Fact Sheet
Round 1 Project

AUSTRALIAN SOLAR INSTITUTE

New materials and architectures for organic solar cells – beyond the Shockley-Queisser limit

SUPPORTING THE UNIVERSITY OF QUEENSLAND, CENTRE FOR ORGANIC PHOTONICS AND ELECTRONICS

AT A GLANCE

Grant Recipient
The University of Queensland

ASI Funding
$0.9 million

Total Project Value
$1.9 million

The project aims to investigate and develop new materials and device architectures in order to improve the conversion efficiency of next generation organic solar cells.

The project seeks to develop new strategies for improving the efficiency of organic solar cells and ultimately to approach the theoretical thermodynamic (Shockley-Queisser) limit. If successful, this could lead to reductions in the price of organic solar cells, driving uptake of the technology and in so doing lowering the cost of solar energy.

Organic solar cells are widely viewed as having significant potential for delivering low cost solar photovoltaic power. However, to date the technology has not delivered cell efficiencies sufficiently high to be competitive with second generation medium efficiency, low cost alternatives. Organic photovoltaic (OPV) is still at a very early stage and many opportunities exist to apply advanced architectural and new materials strategies to push efficiencies towards the thermodynamic limit. This is the focus of the project.

Key challenges are:

i) understanding the basic principles of what limits current OPV efficiencies;

ii) developing new molecules capable of broad band solar harvesting which are stable and easily processable;

iii) implementation of advanced device architectures in organic materials.

"The project will advance a number of highly novel material strategies for the creation of new electron acceptors and donors and investigate architectural strategies yet to be applied to organic solar cells. Assessment of the commercial opportunities of technology outcomes is an integral part of the project plan".

Professor Paul Meredith, Project Leader

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