

All about Solar Thermal

Why we need clean energy

Australia's stationary energy sector, which includes electricity derived from coal-fired power, is responsible for around 50 percent of our greenhouse gas emissions. Australia's environmental, economic and energy security is at risk from climate change unless we can compete in a low carbon world. Any successful climate change solution must first target the energy sector specifically.

Australia has some of the world's best clean energy sources, many of which are already powering Australian homes and businesses. Our superior clean energy resources, like solar thermal, have the capacity to meet Australia's growing energy needs while providing a clean powered, sustainable economy.

Concentrating solar thermal – how it works

Solar thermal energy harnesses the sun's power to generate electricity by using lenses and reflectors to concentrate the sun's energy. The concentrated energy is then used to heat a fluid such as water or oil and uses the steam to drive a turbine. This technology is being deployed on a large scale to provide electricity. Storage systems are also being investigated

The most common solar thermal power stations utilise:

- Trough system – array of linear parabolic concentrator to focus the sunlight into a collector pipe that then pipes the fluid to a central point.
- Tower System – a field of tracking mirrors reflects the sunlight onto a centrally located tower containing the fluid
- Parabolic dish system – an array parabolic dish concentrators that focus the sunlight to a point at the focus of each dish to heat a fluid.

Greenhouse gas savings

Solar power is a zero-emission electricity source. One megawatt hour (MWh) of solar-derived electricity avoids approximately one tonne of CO₂.

In Australia

Australia is blessed with the highest average solar radiation of any continent in the world, which means our solar industry has the greatest potential to lead the world.



Currently there is only a very small number of working solar thermal power systems in Australia. The largest is the Liddell Power station which has a demonstration plant of around 1.5 MW although a larger system is being planned on this site. The CSIRO is also constructing a 0.5 MW solar thermal power station in Mayfield.

With a number of companies evaluating much larger systems in Australia, the commercial deployment of large scale solar power generation could play a significant role in the nation's renewable energy mix. WorleyParsons have plans for power stations of around 250 MW in Australia.

In May 2009 the federal government announced the \$1.5 billion Solar Flagships Program to help fund the construction and deployment of up to four large-scale solar power stations of around 250MW of which two can be solar thermal. State governments and private enterprise would add to this fund to enable the deployment of the power stations.

Global View

The US has one of the world's largest working solar thermal power stations with a 350 MW system dating back to 1985 and has many projects under development. Rajasthan, India, has 140 MW power station and many other countries either have operating solar thermal power stations or are committed to deploying large scale power stations. Spain is a significant player in solar thermal technology and commissioned a 50 MW system in 2008. Globally more projects are expected to come on-line in 2009 including one in Morocco.

Current Issues

While the solar the \$1.5 billion Solar Flagships Program will have a major impact on the deployment of solar thermal technology in Australia, the Renewable Energy Target will also have an impact. In 2007 the government committed to ensuring that 20 per cent of Australia's electricity supply would come from renewable energy sources by 2020 by establishing the expanded national Renewable Energy Target (RET) scheme. Draft legislation on the design of the RET was released in December 2008 with the final legislation passed in August 2009.

About the Clean Energy Council

The Clean Energy Council is the peak industry body in Australia, creating a united strategy built on strong policy and direction in the clean energy sector.

We aim to find solutions that deliver abundant and affordable clean energy and efficiency solutions to Australia, as quickly as possible. For more information please visit www.cleanenergycouncil.org.au



Clean Energy Council