2018 Asia-Pacific Solar Research Conference
4th DECEMBER - 6th DECEMBER
UNSW Sydney

DAY 1
TUESDAY 4th DECEMBER

8:00 – 9:00
Registration
Prefunction Area, Colombo Building

9:00 – 10:30
DAY 1 Plenary Session
Session Chair: Assoc. Prof. Renate Egan
Room: Colombo Theatre A
“What’s next in photovoltaics, beyond PERC?”

9:00 – 9:30
Prof. Martin Green, UNSW Scientia Professor, Director of Australian Centre for Advanced Photovoltaics, UNSW, Australia

9:30 – 10:00
Prof. Craig S. Turchi, PhD, Principal Engineer, Thermal Sciences Group, National Renewable Energy Laboratory, USA

“Gen3 CSP: U.S. and Australian Cooperative Research on 700°C Heat Transfer Systems”

10:00 – 10:30
Dr Jenny Riazi, Principal Market Policy Development – Australian Energy Market Operator (AEMO)

“Distributed Energy Resources: Maximising customer value”

10:30 – 11:00
Morning tea – Prefunction Area, Colombo Building

11:00 – 1:00
PV Devices - Silicon

Room: Colombo Theatre A

Chair: Dr Brett Egan

Concentrating Solar Thermal - Receivers
Room: Colombo Theatre B

Chair: Jin-Soo Kim

Deployment & Integration - Distributed Energy Resources
Room: Colombo Theatre C

Chair: Dr Rob Possie

11:00 – 11:30
Prof. Andrew Blakers (invited)
PERC Solar Cells
Craig Wood (invited)
East Side’s Unique Approach to CSP and early Results from the Testing Program at its World First Modular CSP Plant

Peach Tree

Tiyo Me

11:30 – 11:45
Bunang Song
Thermal Stability of Atomic Layer Deposited Nb2O5 Layer as Electron-Selective Contacts on c-Si Solar Cells

Charles-Alexis Assineau
Solar Reserves: State-of-the-Art and Future Developments

11:45 – 12:00
Tian Zhang
Metallic Modules in Australia: An Analysis of Viability and Potential Value

Medhi Jafarian
An innovative configuration of two interconnected bubble reactors for hydraulic circulation of a high temperature liquid

12:00 – 12:15
Goodfells Powedal
Simulating the role of novel transparent conductive oxides for heterojunction solar cells

Aspar Kamar
Radiation absorption characteristics of a multistage free-falling particle receiver

12:15 – 12:30
Kean Thong Khoo
Investigation of AZO2Z capping layers on Moly and NiSeX: An Assessment via atomic layer deposition

John Pye
Reconfiguring and refining tubular receivers: findings from the Blasted Brothers with Active Airflow propelt

Anthony Brosseau van Groenou
Household Decision-making for home batteries, Solar PV and smart technologies

12:30 – 12:45
Kean Chen Feng
In-situ Low Pressure Thermal Oxidation for Thin-filmed Polysilicon Contacts

Li-Lin Lee
The influence of Temperature Distribution and Wind Speed on the Losses from a Stacked Cavity

Peter Luisi
Solar PV Hosting Capacity Limits with Coordinated PV Inverter Dispatch

12:45 – 1:00
Hieu Nguyen
Probing photo-induced carrier recycling from doped polycrystalline silicon with luminescencepectroscopy

Muhammad Sadiq Siddiqui
A preliminary analysis for development of a high temperature gas-phase solar receiver

1:00 – 2:00
Lunch - Prefunction Area, Colombo Building

2:00 – 3:30
PV Devices - Perovskite

Room: Colombo Theatre A

Chair: Dr Daniel Duniam

Concentrating Solar Thermal - Halosstats and Optics
Room: Colombo Theatre B

Chair: Dr John Pye

Deployment & Integration - Social & Policy Aspects
Room: Colombo Theatre C

Chair: Mike Chester (invited)

2:00 – 2:15
Meng Zhang (invited)
Efficient 1 cm2 mesoscopic perovskite solar cell on transparent and low conductive substrate

Mike Collins
Technologies and Design Considerations for Low Cost Small Halosstats

2:15 – 2:30
Jan-Peng
High Open-Circuit Voltage Perovskite Solar Cells: Role of Surface Passivation

David Ferranti
Halosstats Tracking Sensors for Concentrating Solar Thermal

2:30 – 2:45
Jingjing Bing
The impact of dynamic sequential process on perovskite film formation and solar cell performance

Sheng Li
Application of a Compound Parabolic Concentrator to a Multi-source High-Flux Solar Simulator

2:45 – 3:00
Cho-Fai Jonathan Law
Influence of Performance via Partial Load Replacement by Calcium for CuInS2 Perovskite Solar Cell

Ya Wang
Camera based measurement of reflectance and emission from complex receiver shapes

R. Purnell
Distributed transport opportunities for low carbon mobility in Australian cities

3:00 – 3:15
Chao-Fu Jonathan Law
Influence of Performance via Partial Load Replacement by Calcium for CuInS2 Perovskite Solar Cell

Ya Wang
Camera based measurement of reflectance and emission from complex receiver shapes

3:15 – 3:30
Jiadong Qian
The Impact of Perovskite/Silicon Tandem Module Design on Hot-Spot Performance

Sheng Li
Optical Design of a Keenstat Field for a High Temperature Receiver-Reactor

Rebecca Jeng Yang
Cost Reduction Potentials in BIPV Solutions: A Literature Review

3:40 – 4:00
Afternoon tea - Prefunction Area, Colombo Building

4:00 – 5:30
PV Devices - Silicon

Room: Colombo Theatre A

Chair: Prof. Andrew Blakers

Concentrating Solar Thermal - Power Blocks, Storage and Systems
Room: Colombo Theatre B

Chair: Prof. Frank Bruno

Deployment & Integration - Distributed Energy Resources
Room: Colombo Theatre C

Chair: Dr James Hazelton

4:00 – 4:15
Marco Ernst
Implications of Local Contact Size on Contact Resistivity and Recombination

Schella Rathi
Modeling a Hybrid Sensible-Latent Heat Thermal Energy Storage System for CSP Plants

4:15 – 4:30
Ullahoras Vasudevan
Studying Degradation in Multilayered Silicon by Modulating the Thickness of Silicon as a Backstop Laser

Ming Liu
Evolution of the Thermal Performance of the 1st and 2nd Cell of Cascade PVAs and Hybrid PCMs/Graphite Storage Systems for CSP Plants

4:30 – 4:45
Chang-Hye Lee
Evolution of Hybrid-Hybrid Amorphous Silicon Precursor for Industrial Application on Silicon Solar Cells

Andrew Lui
Investigation of Supercritical Carbon Dioxide Air-cooled Heat Exchangers for Application in C3P Power Cycles

4:45 – 5:00
Daniel Chan
How Insights into Hydrogen Induced Degradation: A study on c- and p-type Silicon

Timothy Anderson
The Effect of Wt on the Performance Natural Draft Dry Cooling Towers in an Intermittent Arrangement

Bai Tang
Generating PV Production and Electricity Consumption Scenarios via Generative Adversarial Networks

5:00 – 5:15
Heiner Kampaugh
Novel PV device characterisation using novel photothermal deflection spectroscopy

Sam Dutam
Dry cooling system options for the c3P3 Brayton cycle for concentrated solar power plants

5:15 – 5:30
Daniel Chen
Record Voltages using Commercial-grade Silicon Water: An Assessment of the Impacts of Defect Engineering for p-type Silicon Heterojunction Solar Cells

Hal Gargnci
How “deployment ready” is C3P supercritical CO2 power generation

Jonathan Dare
Cover the Roof! The Simple Guide to RooFit PV Sizing

Poster Authors are required to accompany their displayed work during the Conference Reception

5:30 – 7:00
Conference Reception - Prefunction Area, Colombo Building
### DAY 2 WEDNESDAY 5th DECEMBER

**Morning tea - Prefunction Area, Colombo Building**

**2018 Asia-Pacific Solar Research Conference**

**4th DECEMBER - 6th DECEMBER**

**LUXON SYDNEY**

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<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Chair / Speaker</th>
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<tr>
<td>8:00 – 9:00</td>
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<td>Registration</td>
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<tr>
<td>9:00 – 10:30</td>
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<td>DAY 2 Plenary Session</td>
<td>Dr. Dietmar Tourbier</td>
<td>Room: Colombo Theatre A</td>
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<tr>
<td>10:00 – 10:30</td>
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<td>“When the sun is shining and the wind is blowing: ideas for regulating abundance” Dr. Stephen D. White, Head of Energy Efficiency Research, “CSIRO Australian Perspectives on the “Cold Crunch”” Ms Kirsty Gowans, General Manager, Project Delivery ARENA &quot;Solar R&amp;D &amp; the ARENA portfolio in review”</td>
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<td>11:00 – 10:30</td>
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<td>Australian Update: IEA Photovoltaics Power Systems Program &amp; IEA Solar Heating and Cooling Program including Panel Discussion</td>
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### DAY 3
#### 6th December

**Morning Session**

**Room:** Colombo Theatre A

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<td>10:00</td>
<td>&quot;Pathways to fuels and electricity using concentrated sunlight&quot;</td>
<td>Prof. Nathan</td>
<td>&quot;Earth-abundant and environmentally-friendly kesterite solar cells&quot;</td>
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**Room:** Colombo Theatre B

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<td>&quot;Global Renewable energy pathways towards 1.5 degrees&quot;</td>
<td>Prof. Richard</td>
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**Room:** Colombo Theatre C

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**Afternoon Session**

**Room:** Colombo Theatre A

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<td>14:00</td>
<td>&quot;In situ monitoring for improving performance of Perovskite Solar Cells&quot;</td>
<td>Prof. Nathan</td>
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<td>Prof. Nathan</td>
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**ACAP Poster Session**

### 5:00 - 6:00
**Closing Ceremony/Award Presentations**

**Room:** LG03 - Colombo Theatre A
Three CEEM Workshops on Distributed Energy Tools and Analysis

CEEM is holding three end of year Workshops on our projects related to distributed energy. At the workshops, we will describe our open source modelling tools, present our findings, and seek feedback from stakeholders about challenges and opportunities and how our tools can be most useful.

10am - 4:30pm, Monday 3rd Dec, 2018
Tyree Energy Technology Bldg LG03 until 2pm then LG07, UNSW, Sydney

Free to participate, lunch provided.
RSVP here for catering purposes, and enquiries to r.passey@unsw.edu.au

**Tariff Design and Assessment Tool: Progress and Next Steps**

This project, funded by Energy Consumers Australia, builds on the earlier work in developing a tool that stakeholders can use to assess the impacts of different network tariff proposals on end-users. It will extend the functionality of the existing tool by incorporating retail tariffs, incorporating the impact of DER and DR, as well as a range of other enhancements. Navid will present the progress to date and seek feedback.

10 to 10:15am  Project intro: Tariff Design Challenges  Iain MacGill
10:15 to 11am  Tool Introduction and plans for new functionality  Navid Haghdadi
11 to 12pm  Stakeholder panel and Q&A

12 - 12:15pm  Break

**PV on Apartment Buildings**

This project, funded by Energy Consumers Australia, assesses the opportunities and challenges for PV deployment on apartments across Australia, and includes a comparative analysis of technical and financial arrangements and an exploration of the distribution of costs and benefits between owners and residents and between different households. Mike will present the findings from this project, discuss potential policy approaches and invite feedback to inform the focus of the final report.

12:15 to 1pm  Dissemination of Findings and policy options  Mike Roberts
1 to 1:15pm  Lunch Provided: Grab sandwiches and a cuppa
1.15 to 2pm  Stakeholder panel and feedback (over sandwiches)

2pm to 2:15  Coffee break

**Tools for Community Sharing, Trading and Aggregation**

Here we will showcase two new models that we have developed with funding from ECA and CRC for Low Carbon Living: one for embedded networks in apartment buildings and one for local network areas, including those owned by network operators. We are now developing a User Interface (UI) for both models to broaden accessibility to a range of different stakeholders. Both models will be demonstrated as well a proposed UI, and we are seeking feedback on the models and the UI.

2:15 to 2:45pm  Model for Community Trading in Local Network Areas  Naomi Stringer
2:45 to 3:15pm  Model for Community Aggregation in Embedded Networks  Mike Roberts
3:15 to 4:30pm  User Interface and Functionality Options and stakeholder feedback  Luke Marshall
The APVI represents Australia on both the IEA PVPS and the IEA SHC programs. We are involved in a number of different tasks for both programs. This Update will include an introduction to the IEA Technology Collaboration Programmes, as well as talks on PV recycling and using solar for water management in industry, followed by a panel discussion.

Moderator/ Chair: Renate Egan

11:00- 11:05 Renate Egan, APVI, Introduction
11:05 – 11:20 Ken Guthrie, Sustainable Energy Transformation, Introduction to IEA TCPS – Why get involved?
11:20 – 11:40 Dr Frank Lenzman, TNO Netherlands PV recycling
11:40 – 12:00 Prof Mikel, Duke VUT Using solar in managing water for Industry
12:00 – 13:00 Panel Discussion, including a 5 minute update from:
  • Warwick Johnson (PV in Australia, data and knowledge sharing),
  • Dr Veronica Garcia Hansen (Daylighting),
  • Prof Alistair Sproul (PV Thermal systems)
  • Navid Haghdadi (High Penetration PV)

Discussion start at ~12:20
Workshop | IEA Technology Collaboration Program for Demand Side Management

A workshop in conjunction with the Asia-Pacific Solar Energy Research Conference, UNSW Sydney, 4-6 Dec 2018.

9:00-11:00 6th December 2018 – Colombo LG01, UNSW
Free

The increasing penetration of renewable generation, electrification of transport and heat, digitalisation and the blurring of the boundaries between consumers and producers are reshaping the energy demand landscape. There is a need to understand the ways in which people and technologies interact within society in order to create the conditions for new business models to flourish, for social innovation to thrive and for energy transitions to be successful.

Australia, through Monash University and UNSW Sydney have re-joined the IEA Technology Collaboration Program for Demand Side Management with funding from ARENA’s Knowledge Sharing Programme. This TCP is to be a world-leading international collaboration platform for policy-relevant socio-technical research on energy use (i.e. demand side).

The TCP is organised in to a series of tasks that bring together an international networks of social researchers, economists, political scientists and policy makers to work collaboratively on policy-relevant sociotechnical issues on demand side use of energy. Australia is joining at a perfect time, when the TCP is relaunching with an updated strategic focus on understanding of the nexus between people and energy technologies. This includes the formation of new tasks on collating outcomes of peer to peer trials, behavioural insights of driving the energy transition (industry wide, not just customer focused) and a task to understand how we achieving the social license of automating demand side services required to provide stability on a network that has reduced system strength.

We invite you to join other Australian experts to discuss participation in the TCP and specifically in new tasks, including providing input on how those tasks are formed.
Workshop on High Penetration Variable Renewables in Pacific Island Countries: 
Small grids and Off-grid 

7th December 2018 - Colombo Theatres, UNSW 
Free, but registration required - register here

Pacific Island nations have ambitious targets for renewable energy penetration, and have been making significant recent progress towards these goals. There are, however, a number of technical and institutional challenges arising, both in serving remote dispersed off-grid end-users, and as variable renewable energy (VRE) penetration levels increase on what are often relatively small grids.

UNSW Institute for Global Development and the Australian Renewable Energy Agency’s Knowledge Sharing Program (Mission Innovation Challenge 2) have provided funding for UNSW, USP and partners CSIRO, IT Power Australia and GSES (Australian RE companies working in the Pacific) to engage with stakeholders to identify key challenges and needs of Pacific Island nations in reaching high RE penetrations.

A workshop will be held in conjunction with the Asia-Pacific Solar Energy Research Conference at UNSW Sydney, 4-6th December 2018.

The aims of the workshop are to:
- Discuss the challenges and opportunities of introducing more variable renewable energy into small grid and off grid contexts in the Pacific
- Hear from a range of invited speakers regarding the status of VRE integration, key challenges and solutions to facilitate high penetration VRE in small grids and improved off grid energy service delivery
- Identify potential future work to address key issues and themes arising in the discussion

Program

10-10:15 Introduction to the Workshop, Iain MacGill, CEEM UNSW
10:15-10:35 Overview of Status and Challenges for RE in the Pacific, Atul Raturi, USP
10:35-10:55 Roadmaps for VRE Upscaling - challenges & issues, James Hazelton, IT Power Australia
10:55-11:15 Utility experience in the Pacific region with high penetration VRE, Andrew Daka, PPA

Break

11:30-1:15 Panel Presentations and Discussion: Technical and Planning Challenges and Opportunities
- Tiaon Aukitino, Kiribati Public Utilities Board
- Saad Sayeef, CSIRO
- Pesalili Tohi, Tonga Power
- Chris Martell, GSES
- Janendra Prasad, Solomon Power

Lunch

2:15-4 Panel Presentations and Discussion: Financing, Policy and Governance Challenges and Opportunities
- Anthony Maxwell, Asian Development Bank
- Kamleshwar Khelawan, World Bank
- Vanda Faasoa Chan-Ting, Ministry of Natural Resources & Environment, Samoa
- Muriel Watt, IT Power Australia
- Katerina Syngellakis, GGGI

4:30 Conclusions
- Key themes and issues emerging from the workshop, priorities, future work, opportunities for collaboration
Solar Research Tours - UNSW

Join us for the free insightful morning tours on-campus!

Grab your tickets now:
Tyree Energy Technologies Building (TETB) - Dec 6' 18; 8:00 – 9:00 am

Solar Industrial Research Facility (SIRF) - Dec 5' 18; 8:00 – 9:00 am
https://bit.ly/2PHll3b

* Limited availability