

Hydrogen technologies in energy

Hydrogen is an energy carrier like electricity. It is the simplest and lightest element on Earth and can serve as a universal energy carrier that is able to store energy and also serves as a fuel for transport and carries heat and electricity in fuel cells.

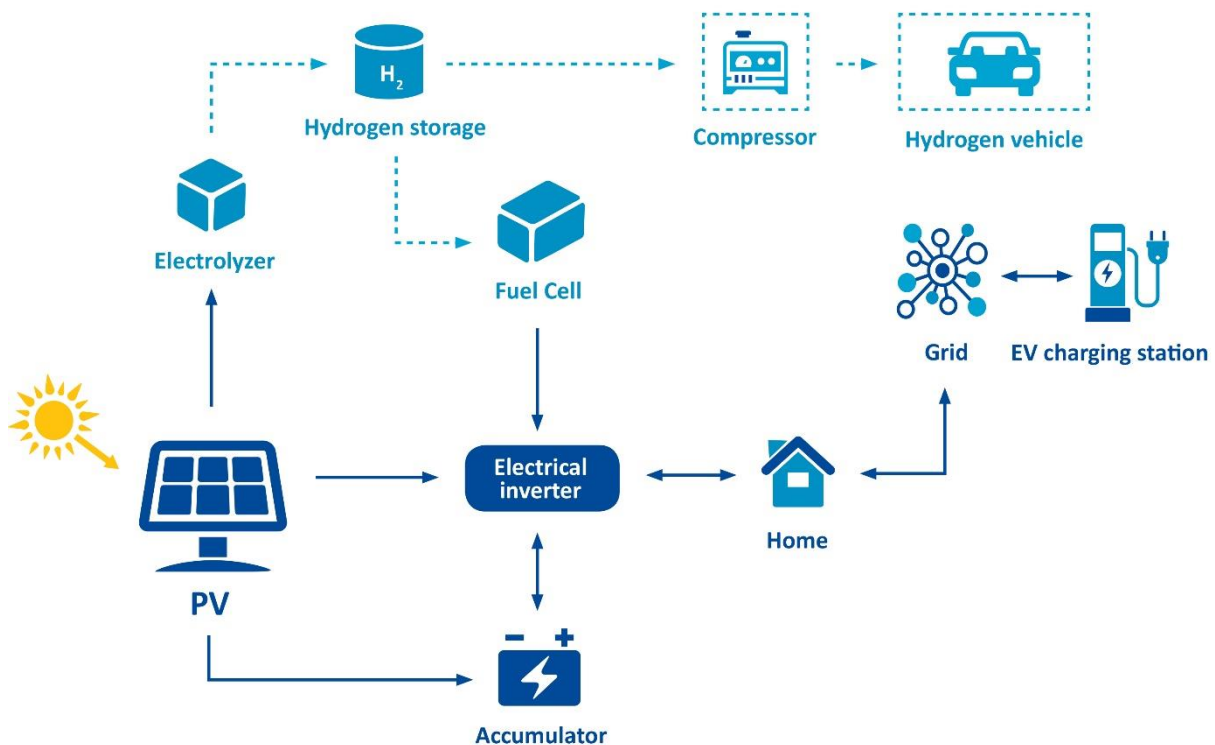
Micro-cogeneration units based on fuel cell may use hydrogen, natural gas or renewable sources (biogas).

Hydrogen is already produced in large quantities, and in the energy sector it is used in many industrial applications:

- more than 100 000 industrial stationary applications are being used around the world by companies like Bouygues Telecom, Toshiba or Apple
- over 100 000 units for the production of heat and electricity in households are in operation in Japan
 - many of leading companies are involved in research and application of hydrogen technologies

Reference - Energy storage system at the ÚJV Řež

The system can store the surplus energy from photovoltaic panels in the form of hydrogen. It is consisting of the photovoltaic plants, the PEM electrolyzer (electricity - hydrogen), the tank of compressed hydrogen, the PEM fuel cell (hydrogen - electric power) and it is connected to the grid.



The wiring diagram of photovoltaic panels and hydrogen storage system ÚJV



Application of Energy storage system - is intended for:

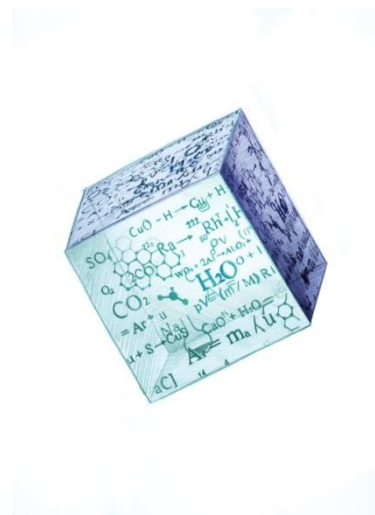
- small, medium and large enterprises that need power supply backup
- suitable also for applications without access to electricity and natural gas grid
- all those who want to run buildings, enterprises in an island mode (independently on the electricity grid)
- all who want a more efficient use and stabilize energy production from renewable energy sources
- those who need an environmentally friendly source of hydrogen of high purity
- all those who want to produce heat and electricity based on micro cogeneration units with high efficiency (suitable for homes, apartment buildings and commercial buildings and enterprises)

Advantages of the system or individual components:

- flexible and efficient production of heat and electricity from hydrogen / natural gas-based micro-CHP / cogeneration units
- low emission facilities -> local air quality improvement (reduction of emissions, dust and noise)
- primary energy source cost reduction
- longer-term energy storage
- backup system in case of power failure
- independence on the electricity distribution grid - in case of the island system
- possibility of co-financing the project from public sources

ÚJV Řež offers:

- a case study for integration of hydrogen technology in your facility or operation
- energy storage systems, which can serve as a backup power source or to stabilize the power supplied to the network from renewable sources
- energy storage system that produces energy self-sufficient operation / building
- in the energy storage system, we provide the following activities:
 - consultancy
 - an appropriate system design
 - design activities
 - turnkey realization
 - drafting a co-financed project from grants



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