



# Solar thermal

We are leading the way in concentrated solar thermal (CST) research, specialising in high-temperature central receiver systems.

## The challenge

### Creating reliable energy from solar

Harnessing renewable energy to reduce Australia's dependence on fossil fuels is one of our biggest challenges. And as lowering emissions becomes more important for industry and homeowners, we are looking at new ways of generating solar energy. Our challenge is how to make solar a reliable, stable part of Australia's energy future.

## Our response

### Creating advanced solar systems

Central receiver systems, sometimes called 'power towers,' harness the heat of the sun. Sun-tracking mirrors, called heliostats, concentrate sunlight by focusing it onto a target, generating temperatures of hundreds of degrees. This heat can then be used to run a power cycle to make electricity, or drive other industrial processes. While many commercial CST power stations are already in operation overseas, much research still needs to be done on lowering the cost of CST technology.

We are aiming to make electricity from CST competitive with fossil fuel-generated electricity in Australia through the [Australian Solar Thermal Research Initiative](#).

Our Energy Centre in Newcastle contains the only high-temperature solar thermal research facility of its type in Australia, and is home to the largest high concentration solar array in the Southern Hemisphere.

The site has two high concentration solar thermal tower facilities: Solar Field 1 and Solar Field 2. Both fields are operated from an elevated control room housing the centre's communications and control systems. Each field contains a tower and a heliostat (mirror) array which tracks the sun throughout the day, concentrating the solar heat to produce temperature in excess of 1000° Celsius (C).

Our CST demonstration and research facilities are used for:

- SolarGas – demonstrating how solar energy can 'supercharge' natural gas
- solar air turbine research and demonstration – generating electricity from the sun and air
- high-temperature solar steam research – combining solar power with the energy industry's most state-of-the-art turbines
- energy storage: showing how solar power can still be used when cloudy or after dark.