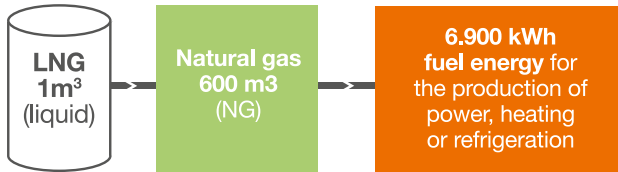


## Potential savings

Regasification only through atmospheric evaporator



Regasification according to the Eco ice principle



+

Cold energy  
**66 kWh**  
at -50°C  
or **79 kWh**  
savings in  
electricity

+

Savings of  
about **46 kg**  
on **CO<sub>2</sub>**  
and **190 kWh**  
on fossil fuels  
(primary  
energy)

## Contact

We are at your disposal for further information.



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Put a big freeze  
on your spending

Environmental and efficient use of cold  
energy resources through regasification  
in LNG satellite storage systems



Natural gas can be converted from gas into a liquid state at atmospheric pressure, after it cools down to  $-162\text{ }^{\circ}\text{C}$  and after dissipating the heat of condensation. The decisive outcome of this production of liquefied gas - LNG (Liquefied Natural Gas) results in the reduction of its volume to six hundredth of the original value at 1.013 bar and  $15\text{ }^{\circ}\text{C}$  (standard conditions according to ISO 13443).

This makes it possible to store natural gas and to transport it over long distances. At the end of this cycle, the gas is often stored in a so-called satellite system, a double-walled, vacuum-insulated LNG storage system.

The potential for using this valuable exergetic cold energy, (which is present in the LNG in those satellite systems besides its fuel energy), is something that has been ignored completely in the past. However, there will be a significant growth in demand for this.

Until now, satellite systems normally use an atmospheric evaporator for regasification, which means that the possibility to recover the valuable cold energy is not exploited. This should be different in the future, as there are considerable economic and environmental benefits to be gained from using this type of recoverable resource.

Conventional refrigeration, requires about 1.2 kWh of electrical energy per kWh to produce the most valuable cold energy, which is available through regasification of LNG at low temperatures.

For this amount of energy, 2.9 kWh (based on the German electricity mix) exhaustible primary energy must be used, while simultaneously 0.69 kg climate-relevant  $\text{CO}_2$  are emitted.

Kälte-Klima-Sachsen GmbH, which is a partner company of Eco ice Kälte GmbH, conducted a research project in 2014 funded by the Development Bank of Saxony (Sächsische Aufbaubank) to develop a method for the technical and commercial exploitation of the cold energy potential contained in LNG. In 2015, a pilot facility was built, which produces 3,3 kW of refrigerating capacity of  $-50\text{ }^{\circ}\text{C}$ , extracting  $30\text{ m}^3$  NG from the system.

To recover cold energy that is released during the LNG regasification process, two coolants are used.

In the future, the Eco ice Kälte GmbH in partnership with the PRIMAGAS Energy GmbH & Co KG will offer products that will supply the customers' energy need of electricity, heating and cooling purposes, while meeting the requirements for energy efficiency and environmental compatibility.

