The role of STORE&GO

Research is needed to assess the potential of PtG (power-to-gas) technologies by which the key technical, economic, regulatory and societal drivers, and the potential role of PtG in the overall energy transition process under different scenarios is evaluated.

The STORE&GO project aims to do just that, and will provide a clear insight, based on the existing knowledge, define an inventory of the knowledge gaps, and execute public-private research to fill these gaps.

A main goal is to identify business cases for PtG in different time frames and to develop a European PtG roadmap to answer the fundamental question: Which applications can PtG serve in which period of the energy transition.

Find more news about the project please visit us at:

www.storeandgo.info

Project partners

ATMOSTAT ALCEN · BFP · CLIMEWORKS Closing the Carbon Cycle

DBI GUT Gas- und Umwelttechnik GmbH · DVGW · ECN TNO innovation for life

Electrochaea · Empa Materials Science and Technology · ENERGIE INSTITUT an der Johannes Kepler Universität Linz

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EPFL École Polytechnique Fédérale de Lausanne · gwi Gas- und Wärme-Institut Essen e.V. · Hanze University of Applied Sciences Groningen

HSR Hochschule für Technik Rapperswil FHO Fachhochschule Ostschweiz · regio energie solothurn · iren

KIT Karlsruhe Institute of Technology · liten CEA tech · Politecnico di Torino · uniper

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HYSYTECH · SVGW SSIGE · thyssenkrupp

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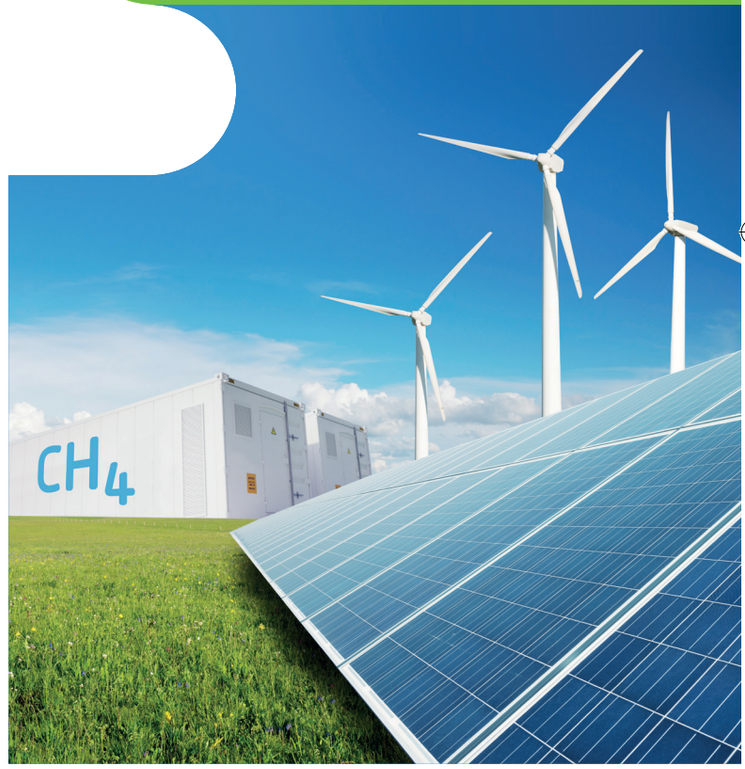
STORE&GO

Innovative large-scale energy storage technologies
& Power-to-Gas concepts after Optimisation

Demonstrating Opportunities for Power-to-Gas on European Level



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STORE&GO

STORE&GO is an EU Horizon 2020 Research and Innovation programme project coordinated by the DVGW Research Centre at Engler-Bunte-Institute, Germany. The project, 'Innovative Large Scale Energy STORagE Technologies & Power-to-Gas Concepts after Optimisation' (**STORE&GO**), works on questions how to integrate the power-to-gas (PtG) technology into Europe's future energy system and involves research on and demonstration of three different PtG plants; one in Falkenhagen, Germany; one in Solothurn, Switzerland; and one in Troia, Italy.

The **STORE&GO** consortium consists of 27 partners from **six European countries**, has a total budget of **28 million Euros** and is running from March 2016 until February 2020. The work builds on previous research that has demonstrated the technical feasibility of PtG technologies, and seeks to further enhance the technology's ability in order to be integrated into the daily operation of European energy grids.

Why Power-to-Gas?

In the medium to long term, energy demand will be served primarily by using renewable energy. However, wind and solar power is volatile, intermittent due to their dependence on weather conditions and time of the day. Electrical energy has therefore to be stored to be made available when needed. PtG is a technology, which can provide this.

The principle is simple: **Renewable electricity** is converted to **hydrogen** by electrolysis. Hydrogen can be used directly and fed into the existing gas grid or converted to **renewable methane** via methanation.

Benefits of Power-to-Gas

Power to gas is an indispensable component for the transition toward a low-carbon energy system and the coupling of energy sectors, because it:

- generates CO_2 neutral gas that can easily be **used and stored in the existing gas infrastructure**
- further uses the existing gas infrastructure and could be **supplied to European gas users**
- offers **large-scale and flexible energy storage** and thus energy security
- helps balancing and backing-up the electricity grid,
- reduces the need of extending the electricity grid and thus **minimises costs**
- provides **'green' hydrogen**
- enables the **supply of 'green' energy into applications** where renewable electricity solutions are not possible e.g. as fuel for ships and heavy road trucks.

The Demo Sites

At the **three demo sites located in Germany, Switzerland and Italy** PtG will be tested under different conditions and circumstances like:

- Available source of electricity (wind, solar or hydro power)
- Offtake from consumers (consumption; municipal region; rural region)
- Connection to the electricity grid (transmission grid; municipal distribution grid; regional distribution grid)
- Connection to the gas grid type (long distance transport; municipal grid; regional distribution grid)
- Source of CO_2 (from bio-ethanol; from waste water treatment; from atmosphere)
- Heat integration (veneer mill; district heating; CO_2 enrichment)

Moreover, **STORE&GO** goes beyond the state of the art of PtG technology at its three demosites. Three different innovative methanation processes will be applied, tested and improved:

- Catalytic honeycomb/structured wall methanation reactors
- Biological methanation
- Modular milli-structured catalytic methanation reactors

To test these technologies the plants will have different capacities ranging from 200 kW to 1 MW. They will be tested under varying conditions for a period of two years.