



POWER-TO-GAS

One of the biggest challenges when it comes to using renewable energy is the storage of it. The sun doesn't always shine, and the wind doesn't always make the wind turbines turn when energy is needed. What if renewable energies could be used and stored for later use as chemical energy?

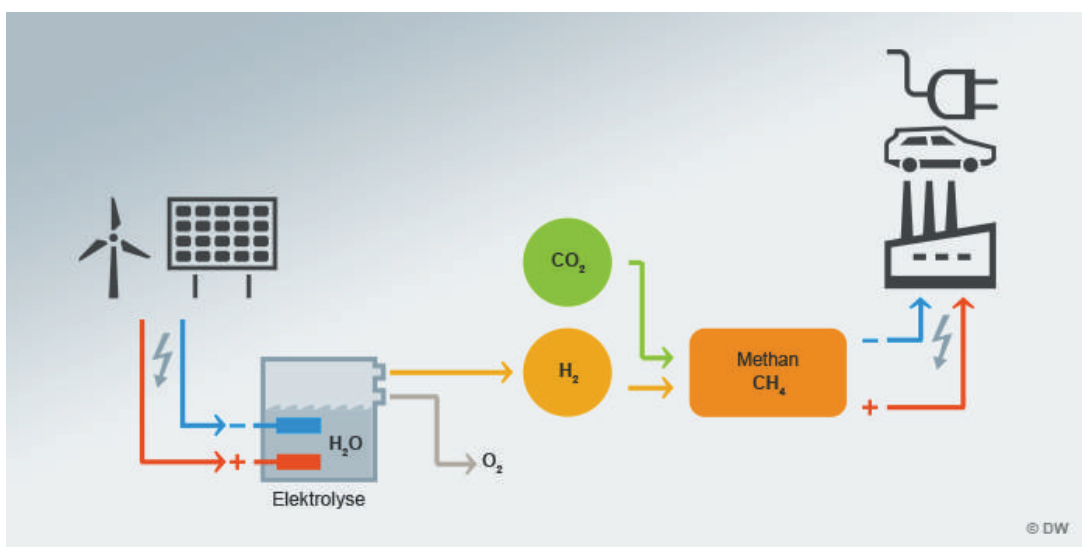
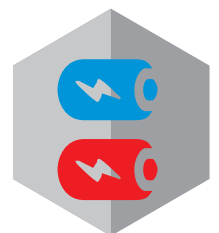
This is, where the process called Power-to-Gas steps onto the stage. In this process either hydrogen or methane can be produced out of water and carbon dioxide. These gases can then be used to fuel cars, to heat buildings and many more things.

The whole process starts with the electrolysis of water. During that chemical process, water (H_2O) is split up into hydrogen (H_2) and oxygen (O_2) by using electrical energy. A part of the energy used to split the water is being stored in the bonding of the hydrogen molecules. In some applications hydrogen can be used directly. In others, methane is a lot easier to handle.

If methane is needed, after the electrolysis, the methanization happens. During this process, the hydrogen is catalytically reacted with carbon dioxide. This biological process can be performed by special single-cell organisms in a bioreactor. The final products of the methanization are water (H_2O) and methane (CH_4).

Dependent on the later applications of the gas, it has then to be cleaned, purified or worked up to be used.

The methane gas can then be used in many different ways. It can be saved, e.g. in big gas tanks or in the national gas grid. Alternatively, the gas can be used locally and burned in combined heat and power plants (CHP) or used as a fuel for motor vehicles.



Links:

<https://www.energie-klimaschutz.de/infografik-power-to-gas/>

<https://www.dw.com/de/energiewende-ist-power-to-gas-die-l%C3%B6sung/a-18677372>