

## **RDG-06-23: Solar Photovoltaic Linear Concentrator Systems**

### ***Project***

The aim of this project is to develop improved solar photovoltaic linear concentrators that are commercially competitive in a wide variety of markets. The technical goals are to reduce the cost and increase the efficiency of linear photovoltaic concentrators, and to resolve some significant technical impediments. Potential markets include (1) the supply of solar concentrator photovoltaic (CPV) electricity from large ground-mounted parabolic trough arrays and (2) the supply of both solar concentrator heat and photovoltaic electricity (CHPV) from parabolic trough systems mounted on the roofs of buildings, in which circulating water that removes excess heat from the solar cells is used to provide hot water and space heating within the building.

### ***Participation***

The Project will be managed by the Australian National University (R&D <http://solar.anu.edu.au/>) and Solar Heat & Power (commercialization <http://www.solarheatpower.com/>). Partners in India have been identified. It is anticipated that partners in China and United States (and possibly Japan and Korea) will join the project.

### ***Objectives***

The key objective is to resolve the remaining barriers to the widespread deployment of photovoltaic trough concentrator systems. Principal barriers include (1) the difficulty of supply of high-performance, low cost solar cells suitable for parabolic trough concentrator systems, (2) the technical problem of moving shadows cast by gaps between mirrors and structural elements on strings of solar cells, and (3) the integration and qualification of the system.

### ***Milestones***

30/6/08	Develop a solution to the problem of the supply of high-performance, low-cost solar cells for parabolic trough concentrator systems
31/12/08	Develop low-cost shadow-tolerant CPV and CHPV receivers incorporating these cells
30/6/09	Integrate these receivers with low-cost parabolic trough solar concentrators
31/12/09	Demonstrate retrofitting of CPV and CHPV receivers to existing parabolic trough solar thermal concentrator systems
30/6/10	Conduct extensive performance and qualification testing
31/12/10	Transfer the technology to other Partner countries for use in demonstration systems

### ***Location***

R&D will take place in Australia at the premises of the Australian National University (Canberra) and Solar Heat and Power (Sydney). Testing and demonstration will initially occur in Australia and India, and later in China and United States and possibly also Korea and Japan.

***Resources***

An Australian government contribution of \$1.6 million in cash over four years is requested. The Australian partners will provide matching in-kind contributions. It is anticipated that other Partner countries will join the project early in 2007 in order to contribute to the R&D, and to provide field testing and technology demonstration, with support from their own governments of approximately \$4 million (also with matching in-kind contributions).