

AUSTELA

Australian Solar Thermal Energy Association Ltd

31 July 2011

NSW Department of Trade & Investment

By email: solarsummit@dpc.nsw.gov.au

Submission in response to the Solar and Renewable Energy Summit and calls for input into the development of a Solar and Renewable Energy Action Plan for NSW

The Australian Solar Thermal Energy Association Limited (**AUSTELA**) is pleased to have this opportunity to provide input into the Solar and Renewable Energy Action Plan for New South Wales (Plan).

About AUSTELA

AUSTELA is the industry body solely dedicated to concentrating solar thermal power generation (CSP) in Australia. Composed of some of leading national and international solar thermal industry participants, AUSTELA's membership is open to organisations involved in the development of solar thermal power systems on a large scale to supplement or replace existing power requirements in Australia, whether in the electricity sector or in other industry sectors.

Companies involved in large scale solar thermal energy observe significant misconceptions among policy makers and investment decision-makers in Australia about the cost of solar thermal power, and a lack of understanding of the rapidly improving cost dynamics of large scale solar thermal energy production emerging from research and deployment at scale in other markets.

AUSTELA's goal is to significantly improve the investment environment for solar thermal power generation in Australia by providing information, analysis and data to assist policy and investment decision-makers to better understand the value, cost and potential importance of solar thermal power in Australia's electricity system.

Concentrating Solar Thermal Power - a major industry, and a major opportunity for New South Wales

AUSTELA applauds and supports the Government's initiative in establishing the role of Parliamentary Secretary for Renewable Energy and committing to development of the Solar and Renewable Energy Action Plan for NSW.

In this submission, AUSTELA seeks to make three key points:

1. Solar thermal power generation can play a major role in meeting the challenges for New South Wales in achieving an economically efficient, low carbon energy future
2. It is vital that the New South Wales Renewable Energy Action Plan is based on the best and most current data available internationally as to projected costs of solar thermal power generation; data currently relied on by Australian governments significantly overstates current solar thermal energy costs and understates the rate of cost reduction being achieved by CSP technologies
3. As part of the Renewable Energy Action Plan, it will be critical to address, and to implement measures to overcome, market failures which have constrained the appetite of capital market participants to invest in renewable energy development in Australia.

AUSTELA

Australian Solar Thermal Energy Association Ltd

Evolution of solar thermal electricity generation internationally has accelerated rapidly in the past 2-3 years. There is more CSP generation capacity operating and under construction internationally that all the wind capacity in Australia today, and many times more than Australia's photovoltaic generation capacity. CSP is a proven technology, now attracting strategic investment from the world's leading energy companies and utilities. Solar thermal power generation offers:

- dispatchability, ease of hybridisation, cost effective energy storage, and alignment to peak demand
- opportunities for industry and regional development, particularly in New South Wales' solar, land and minerals-rich western regions.

CSP can support New South Wales' efforts to protect against electricity cost increases

NSW's existing generation capacity, dominated by coal-fired generation, has a poor correlation to the demand profile of New South Wales' major economic centres, and high exposure to carbon emissions pricing. This exposes the New South Wales economy to significant economic risks.

In regions such as Western Sydney, this poor correlation will be exacerbated as:

- Population growth drives increased usage of air-conditioning and cooling
- Small business continues to drive economic growth, increasing the small retail customer demand profile
- Climate change drives higher peak temperatures and increasing frequency and unpredictability of peak temperature events.

Unless action is taken in the near future to accelerate low-carbon energy supply for major urban and industrial centres in New South Wales, such as Western Sydney, New South Wales will be exposed to a worst case scenario of escalating peak demand, increasing risk of supply shortfalls, and dramatically increased costs of providing electricity system capacity to meet peak demands.

Open cycle gas and diesel peaking capacity will further exacerbate the risks of extreme price spikes from peak power demand.

Large scale generation alternatives aligned to peak energy demand will need to be implemented. There is a compelling economic case for New South Wales to support and facilitate development of large scale solar thermal power.

Achieving NSW's 20% Renewable Energy Target

For New South Wales, the challenge of achieving 20% electricity supply from renewable sources is greater than in some other jurisdictions, due to NSW's relative lack of high-value wind resources. At the same time, evidence from South Australia and other regions with high proportions of wind generation capacity (such as Texas in the US), continues to build a picture of the economic cost in electricity networks comprising high proportions of intermittent generation capacity.

AUSTELA

Australian Solar Thermal Energy Association Ltd

Domestic photovoltaic systems, while valuable to reduce domestic peak demand and to encourage energy efficiency and behaviour change, present further challenges of intermittency as well as cost efficiency.

Ultimately, consumers will be required to pay for poor capital efficiency caused by an excessive reliance on intermittent generation sources.

If New South Wales, in meeting its renewable energy target, is to avoid embedding long-term higher costs associated with:

- high reliance on expensive fossil-fuelled peaking capacity, and
- high reliance on intermittent wind and PV renewable generation

a utility scale renewable energy technology that is capable of delivering energy to meet growing peak demand must be accelerated for deployment at scale, alongside wind generation, in the current decade.

AUSTELA believes that solar thermal technology is the only technology capable of addressing this urgent need, and delivering the necessary cost efficiencies (at both project and network levels), in the period to 2020.

Already in New South Wales, solar thermal technologies have been deployed in significant projects that illustrate the versatility and strategic value of solar thermal power for the State – AUSTELA member Novatec Solar and Macquarie Generation are currently implementing a major expansion of their solar thermal project at the Liddell Power Station, and the CSIRO's Energy Transformed Flagship project at West Mayfield (Newcastle) is Australia's largest solar thermal research hub.

There is a strong economic case for New South Wales to support and expand upon these investments and to implement policies and measures to facilitate a significant acceleration and expansion of demonstration of solar thermal power in the State.

There is also a strong case, as highlighted in the AECOM Pre-Feasibility Study for a Solar Power Precinct (AECOM, 2010) for New South Wales to investigate further the potential benefits of transmission system planning to support large scale solar thermal power generation in New South Wales.

Updating incorrect and out-dated data concerning LCOE of solar thermal energy generation

The recent Solar and Renewable Energy Summit highlighted discrepancies between projections of levelised cost of energy (LCOE) for solar technologies commonly used in modelling undertaken by Government and energy sector investors in Australia, and those used in international markets. LCOE projections for solar thermal technologies commonly referred to by Australian governments and agencies are far higher than comparable projections used in the US and Europe, where experience in development of solar thermal power technologies and deployment of large scale solar thermal energy projects is greatest.

One clear example of this can be seen in the Power Tower Technology Roadmap and Cost Reduction Plan (April 2011) undertaken by Sandia Laboratories for the US Department of Energy. Presentations made at the Summit, and based on data from the Electric Power Research Institute (EPRI, 2009), indicated LCOE for central receiver solar thermal power at

AUSTELA

Australian Solar Thermal Energy Association Ltd

A\$210/MWh at 2020. By comparison, the Sandia Roadmap projects potential LCOE at US\$86/MWh at 2020 (refer page 32). On 30 June 2011 at the CSP Today USA Conference in Las Vegas, major solar thermal industry participant SENER (www.sener.es/inicio/es) endorsed the Sandia Roadmap's findings, and went further, saying that SENER was confident it could deliver LCOE under \$100/MWh by 2015.

While these comments relate to one particular CSP technology, the principle holds generally for CSP technologies - that recent international experience and research, and the resultant cost projections for CSP internationally, are typically far more competitive and compelling than is reflected in data historically used by New South Wales and Federal agencies.

AECOM's Pre-feasibility Study for a Solar Power Precinct is an example of an important and influential study which can be argued not to adequately take account of recent international experience and research relating to the LCOE of some solar thermal technologies, and as a consequence to assume LCOE and rates of projected reduction of LCOE less competitive than those emerging from international research and experience.

It is vital that the NSW Renewable Energy Action Plan be based upon the most accurate, contemporary data and experience available internationally. AUSTELA urges the New South Wales government to ensure that data used in the development of the Plan is reviewed and updated, and AUSTELA stands ready to assist the Government to access data and analyses that may be of use in the development of the Plan.

Addressing market failure in relation to power purchase (off-take) agreements

Renewable energy development in Australia suffers from the narrow market for purchase of off-take (power and/or RECs) from renewable energy generation facilities. The narrow market for power purchase agreements, with few market participants and limited (if any) commercial incentives to support new forms of renewable energy generation, mean that it is extremely difficult for renewable energy developments to secure a revenue stream from off-take that can be leveraged to provide project equity or debt finance.

As major utilities have mitigated their RET compliance risks by buying up wind assets and building up stocks of RECs from small-scale domestic generation, there is currently little effective compliance incentive to enter into power purchase agreements.

One of the most effective forms of support that New South Wales and other governments can provide for renewable energy development, demonstration and deployment, is to implement measures to enhance security of revenue for private sector investors in renewable energy projects.¹

AUSTELA believes that the proposed Clean Energy Finance Corporation, recently announced as part of the Federal Government's Clean Energy Future (CEFC) package, provides one potential avenue to develop sustainable, commercially structured measures to help to address critical market failure in relation to off-take for solar thermal (and other renewable) power generation projects.

¹ This observation is also made in AECOM's Pre-Feasibility Study for a Solar Power Precinct

AUSTELA

Australian Solar Thermal Energy Association Ltd

Contribution by the States to the capital resources underpinning the CEFC's range of products and services can potentially have a significant impact in addressing market failures and promoting large scale renewable energy development. Pooled investment by New South Wales along with other States could support more effective leverage of Commonwealth and private sector funds than action that New South Wales might contemplate individually.

Addressing market failure in relation to perceived technology risk in relation to large scale solar thermal power development

AUSTELA urges the New South Wales Government to consider and address the critical issue of technology risk in the NSW Renewable Energy Action Plan, by acknowledging the need to work with the Commonwealth and with energy sector investors to develop appropriate risk sharing mechanisms.

Australian government policy, as a general rule, rightly eschews 'the picking of winners' as between technologies. Long economic experience and analysis has shown that effective markets are more efficient in identifying lowest cost technology solutions, including solutions to environmental and energy markets issues, than government mandate. After 15 years of productive energy market liberalization, Governments are understandably reluctant to intervene in the choices made by electricity market participants in the transition to a low-carbon electricity sector.

However markets are rarely perfect and Australia's energy markets – world-leading in terms of the adoption of competitive market philosophy – are no exception. Without diminishing the economic achievements of energy market reform in Australia since the 1990's, energy markets are failing to keep pace with the need for renewable energy technology innovation and development.

The structure of Australia's energy market system is such that Government cannot and should not provide the very significant levels of capital required to develop the renewable energy capacity implied by the New South Wales and national renewable energy targets. Private sector capital must be mobilised. However Australian capital markets currently have little interest or incentive to invest in forms of renewable energy development new to Australian investors.

During the interregnum until perceived technology risks have been mitigated through deployment and demonstration at scale, there is a role for Government to play in implementing measures so that those risks are shared appropriately between the public and private sectors.

Close and Summary

The period to 2020 is a vital formative period, when choices as to Australia's generation portfolio and electricity network design will set the parameters for electricity sector investment for decades ahead.

Concentrating solar thermal power generation provides answers to many of the challenges facing New South Wales in implementing a secure, reliable and economically efficient low-carbon energy system for the 21st century.

New South Wales has practical experience in deployment of solar thermal technologies in projects illustrating the versatility and potential breadth of application of solar thermal power in

AUSTELA

Australian Solar Thermal Energy Association Ltd

the State's low carbon energy future, and should leverage and build upon this experience further.

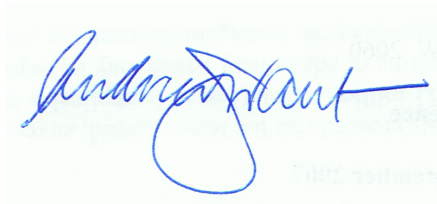
Excessive reliance on wind power plus small-scale photovoltaic generation risks both failure to achieve the State's 2020 Renewable Energy Target, and embedding high costs and significant economic inefficiencies in New South Wales' electricity supply system.

It is vital that the Renewable Energy Action Plan is built upon the most contemporary data and information available internationally as to the value and costs of solar thermal power generation. Cost data and projections historically used by State departments and agencies should be critically reviewed and updated.

New South Wales' exceptional solar, land, manufacturing, project execution and regional community resources, present the opportunity for New South Wales to lead the nation in harnessing the value that only solar thermal power generation can deliver.

AUSTELA looks forward to further opportunities to assist the Government in the development of the Plan.

Best regards,



Andrew Want | Chair | AUSTELA
M [+61 408 956 210](tel:+61408956210) | E andrew.want@vastsolar.com
Skype [andrewwant09](https://www.skype.com/people/andrewwant09)