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The Solar Taxi visits RISE

A Swiss adventurer, Louis Palmer, who plans to drive his home-built solar-powered car around the world, finished the Australian leg of his tour at Murdoch University and RISE on 6 March 2008. His visit to Perth was the culmination of a 21,146 km journey, representing just over the halfway point of his total mission.

Louis Palmer left Switzerland in his solar taxi in July 2007 and spent a few weeks during February and March driving across Australia in a bid to highlight the benefits of sustainable transport.

Prior to his arrival in Australia he had passed through 19 European cities, the Middle East, India, Indonesia and New Zealand.

"Admittedly, as a regular citizen I cannot change the world," Mr Palmer said, "but I can demonstrate to the world just how dire the global climate situation has become and how many sophisticated solutions to lower the greenhouse gases already exist, which bring with them many other advantages. The solar taxi should rekindle hope and a zest for life, set an example to counteract resignation and stimulate reflection. And show that every single one of us can take a step towards preserving our planet."

Louis was also critical of the lack of research and development of renewable energy technology in Australia, pointing to the country's abundant renewable energy resources. "It surprises me there is so much sunshine but compared to other countries there's nothing by way of renewable technology, like wind turbines and solar cells on roofs," he said. "Australia, which still uses coal, is behind the rest of the world as it has so much sunshine here, but it has been ignored for the last 10 years. Now it's time to catch up."

The solar taxi weighs just 500 kg, has a top speed of 90 km/h and a range of 300 km, which can be extended to 400km with the addition of a trailer equipped with solar panels.

Mr Palmer's next stop after Perth was Singapore and his journey continues from there to Kuala Lumpur, Bangkok, Kunming, Shanghai, Beijing, Seoul, Osaka, Tokyo, Vancouver, San Francisco, Los Angeles, Phoenix and Chicago before returning once more to where the journey began in Lucerne.

You can find out more about the technology, the tour and Louis and his team at www.solartaxi.com

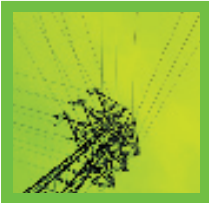


Staff News

Mehul Patel, an Instrument Systems Engineer at RISE, recently became a father for the first time with the arrival of Pathik, 3.3 kg baby boy.

Houman Pezeshki, a student from Iran is undertaking his Masters degree at RISE this year. Houman is working on the project, "Design And Analysis of a Grid Connected Inverter as a Series Active Filter for Voltage Harmonic Compensation" and will be analysing and designing a grid connected inverter as a series active filter to cancel voltage harmonics by generating the negative of those harmonics that exist in the grid, both in magnitude and phase angle.

Andrew Beveridge has joined RISE as a part time Business Development Manager. Andrew was previously at UWA where he was the Project Commercialisation Manager in the Office of Industry & Innovation.



PV Battery Charge Controller (BCC) Testing Activities

RISE has tested several battery charge controllers of different technologies from various Australian and international manufacturers over the past 18 months. The results for power efficiency and self consumption from some of the units tested in the lab so far can be seen at <http://www.rise.org.au/reslab/services.html>

The main outcomes of this activity are the validation of test protocols and the establishment of performance benchmarks for these types of devices. This work is linked to our involvement in standards development.

RISE is leading a BCC standard project in the international arena: IEC 62509 Ed.1: "Performance and functioning of photovoltaic battery charge controllers". This document is in the committee draft stage (CD) and will be revised at the forthcoming IEC TC82 WG3 meeting in San Francisco California at the end of May this year.

It is expected that after the review is completed, the document will move forward to the enquiry stage, where a voting draft (CDV) is prepared for public comment and committee vote.



RISE Website Traffic

The RISE website continues to be a popular source of information about renewable energy systems and technologies. The number of unique visitors to the site in 2007 was 181 842 and the number of total hits was an impressive 4.4 million! We've already had 1.1 million hits in the period 1 Jan - 17 Mar 2008.

Analysis of monthly traffic demonstrates a surge of interest in renewable energy around the time that the Federal Government announced increased rebates for domestic PV systems

The highest level of interest has been in hydrogen, geothermal, large hydro and wave power. The Information Portal will be regularly updated and maintained to always reflect the latest information on renewable resources, technologies and their applications.

Designing and Installing PV Systems (Grid-Connected)

13/14 May & 16/17 September (Perth) & other centres dates to be advised 2008

RISE has developed a two-day course that provides an introduction to solar photovoltaic power systems and how they can be integrated into grid-connected or stand-alone power applications.

The course covers the characteristics of photovoltaic modules and inverters suitable for connection to the grid. There are sessions that provide an introduction to PV systems and system design and design case studies will be examined. The installation standards for PV grid-connected systems (AS4777, AS5033 & AS3000) are also covered.

The course in Perth is presented by Nigel Wilmot, Manager Standards, RISE and Mike Dymond, Director, Sowilo Engineering Pty Ltd, a consulting renewable power systems engineering company based in Perth. The course in other centres across the country are run by Geoff Stapleton & Stephen Garrett, directors of Global Sustainable Energy Solutions Ltd (GSES).

These courses are suitable for electrical contractors, existing BCSE accredited system designers and installers, utility representatives, electrical inspectors and electrical engineers who are involved in the installation of systems either as designers, specifiers or inspectors and academics and professionals working in the area of renewable energy and the environment.

To enrol in the May or September courses in Perth, or to express interest in 2008 courses in other centres, please contact Sue Taylor on (08) 9360 6620 or susan.taylor@rise.murdoch.edu.au

The 3rd International Solar Congress

Members of the RISE staff recently attended the 3rd International Solar Cities Congress which was held in Adelaide on 17-21 February.

The objectives of the International Solar Cities Initiative are to support UN energy and climate policies by stimulating the interest of cities into becoming benchmark cities that commit to ambitious emission reduction goals; help cities systematically integrate renewable energy and energy efficient technologies and industries into environmental, economic and city planning; and provide scientific support for the validation and design of effective measures and policies for Solar Cities. The International Solar Cities Initiative (ISCI) has been formed to address climate change through effective measurable action at the urban community level. The members of ISCI are cities, institutions and individuals who want to help each other in this task.

The 3rd Congress featured a diverse and inspiring program with over 90 speakers from 30 countries, a mayoral forum, panel discussion and field tours. Topics covered included:

- science, technology and innovation
- rules, regulations and the market mechanisms to effect change
- climate change and its impact on society and culture.

The Hon. Peter Garrett AM MP announced various government funded responses to climate change including:

- The provision of additional funding for a National Solar Schools Program (making a total of \$489 million) that will provide up to \$20 000 for PV and \$30 000 for solar hot water, energy and water efficiency measures for every school in the country.
- An additional \$25 million for two more Solar Cities, Perth and Coburg Victoria to follow the 5 already announced
- \$3.55 million towards the cost of the construction of a 26 concentrating PV power station in Coober Pedy in South Australia. This will reduce diesel consumption by more than 520 000 litres and GHG emissions by more than 1,500 tonnes per year.

Presentations from overseas speakers highlighted the exciting developments occurring around the world. Talks given by Dr Zhengrong Shi of Suntech (the "Sun King") and Ming Huang of the Himin Solar Energy Group in China demonstrated that whilst some commentators see China as playing a big part of the climate change problem, Chinese enterprise and innovation in PV and other renewables gives China the potential to be very much part of the solution.

A highlight was a keynote address from Robert F Kennedy Jr, son of the late Senator Robert F Kennedy, American author and one of the US's most influential environmental lawyer and activist and named one of Time magazine's "Heroes for the Planet". His Waterkeeper Alliance protects

rivers worldwide, including ones in Australia. He said that confronting polluters made economic sense because it encourages free markets. "The economy is a wholly owned subsidiary of the environment" Mr Kennedy said. "Good economic policy is good environmental policy."

The 4th International Solar Congress will be held in Dezhou, China in 2010 and will be held in a new conference centre that will source 95% of its energy needs from renewable energy and will feature a 5000m² solar system, a solar desalination plant and a solar energy theme park. It promises to be an event not to be missed!



<http://www.robertfkennedyjr.com>

".....the deadly addiction to fossil fuels that White House policies encourage has squandered our treasury, entangled us in foreign wars, diminished our international prestige, made us a target for terrorist attacks....." RFKJ

PV Safety, Arcing and Fusing Workshop

The August 2006 edition of Photon International magazine reported several cases in which modules showed fire damage in the area around the junction box. Although these occurred in Germany and Switzerland, specifically building integrated PV applications, it highlighted an important issue relating to the installation of PV modules. The cause of these faults was problems in the manufacturing of certain junction boxes on specific modules which have been now addressed by the manufacturer. The consequence of the Photon article is the raising of a concern about potential safety issues in PV installations.

In October, 2007 a workshop was held in conjunction with an international standards meeting in Switzerland where these safety issues were discussed. This workshop was attended by Nigel Wilmot (RISE) and Ted Spooner (UNSW). The issues raised concerning the safety of PV installations are just as relevant for Australian PV installations. A workshop on PV safety, arcing and fusing was held at the University of New South Wales on 26 March 2008. Presenters at the workshop included Ted Spooner (UNSW), Mike Russell (Clean Energy Council), Geoff Webb (Standards Australia) and Nigel Wilmot. This important event brought together a range of experts from manufacturers, system integrators, industry, academia and government to discuss these important issues.

Nigel Wilmot's presentation on "Fusing of PV arrays" highlighted the recent investigation conducted at the RISE test center into the performance of fuses in relation to PV module characteristics. To ensure that correct installation and system design techniques are used, the characteristics of modules and fuses need to be understood. A PV module is a current limited source. A fuse is typically used in situations to break large fault currents due to short circuit faults. In a typical PV array, short circuit and earth faults create limited currents which may prevent the fuse from operating and breaking the fault current. So the correct specification and matching of fuses to the PV array installation is an important issue.

The Australian standard for "Installation of Photovoltaic (PV) arrays (AS/NZS5033)" addresses the requirement for fuses but this is not necessarily fully understood by industry. The work RISE is doing in this area will be included in the standard's future development to aid industry and users of the standard in understanding this important requirement. Nigel's presentation can be downloaded at <http://www.rise.org.au/standards>. This work will also contribute to the recommendations for the IEC standard on PV array installation requirements, which is based on AS/NZS5033.

Australian Standards Committee Meeting

A two day meeting in March 2008 at Standards Australia headquarters in Sydney for the Australian Standards committee EL042 Renewable Energy Power Supply Systems and Equipment looked at both local and international current standards in order to identify developments that would affect the use of renewable energy systems in Australia. Currently this committee is progressing two main projects: the update of the AS4509 series of documents for stand-alone power systems design and installation, and the ongoing development of a new standard for stand-alone inverter performance requirements.

RISE has been leading the stand-alone inverter document project with involvement in the development of the requirements and testing procedures. This work has also involved the testing of a series of different components and inverters for each of the specific tests in the draft standard (a sample test report can be downloaded at <http://www.rise.org.au/reslab/services.html>.) It is expected that this will assist the development of the Australian renewable energy industry, by setting a performance benchmark for stand-alone inverters based on Australian industry best practice. It will enable system designers, installers and distributors to easily distinguish good from poor quality inverters. This will protect both the end consumer and the renewable energy industry by helping create and maintain consumer confidence.

The Committee also discussed the issues raised at the PV safety, arcing and fusing workshop to ensure that they would be included in the process of ongoing standards development. The new edition of AS/NZS 3000 in 2007 has created the need for the review of standards. The new edition now references the standards for renewable energy systems and provides a new mandate for adhering to the standards for installation. So the standards for the grid connection of energy systems via inverters, stand-alone power systems and the installation of photovoltaic (PV) arrays will need to be updated to reflect the changes in AS/NZS 3000:2007.

The Australian standard for the installation of photovoltaic (PV) arrays (AS/NZS5033) has been used as the basis for a new international draft standard. The committee will review the progress on this draft and include significant changes in the Australian standard in the future. Review of standards and the addressing of issues raised will be progressed over the coming year by the committee.

Anyone interested in the development of standards or wanting to gain information on how they can access and comment on any public draft standards can contact Nigel Wilmot on nwilmot@rise.murdoch.edu.au.



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