

# Underground Sun Storage

Stephan Bauer

RAG Austria



Austrian Ministry  
for Transport,  
Innovation and Technology

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# Underground Sun Storage

Developing a Low Carbon Energy System by Linking the Power Grid to the Gas Infrastructure

Austria Showcase, Abu Dhabi

28 Feb. 2016

## RAG Company Profile

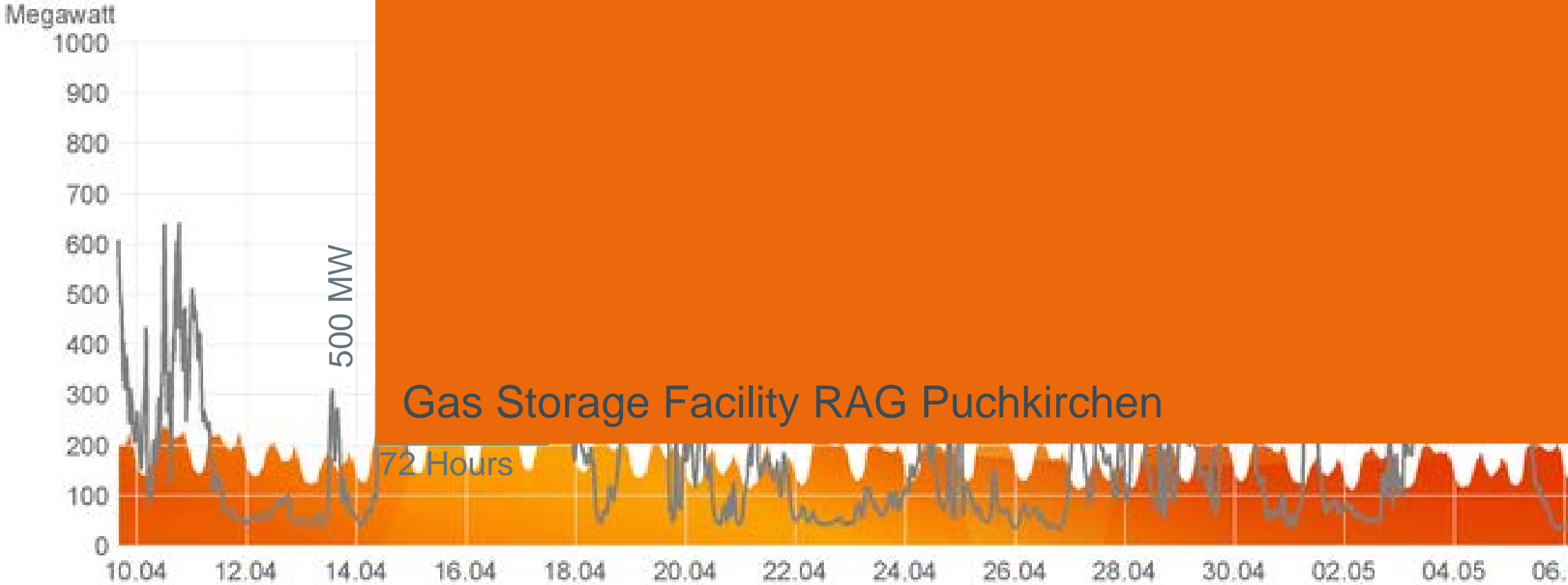
- No. 1 independent Underground Gas Storage Operator in Europe
- State of the art and most innovative Storage Operator
- Storage capacity 65 TWh

Our vision:

- Positioning RAGs assets in a changing energy system

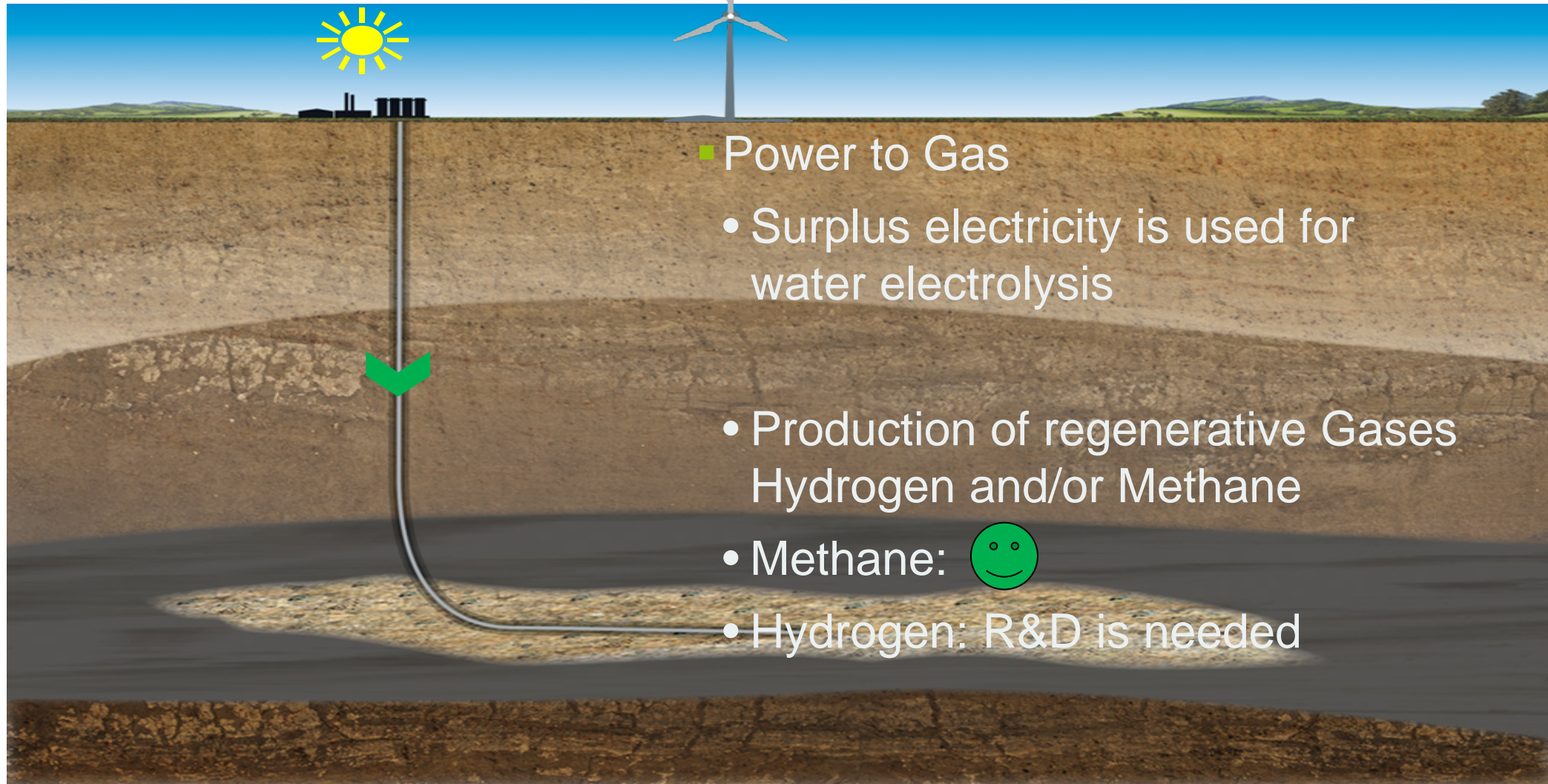


# What is the Pro

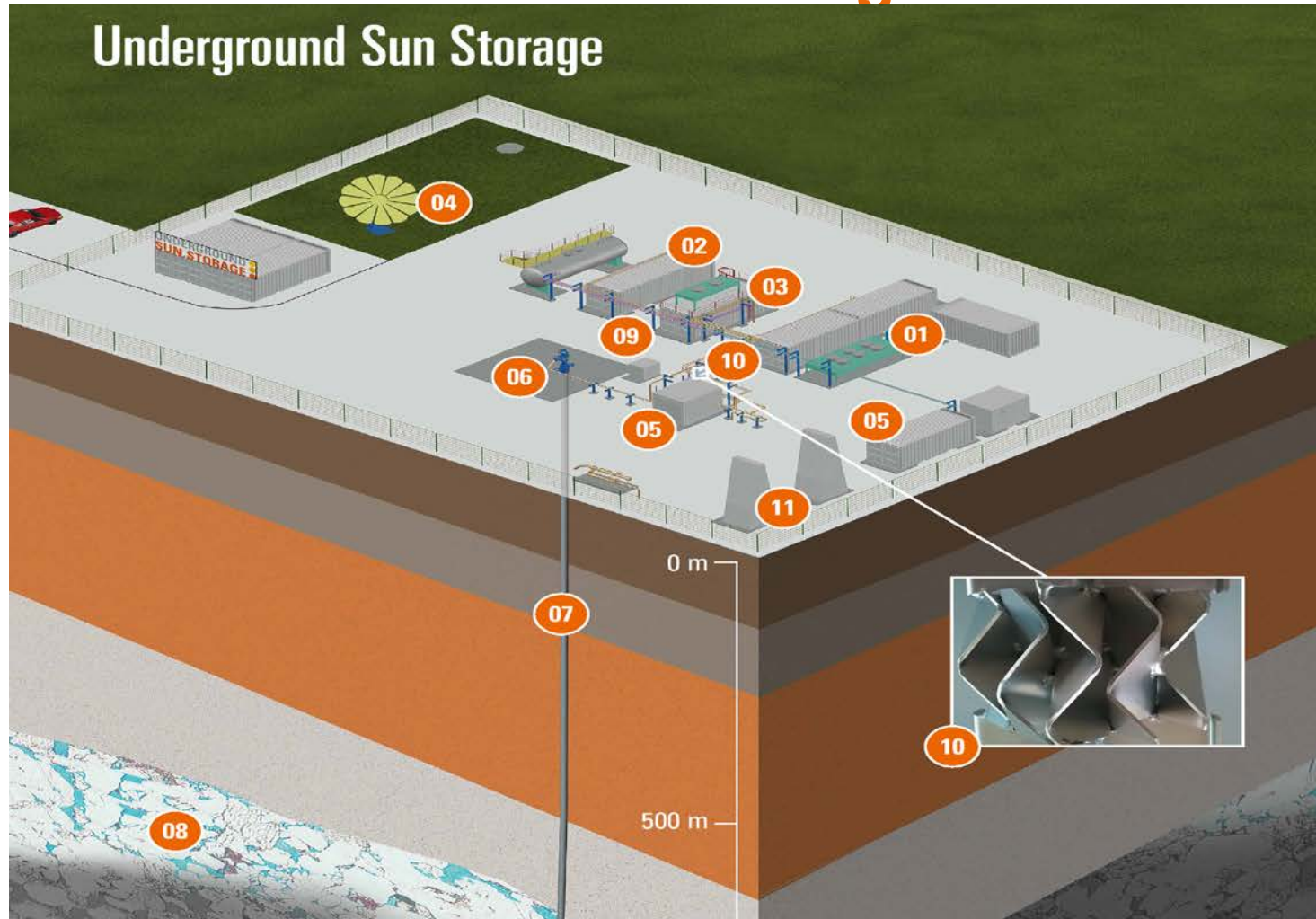


## Power to Gas: Linking the Infrastructures





## Schematic View – Underground Sun Storage



- 01 Elektrolyse | Electrolysis**  
Wasserstoffproduktion, 600 kW, 100 Nm<sup>3</sup>/h  
Hydrogen production unit, 600 kW, 100 Nm<sup>3</sup>/h
- 02 Membranmodul | Membrane unit**  
Abtrennung H<sub>2</sub>, Polymer-Hohlfasermembran  
Separation of hydrogen, Polymer hollow fibre membrane
- 03 Verdichter | Compressor unit**  
3-stufiger Kolben-Verdichter mit Elektromotorantrieb, 130 kW  
3-stage reciprocating compressor with electrical drive, 130 kW
- 04 Solar-Blume | „Smartflower“**  
Photovoltaik-Anlage, 2,3 kWp, 2-achsige Nachführung  
Photovoltaics unit, 2,3 kWp, 2-axis autotracking
- 05 Steuerung/EMSR | Control system**  
Prozessüberwachung, Prozesssteuerung  
Process monitoring system, Process control
- 06 Sonde | Well**
- 07 Bohrung | Borehole**
- 08 Lagerstätte | Reservoir**
- 09 Gas Chromatograph | Gas chromatograph**  
Gasanalyse für Wasserstoff Bilanzierung  
Gas analysis for hydrogen balancing
- 10 Statischer Mischer | Static mixer**  
3 Mischelemente, Länge 0,5 m  
3 mixing stages, length 0,5 m
- 11 Stromversorgung | Power supply**  
30 kV Trafo, 1,1 MW Anschlussleistung  
30 kV Transformer, 1,1 MW primary power supply



# UNDERGROUND SUN.STORAGE

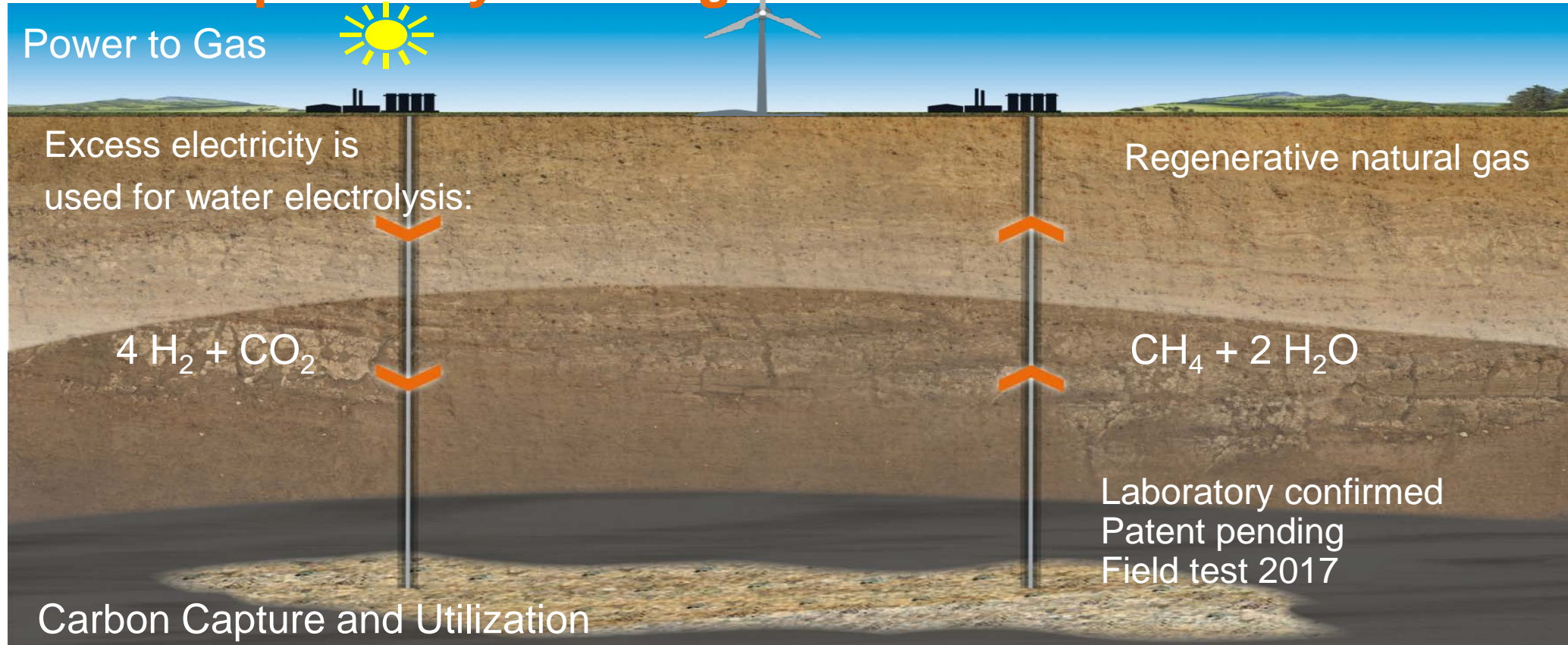
## Impressions Underground Sun Storage Facility





# UNDERGROUND SUN.STORAGE

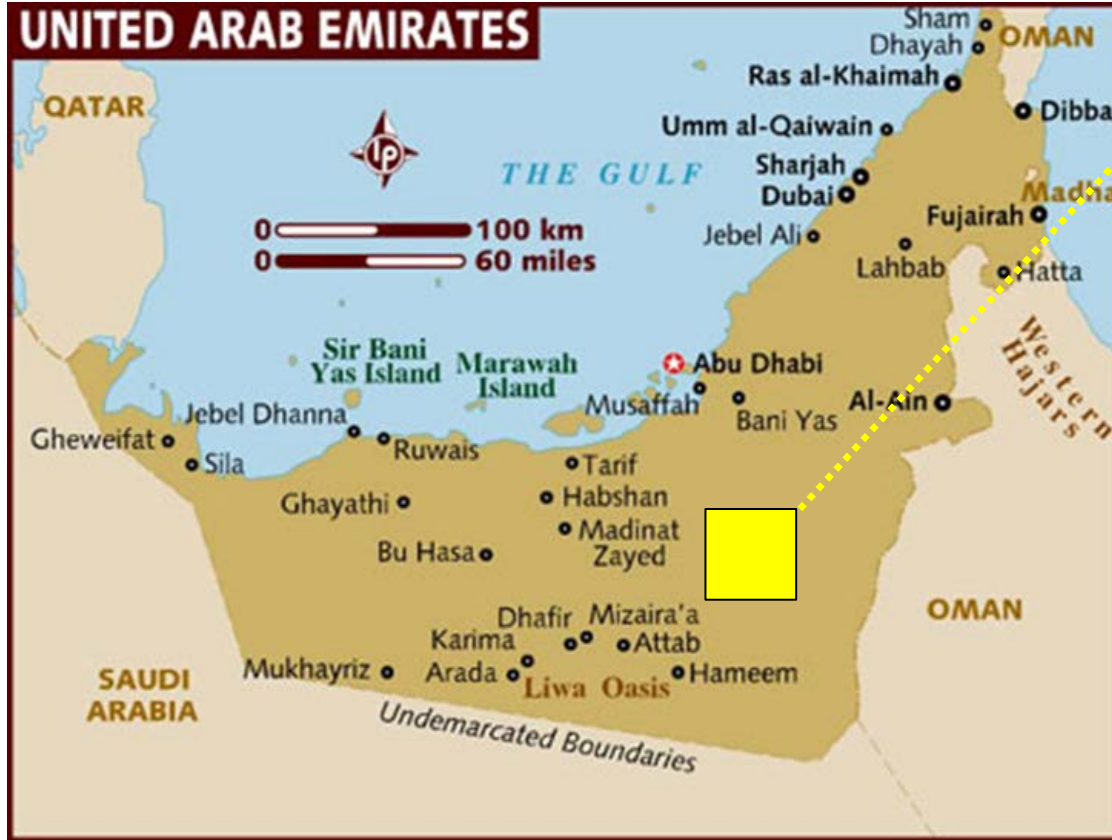
## Follow up activity: Underground Sun Conversion



- **Endemic Microbial reaction within the reservoir**
- Could possibly convert a single way system into a sustainable circle
- Storability of green energy and utilization within existing infrastructure

# UNDERGROUND SUN.CONVERSION

## Vision for United Arab Emirates



- Theoretically 2.5% of UAE territory covered with solar panels to substitute fossil fuel consumption
- Export of renewable energy using existing logistics
- Greening of energy exports by adding shares of renewable hydrocarbons
- Sustainable utilization of hydrocarbon reservoirs
- Establish cooperation at early stage of technology development

## Underground Sun Storage – Contact

- Stephan Bauer; Manager Power to Gas  
(+43-50724-5377; [stephan.bauer@rag-austria.at](mailto:stephan.bauer@rag-austria.at))
- [www.underground-sun-storage.at](http://www.underground-sun-storage.at)



Thank you for your kind Attention!