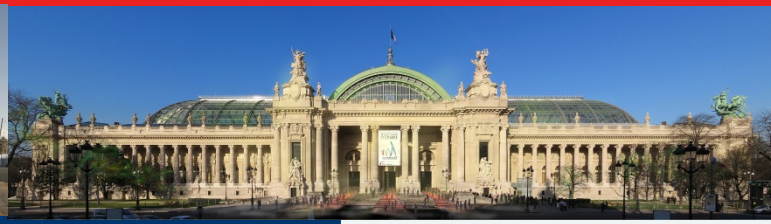
26th World Gas Conference

1 – 5 June 2015, Paris, France



WOC 2.2

UNDERGROUND SUN STORAGE

Stephan Bauer
RAG Austria

WGCPARIS2015
WORLD GAS CONFERENCE

Company Profile

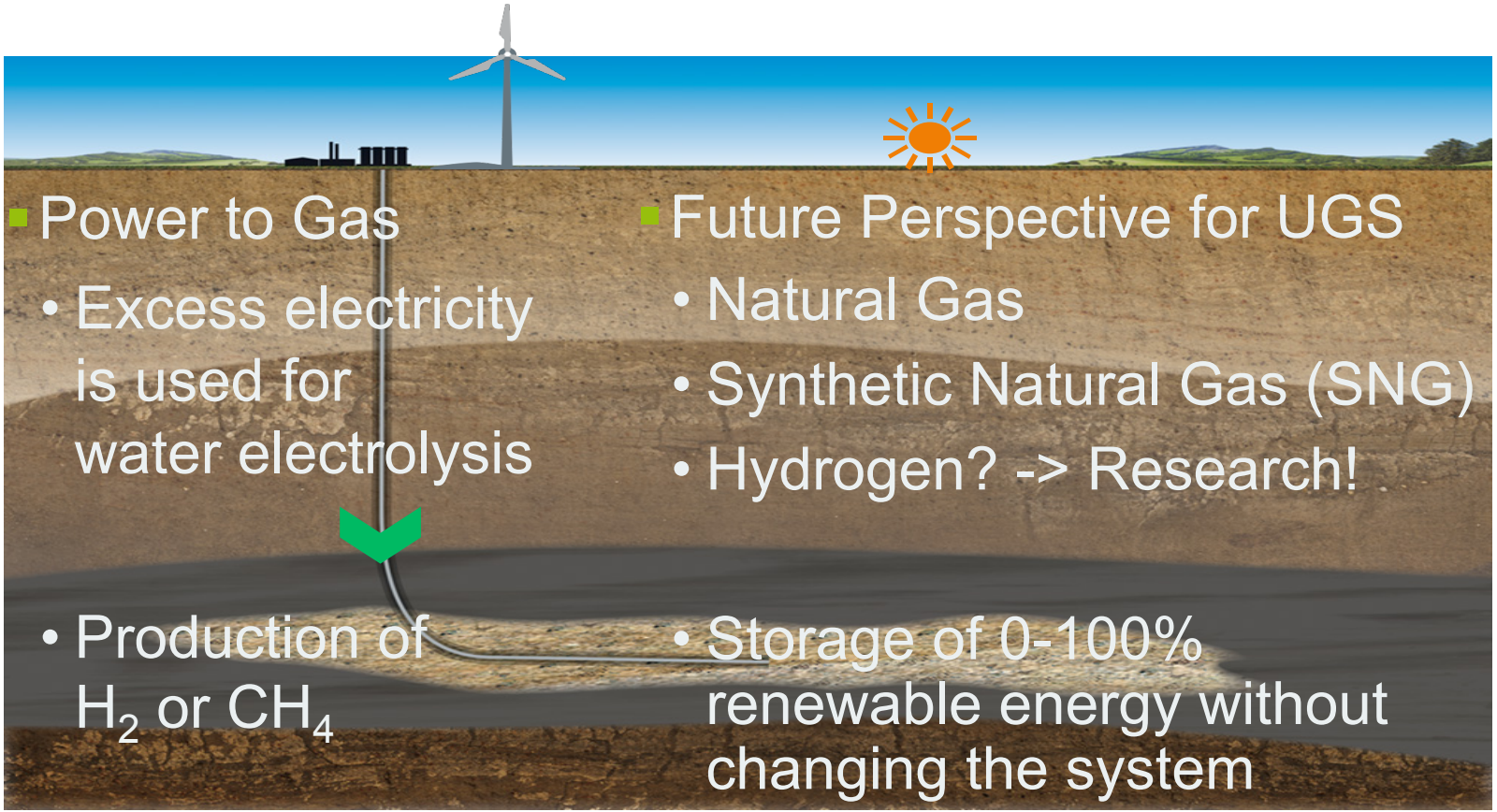
- RAG Rohöl-Aufsuchungs AG
  - E&P Tradition since 1935
  - Among Top 5 Underground Gas Storage Operators in Europe
  - Storage capacity 5,7 bcm (depleted reservoirs)
- Our Vision:

  Positioning RAG´s assets in a changing energy system

Project Outline

- Underground Sun Storage
  - Chemical storage of renewable energy in porous subsurface reservoirs with exemplary field experiment
  - Using the « Power to Gas » technology
  - Research on effects of **hydrogen** exposure (10%) to porous storage reservoirs
- Partners
- Cooperation
- Funding: Flagship project

Options for UGS of renewable energy

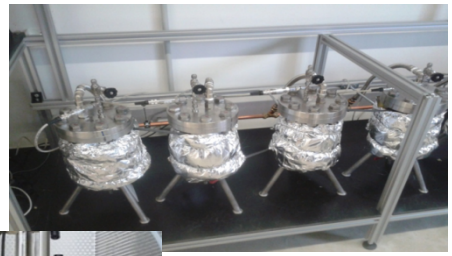


Intermediate Results

- Laboratory tests indicate no problems with storage integrity
  - H_2 Permeability in cap rock
  - H_2 Permeability in cementing

  } same range like natural gas

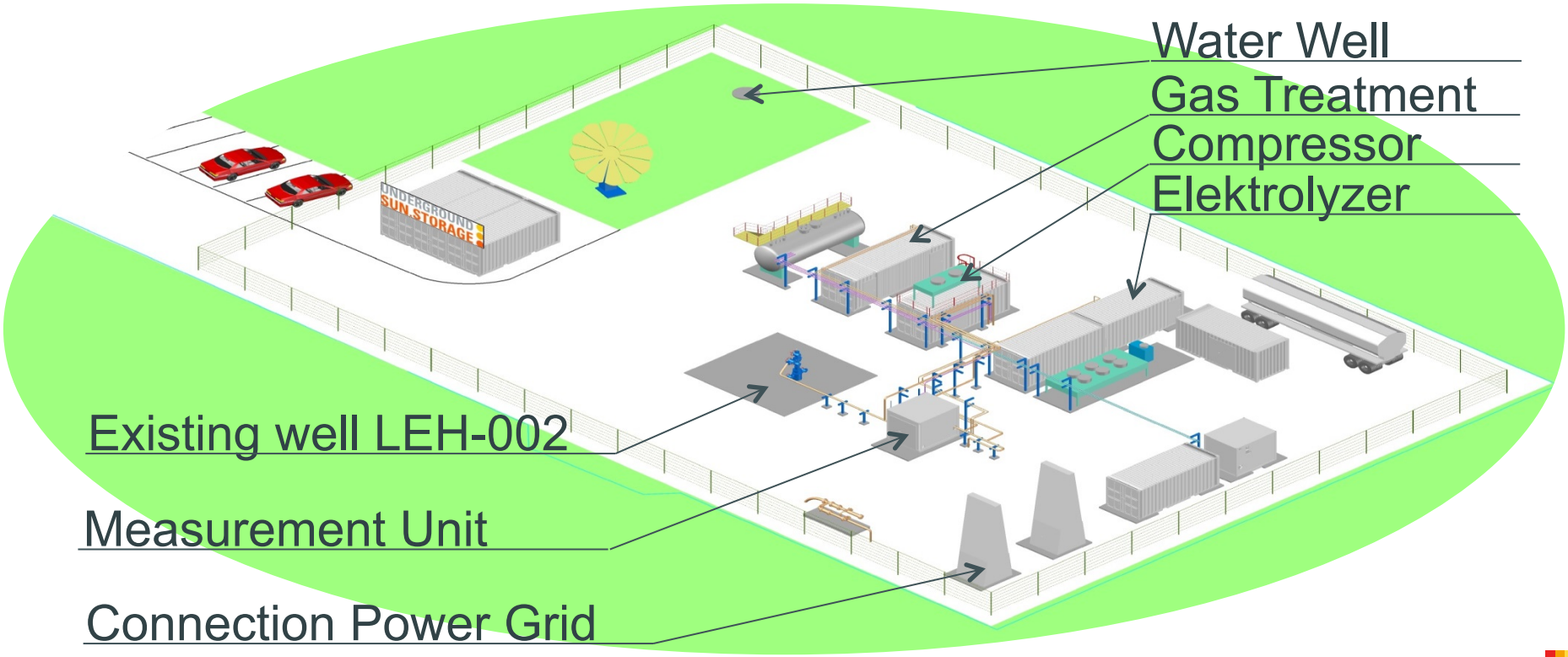
  - No generation of H_2S
  - No influence of H_2 on well completion materials
- Microbial activity verified
  - Microbial consortia characterized
  - Environmental circumstances defined
- Due to positive results intensive preparation of this worldwide unique field experiment started Q3/2014



Field Experiment

- Reservoir
  - in Austrian Molasse Basin, very small and isolated
  - Tertiary sandstone formation compareable to commercially reservoirs
  - Depth: ~ 1.000 m
  - Gas initially in Place:
    - 5 Mio Nm³ @ 107bar depleted to 1.7 Mio Nm³
  - Reservoir temp.: ~ 40°C; Salinity: 18g/l
- Experimental set up
  - Storage of 1.7 Mio Nm³ gas
    - Blend of 10% Hydrogen, 90% Natural Gas
  - 3-4 months shut in @ app. 70bar
  - Hydrogen balancing, pressure and temperature observation
  - Full scientific observations and measurements

Pilot Plant


Water Well
Gas Treatment
Compressor
Elektrolyzer
Existing well LEH-002
Measurement Unit
Connection Power Grid
UNDERGROUND SUN.STORAGE

Contact and Information

- Underground Sun Storage – The Future of Energy Storage
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Thank you for your attention!