**Senate Standing Committee on Economics**

ANSWERS TO QUESTIONS ON NOTICE

Resources, Energy and Tourism Portfolio
Budget Senate Estimates
1 June 2010

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| **Question:** | **BR45** |
| **Topic:** | **Australian Solar Institute** |
| **Proof Hansard Page:** | **Written** |

**Senator Eggleston asked:**

1. **What other areas are being investigated for future solar power towers?**

2. **Can ASI provide a list of all recipients of grants in the first round of competitive funding? Please include the amount received and a summary of what the grant will be used for**

**Answer:**

**1.**

The ASI has provided a $5 million grant to the CSIRO to develop a new solar power tower at the CSIRO National Solar Energy Centre in Newcastle. The grant was announced by the Minister for Resources and Energy in January 2009 as a Foundation Project for the ASI.

The new solar tower and it's heliostat field will be located next to an existing solar tower field that creates SolarGas – a combination of water and natural gas. SolarGas is a solar thermal technology that combines natural gas and solar energy to boost the efficiency of natural gas by about 25 per cent, which results in reduced emissions when used to produce electricity.

The ASI is investigating other opportunities but is yet to reach the point where it can make a funding decision.

**2.**

**Projects funded by the Australian Solar Institute (ASI) as at end May 2010:**

**<u>Foundation Projects announced January 2009</u>**

**ANU Foundation Project**
This is a $6m project that will establish a world-class process and characterisation solar research facility. The new facility extends existing capability at ANU. The primary focus of the new facility will be advanced process and characterisation equipment that is not currently available in Australia. The facility will be fully compatible with the needs of industry for advanced prototyping and where feasible

will be capable of accommodating full sized solar cells and solar concentrator receivers and systems. The facility will be accessible to academic and industrial users. ASI funding is $5m.

**CSIRO Foundation Project**
This is a $5m project to construct a new solar tower and heliostats at the CSIRO Energy Centre in Newcastle. It will be used to generate high temperature media which can be used in a heat engine to produce electricity and will demonstrate storage which offers the potential for dispatchable solar energy. Modifications to the ANU's Solar Thermal Dish will also be undertaken to allow testing of a high temperature solarised engine. The project will demonstrate the versatility of concentrated solar thermal energy. ASI funding is $5m.

**UNSW Foundation Project**
This is a $21m project to construct a pilot production scale, advanced technology "turn-key" crystalline silicon screen print production line, which will be housed and will commercially operate in the UNSW's Solar Industrial Research Facility. A showcase manufacturing platform will be established which is ideally suited to the development and demonstration of advanced UNSW solar cell technologies and those of other academic institutions. ASI funding is $5m.

**<u>Round 1 Project Grants Announced December 2009</u>**

**University of New South Wales: Development and Commercialisation of High Efficiency Silicon Solar Cell Technology.**
$3.972m funding to support a $12.75m core funded research project. This project builds on the Solar Industrial Research Facility (SIRF), which is being constructed at the University of New South Wales with funding from the ASI. It will expand the capability of the SIRF to evaluate, demonstrate and industrialise high performance/ low-cost PV technologies developed by UNSW and the ANU.

**University of Newcastle: Fabrication of Thermionic Devices Using Directional Solidification / Sintering Processes for High Temperature Concentrating Solar Thermal Applications.**
$515,000 funding to support a $700,000 basic research project. This project aims to develop and demonstrate a thermionic device for electricity production using advanced ceramics which are able to operate at considerably higher temperatures than current devices. The higher the temperature a thermionic device can operate at, the more efficient it is at producing electricity. The increase in efficiency offers a way of reducing the cost of solar electricity.

**CSIRO and the Australian National University: Advanced steam generating receivers for high concentration solar collectors.**
$4.084m funding to support a $9.7m core funded research project. CSIRO and ANU in collaboration with international company Abengoa Solar, will develop high temperature (>540°C) steam generating receivers that maximise the efficiency and cost performance of solar towers and dish systems in the near to long term. The project will test steam receivers (Rankine Cycle) which are designed to match the highest efficiency commercial turbines such as those which are used in coal-fired power stations. A key part of the project is the partnering with Abengoa Solar who

are the largest Concentrating Solar Power company in the world and the owner/operator of the only commercial solar steam towers, and whose key interest is to aim for higher steam temperatures which bring higher efficiencies reducing the cost of solar electricity.

**Australian National University: Plasmonics for high efficiency Photovoltaic Solar Cells using nanotechnology to capture more light.**
$1.67m funding to support a $5.84m applied research funded project. This project seeks to increase the light captured by thinner layers of silicon through the use of plasmonics. The plasmonic solar cell will use nanoscale metal particles on the cell surface which act like tiny antennas collecting light and directing it into the solar cell. This makes the cell more efficient at capturing light, increasing the amount of solar energy that is turned into electricity.

**University of Queensland: New Materials and Architectures for Organic Solar Cells - Beyond the Shockley-Queisser Limit.**
$945,000 funding to support a $1.945m basic research funded project. This project will take advantage of ideas which have been shown to dramatically increase the efficiency of traditional inorganic PV cells and apply these principles to OPV.

**Round 1 Project Grants Announced May 2010**

**University of New South Wales: Overcoming the Fundamental Performance Limitations of Commercial Solar Cells.**
$5.0m funding to support a $24.16m applied research project in collaboration with Suntech Power and Silex Solar. The project targets the delivery of a 25% performance increase with a corresponding 15-20% reduction in solar cell costs in $/watt.

**BT Imaging Pty Ltd: Inline Inspection Tools for Photovoltaic Manufacturing.**
$2.25m funding to support a $5.43m applied research project in collaboration with Q-Cells, REC Wafer, ANU & CSIRO. The project looks to develop an inspection tool to find micro-cracks in silicon wafers and cells during their manufacture and an inspection tool that delivers process and quality control, and sorting of multi-crystalline and mono-crystalline silicon blocks.

**Sapphicon Semiconductor Pty Ltd, a Silanna Group Company: A High Efficiency, Integrated Solar Module on a Transparent Substrate.**
$2.25 million funding to support a $15.65m applied research project. The project aims to deliver significant improvements in the efficiency, cost and robustness of concentrating photovoltaic systems through the development of novel, high efficiency, single-crystal silicon solar cells.

**CSIRO and the Australian National University: Development of Advanced Solar Thermal Energy Storage Technologies for Integration with Energy Intensive Industrial Processes and Electricity Generation.**
$4.0m funding to support a $9.0m core funded research project. CSIRO and ANU in collaboration with international company Abengoa Solar, have joined forces to pursue the promise of solar electricity after dark through the development of cost effective solar thermal storage. The collaboration will quantify the potential for integrating solar thermal storage within Australian electricity generation and industrial

processes. It will identify the most suitable heat transfer and storage mediums for solar, undertaken proof-of-concept performance assessments and explore opportunities for commercialisation.

**Australian National University: Next Generation of Solar Cells.**
$4.95m funding to support a $13.5m applied research project in collaboration with Transform Solar (an Origin Energy Joint Venture with Micron Technology, Inc.). The project looks to significantly increase SLIVER cell efficiency and simplify the cell fabrication process to lower fabrication costs, while also allowing improvements in cell yield.