ASIA-PACIFIC SOLAR RESEARCH CONFERENCE

Instructions to Abstract Authors

2018 Key Dates

Submission of Abstracts due:	**Monday, 16 July 2018**
Notification of abstract selection to authors:	**Monday, 13 August 2018**
Papers due for peer review:	**Monday, 15 October 2018**
Feedback from reviewers to authors:	**Monday, 12 November 2018**
Final paper submission due from authors:	**Monday, 26 November 2018**

Your contribution will <u>not</u> be formally accepted and scheduled, until you have registered your attendance at the conference.

Please indicate by ticking which stream/s best fits your abstract

STREAMS Topics listed are a guideline only. Submissions in related areas are welcome	
☐	**Photovoltaic Devices** *Silicon solar cells* *Inorganic, organic, dye sensitized and perovskites* *Tandem and other solar cells* *Characterisation and quality control* *Modules and manufacturing*
☐	**Deployment & Integration** *Renewables integration, policy and regulation* *Forecasting and Resource assessment* *Minigrids and Community owned Renewables* *Field experience, performance, yield and reliability* *Distributed Energy Resources, EVs and Low emissions transport*
☒	**Solar Heating and Cooling, Low Carbon Living** *Energy Efficiency and Demand Management* *Housing and appliances* *Solar heating and cooling including heat pumps* *Cities and Communities* *Competing with gas in the domestic & commercial market*
☐	**Concentrating Solar Thermal** *Fundamentals and components* *Storage, systems and power cycles* *CSP integration, design and modelling* *CSP and high temperature processing*
☐	**Solar Fuels & Chemistry** *Storage* *Hybrids, complementary solutions and discrete applications* *Fuels and chemicals from electricity and heat* *Energy for heavy industry*
☐	**Solar energy solutions for emerging economies** *Islands and remote regions* *Supergrid and interconnections between countries* *Field Experience, Performance and deployment*

Please tick which best describes you:

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Balancing solar PV output with air conditioning pre-cooling & electricity Demand Management.

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Solar and wind power are already cost competitive with new gas and coal-fired power generation in terms of lifetime cost of energy (LCOE). However, the challenge now for variable output renewable energy like solar PV is to ensure reliable firm capacity 24/7 all year round. While this is not a serious problem yet in the National Electricity Market, it is likely to become so over the next 15 years as up to two thirds of Australia's current coal-fired generation fleet reaches retirement age.

Several solutions have been proposed to this challenge of "firming renewables", including: gas-fired peaking generators, pumped hydro, such Snowy 2.0, large scale battery storage, small scale distributed battery storage and electricity demand management, including load shifting and flexible pricing.

This paper compares the merits and costs of these various firming options and ranks them in cost order. It considers the practicality and cost of demand management as a firming option for various levels of solar PV penetration. In particular, it considers the practicality and cost of load management in the form of residential solar pre-cooling, where consumers use "surplus" rooftop solar PV generation to cool homes in the afternoon (2-5pm), in order to reduce demand on the electricity supply system during the peak period of energy evening (5-7pm).

The paper outlines the practicalities of solar precooling relating to monitoring, communication and control technologies, electricity pricing and consumer engagement. The paper outlines the potential scale of solar pre-cooling as a resource and its potential to address low demand and high voltage conditions as well as addressing high demand, supply shortfall conditions.

The paper concludes by estimating the net benefits to consumers, collectively and individually, of adopting least cost firming renewables options and suggests policy strategies to tap these resources.