

# SolarPACES 2012 – Trip report

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This year the city of Marrakech hosted the 18<sup>th</sup> annual SolarPACES conference with an aim to facilitate the success of CSP technologies for diversifying the energy mix. CSP experts from around the world focused discussions on technology maturity, optimization techniques, cost considerations, and bankability.

A large SA contingent was represented including: Stellenbosch University (SU), Council for Scientific and Industrial Research (CSIR), University of KwaZulu-Natal (UKZN), Nelson Mandela Metropolitan University (NMMU) and Sasol. In addition, South Africa's electricity utility provider, Eskom, was amongst the opening plenary talks outlining the current status of SA CSP projects. Vikesh Rajpaul (CSP Programme Manager, Eskom and SASTELA representative) spoke about Eskom's vision to develop a Central Receiver plant for demonstration purposes, which will form the basis of their future CSP plans.

Amongst key stakeholders in the CSP industry Stellenbosch University's Solar Thermal Energy Research Group (STERG) published 6 articles at SolarPACES. STERG research areas presented included:

- solar resource assessment,
- thermal storage using metal alloys,
- calorimetric heat-flux measuring devices,
- optimal heliostat geometry and
- point-focus concentrator technology.

STERG delegates include:

- Mr. Paul Gauché (STERG Director and coordinator, SolarPACES scientific committee member and session chairman) ,
- Prof. T. W. van Backstrom,
- Prof. Thomas Harms (SolarPACES scientific committee member),
- Mr. Riaan Meyer (SolarPACES scientific committee member),
- Prof. Wikus van Niekerk,
- Mr. Thomas Roos,
- Mr. Johan Kotze,
- Mr. Holger Kretzchmar,
- Mr. Willem Landman,
- Mr. Michael Mouzouris, and
- Mr. Jean Pitot (UKZN and STERG).

#### STERG SolarPACES 2012 publications:

- Kotze, J.P., Erens, P.J., Von Backström, T. W., Evaluation of a latent heat thermal energy storage system using AlSi12 as a phase change material. SolarPaces 2012, 11- 14 September, Marrakech, Morocco.
- Kotze, J.P., Erens, P.J., Von Backström, T.W., NaK as a primary heat transfer fluid in thermal solar power installations. SolarPaces 2012, 11- 14 September, Marrakech, Morocco.
- Kretschmar, H., Gauché, P., Mouzouris, M., Development of a flat-plate calorimeter for a small scale heliostat field. SolarPaces 2012, 11- 14 September, Marrakech, Morocco.
- Landman, W.A., Gauche, P., Sensitivity analysis of a curved heliostat facet profile. SolarPaces 2012, 11- 14 September, Marrakech, Morocco.
- Meyer, A.J., The South African REFIT: Solar Resource Assessment Options for CSP Developers. SolarPaces 2012, 11- 14 September, Marrakech, Morocco.
- Mouzouris, M., Brooks, M.J., Kretschmar, H., Design challenges in point – focus solar collectors: Optical error analysis and Thermal performance validation. SolarPaces 2012, 11- 14 September, Marrakech, Morocco.

#### Conference key learning's from delegates:

##### Mr. Paul Gauché:

- The collapse of CSP projects in Spain is clearly hurting but this has caused a shift of focus towards the other big growth areas: USA, South Africa, Australia. The Abengoa plans in particular were emphasizing the 50 MW tower to be built in SA.
- The US DoE SunShot initiative seems to have caused the worldwide CSP community to adopt the cost goal of US\$0.06/kWh.
- The status of the various central receiver projects in Spain (Gemasolar) and USA (Ivanpah and others) is quite uplifting. Clearly the value of central receivers is beginning to be felt.
- Except for the small prototype heliostat of Andreas Pfahl, I didn't see anything that was a major breakthrough. It was more the project status that was impressive.
- The CSP community still seems to have a long way to go before standards are adopted for modeling and metrics. STERG might get formally involved in this effort.

##### Mr. Willem Landman:

- Conference was a good update as to what is happening in industry at the moment. Many but not all industry players were present.

- The STERG delegation had a good presence at the conference and was noticed and commented on.
- Europe and the US remains in an economic slump and have withdrawn some of its financial incentives and funding for CSP. NREL has also pulled all funding for line focus research and is focussing solely on CRS.
- The fact that the CSP investment opportunities elsewhere in the world are rare has sent companies looking elsewhere for projects. South Africa and India appears to be the two large emerging markets for investors and is thus receiving a lot of attention. This said we are still small in comparison to what is happening around the world.
- The saturation of the German grid with renewables and the large capital investments into PV production facilities has resulted in current oversupply of PV and further PV price reductions. This PV remains the large threat to CSP. The only distinct advantage of CSP remains storage and dispatchable energy.
- High temperature is the future for utility scale energy production and this pursuit remains the long term goal. The Desertec Project was mentioned but is still far off in the future.
- The bankruptcy of Solar-Millennium was surprising and discussed in the small talk at the conference. HelioTower, a breakaway from Solar Millennium, is up for sale.
- Biggest obstacle is still cost. Cost reduction strategies and future cost projections were presented. HelioTower presented some of their concepts. They suggest a modular system like eSolar but where each field is unique and the receiver and power block reproduced.
- Johan with his liquid metals made quite a stir at the conference. There appear to be several new research groups that are looking into this technology. Johan feels he is at the forefront and ahead of the others. Good opportunity for STERG.
- Young people's dinner allowed the students "and Mike" (HA HA) to meet up and coming individuals in the industry.
- Myself and Johan visited the ENEA facilities in Rome. They have developed their own technology and look specifically at parabolic trough technology. Marco Montecchi was our guide and his work on development of facet characterisation and optical measurements tools was the focus of the tour. The facility has approx. 100 m of trough and is used mainly for component testing.
- It was great to meet the people whose papers you read

Key CSP stakeholders such as DLR, ESTELA and GeoModel Solar showed interest in CSP research within SU. Comparing the overall demeanor of SolarPACES 2011 to 2012, it was evident that a global, increasing urgency exists for CSP plant deployment. Since SolarPACES 2011, the amount of globally installed CSP plants exceeded 2 GW, providing a modest, yet firm platform to build-on compared to future proposals. Towards the end of the conference SolarPACES 2013 was announced. Destination Las Vegas, early October 2013.

Pictures from SolarPACES 2012:



Wolfgang Scheffler demonstrating a Scheffler reflector at the local university. (Photo: Paul Gauché)



Willem Landman presenting. (Photo: Paul Gauché)



Sunset in Marrakech at the end of the conference. (Photo: Paul Gauché)



SolarPACES 2012 was held at Hotel Mansour Eddahbi (Photo: Michael Mouzouris)



Gala dinner celebrations (Photo: Michael Mouzouris)