

Die biologische Methanisierung aus dem Projekt Store&Go in Solothurn



Expertinnen- und Expertengespräche Power-to-X
23. September OST Rapperswil

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Electrochaea's Rapid Technology De-risking and Scale-up



50 MW Commercial-Scale

With support from strategic investors, Energie 360, Storengy and Baker Hughes, Electrochaea focuses on scale-up and integration for grid scale commercial projects

10 MW Commercial-Scale

Scale-up for first commercial biomethanation plant co-funded by EIC Accelerator program

Commercial-Scale Field Trial

Preparing for market entry with a commercial-scale demonstration unit, using an optimized reactor, Copenhagen, Denmark

Pre-Commercial Field Trial

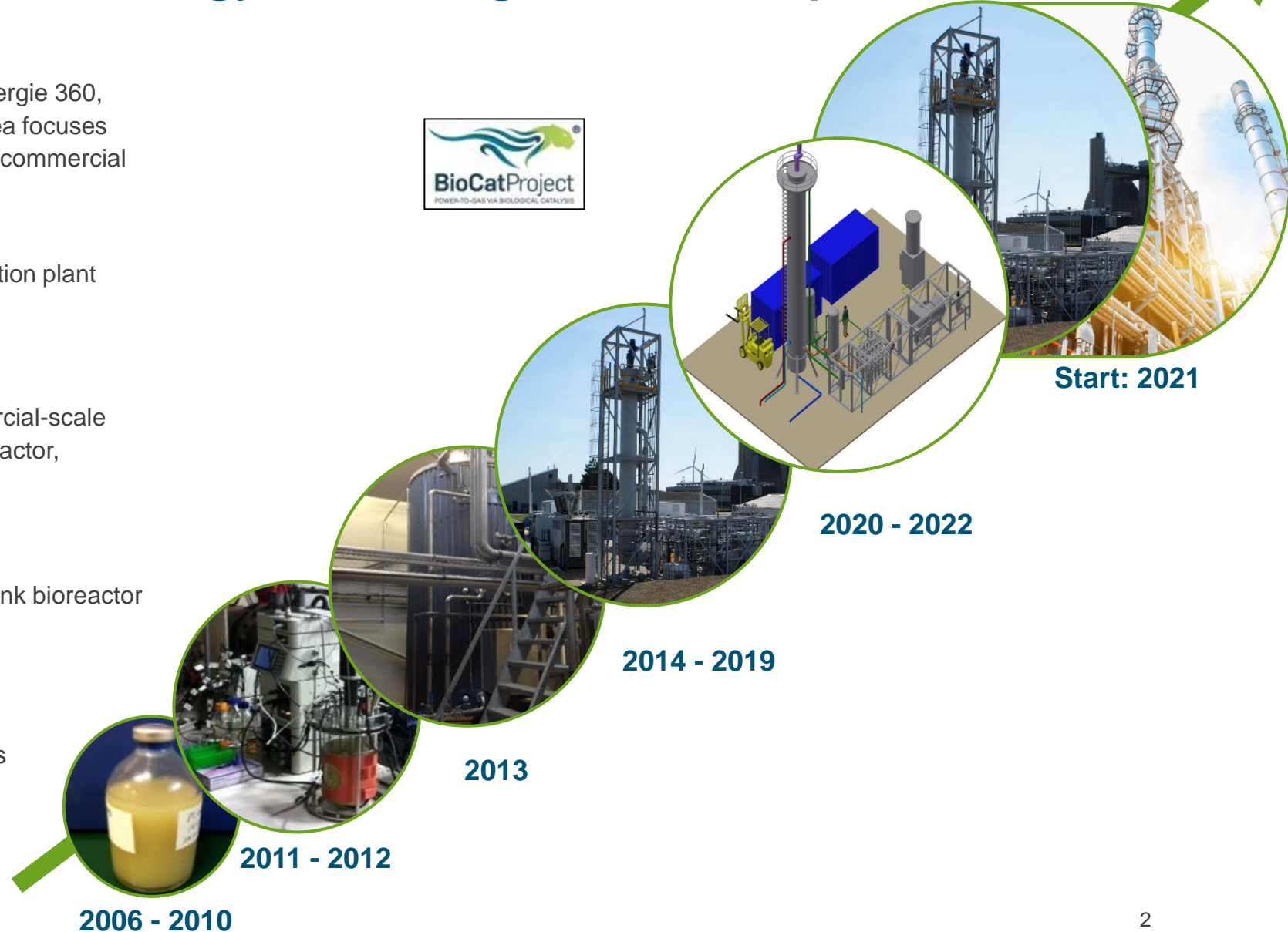
Process demonstration in a 5m³ stirred tank bioreactor using raw biogas, Foulum, Denmark

Lab-Scale Field Trial

Biocatalytic capability test with raw biogas

Basic Research

In Dr. Mets' laboratory at the University of Chicago



Store&Go Plant in Solothurn - Objectives

Grant Objectives

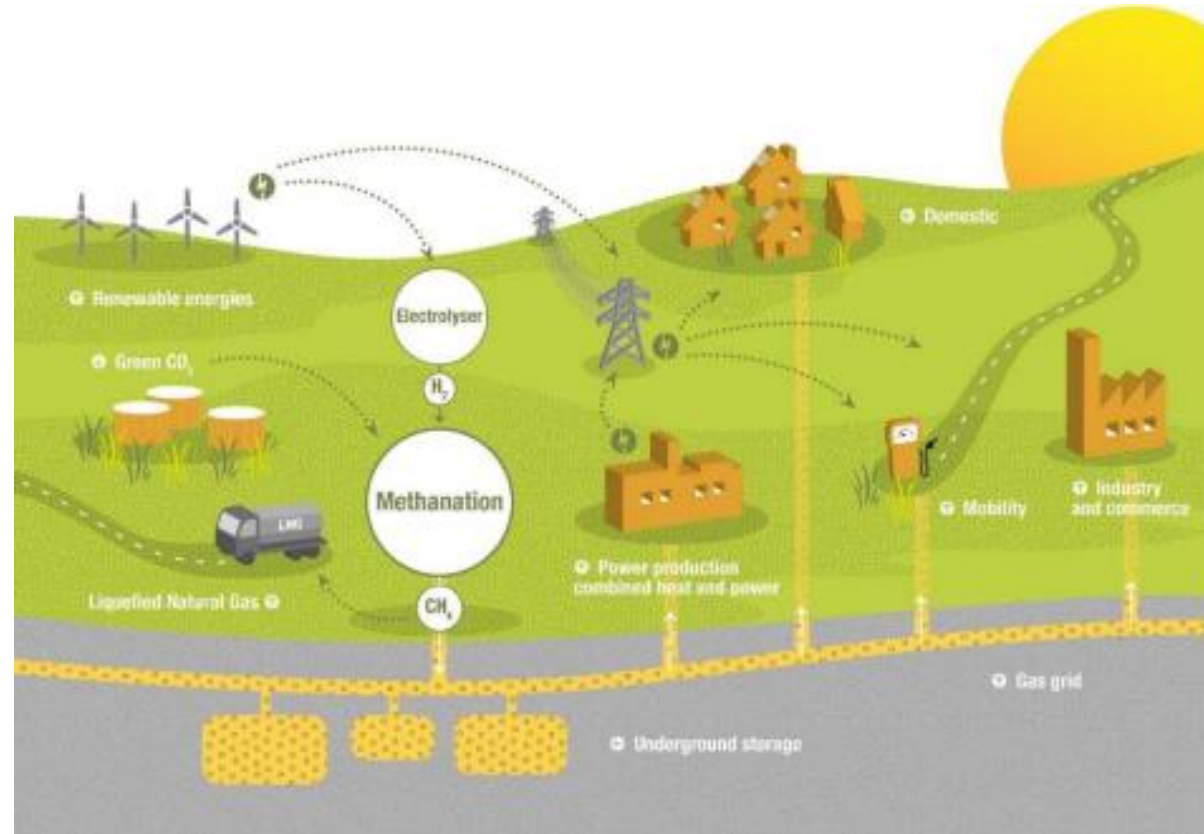
To further develop biomethanation technology from TRL 5 to 7 and adapting it to large scale SNG production

To erect a demonstration plant with intelligent interconnection to electricity and gas grid as well as a district heating net

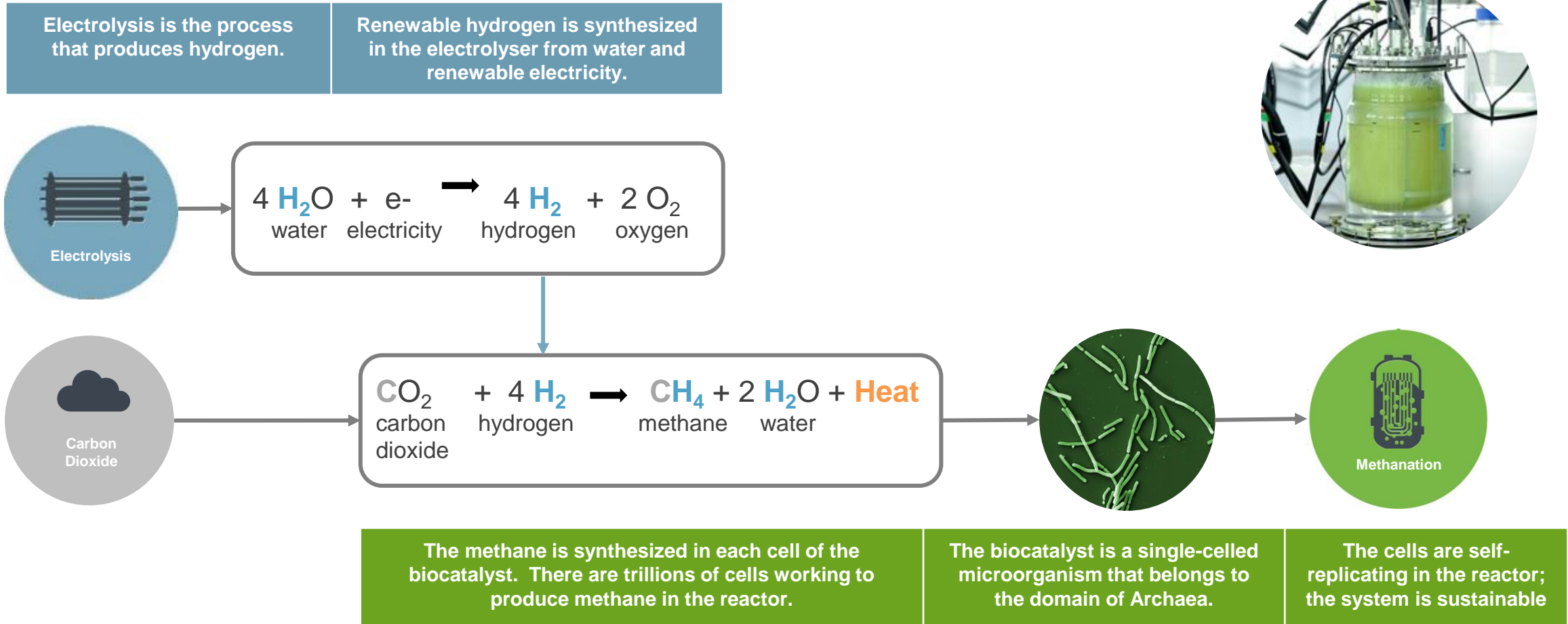
To gain operation data and experiences for the optimization of the plant operation

To benchmark and compare advanced methanation technologies

To utilize the demo site and results for dissemination and training activities



Usage for commercial methane production



Store&Go Plant in Solothurn, Switzerland



Key features:

- ✓ Gas grid injection within 96 hours of start up
- ✓ Gas quality without post purification: > 97% CH₄, 0.2-1% CO₂, 1-2% H₂
- ✓ Process flexibility: on/off cycles with immediate recovery after various shut-down periods

Store&Go Plant in Solothurn - Accomplishments



Gas quality without post purification:

- > 97% CH₄
- 0.2-1% CO₂
- 1-2% H₂



- **1200+ hours** of operation
- Gas grid injection **within 96hrs** of start up
- **>13800 Nm³** renewable methane injected
- Full **remote** plant operation from Germany and Denmark
- Improved **energy efficiency**
- Comprehensive **training materials** (plant operation, commissioning & biocatalyst handling)
- Basis for design of 1MW system – enabled EPC delivery of plant
- **Load factor tests:** 10%-100% capacity testing achieved (at > 97% CH₄ in product gas)
- Process flexibility: on/off cycles with **immediate recovery** after various shut-down periods
- **Flexible operation without** incorporation H₂ and CO₂ buffer vessels
- ~900 **international visitors**, commercial opportunities generated

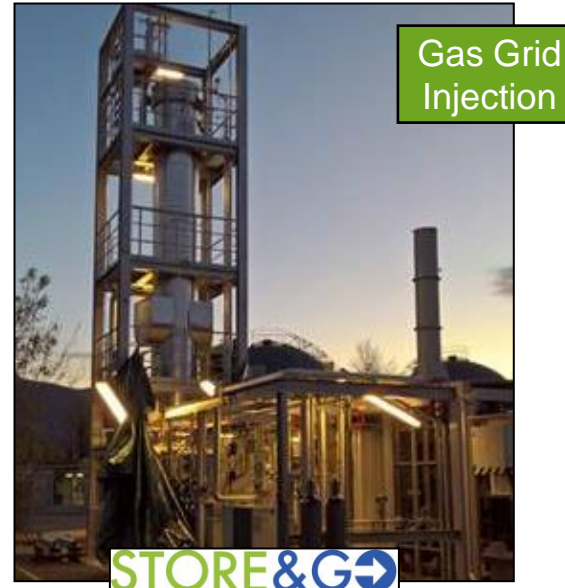
Electrochaea has Demonstrated its Technology in the US and EU

12,5 Nm³/h of CO₂ (0.25 MWe)
Golden, Colorado, US
July 2019



- ✓ Commissioning completed
- ✓ 1st US biological methanation
- ✓ High pressure (18 bar)
- ✓ Project support SoCal Gas, NREL (US DOE)

35 Nm³/h of CO₂ (0.7 MWe)
Solothurn, Switzerland
May 2019



- ✓ Gas grid injection within 96h
- ✓ Operation >1200h, 17 216 Nm³ RNG injected
- ✓ Automated operation
- ✓ Commercial design
- ✓ Project support EC (H2020), RES
- ✓ [Click here for a virtual tour of Solothurn](#)

confidential

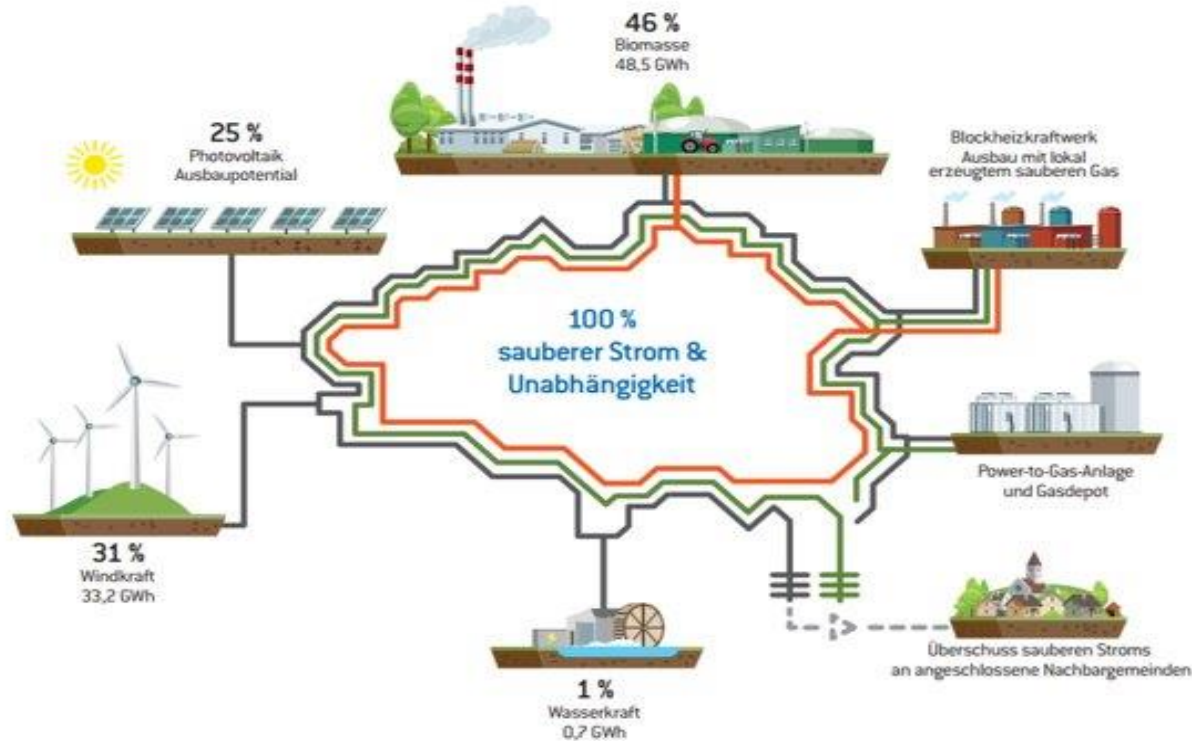
50 Nm³/h of CO₂ (1 MWe)
Avedøre, Denmark
April 2016



- ✓ WWTP site integration
- ✓ Flexible operation, load following
- ✓ 1st grid scale demonstration
- ✓ Project support EUDP, Energinet, HMN, AUDI, Insero, Hydrogenics, BioFos

The future of the Store&Go Plant – Pfaffenhofen, Germany

Stromerzeugung in Pfaffenhofen 2021



- ✓ Full integration of P2G plant into WWTP
- ✓ Demonstration site available near the Electrochaea offices
- ✓ Integration of heat, biogas, oxygen, methane
- ✓ Generate a business model for utilities

Electrochaea's international and multidisciplinary Team



Electrochaea – Investors

VENTURE INVESTORS



STRATEGIC INVESTOR



Thank you!



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