

ASTRI and AUSTELA joint statement on the capacity mechanism

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Quotes can be attributed to Dominic Zaal, Director, ASTRI.

The Australian Solar Thermal Research Institute (ASTRI) and the Australian Solar Thermal Energy Association (AUSTELA) welcome the Energy Security Board's (ESB) discussion paper on the capacity mechanism. If implemented with a focus on renewable technologies, the proposed mechanism has the potential to incentivise essential investment in dispatchable, long-duration renewable energy storage.

Long-duration renewable energy storage is a fundamental requirement if Australia is to achieve emissions reduction targets while withdrawing coal and gas from the grid. The proposed ESB mechanism provides a pathway to achieve this outcome through investment in firm, reliable and cost-effective renewable capacity.

The role of concentrated solar thermal power (CSP)

CSP is a zero-emission replacement for nighttime generation currently provided by coal and gas fired power plants.

CSP systems convert sunlight into multiple hours of thermal energy storage, which can then be used to dispatch power at night or anytime there is insufficient sun or wind. CSP systems use a steam turbine with a synchronous generator for power production, which also allows the technology to deliver the essential grid support services currently provided by coal and gas generators.

CSP systems complement existing PV and wind systems. PV systems can provide for daytime power needs and CSP systems can support night-time power needs. PV and wind can also be coupled with batteries to provide a storage solution. These battery systems are cost effective for short duration energy storage, while alternative energy systems such as CSP and pumped hydro are more cost effective for longer duration energy storage.

An effective capacity mechanism

The proposed ESB capacity mechanism needs to attract investment in short and long-duration energy storage systems. Both are needed to progressively displace fossil fuel generation, but the proposed mechanism will require careful design to get the right balance of investment in short and long duration systems.

With over 95 CSP systems in operation around the world totalling more than 6GW of installed capacity, the proposed capacity mechanism is a timely incentive to drive deployment of the technology in Australia. Without such technologies in Australia's energy mix, our dependence on coal generation will continue and will not meet our emission reduction targets.

Quickly deploying long-duration renewable energy storage into the grid is the only way Australia can decarbonise while keeping the lights on and, designed in the right way, the capacity mechanism can support this.

Background on solar thermal – extracted from [2021 ASTRI Public Dissemination Report](#)

- Solar thermal uses the sun's light to generate heat that can be used in industrial processes or to generate electricity. To achieve high temperatures, it uses high quality mirrors to concentrate sunlight, which heats a liquid (e.g. water, molten salt, molten sodium, oil or particles) that is then stored or used directly for power or heat production.
- Over 95 large scale concentrating solar thermal plants are operating commercially overseas in countries with high solar radiation levels.
- CSP plants are typically built with 8-15 hours of energy storage built in as standard. They are also synchronous generators with all the system strength benefits typically associated with coal or gas plants.
- Given Australia's high solar irradiance levels, solar thermal is a renewable energy option that has the potential to provide low-cost, utility-scale, firm and fully dispatchable energy in the form of heat or electricity.