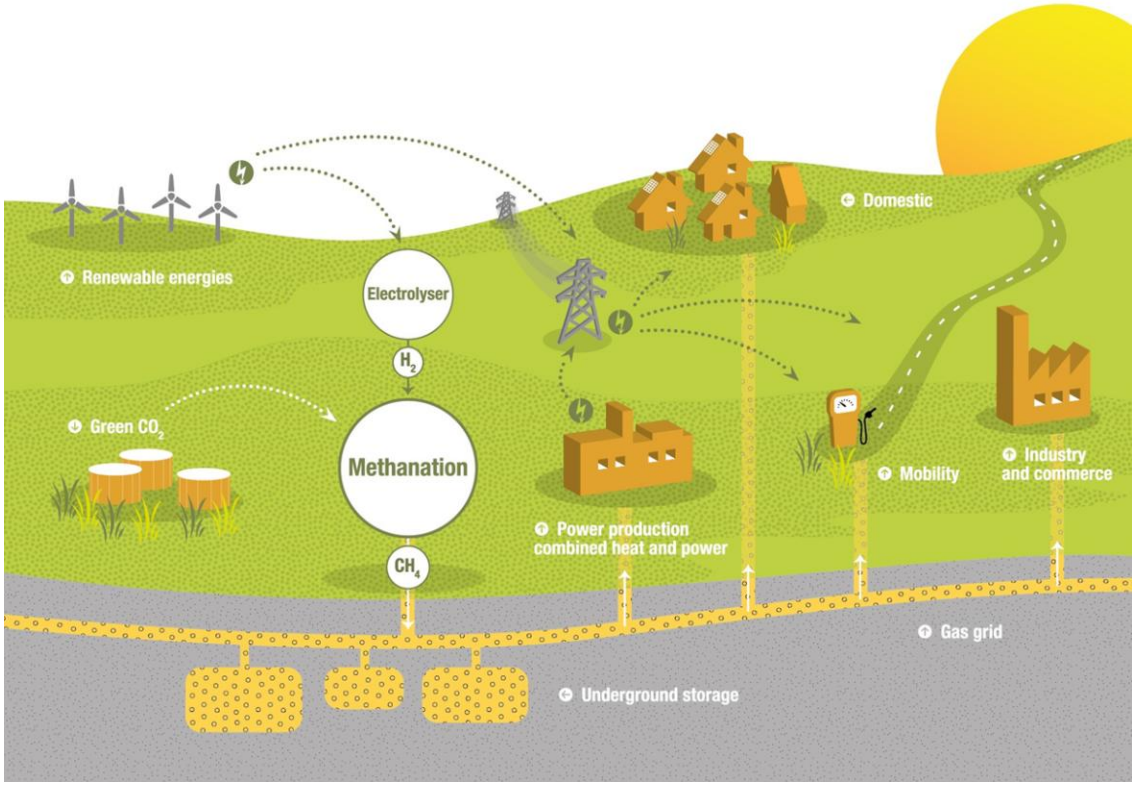
STORE&GO

Demonstrating Opportunities for Power-to-Gas on European Level



Jachin Gorre

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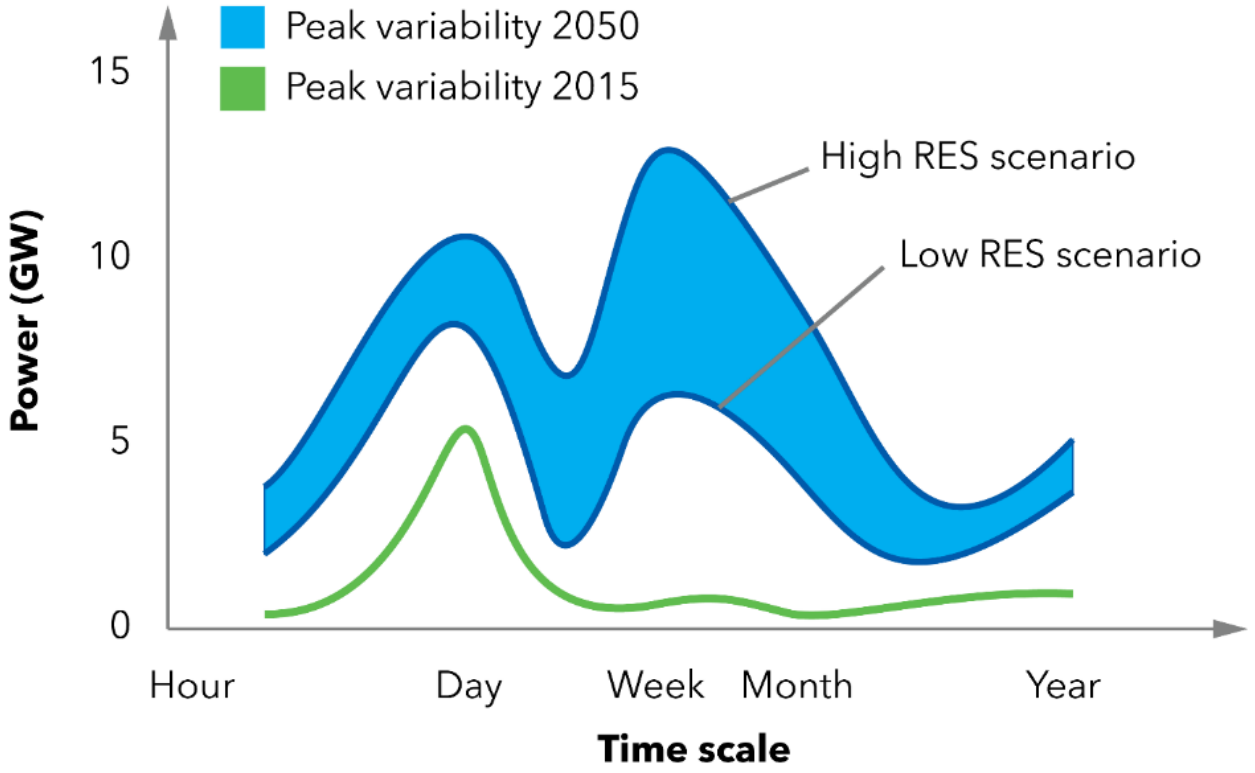
Innovative large-scale energy **STOR**ag**E** technologies **&** Power-to-**G**as concepts after **O**ptimisation

Why is long-term and large-scale power storage needed?

- Share of variable RES grows rapidly with fluctuating generation patterns
- Extreme variability in week/month range: “Dunkelflaute”
- High need for flexibility of the energy system



Source: DNV GL; Breakfast event; Power-to-gas – economic value and technological developments; 06.06.2018; https://bit.ly/2JL0yZz; Zugriff: 12.06.2018

STORE&GO: Project Targets

- Show **potential of Power-to-Gas**
- **Three demo sites** exhibit three different innovative methanation concepts
  - Catalytic honeycomb methanation
  - Modular milli-structured methanation
  - Biological methanation
- **Integrate and operate** in existing gas networks
- Achieve **operation ≥ 24 months** (4.000 h)
- Increase **flexibility in operation**
- Constant **gas grid quality** (≥ 90 vol.% methane)
- Achieve **high efficiency** by using waste heat

STORE&GO: Project Targets

- Decrease **capital costs** for large plants by **≥ 15%**
- Analyse value chains
- Consider legal and regulatory framework
- Derive political recommendations
- Identify **business cases**

Key Data

March 2016 February 2020

27 European project partners

Industry • 4 million €

• 6 million €

• 18 million €

28 million €

Project Structure

Management & Coordination *WP 1*

Demonstration Site PtG concept I *WP 2* Falkenhagen, DE	Demonstration Site PtG concept II *WP 3* Solothurn, CH	Demonstration Site PtG concept III *WP 4* Troia, IT

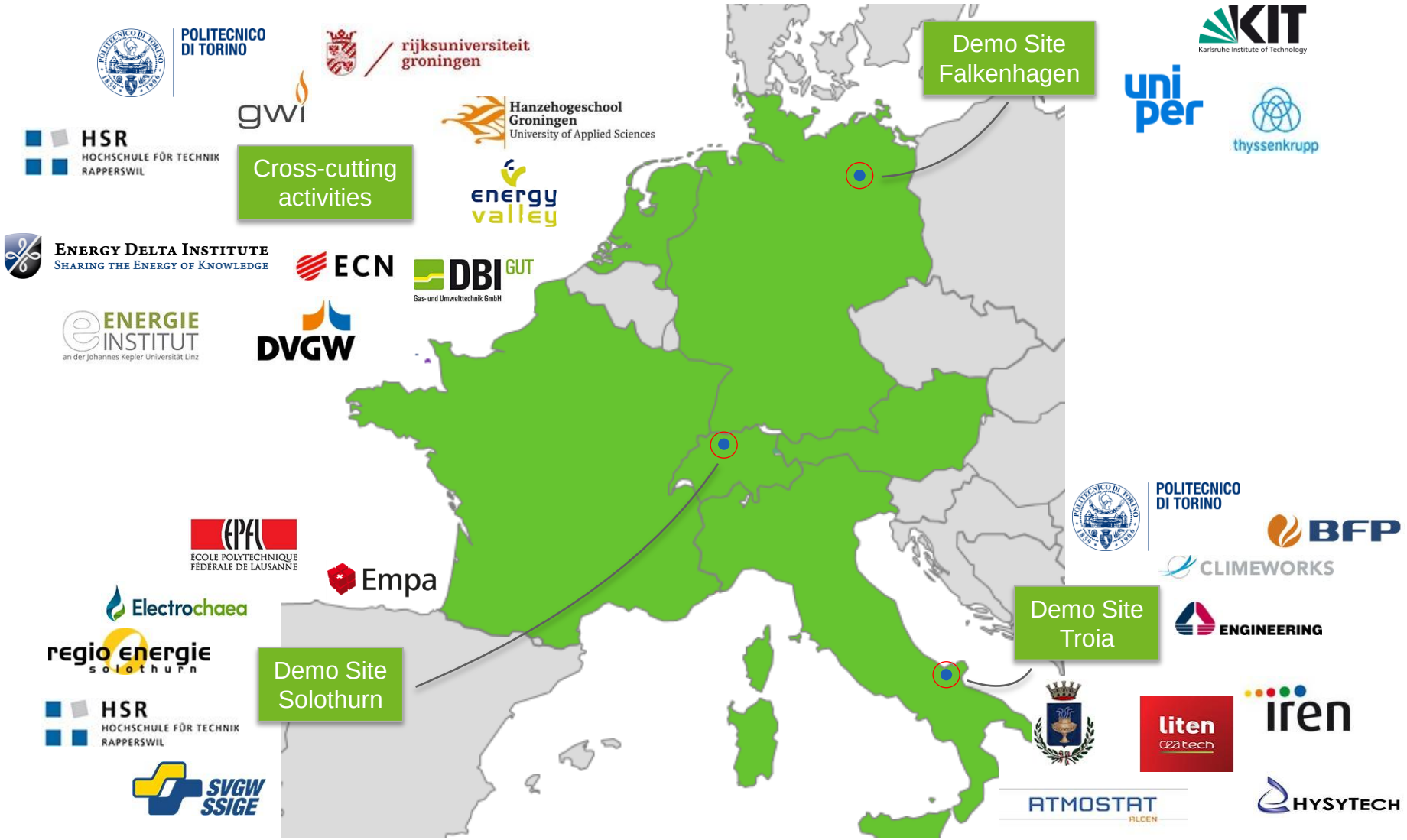
Cross-cutting activities *WP 5 – WP 8*

Dissemination *WP 9*

Cross-cutting-Activities WP5 – WP9

- Techno-economic analysis of storage demonstration operation
  - Environmental impacts
  - Optimized Operation schemes for gas grids
  - Economic analysis
- Integration of PtG concepts in electricity grid management and power supply
  - Opportunities and options for PtG in the power system
  - Impact analysis of PtG
- Reducing barriers
  - Licensing modalities
  - Regulatory regimes
  - Analysis on future technology options and on techno-economic optimization
- Market uptake
  - Analysis of future demand of ‘green gases’
  - Potentials across the EU
  - Economic costs and benefits of the PtG large-scale storage option

27 Project Partners



Demonstration Site Falkenhagen, Germany

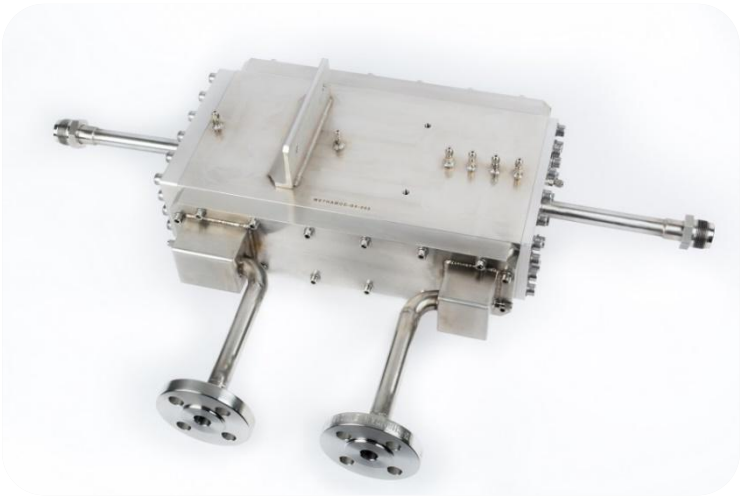
- isothermal catalytic honeycomb and structured wall reactors for methanation
- integration into long distance natural gas transmission grid
- CO_2 from bioethanol plant
- wind power rich region

Demonstration Site Solothurn, Switzerland

- biological methanation
- integration into municipal gas distribution grid
- CO_2 from waste water treatment plant
- mainly photovoltaics

Demonstration Site Troia, Italy

- mainly photovoltaics
- integration into regional gas distribution grid
- modular milli-structured catalytic methanation reactors
- CO_2 from atmosphere

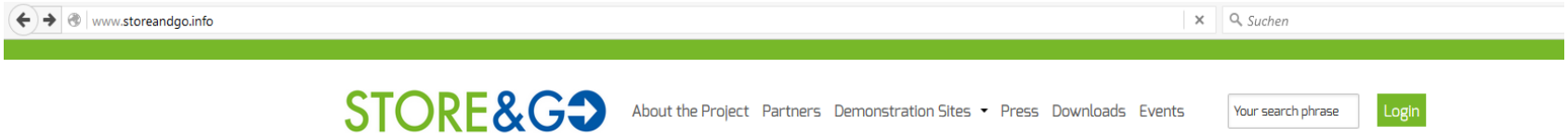


First public results

- D7.2 - European Legislative and Regulatory Framework on Power-to-Gas
- D8.1 - Exploring the future for green gases
- D6.1 - Report on opportunities and options for PtG in the power system

- Applied Energy - Calculation and analysis of efficiencies and annual performances of PtG systems
- Scale-Up of Innovative Honeycomb Reactors for Power-to-Gas Applications – The Project Store&Go
- Green methane: speeding up a cost-efficient energy transition

Dissemination and Public Relations



Find us on:

- http://www.storeandgo.info
- LinkedIn group

  “Power-to-Gas in Europe: STORE&GO and beyond”
- @STOREandGOEU

Thank you for your attention!

Key - Advantages

- **Storing** surplus of renewable **energy**
- Creating a **flexible energy system**
- **Connectivity through PtG** (Sector coupling)
- Usage of the already **existing gas infrastructure**
- **Versatile usage of gas**
- **Balancing** and **backing up the electricity grid**