



**Dantherm Power**  
Fuel cell solutions for heat and power



# Dantherm Power

Since 2003 Dantherm Power has focused on the development and production of solutions using hydrogen and fuel cell technology. Today we market and sell highly efficient backup power units for the telecom sector, and we are currently testing and demonstrating Micro Combined Heat and Power units, which will be a major source of heat and power production in the near future.

Hydrogen powered solutions is a fairly new concept, but already now telecommunication suppliers around the world are replacing battery operated backup units with fuel cell based power supply solutions from Dantherm Power.

Fuel cell based Micro Combined Heat and Power solutions for private households and small-scale industry are soon ready for production. – And the ball doesn't stop there.

At Dantherm Power we believe in initiative and we will continue to focus com-

mitedly on hydrogen powered fuel cell solutions to replace traditional energy conversion technologies e.g. combustion engines, batteries etc.

## **Environmental benefits**

Fuel cells are electrochemical units, producing electricity and heat from hydrogen fuel and oxygen. The process is virtually pollution free producing no harmful substances.

With governments and international organisations focusing on global warming issues clean hydrogen technology

is bound to become a major source of heat and power in the near future. Dantherm Power fuel cell solutions are designed to run reliably and efficiently on gaseous hydrogen, alcohols, biofuels or reformed fossil fuels like oil and natural gas.



# Uninterruptible Power Supply

Dantherm Power offers compact and modular fuel cell based power supply solutions with integrated power and thermal management for telecom and IT networks. Launched in 2005 Dantherm Power solutions are providing uninterruptible power supply to networks around the world.

In the modern world we are very dependent on well-functioning telecom and IT networks. Therefore a steady and reliable power supply for the supporting infrastructure is crucial.

Even a short local power failure can take out large proportions of the entire network. To avoid this telecom and IT networks base stations are equipped with backup power solutions. The most common backup is based on traditional batteries taking over when the main power fails.

## Immediate response

The advantages of replacing battery powered backup with fuel cell based technol-

ogy are quite obvious. The compact and modular power supply units marketed by Dantherm Power takes up only a fraction of the space needed for batteries providing the same backup time. A standard commercial 50 ltr bottle of gaseous hydrogen yields about 9 kWh backup. The fuel cell contains no harmful substances. Therefore, when disposed of, the environmental impact will be minimal, compared to lead acid batteries and other traditional solutions.

The power supply unit takes over immediately in case of power failure and provides constant power as long as hydrogen is available.

Dantherm Power provide solutions according to specific customer requirements including integrated power and thermal management. The next generation power supply will soon be available with extended runtime achieved via conversion of methanol and water into pure hydrogen on site.



## Supported networks

Telecommunication networks:

UMTS, GPRS, TETRA, etc.

IT networks:

Fixed and wireless broadband





# Your own private heat and power plant

Imagine a complete heat and power plant the size of a common refrigerator providing all the electricity and heat needed by a normal household or a small-scale industry. Developing this – the energy solution of the future – and making it available for end consumers at a competitive price level is a major part of our everyday efforts at Dantherm Power A/S. We are pleased to announce that the products will soon be available in the market.



A commercial solution is already well on the way from Dantherm Power. In 2009 the first Micro Combined Heat and Power units will leave our production facilities in Skive, Denmark to be installed at selected end consumers participating in a number of groundbreaking Danish demonstration projects.

Several different Heat and Power units capable of running on either pure hydrogen or biogas/natural gas are currently undergoing the final test phases in our labs. Units capable of running on other fuels such as bio-alcohols will follow right after.

At Dantherm Power we are convinced that it is only a matter of time before the

world realize the potentially enormous advantages of decentralized heat and power production based on hydrogen and fuel cell technologies. The environmental implications are obvious. Fuel cells running on hydrogen emit no CO<sup>2</sup> nor polluting particles. They contain no substances harming the environment. The only by-product from the production of electricity and heat is water.

### Economic benefits

The environment is however not the only beneficiary of the fuel cell solution. It will significantly increase the energy efficiency, as opposed to currently available solutions, when Micro Combined Heat and Power units are installed in private households, small apartment blocks, and

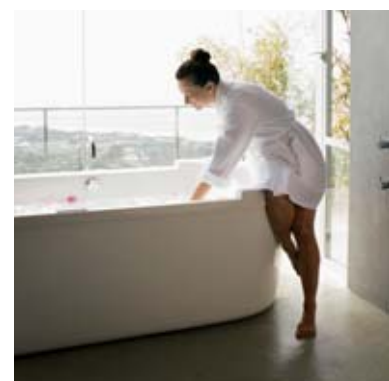
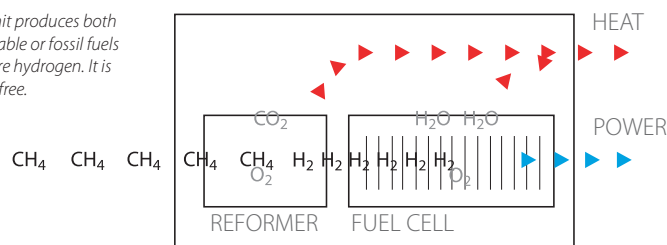
small-scale industry. This means lower fuel costs for the end users. Globally total energy consumption will drop due to higher efficiency and better utilization of our available resources. Decentralization of the heat and electricity supply can also minimize the future investments necessary for enlargement of our power and district heating networks.

This is why Dantherm Power has decided to develop and demonstrate Micro Combined Heat and Power units.

**We will be ready when you are!**

### Reforming and PEM conversion process

*A Micro Combined Heat and Power unit produces both heat and power from reformed renewable or fossil fuels e.g. natural gas or from a source of pure hydrogen. It is highly efficient and virtually pollution free.*





## Dantherm Power - a company you can trust



Dantherm Power A/S is a subsidiary of Dantherm A/S located in Skive, Denmark.

Since 1958 Dantherm A/S has built a solid reputation as a trustworthy supplier dedicated to constantly setting new standards for customized solutions, support and customer relations.

Dantherm Power focuses on the commercial exploitation of fuel cell techno-

logy. From development and production, to sale and support of complete solutions to customers within the telecom industry, defence, relief organisations and others who need backup power solutions and mobile power supply equipment.

Dantherm Power also commit major R&D resources to the development of new fields in which the hydrogen and fuel cell technology is expected to become

commercially profitable in a few years, such as Micro Combined Heat and Power units aimed at private households.

**Focus. Trust. Initiative.** These are the keywords to the way we do business. They are your guarantee that Dantherm Power A/S is your most reliable partner when it comes to development and production of customized solutions based on fuel cell technology.

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