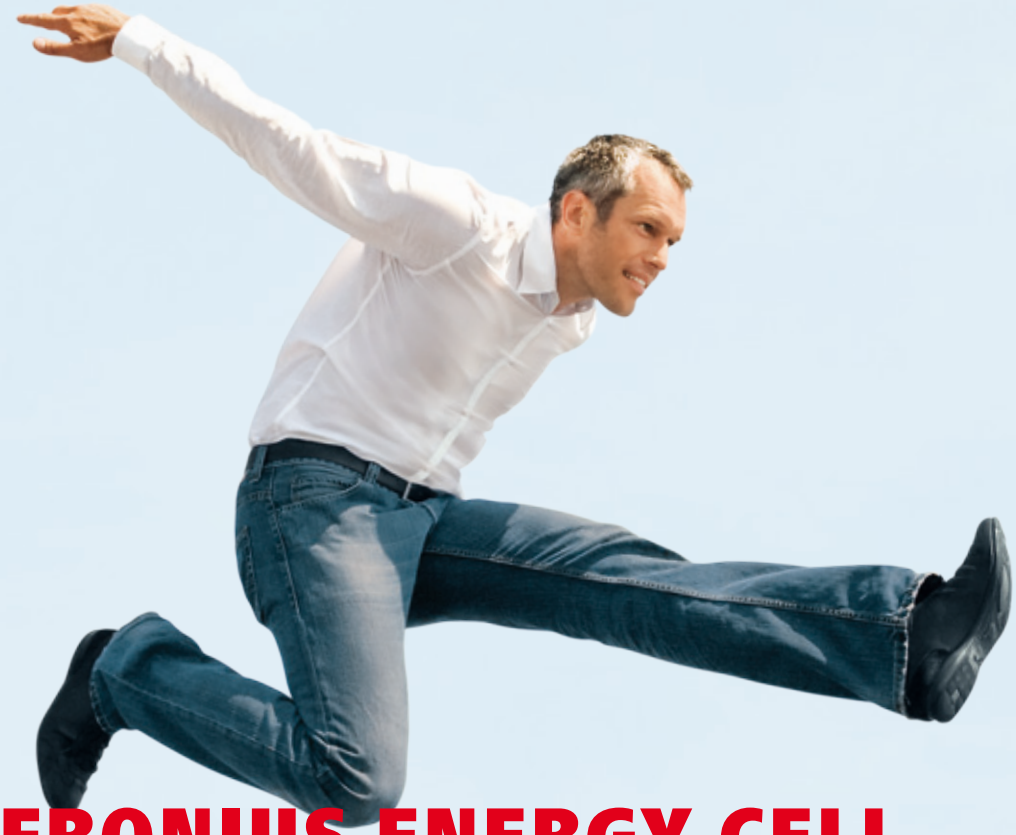
/ Battery Charging Systems / Welding Technology / Solar Electronics

Fronius

SHIFTING THE LIMITS



THE FRONIUS ENERGY CELL

/ Clean energy – reliable energy.

/ Every day, we work hard to realise our vision: to fully utilise renewable energy and promote energy self-sufficiency. As the leading producer of inverters, Fronius is constantly shifting the limits of what's possible with its innovative solutions. It all started with the idea of finding a way to use the sun's energy all year round and at any time of day. The problem with this idea was how to store the energy effectively. What we finally came up with is nothing less than a revolution in energy supply: the Fronius Energy Cell.

WE THRIVE ON CHALLENGES, SO WE DECIDED TO REVO-LUTIONISE THE ENERGY SUPPLY OF OUR PLANET.

THE ENERGY CONCEPT OF THE FUTURE: STORING SOLAR ENERGY IN HYDROGEN.

/ To date, the options for storing excess solar energy have been very limited or even non-existent. Conventional batteries are susceptible to self-discharge and can only store a relatively low level of concentrated energy. This is not the case with the Fronius Energy Cell, which stores energy produced in the summer right through to the winter. The result is a sustainable, independent and intelligent power supply.

SUSTAINABLE

/ Environmentally friendly system for storing excess solar power by converting it into hydrogen.

INDEPENDENT

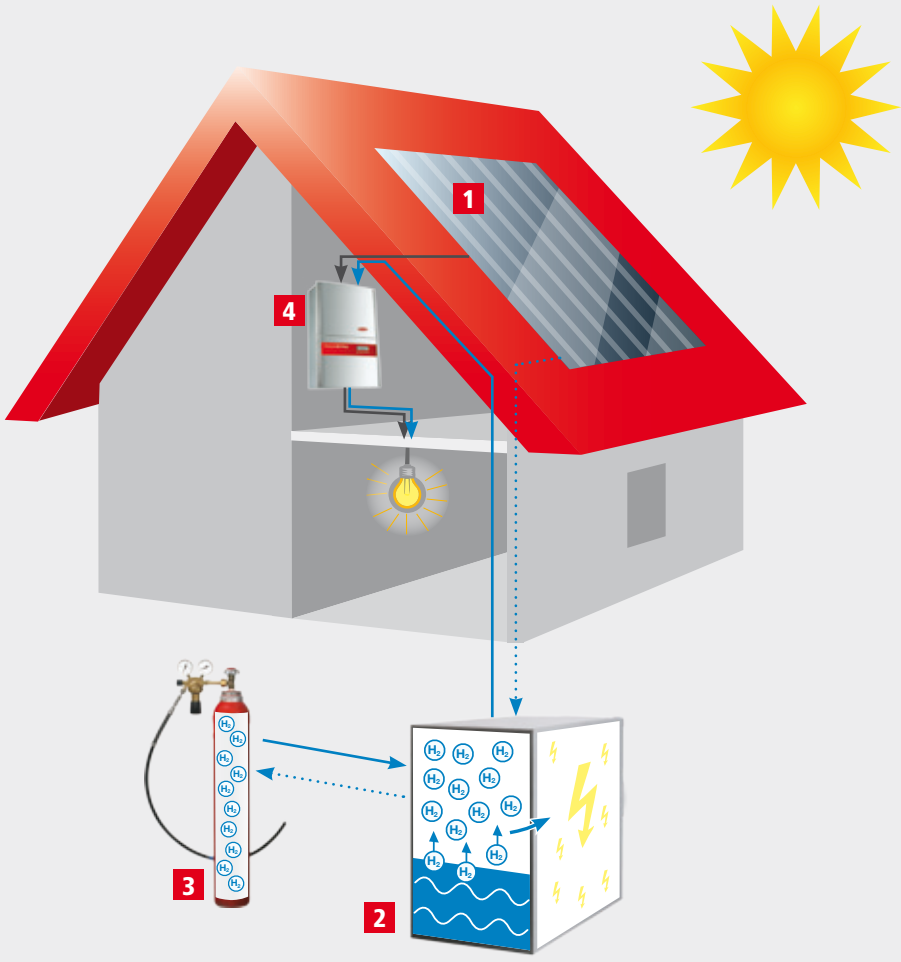
/ Solar energy is efficiently stored and is reconverted into power when needed. Power from solar energy is therefore available all year round and at any time of day.

INTELLIGENT

/ Energy is stored and can be used when required.

AN EFFICIENT AND CLEAN ENERGY CYCLE.

/ A smart concept: solar energy that can be used immediately as electrical current or made available for use at a later date.



HERE'S HOW IT WORKS:

/ The Fronius Energy Cell is a complete system of renewable energy generation and storage. The final version will fulfil two roles - the electrolysis function and the fuel cell function. The PV system (1) converts sunlight into direct current. One of two things may now happen: either it is converted into alternating current by the inverter (4) and fed to the consumers. Or, if there is no demand for energy at that time, the Fronius Energy Cell (2) uses the solar power to break water down into oxygen and hydrogen (electrolysis function of the energy cell). The hydrogen is then stored temporarily in a cylinder (3). The fuel cell function of the Fronius Energy Cell allows the stored hydrogen to be converted back into electricity (2) when it is needed, i.e. when no power is being generated by the solar modules. The result is clean, zero-emissions energy that is available for use at all times. The fuel cell function of the Fronius Energy Cell is now ready for series production and has already been successfully deployed in a variety of applications. The electrolysis function will be integrated in the full version of the Fronius Energy Cell.

Direct consumption of the electricity generated

Converting the electricity into hydrogen so that it can be used later

Conversion of hydrogen into power as and when required

1 *Photovoltaic system*
2 *Fronius Energy Cell*
3 *Hydrogen storage system*
4 *Inverter*

THE FRONIUS ENERGY CELL IN DETAIL.

/ The Fronius Energy Cell is the world's first TÜV Süd-certified hydrogen-powered fuel cell system. It is reliable, produces no emissions and is easy to operate and maintain.

THE ADVANTAGES:

/ Compared with diesel-powered back-up systems, the Fronius Energy Cell is a zero-emissions, low-noise and low-maintenance system with a high level of overall efficiency. A further benefit of hydrogen storage over battery-dependent systems is the high level of concentrated energy (conventional lead batteries are around ten times bigger and heavier). In addition, hydrogen storage is not susceptible to self discharge.

THE FRONIUS ENERGY CELL ON THE INTERNATIONAL STAGE.

/ Whether stationary or mobile – the Fronius Energy Cell allows solar energy to be put to use in hundreds of practical ways. Here are a few examples:

USE OF THE FRONIUS ENERGY CELL IN STATIONARY APPLICATIONS.

CENTRE FOR RENEWABLE ENERGY IN SULECHÓW:

/ In January 2011, a stationary Fronius Energy Cell 25F was installed at the centre for renewable energy at the technical university in Sulechów, Poland. Engineers specialising in alternative energy technology will in future be trained at the centre. For this reason, a training laboratory was built as part of an EU development programme. In addition to the Fronius Energy Cell, the laboratory will also have a thermal pump, a microturbine, a photovoltaic system and wind generators.

WSW ENGINEERING S.R.O.:

/ In June 2010, the first two series production Fronius Energy Cells were sold to WSW Engineering S.R.O., one of the biggest PV dealerships and project development companies in the Czech Republic. One of the Fronius Energy Cells is being used for research purposes at the company's Czech development facility. The other is employed for demonstration purposes in its sales office. At the development facility, experts simulate a PV system and use the fuel cell to analyse the system as a whole. It is hoped that the system will be within the reach of the public at large in a few years, allowing society as a whole to reduce its dependence on fossil fuels.

USE OF THE FRONIUS ENERGY CELL IN MOBILE APPLICATIONS.

THE HYLOG PROJECT:

/ Fronius demonstrates zero-emissions and efficient logistics operation as part of the HyLOG (Hydrogen Powered Logistic System) pilot project. Logistics vehicles at the Fronius site in Sattledt now run on environmentally-friendly hydrogen instead of electrical power. The main benefits are the rapid refuelling (batteries take 8–10 hours to charge) and the doubling of the range of the vehicles and the amount of concentrated energy.
Fronius produces the hydrogen used to power the HyLOG vehicles itself and for the electrolysis process uses solar power generated by a 615 kW PV system on the roof of the building. The hydrogen is stored temporarily and a special refuelling station infrastructure allows the logistics vehicles to be refuelled. The fuel cell drive integrated in the vehicle converts the hydrogen into power for the vehicle. The project won the World Energy Globe Award in 2007.

FRAUSCHER BOATYARD:

/ Fronius and its two partners, Frauscher and Bitter, have developed the world's first production-ready electric boat powered by hydrogen technology. The cost benefits compared to a conventional battery-powered boat lie in the fact that charging time is reduced to zero, while the range of the boat is doubled without any drop in performance.

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS.

/ What Günter Fronius started in 1945 in Pettenbach, Austria, has now become a modern day success story. Today, the company has more than 3,000 employees worldwide and owns 737 active patents. Since the very beginning, our goal has not changed: to be the technology and quality leader. We shift the limits of what's possible. While others progress step by step, we innovate in leaps and bounds.

BATTERY CHARGING SYSTEMS

/ We started a technological revolution with Active Inverter Technology and are now one of the leading suppliers in Europe. We are driven by the aim of providing intelligent energy management systems that ensure mobility stays as economically viable as possible in the twenty-first century.

WELDING TECHNOLOGY

/ We develop welding technologies, such as entire systems for arc and resistance spot welding, and have set ourselves the task of making impossible weld joints possible. Our aim is to decode the »arc welding's DNA«. We are the technology leader worldwide and the market leader in Europe.

SOLAR ELECTRONICS

/ The greatest challenge of our time is to make the leap to a regenerative energy supply. Our vision is to use renewable energy to achieve energy independence. With our mains-connected inverters and products for monitoring photovoltaics systems, we are now one of the leading suppliers in solar electronics.

v03 2011 EN

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

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