



Stored Solar is developing a stand-alone solar power station for domestic and small-scale users to provide 24 hour, all-year-round energy with complete grid independence.

[Home](#)

[Energy System](#)

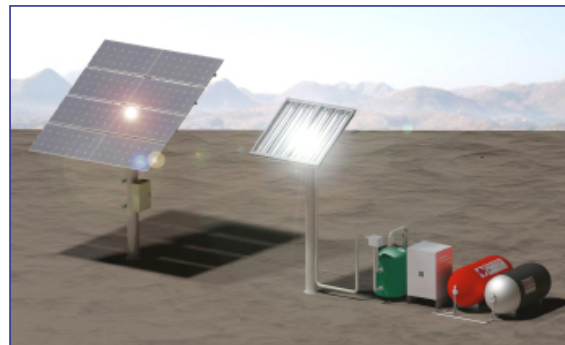
[Company](#)

[Resources](#)

The Stored Solar Energy System



The Stored Solar Energy System can be optimized to provide a bespoke balance of hot water, electricity and gas with appropriate storage to accommodate the varying sunlight and weather conditions in your location. The size and cost of the systems will vary, depending on the strength and duration of the solar input. Our careful choice of the solar capture devices coupled with the most appropriate amount of storage will provide the lowest cost solution. The modular system is designed to harvest the maximum energy from the sun in any given region. To enable both day and night supply of power, the system principally uses hydrogen gas as a scalable, convenient long-term storage solution.



A typical system showing both PV and Solar Thermal collection panels along with electrolyser and both hydrogen and oxygen storage cylinders. See the Energy System pages for more detail.

Stored Solar Energy System Benefits



Provides true grid independence



Uses the ultimate, most renewable and clean source of energy - The Sun



Is self contained for ease of installation and deployment



Provides a balance of gas, electric and hot water through modular design



Is designed to give the lowest cost solution for each geographic region



Uses integrated storage for 24 hour, 365 day per year supply of energy

[Home](#) | [Energy System](#) | [Company](#)

© Copyright 2008 Stored Solar Limited | [Privacy Policy](#) | [Site Map](#) | [Terms and Conditions](#)



Each stand alone power station is individually configured from modular components and the storage capacity is scaled to compensate for varying insolation levels.

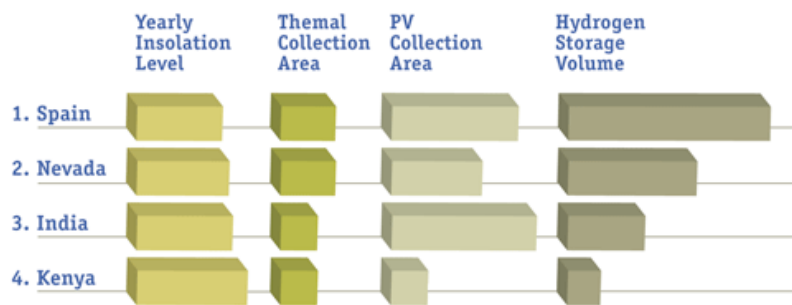
Home	Energy System	Company	Resources
Examples	Hydrogen	Electrolysers	Solar Electrolyser

Power System Comparison: Equal Outputs with Unequal Sunlight

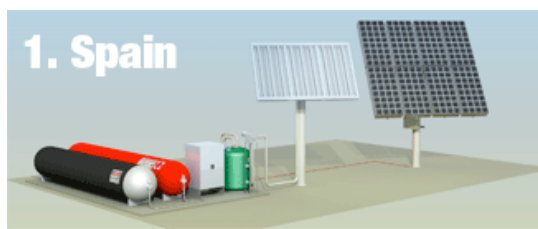
The Stored Solar Power Station is optimized to provide a balance of hot water, electricity and gas with appropriate storage to provide all-year-round energy needs from the Sun. Depending on the strength and reliability of the sunlight in specific locations, a mix of commercially available solar thermal and photovoltaic input solutions are used, coupled with a hydrogen gas generation system, to provide the three main energy requirements. A balance of short term electrical and thermal storage with longer term gas storage is used to provide day-long, year round power.

The modular system is designed to harvest the maximum energy from the Sun at the lowest possible cost and is best suited to countries in the sun-belt. The unit will be self-contained to simplify deployment, installation, operation, safety and maintenance.

The versatility of the modular Stored Solar Power Station is highlighted in the solutions for Kenya, Spain, India and Nevada - each designed to yield equal quantities of electricity, gas and hot water under the varying sun conditions in each location.



In equatorial locations with consistent, strong sun conditions, less solar capture area and less gas storage is required. In Spain with relatively less continual sunlight, more storage is required with significantly more area of PV. Where direct sunlight is prevalent, concentrating optics can be used to minimise system costs.





Hydrogen, when separated from water using clean, renewable energy, is an ideal replacement for fossil fuels. Even when it is combusted, as with natural gas, it emits only water.

Home	Energy System	Company	Resources
System Examples	Hydrogen	Electrolysers	Solar Electrolyser

Hydrogen for Energy Storage

There is no shortage of discussions concerning the worldwide problems created by fossil fuels. Hydrogen, if produced through electrolysis, has can When hydrogen is used in a fuel cell to create power, it is a completely clean technology. The only byproduct is water. There are also no environmental dangers like oil spills to worry about with hydrogen. The elimination of greenhouse gases - If the hydrogen comes from the electrolysis of water, then hydrogen adds no greenhouse gases to the environment.

There is a perfect cycle -- electrolysis produces hydrogen from water, and the hydrogen recombines with oxygen to create water and power in a fuel cell. The elimination of economic dependence - The elimination of oil means no dependence on the Middle East and its oil reserves.

Distributed production - Hydrogen can be produced anywhere that you have electricity and water. People can even produce it in their homes with relatively simple technology. The problems with the fossil fuel economy are so great, and the environmental advantages of the hydrogen economy so significant, that the push toward the hydrogen economy is very strong.

Stored Solar recently gained access to this technology through the acquisition of **Hydrogen Solar's** intellectual property in the area of photo-electrochemical (or PEC, to which it is often referred) production of hydrogen.

An exciting development is the use of solar assisted electrolysis to minimise the electricity required to produce the hydrogen gas in electrolysers so enabling a lower cost solution.

Hydrogen Solar



These examples of early hydrogen vehicles and refueling stations are largely dependant on electricity derived from fossil fuels and as such, do not constitute a viable energy alternative. However, hydrogen produced from renewable electricity such as solar, wind and hydroelectric will enable a clean form of stored energy.

Home	Energy System	Company	Resources
System Examples	Hydrogen	Electrolysers	Solar Electrolyser

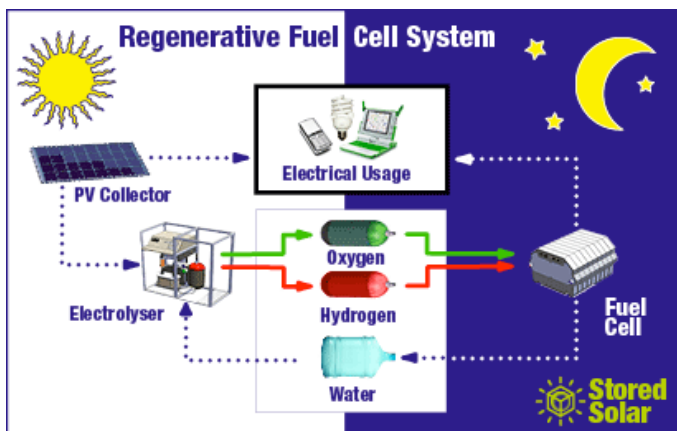
Low Cost, PV Driven Electrolysis

Water electrolysers are well known both at industrial scale and in laboratory applications. Alkaline electrolysers can produce large quantities of gas at relatively high pressure. These devices only become economically attractive at very large scale and are most usually grid-connected although can be powered using significant amounts of photo-voltaics. Laboratory electrolysers used to produce small amounts of highly pure hydrogen are usually based on proton exchange membrane technology (**PEM**) but unit costs are high as they are tailored for high precision applications. However, a number of PV powered lab based PEM electrolysers have been demonstrated using renewable energy sources to power the unit.

Recent innovative advances by companies such as **ITM Power** in PEM electrolyser technology signal a route to low cost, economic hydrogen production at the intermediate scale.

Regenerative fuel cell technology under development in companies such as **Infinity Fuels** is very attractive for PV driven applications. The single device can either be operated in one direction like a PEM electrolyser to generate hydrogen and oxygen from water using electricity supplied to the unit. In reverse, if hydrogen and oxygen are fed into the unit, it functions as a PEM fuel cell producing electricity and water as a by-product. Therefore during intense sunlight and low electricity demand periods the unit can be used to generate gas from the excess power generated from photovoltaics. During periods of high electricity demand and periods of darkness electricity can be generated by using the system in reverse. Thus saving on system parts and integration complexity and leading to much lower costs.

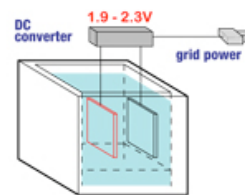
The current range of electrolysers all use high currents with voltages around 2 volts to enable electrolysis to be undertaken. Just as the costs for the electrolyser units decrease, a reduction in the cost of power used to drive the units would also improve the economics. One such way to achieve this is to use solar electrolysis, in which the voltage required to enable the water splitting is reduced and can potentially be dispensed with.



This diagram shows the regenerative system using a separate fuel cell and electrolyser. As described above, these can now be combined in a single device that is sometimes referred to as a reversible fuel cell.

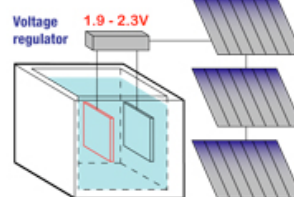
Electrolysis Methods Compared

Standard Grid Powered Electrolyser



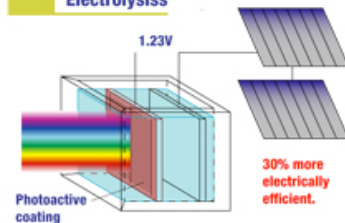
Available, with a grid connection

Standard electrolyser driven by PV



Stored Solar Current Technology

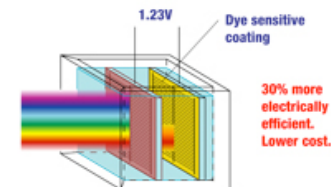
Partial Solar Electrolysis



30% more electrically efficient.

Under Development and Testing

Complete Solar Electrolysis



30% more electrically efficient. Lower cost.

Material Development Programme



Further development of solar assisted electrolysis can provide a route to lower cost energy all year round, in remote off grid applications.

[Home](#)

[Energy System](#)

[Company](#)

[Resources](#)

[System Examples](#)

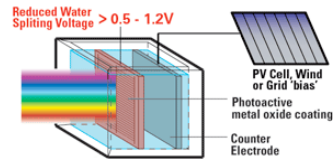
[Hydrogen](#)

[Electrolysers](#)

[Solar Electrolyser](#)

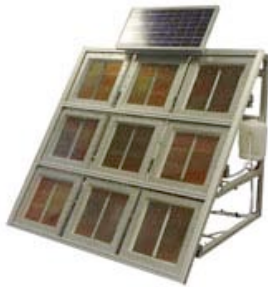
Solar Assisted Electrolysis

In a solar assisted electrolyser, commonly referred to as photo-electrochemical (PEC) generation of hydrogen, the required bias for water electrolysis is reduced. The additional energy required to split the water is provided by light from the sun at the blue end of the visible spectrum. The light is absorbed in the electrolyser by a metal oxide photo-electrode with nano-crystalline properties.



Hydrogen Solar

Stored Solar recently gained access to this technology through the acquisition of intellectual property from **Hydrogen Solar** in the area of PEC hydrogen generation for solar assisted electrolysis.



Further developments are underway to significantly reduce the bias requirements and increase the spectral range of light absorbed by the photo-material to increase the efficiency of hydrogen production.



The proprietary photo-material is deposited at elevated temperature in ultra thin layers to achieve the correct chemical and physical properties.

[Home](#) | [Energy System](#) | [Company](#)

© Copyright 2008 Stored Solar Limited | [Privacy Policy](#) | [Site Map](#) | [Terms and Conditions](#)



The Stored Solar team brings together a wealth of experience in solar technology, low cost design for consumer markets and commercial deployment of innovative products

Home	Energy System	Company	Resources
Management	Investment	Careers	Contact

The Stored Solar Team:

Julian Keable Company Chairman. Founder of the UK Renewable Energy Forum and former Chairman of the International Energy Society. A successful international architect including innovative high density and energy efficient housing projects.

Brian Holcroft CEO. Worldwide managerial expertise in the development and exploitation of early stage technology across a broad range of market areas. Has established and managed a number of spin-out business units in the domestic gas monitoring, industrial analysis and consumer electronics areas and successfully licensed intellectual property globally. More recently has raised significant venture funding and negotiated the disposal of several high technology businesses to major international corporations.

Scott Voorhees Experienced entrepreneurial consultant in product design, development and commercialization. Patented inventor with experience in successful venture capital start-ups including complete product development from idea through introduction, pricing and distribution channel partner selection in Asia, Europe and the US. Managed Southeast Asian design consultancy and established Singapore based R&D centre concentrating on Design for Manufacturing and product testing for high volume manufacturing within Asia.

Steve Denison Experienced technologist and consultant in electrochemistry and photovoltaics having worked with companies such as BP Solar. Worked with Wallace and Tiernan as New Product Development Manager in the field of water disinfection. Expert in nanotechnology with an extensive network in the research community. Currently working on photo-electrochemical assisted electrolysis for the production of hydrogen, as part of a large multi-disciplinary project at Imperial College, London.

Boren Burman Industrial Design Engineer with wide, multi-sector experience working as designer and project leader within New Product Development for Industrial MNCs. Recent work in development and design of modular, containerized infrastructural systems for worldwide deployment.

[Home](#) | [Energy System](#) | [Company](#)

© Copyright 2008 Stored Solar Limited | [Privacy Policy](#) | [Site Map](#) | [Terms and Conditions](#)



The Stored Solar team brings together a wealth of experience in solar technology, low cost design for consumer markets and commercial deployment of innovative products

[Home](#)

[Energy System](#)

[Company](#)

[Resources](#)

[Management](#)

[Investment](#)

[Careers](#)

[Contact](#)

Contacting Stored Solar

For general questions on partnering and project participation:

info-at-storedsolar.com

For general questions on employment at Stored Solar (see page above):

careers-at-storedsolar.com

For general questions on partnering and project participation (see page above):

investment-at-storedsolar.com

[Home](#) | [Energy System](#) | [Company](#)

© Copyright 2008 Stored Solar Limited | [Privacy Policy](#) | [Site Map](#) | [Terms and Conditions](#)