

GREATCELL ENERGY PURCHASES MODULE MANUFACTURING PLANT

Following being informed that the existing manufacturing facility operated by Tindo Solar in Adelaide was to be replaced by a plant of greater capacity, Greatcell Energy made a successful bid for the existing plant at auction.

Tindo Solar is the only solar module manufacturer in Australia and the plant Greatcell has acquired was in continuous operation until recently producing silicon modules profitably for the Australian and S.E Asian retail market places. The facility needs an operating area of 600 sqm and is planned to be installed in warehouse space adjacent to our factory in Bomen.

Pending minor modifications to the new site, the plant has been placed in storage under instruction by engineers contracted by Greatcell.

The module manufacturing plant will advance our manufacturing plans and it will be utilised both as an R&D and as a prototyping facility for Greatcell Australia to test and trial assembly and encapsulation of our single layer and tandem perovskite solar cells in an industrial environment. Greatcell Energy expects to continue to collaborate with Tindo Solar in the recommissioning phase of the plant and potential development of tandem solar modules.



GREATCELL SOLAR ITALY – ANOTHER MAJOR MILESTONE

In the middle of the Italian summer, just prior to the Ferragosto feast (which is the major Italian festival originally founded by Emperor Augustus), Dr Babak Taheri, Senior Devices Engineer at Greatcell Solar Italy, achieved another breakthrough performance for large area multi-cell modules at the Tor Vergata facilities in Rome.

Two module designs were produced: the first being a 9 cell, 27 sqcm active area module and the second, nearly twice the size at 54 sqcm active area comprising 15 cells. The formulation comprised triple cation, double anion perovskite compositions on double layer titania electron transport layer with a PEAI barrier layer interfacing the perovskite to the hole transport layer.

The smaller module was encapsulated and generated a record 21.1% efficiency at 1000 Lux. The larger device generated 16.4% efficiency at full sun, with an improved fill factor. We look forward to more advances in the next phase of the EU projects, after the summer vacations.



PEROVSKITE DRIVEN TRUCKS



Greatcell Solar Italy is collaborating with Workspport Ltd, a Canadian NASDAQ listed company that manufactures high quality, functional, and cost effective tonneau/truck bed covers for light 'trucks', known traditionally as 'utes' in Australia. Together we are addressing the application of solar to the Workspport tray covers.

The challenges for electric vehicles are value for money and range anxiety - the fear of running out of battery power before a charging station. Battery recharging technology must be facile and regular for people to stop having range anxiety and the EV needs a 'security blanket' to 'kick & go' when the main battery is below critical voltage. The solution that has been discussed for a long time is having solar panels on EVs so that they aid the range. However, available space in most EVs is an issue and except for exotic models, covered in very expensive solar modules, there has not been a practical solution.

Interestingly, the vehicle that is most often lampooned as a 'gas guzzler', may actually be a viable market place. The 'truck' provides a large and ideal space for solar panels and the best solar panel is one that is tough, durable, unbreakable, foldable and capable of producing power in any level of light. The answer of course is a lightweight flexible PSC array covering the complete tray of the vehicle, an array that generates power at the charging voltage even in heavy shade (when the vehicle is parked). And the marketplace is not just the future EVs, as it can also be used on fuel-powered trucks for portable on-demand power.

PEROVSKITES IN SPACE NOT JUST A DREAM

Greatcell Energy has joined an Australia wide network of companies and research organisations seeking to expand Australia's space endeavours.

The network has a multi-year programme to achieve its goals that include producing a range of satellites and rocketry. We share this adventure in space with top research organisations in the world, such as NASA and NREL.

Greatcell Energy has proposed a fully flexible PSC solution that will minimise added weight and optimise specific power. Other developers of PSC products also recognise that, while GaAs/InP photovoltaics have adequate space radiation hardness, they are far too expensive for small commercial satellites and maybe even landing vehicles. Early international tests in simulated space conditions have been positive, and real space trials are eagerly awaited.

Updates will appear in the next newsletters.



Greatcell Energy is **The Australian Perovskite Solar Cell (PSC) Company** and is one of the few organisations worldwide at the forefront of industrialising and commercialising this perovskite photovoltaic technology that has leapt into the attention span of everybody in the energy field.

We publish this newsletter to regularly inform shareholders and other interested parties of the recent advances we have made.



GREATCELL ENERGY – WHAT DO WE DO?

- **Greatcell Australia's** pilot production facility based in Wagga, is to provide strategic and commercial users such as border protection and disaster relief organisations, industries developing EVs, smart agriculture, consumer electronics and IoTs, with a sovereign PV power solution optimised to their requirements.
- **Greatcell Solar Italy** is our face in Europe, developing high specific power PSC solutions in collaborative EU projects to meet the expectations of the increasing number of companies that approach us seeking high power low weight PV solutions.