

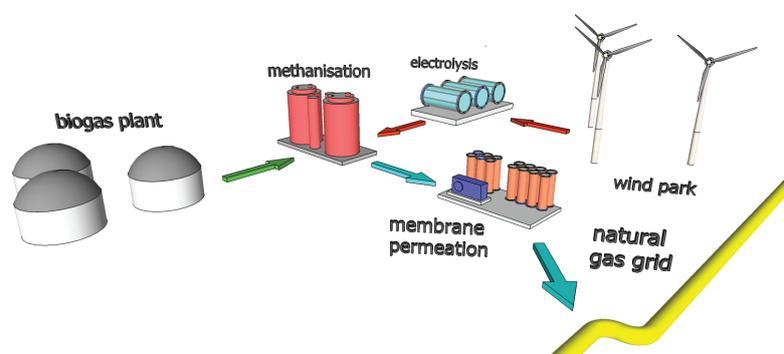
# Combined biogas upgrading & power-to-gas energy storage

Economic viability of renewable energy production from fluctuating energy sources like wind or solar power plants depends on the possibility to consolidate power supply. Power-to-gas energy storage could use existing gas networks, thus reducing investment needs. An important precondition for the success of power-to-gas is the quality of the gas to store. The novel combined power-to-gas & biogas upgrading technology is producing high-purity methane, carbon dioxide and water in a single membrane separation system.

## BACKGROUND

Power-to-gas concepts aim at the use of surplus power from wind- or solar-power plants for the production of hydrogen by water electrolysis. Hydrogen could then be stored and later on returned to thermic energy. Hydrogen could also be converted into methane and stored in the gas network.

The concepts are facing the problem that impurities in the resulting methane are impairing the possibilities to store or process the product gas further. The solution is to combine power-to-gas energy storage with biogas upgrading.



## TECHNOLOGY

The novel technology uses one single membrane separation system:

- for the simultaneous and selective separation of  $\text{CO}_2$ ,  $\text{H}_2$  and  $\text{H}_2\text{O}$  from  $\text{CH}_4$
- for the purification of the raw biogas as well as the product gas in a simultaneous or alternate flow

## ADVANTAGES

- Production of high purity methane that can be stored in the gas network
- Optimization of power-to-gas plant dimension and thus investment and energy costs
- Improvement of the economic viability of sustainable and environmentally friendly energy production

## REFERENCE:

MO45\_12

## OPTIONS:

- License agreement
- R&D cooperation
- Expert reports

## KEYWORDS:

wind/solar gas , high purity methane, energy storage, membrane separation system

## DEVELOPMENT STATUS:

Proof of concept, simulation tool

## IPR:

Patents pending, AT 514.614 granted in Austria

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