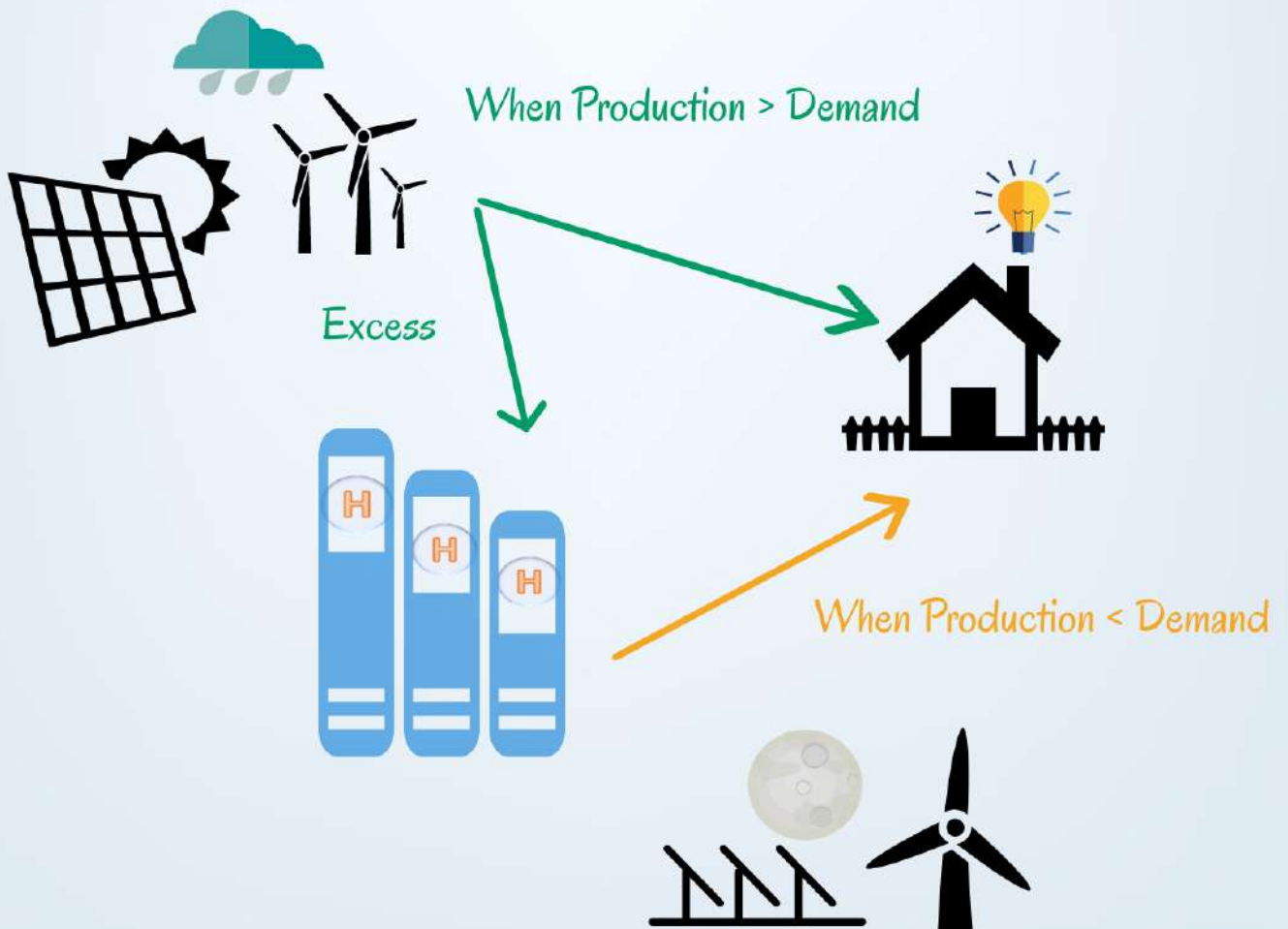
“Introducing the importance of the coming European “green” energy model in School Education”

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WHY HYDROGEN?



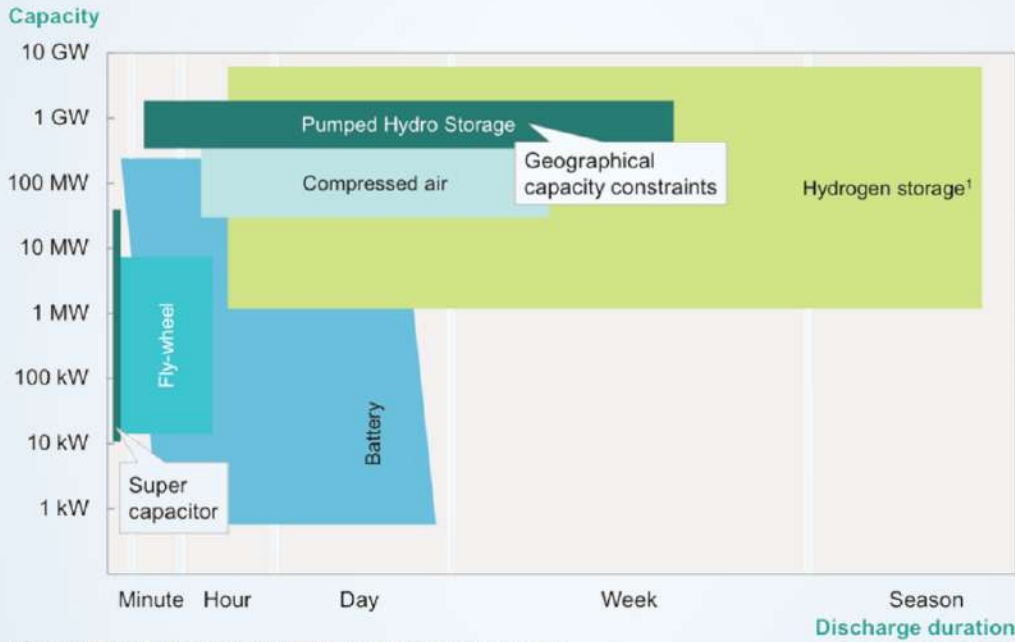
Hydrogen would allow a higher renewable energy production rate in the electrical mix. As a massive, long-term energy storage solution it would act as a buffer for intermittent renewable energy production.



Why are Energy Storage Systems important?



Attending to the different storage capacities and discharge times, these energy storage systems differ significantly from each other.



¹ IIEA data updated due to recent developments in building numerous 1MW hydrogen storage tanks
 Source: IEA Energy Technology Roadmap Hydrogen and Fuel Cells: JRC Scientific and Policy Report 2013



Mechanical storage

- Pumped Hydro Storage
- Compressed Air Energy Storage
- Flywheel



Electrochemical storage

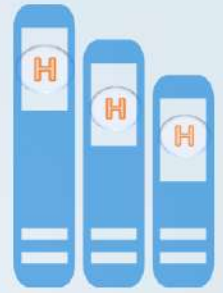
- Batteries
- Supercapacitors
- Hydrogen storage



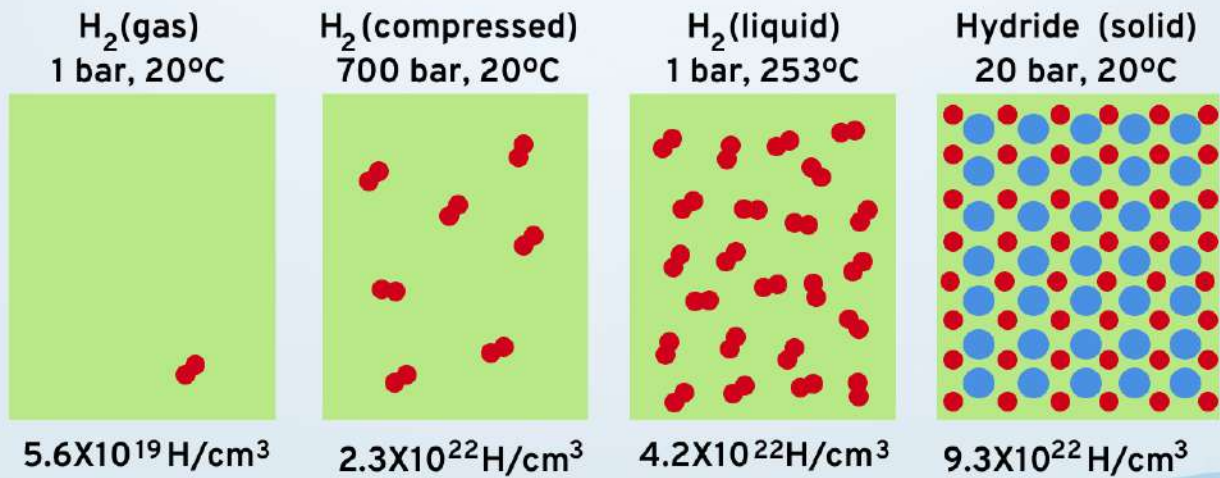
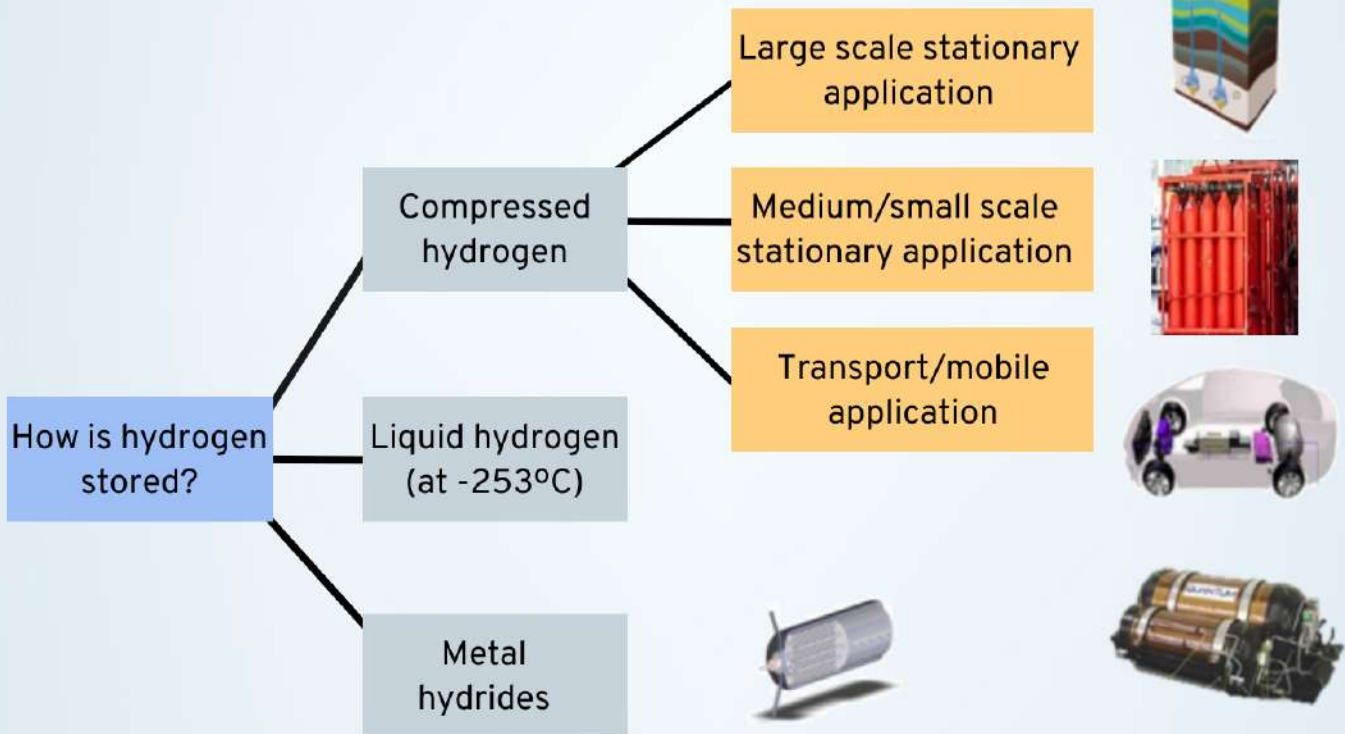
Other

- Thermal energy storage in aquifers, caves, water reservoirs, etc.
- Electrical methods (superconducting magnetic, capacitor, etc.)

Methods of hydrogen storage



As a gas: 7% of air's density
As a liquid: 7% of water's density



HOW IS H₂ PRODUCED?

The two most extended methods to produce H₂ are...



Methane Steam Reforming



High temperatures



CO₂ emissions



Uses natural gas as feedstock
(relies on imported fossil fuels, energy dependence, risk of increasing costs)



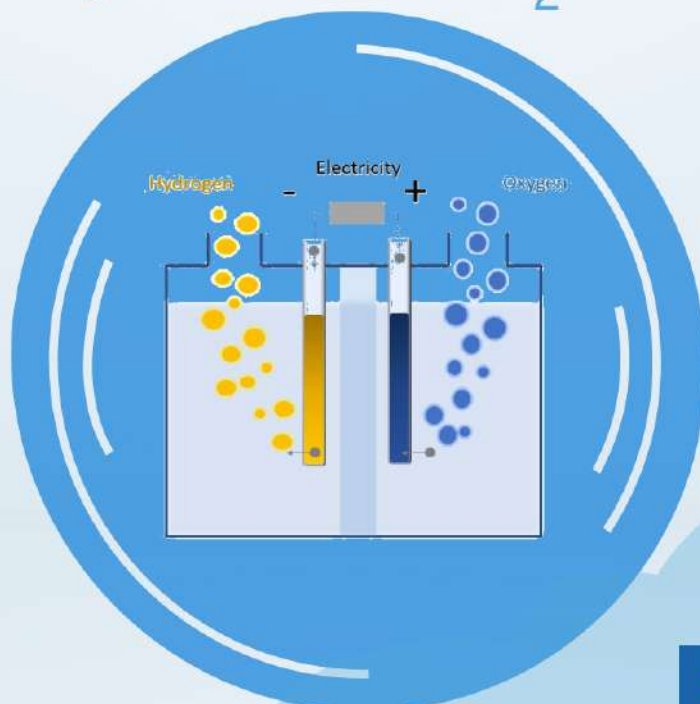
Chemical reaction



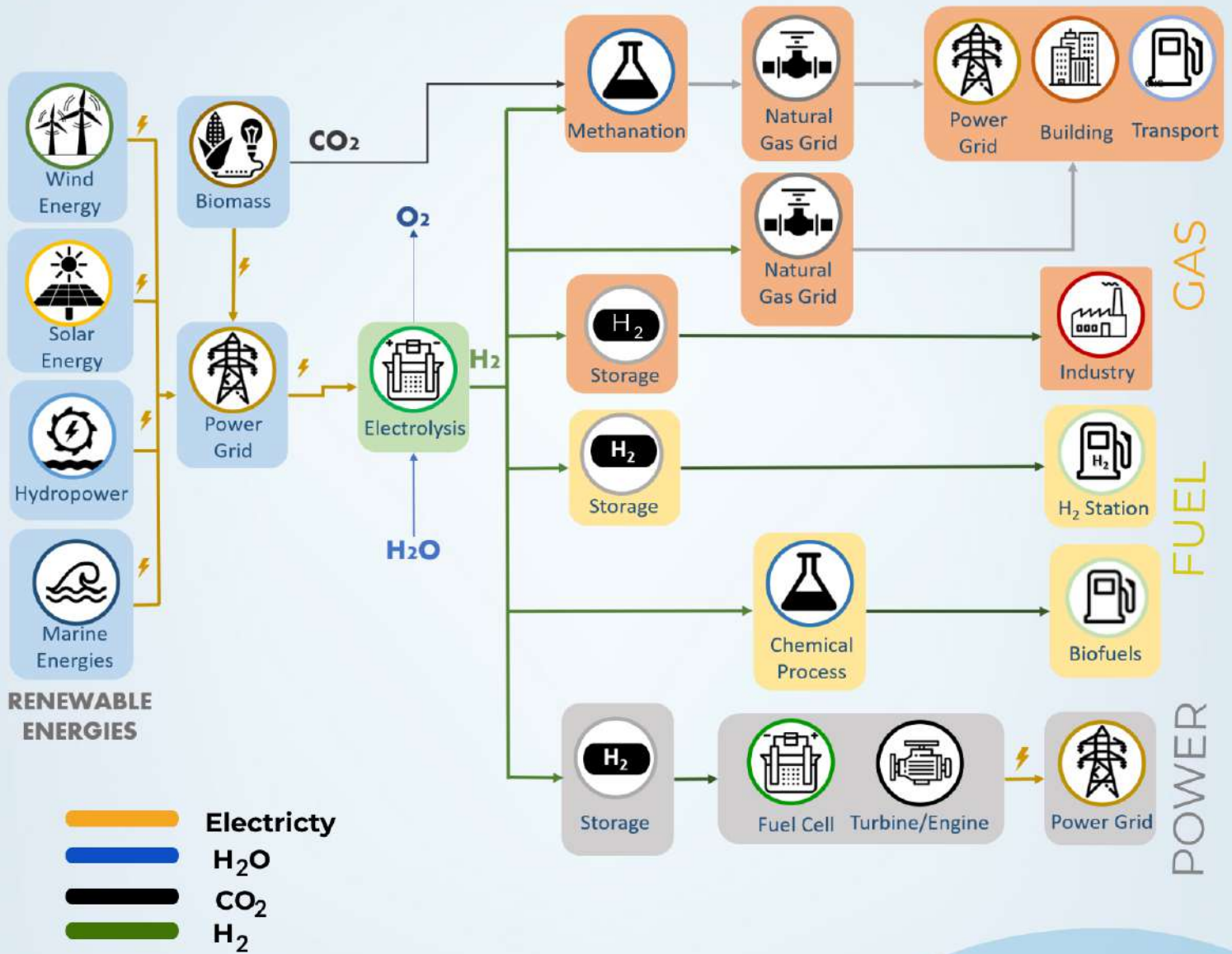
Water Electrolysis



Water electrolysis is the decomposition of water into oxygen and hydrogen gas by the passage of an electric current.



POWER TO





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