



## Project partners



The project will receive funding from the Austrian Climate and Energy Fund established by the Ministry for Transport, Innovation and Technology, as part of its energy research programme.



## Company RAG

RAG Austria AG is a long-established innovative energy company. Its core business is gas storage, and it uses its extensive expertise in underground operations to develop sustainable energy solutions for the future. In particular, RAG develops new energy technologies through research into and production of renewable gas.

With storage capacity now totalling around 6 billion cubic metres, RAG makes a major contribution to security of supply in Austria and Central Europe as a whole, and is one of Europe's biggest storage operators.

RAG is clearly focused on gas, an energy form that is highly versatile and has a bright future. Conventional natural gas, which will play an indispensable role in energy supplies in the future, is only one aspect of this focus. The other comprises green gas – such as synthetic gas produced using power-to-gas technology or other biogas (or biomethane). Gas already has a broad range of applications, underpinning safe, efficient and sustainable supplies of energy: gas is used to generate electricity and heat, and in transportation as compressed natural gas (CNG) and liquefied natural gas (LNG).



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**UNDERGROUND  
SUN.CONVERSION**



# Underground Sun Conversion

Refining renewable energy

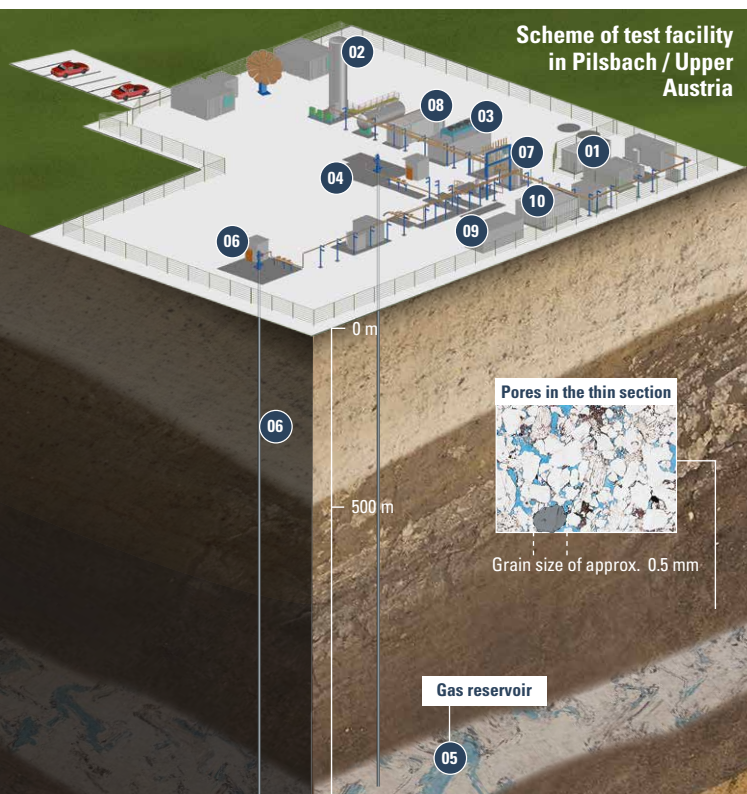




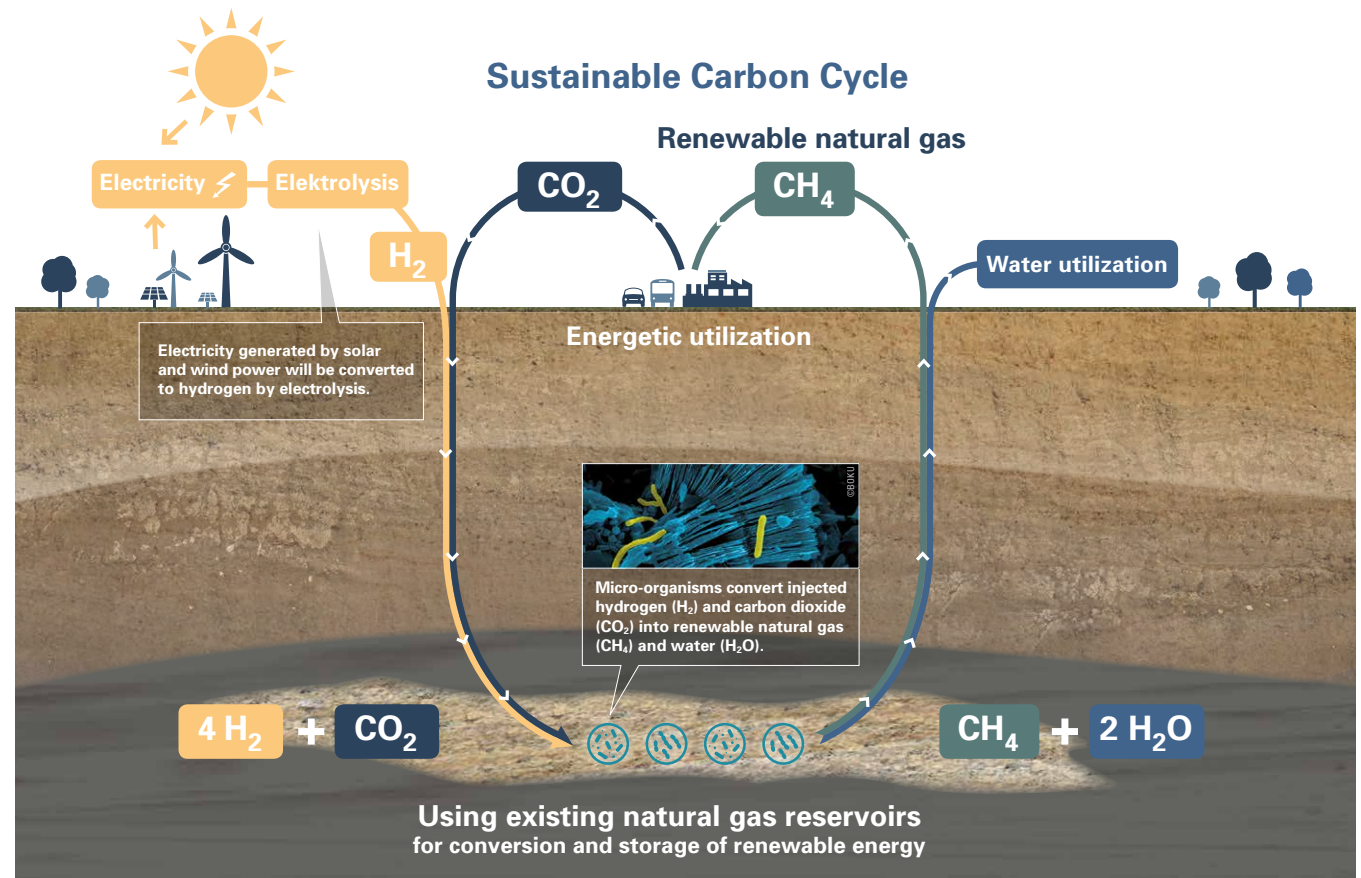
## Concept

Over 1,000 metres below the ground – where natural gas was formed millions of years ago – renewable natural gas production will be investigated for the first time using a microbiological, environmentally friendly process. The aim of the RAG-initiated project is to carry out research on producing large quantities of renewable gas, using a carbon binding process, and storing it in naturally formed gas reservoirs, which will provide urgently needed flexibility for renewable energy sources.

This innovative method is unique worldwide, and recreates the natural process by which gas originates.



## Sustainable Carbon Cycle



This environmentally friendly process has three major advantages:

- CO<sub>2</sub> neutral – sustainable carbon cycle**  
 Renewable natural gas is carbon-neutral when it is used, because carbon dioxide is introduced and captured in the production process. This creates a sustainable carbon cycle.
- Renewable energy becomes storable on a TWh-scale**  
 Solar and wind power output fluctuates seasonally and due to changing weather conditions, meaning that production cannot be adjusted to demand. The problem of storing renewable energy is solved by converting it into renewable natural gas.
- Existing infrastructure is used**  
 Infrastructure already in place can be used for the natural production process, as well as for underground storage in natural gas reservoirs, and environmentally friendly transportation to consumers.

## Project description

Hydrogen, produced from solar or wind energy and water in an above-ground facility, will be injected together with carbon dioxide into an existing (porous) natural gas reservoir in Pilsbach / Upper Austria. At a depth of over 1,000 metres, in a relatively short time naturally occurring microorganisms convert these substances into renewable natural gas which can be stored in the same reservoir, withdrawn as needed at any time, and transported to consumers via the existing pipeline network. A further objective is to test whether the outcomes can also be achieved at many other reservoirs all over the world. The research project with its scientific field tests will take until 2021.

Further information:  
[www.underground-sun-conversion.at](http://www.underground-sun-conversion.at)