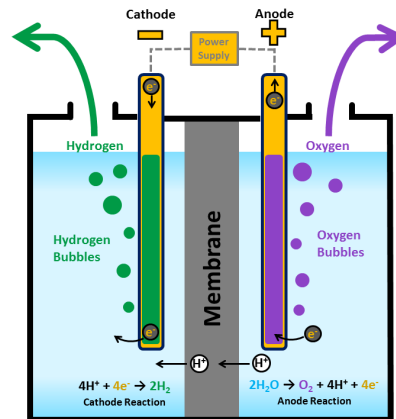


Power to gas

The power to gas concept is an energy storage system. It is used to store unconsumed electricity of a Electricity grid with the intention of a future recovery of the energy.

The main idea is the electrolysis of water by the use of a power supply and the gaining of hydrogen as a combustible and storable fuel. The simplified process is shown in the picture below.



It is possible to convert the hydrogen to natural gas by adding carbon dioxide to increase the energy content or compress the gas to Liquid Pressure Gas (LPG). All the produced fuels are storable and can be used for various applications. Industrial use, mobility, heat and also the reversion to electricity. The actual state of technology offers an efficiency of around 40 % and the concept is tested in various pilot projects and is almost developed for industrial use. But there is still the need to improve the Power to Gas facilities and increase the connection to the power grid. In a smart grid the consumers and producers are connected in a electricity and gas grid together with storage units.

It is very important to develop energy storage technologies. The consumption of energy is more or less constant over the days. But with the use of renewable energies its not possible to produce a constant power supply. On a very sunny day the demand of energy in Europe is very few, but there is a great production of energy by photovoltaic and solar power plants. The solution is to save the unconsumed energy which is produced on windy or sunny days and use it when its needed. But currently there are very few storage technologies which are economic and ready for industrial use and its time for innovative ideas and technical development.