CENTRE
FOR SUSTAINABLE
ENERGY SYSTEMS

THE AUSTRALIAN NATIONAL UNIVERSITY

CSES

***CSES* is a large research group of staff and PhD students developing breakthrough technologies in the areas of photovoltaics, solar thermal power and solar energy systems**

Laboratory work in photovoltaic centre

***CSES* seeks to commercialise its technologies by entering into agreements with appropriate industry partners**

***CSES* provides expert staff for the faculty's lecturing and tutoring program for undergraduates and masters students**

***CSES* hosts the Australian Research Council Centre of Excellence for Solar Energy Systems**

CSES Technologies and Achievements:

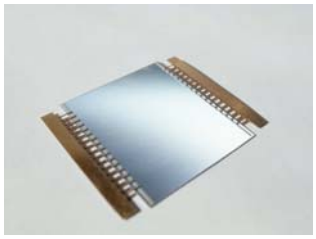
Photovoltaic technology that substantially reduces costs compared with existing technologies in conjunction with partner Origin Energy. These are the breakthrough Sliver® cells.

Revolutionary "see through" Sliver module

CHAPS system installed at ANU

Photovoltaic concentrator systems. These are based on sun tracking parabolic mirrors that produce both hot water and electricity at the same time. This is the Combined Heat and Power Solar (CHAPS) system.

High performance silicon solar cells for use in concentrator systems. These cells will operate under concentrations of between 20 and 50 suns.



High efficiency concentrator cell

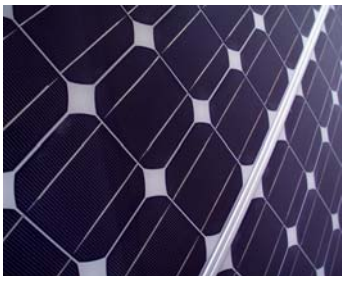
The Big Dish at ANU

The world's largest paraboloidal solar power dish "The Big Dish". Features a 400 m^2 point concentrator dish which produces superheated steam at 500^0C and 4.5 MPa. The dish output is around 350 kW_{th}. Work is continuing on commercial activities.

CSES Technologies and Achievements:

Low cost / highly efficient solar concentrating mirrors. The mirrors use 1mm glass on a metal substrate and can be moulded to form parabolic reflectors for big dish and CHAPS systems.

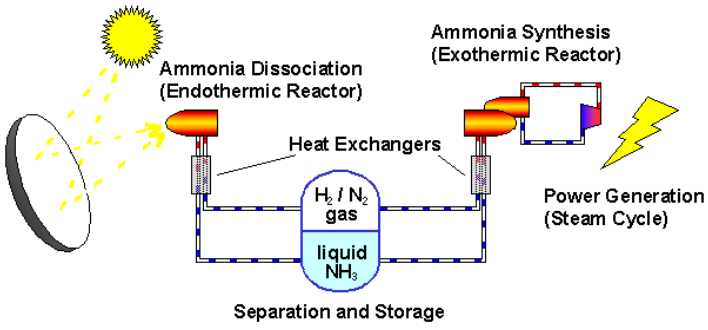
Glass on metal laminate (GOML) mirrors used in CHAPS and Big Dish



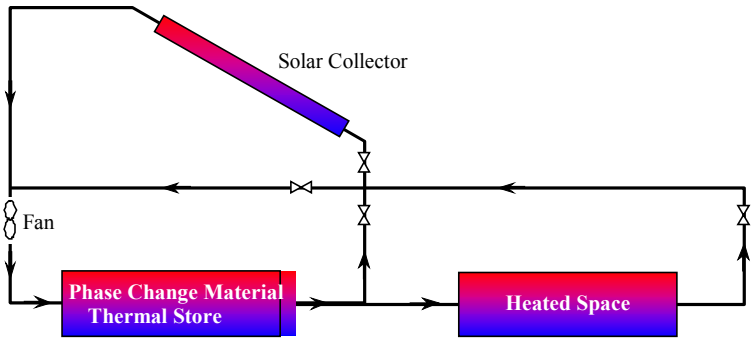
Improved commercial solar cells.

Solar module using high efficiency cells

Groundbreaking research using solar thermochemistry - using chemical reactions to store energy collected from the sun for later use. Can provide true 24 hour power from solar.



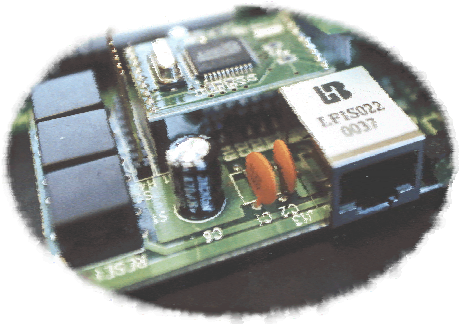
Schematic of ammonia dissociation, storage and synthesis



Phase change materials which store solar heat and maintain stable temperatures in buildings.

Schematic of Phase Change storage using solar air collectors

Electronic controlling devices for solar off-peak hot water system optimisation. The controller monitors household patterns of use and weather data. It then adjusts the pump duty cycle to accept solar input from the collectors when there is heat to be gained and when there is a household demand. The device further increases solar water heater efficiency.



Contacting CSES

See http://solar@anu.edu.au for further details, a list of current projects, media releases and papers presented at national and international conferences.

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