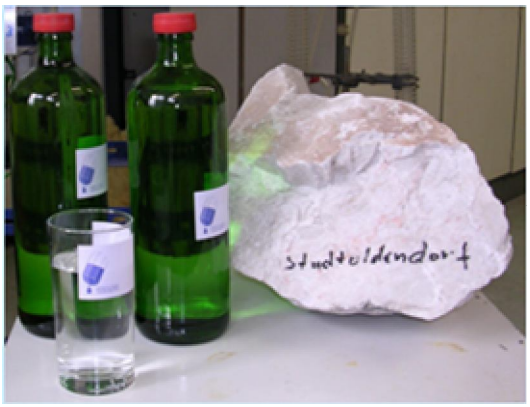
Mining water from gypsum with solar heat:

A possibility to green the desert and produce building material in one go.

One cubic meter of gypsum contains approximately 426 litres of pure water. This crystalline water is released when the gypsum is heated up to temperatures of 90 degrees Celsius. Gypsum formations on earth contain one of the world's largest reserves of potable water. This huge potential of water has never been exploited so far. Water extracted from gypsum formations in dry areas can turn deserts into green fields. Laboratory tests and analysis showed that potable water can be produced, which meets all standards for drinking water. The final report emphasizes that all conditions are favourable to start a pilot in arid countries.



Presence of gypsum formations and heat

One can find gypsum formations at inland locations in many African and Arab countries. Libya, Mauritania, Oman, Jemen,and Jordan are examples of countries where millions of cubic metres of (almost) pure gypsum are available, at or just below the surface. In this respect gypsum formations can be considered as large natural water supplies. While flare gas could be used to provide the heat for dewatering the gypsum, there is another source of energy which is always available in the desert: solar radiation.

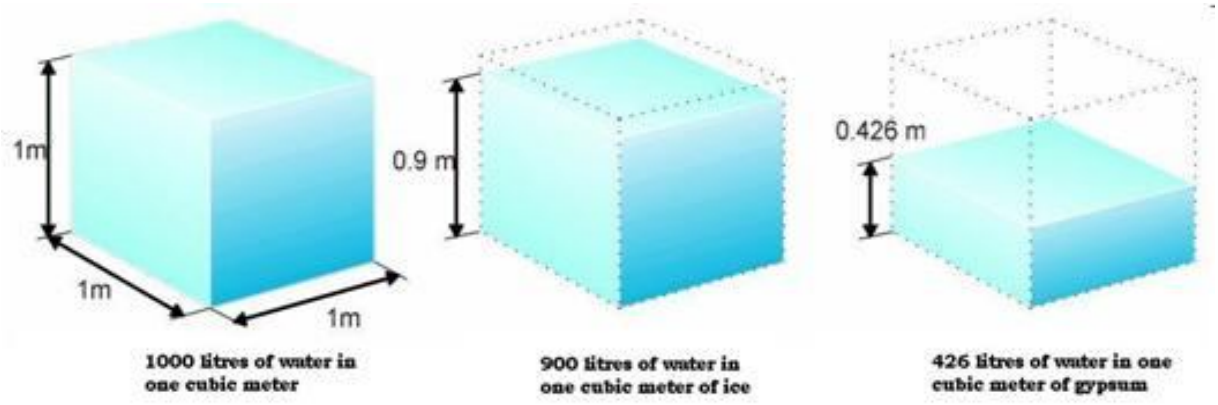
Harnessing solar heat: the sustainable way to proceed

Solar radiation, which is available in abundance in Oman, will be concentrated by means of mirrors in order to provide the necessary heat. In addition electricity will be generated, making the overall system a fine example of a clean energy system through multi-commodity generation. The mirror system is developed by SOLAq, a Dutch company that designs and manufactures solar mirrors.

The work which has been carried out sofar is very promising. A model has been developed to simulate the introduction of heat energy into the raw gypsum. We have been able to capture water from the samples simply by inserting a soldering iron into the gypsum samples. In this manner water has been extracted from gypsum samples from European and African countries. Analysis shows that the quality of the water meets Dutch drinking water standards. The final report shows that the setup heat supply requires careful consideration. A patent which protects the idea has been granted.

But there is more: production of plaster of Paris building material

Perfect Plaster of Paris building material can be produced in the process. In our tests we discovered that dehydrating (dewatering) of gypsum at moderated temperatures during controlled conditions, liberates ¾ of the water, leaving a perfect building material, famous and used since ancient times, currently known as Plaster of Paris ($CaSO4.1/2\ H_20$)



The next step: a large scale field test

We propose a large field test in a desert area with suitable layers of gypsum available.The size of the project is such that about 5 tons of gypsum will be processed per day. A project proposal for such a large-scale test has been worked out by a professional team, using all available data. We are looking for financial support to set up a pilot.

Deliverables

We have full confidence that the large scale test will verify the laboratory results. The enormous water reserves from the gypsum formations can be used to solve the water problem in desert areas and produce building material at the same time, making use of the sun which is always available.

Contact:

Drs. Peter van der Gaag

Holland Innovation Team
Korte Hoogstraat 15-B
NL-3011 GJ Rotterdam
The Netherlands

Phone: +31 10 2417248
Fax: +31 10 2417354
Mobile: +31 6 55366010

Web: www.hollandinnovationteam.nl
Mail: pvdgaag@hollandinnovationteam.nl