# Network stability through a green gas network

With an increasing proportion of fluctuating power feed-in, stabilizing the power grid becomes more and more complex. The current practice of stabilizing electricity with fossil shadow power plants is already reaching its limits. The previously proposed methods for solving the problem are expensive and/or wasteful.

Against this background, a solution is presented that is neither expensive nor wasteful.
The proposal is to produce hydrogen from biomass and feed the hydrogen into a pipeline network. Fuel cell heating systems are located in this green gas network. Fuel cell heaters consist of fuel cells, a heat accumulator and immersion heaters in the water circuit. Fuel cells in the hydrogen network are highly dynamic and enable power changes from 0 to 100% in microseconds. Fuel cells will replace gas burners in the future and are hardly more expensive than them. Fuel cells have a typical electricity efficiency of 60% and an overall efficiency of more than 100% when used for space heating (condensing technology).

Due to the enormous electricity surplus for almost every end consumer, it is a heat-led regional energy industry in which a large part of the electricity has to be converted into heat. Since hydrogen from biomass is expected to be cheaper than natural gas, the heat supply is also covered by fuel cells.

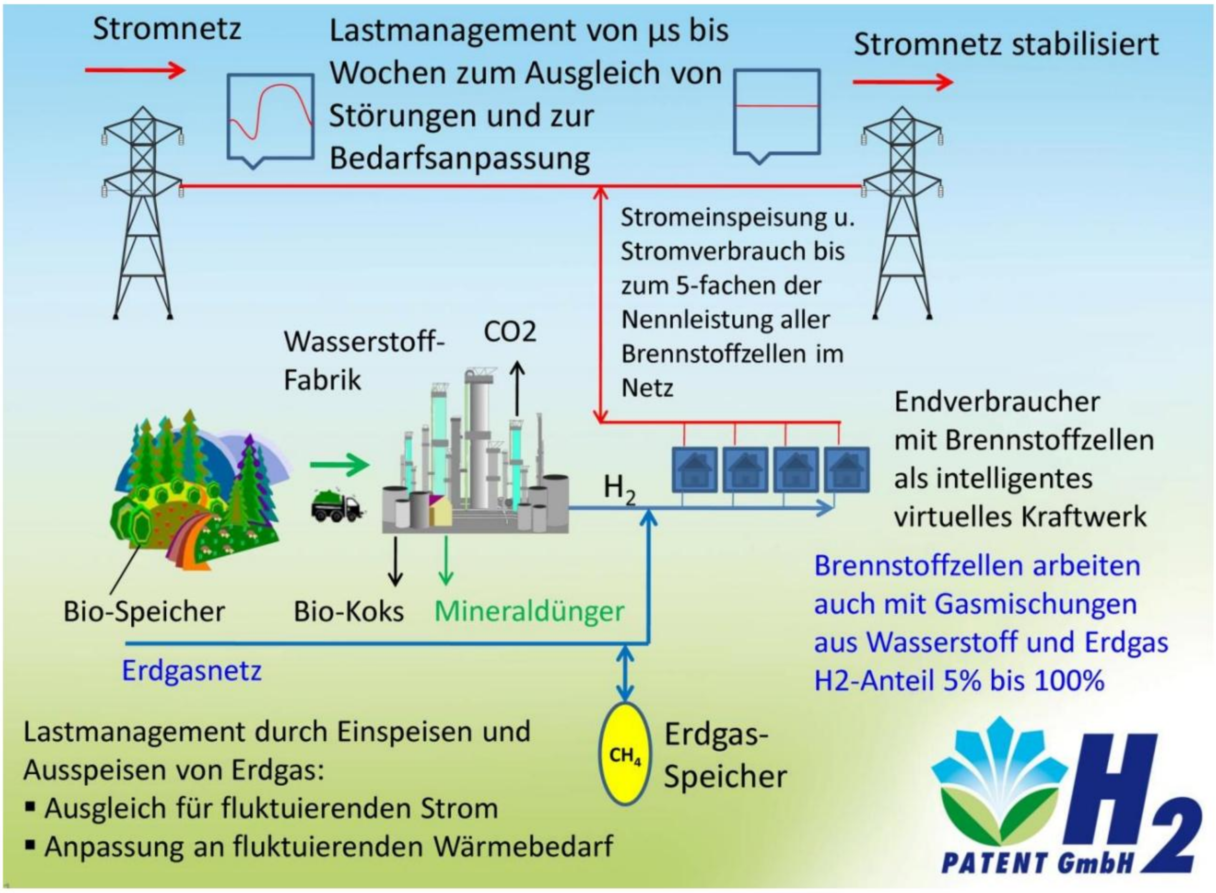
Therefore, a fuel cell with approx. 10 kWel is installed in a typical household with an average consumption of 0.5 kWel , which has a heat requirement of approx. 20 kW in winter
can cover. When there is a demand for electricity in the grid, this fuel cell can use up to 5 times its
Rated output, i.e. 50 kWel , into the grid. The duration of this overload depends on the time of year and the size of the integrated heat accumulator. If there is excess electricity in the grid, the fuel cell can be switched off. The hydrogen is then stored by building up pressure in the network and in the integrated storage caverns. If there is a strong oversupply of electricity, up to 50 kWel can be drawn from the power grid for heating purposes. In this way, the model household with a fuel cell heating system can generate 100 times the

average power consumption and 100 times the average
deliver power generation.

For example, a virtual power plant that is supplied by a 100 MW hydrogen factory can compensate for peaks of around +/- 5 GW.

This means that even a few hydrogen regions enable more than 50% fluctuating electricity to be fed in - without any additional costs arising as a result. The basic properties of the concept proposed here can also be achieved with mixtures of natural gas and hydrogen.

Put simply, the principle is to smooth out the fluctuations in the electricity grid by diverting these fluctuations to the gas grid.




## Network stability through bio-hydrogen in the natural gas network


H2 Patent GmbH
PO Box 13 61
D-49182 Bad Iburg

Telephone: 05403-7 24 42 77

Fax: 05403-7 24 42 79

Email: info@h2-patent.eu


If you have any questions about the technology, you can also contact the head of development, Mr. Tetzlaff, directly: tetzlaff@h2-patent.eu Phone +496195 960813


District Court of Osnabrück, HRB 202725
Personally liable partner: H2-Patent GmbH, district court Osnabrück HRB 202725
Management: Hubertus Rau / Hayo Sieckmann