UNLEASHING RENEWABLE ENERGY STORAGE

NOVEMBER 2022

SMART ENERGY COUNCIL

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EXECUTIVE SUMMARY

Australia cannot achieve 82% renewables or 43% emissions reduction by 2030 unless it unleashes substantial investment in renewable energy storage.

Renewable energy coupled with storage is the cheapest form of electricity generation and by matching renewable energy generation with storage we will deliver cheaper, cleaner and more reliable power for all Australians.

In fact, when it comes to renewable energy storage we need everything, everywhere, all at once, again and again and again.

We need household battery storage, electric vehicles as batteries on wheels, community and commercial battery storage, large-scale storage and long duration solar thermal and pumped hydro, underpinned by national, state and territory Renewable Energy Storage Targets.

We need national policy settings to ensure that we deliver renewable energy storage at the right magnitude and at the right pace.

And we need all relevant Government agencies, including the Clean Energy Finance Corporation, the Australian Renewable Energy Agency, the Clean Energy Regulator and the Northern Australia Infrastructure Facility to prioritise renewable energy storage at all scales.

As an immediate priority, the Smart Energy Council calls on all Australian Governments to agree to an Accelerating Renewable Energy Storage Scheme by the end of 2022 to fast-track investment in large-scale renewable energy storage.

In committing to a National Renewable Energy Storage Target, all Australian Governments should also commit to building a strong domestic renewable energy storage industry, from the mining of rare earths to refining, processing and value adding, assembling and manufacturing battery storage systems.

How much storage do we need?

The Australian Energy Market Operator (AEMO) has estimated through their Integrated System Plan that Australia needs at least 19 gigawatts of storage to be installed and operational by 2030 to meet the 82% renewables target.

There is currently 2.2 gigawatts of storage installed in the National Electricity Market, two thirds of which are pumped hydro projects and one third large-scale battery storage.

The arrival of the 100 megawatt Hornsdale Power Reserve battery storage asset in South Australia in 2017 was a game changer, representing the emergence of battery energy storage at a large scale (previously the largest assets were only at a 1-2 megawatt scale).

Why we need storage

Deployment of renewable energy storage is required to deliver flexible, reliable power and to enable a higher penetration of low-cost, zero emissions wind and solar energy as the aging fleet of polluting coal plants is retired.

Historically, an argument was made that investment in new gas peaking plants was required to balance the increase in variable renewables, although this was in clear contradiction to our international carbon emission obligations under the Paris Agreement. This rationale is no longer available, as large-scale battery storage now provides a lower levelised cost of capacity (LCOC) and a levelised cost of energy (LCOE) when compared to open-cycle gas turbine peakers (gas plants), according to BloombergNEF.

The commercial case for batteries relative to gas plants will continue to improve as the price of battery storage falls and the price of gas soars, as advancements are made with battery technology (such as longer life expectancy) and manufacturing processes, and as new markets are implemented to recognise more of the capabilities and services batteries can provide to support stability and function of the network.

Why we need government action

The current investment case for storage is complex. For large scale storage, the National Electricity Market is missing markets that would adequately value the full suite of essential services storage can provide. Finance and debt markets are still nascent and cautious of volatile revenue streams, and the integration of storage within existing network connection and system frameworks still faces barriers and delays.

While there is currently some work underway by energy market bodies, they are unable to deliver regulatory reform at the pace required to recognise the services storage delivers to the power system.

In addition, grid connection approvals mean that financing and entry dates for new projects are closely tied to the exit of existing capacity, which to date remains uncertain and changeable. This is causing significant delays to renewable energy storage projects.

Delays to the uptake of battery storage are creating consequences such as increased electricity power volatility, reliability and network stability challenges, which ultimately increase the cost to consumers. These impacts are already evident and are anticipated to significantly increase in the coming years as aging coal plants exit the system.

Governments must act quickly to intervene to repair the system to provide strategic policy direction via a multi-faceted solution for a modernised and ultimately lower cost electricity network, to defend against these repercussions. Targeted mechanisms are therefore required to bridge the gap until the regulatory and market frameworks catch up. These mechanisms will support the business case and bring forward investment in storage capacity.

The Snowy Hydro (2 gigawatts pumped hydro), and Battery of The Nation (around 600 megawatts sub-sea cable accessing multiple gigawatts of Tasmanian pumped hydro) projects are unlikely to contribute a high quantum to the 2030 target.

Industry experience suggests it will be difficult to finance and deliver Snowy Hydro 2.0 and Battery of the Nation this decade due to their scale and complexity. Investment in long-duration pumped hydro should be sustained in recognition of the long development timeframes and value this technology will play with regards to long duration storage, particularly in the next decade and beyond.

Conversely, initiatives targeting the two most deployable forms of storage, small-scale storage and large-scale storage, should be the highest priority at this moment in time.

Summary of renewable energy storage types

Assumptions about the potential weighting of the various storage technologies through to 2030 based on realistic policy incentives in the current political context, are listed below:

1. Small-scale batteries

Collectively, many small-scale storage systems, located behind the meter at the household, commercial and industrial level, can act in an orchestrated way as a virtual power plant (VPP). This is otherwise known as Coordinated 'Distributed Energy Resource (DER) storage'.

The Reputex study modelling that underpinned the Australian Government's 82% renewable energy target assumed 8 gigawatts of household battery, which could theoretically also include bi-directional electric vehicles.

If one fifth of the current 3 million solar homes were incentivised to invest in home storage, averaging 10 kilowatt hours, this would equate to 6 gigawatt hours of capacity.

2. Large-scale battery storage, short to mid duration

The remaining volume of storage (more than 10 gigawatts) will be dominated by large-scale battery storage, including electro-chemical cell batteries such as Lithium Ion, Vanadium-flow and lead acid.

Stand-alone and hybrid (i.e. connected to wind and solar farms) large-scale storage systems have potential to meet the remaining 10 gigawatts (or more) of storage capacity required in the next 8 years, predominantly ranging between 2 and 4 hours duration.

Large-scale battery storage also has significant potential to help augment the transmission and distribution networks, reducing costs and improving how we build new lines. This application is not accounted for in the AEMO's Integrated System Plan, which could represent gigawatts of extra capacity required by 2030.

3. Community batteries

Community batteries have a small but important role to play in the 2030 target. At a minimum, the community battery scheme should deliver 200 megawatt hours of storage (400 locations starting at 0.5 megawatt hours per unit).

Given batteries are scalable the upside estimate of this program could be significantly enhanced if the right tools and processes (such as streamlined permitting and access to finance) are put in place.

4. Large-scale, long duration

Solar thermal and pumped hydro are not anticipated to have a meaningful impact on total storage capacity before 2030, but it is critically important to develop, and where appropriate pilot, these technologies well before the end of the decade.

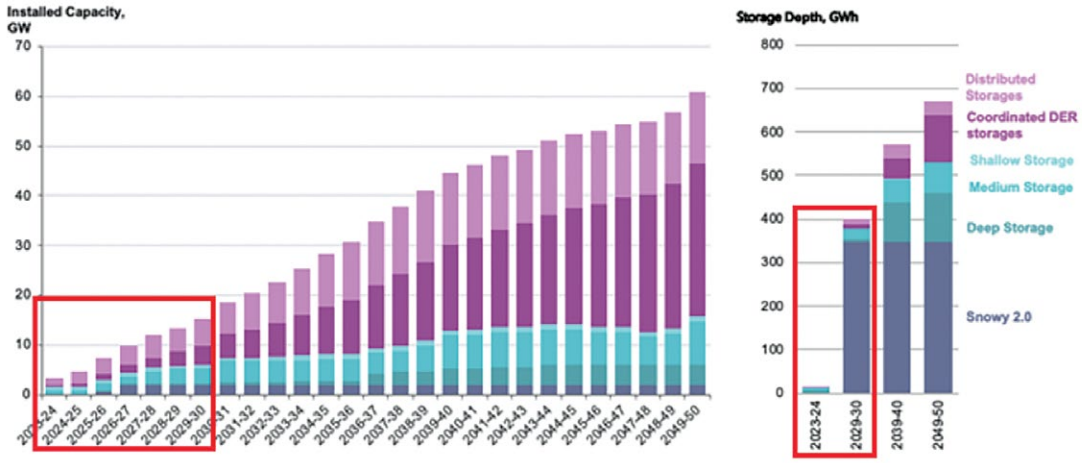
Pumped Hydro:

There is some potential to deliver up to 2 gigawatts through Snowy Hydro 2.0 close to the end of the decade, but significant investment will be required to network upgrades to fully realise the storage capability the project will deliver.

Access to a further 600 megawatts of capacity accessing vast storage resources within Tasmania if the Marinus Link is commissioned at the end of this decade. Other pumped hydro projects currently in development promise significant volume but are unlikely to be commissioned this decade.

Solar Thermal: A small number of projects could and should be commissioned by the end of the decade, beginning as soon as possible, with sizable penetration of this technology not expected to ramp up until early in the following decade.

AEMO Integrated System Plan Graph showing the proportionate uptake of storage in the NEM.



The above graph provides one view captured within AEMO's Integrated System Plan. If Snowy Hydro 2.0 is to be delayed it is anticipated that this volume will largely be met by large scale battery storage up until 2030.

Furthermore, the volume of storage required may increase if assumptions about the volume and pace of the delivery of transmission lines is overestimated, and if the electrification of the household and transport sector forecast is underestimated.

DISTRIBUTED ENERGY GENERATION

1.1. Small-Scale Renewable Energy Storage

There are a small number of State and Territory policy initiatives supporting household battery storage. In particular, the South Australian and Victorian Governments provide upfront financial support and the ACT and Tasmanian Governments provide no interest loans for the purchase of household batteries and other smart energy products.

It is worthwhile exploring the potential for the rapid deployment of solutions at scale by harnessing support and investment of household and business electricity consumers.

The Renewable Energy Target (RET) which initiated the renewable energy transformation has supported the installation of more than 3 million solar PV and 2 million solar hot water systems through the Small-Scale Renewable Energy Scheme.

A Small-Scale Renewable Energy Storage scheme, utilising the RET architecture, would simultaneously bolster Distributed Networks, to build 'resilient local networks through the energy transition', put downward pressure on power prices by reducing gas and electricity consumption and build a significant industry, supporting the continued decline in installed solar system costs.

Benefits of such a scheme are listed in further detail below:

- Protect all energy consumers from rising power bills in line with Government commitment, based on Reputex modelling, by:
  - Decentralising energy management, reducing further need for multi-billion-dollar network infrastructure upgrades.
  - Providing essential storage service to support greater penetration of wind and solar into the electricity network, the lowest cost source of energy
- Provide crucial network stability in the distributed networks over the decade of increasing:
  - household density,
  - electrification of the average household and
  - Electric vehicle charging.
- Improve the return on investment of household solar that Australian homeowner's have invested by capturing excess solar to store and put back into their household or sell it into the electricity market in the evening when it is most valued.
- Improve the household business case and further incentivise the uptake of electric vehicles, effectively helping households to speed up their ability to decarbonise the transport and household sectors simultaneously.
- Rooftop solar leads in providing the quickest deployment of renewable energy on the electricity network, where we need it. By the same token, home batteries are the fastest way to deploy energy storage.
- Drive a massive employment surge at the distributed level of energy,
- Generate significant opportunities to bolster battery manufacturing in Australia.
- Smart Managed charging, as set out below will ensure this investment see's significant savings for the local energy network, seeing a 30-50% reduction in capital costs.
- A back payment scheme could be deployed from the date the bill is presented to not disincentivize the prospective purchasers of battery products up until the commencement of the scheme.

Recommendations:

On 14th February 2022, the Member for Indi Helen Haines MP introduced a Private Members Bill – *Renewable Energy (Electricity) Amendment (Cheaper Home Batteries) Bill 2022*, in recognition of the need to support consumers in the uptake of batteries in homes and businesses The Bill lapsed on 11 April 2022, with the calling of the federal election.

The Smart Energy Council supports the establishment of a Small-scale Renewable Energy Storage Scheme, utilising the architecture of the Small-scale Renewable Energy Scheme.

The changes to the Small-scale Renewable Energy Scheme (SRES) regulations proposed are:

1. Changes to Provision 19BE covering the certificates to be created, whereby solar water heaters that replace a gas hot water system would receive 15 years of certificates to 2030

2. Changes in Provision 19D covering the certificates to be created, whereby households can have installed with an appropriately sized battery*, conditional to be Virtual Power Plant* ready as is the case in South Australia, or capable of smart managed charging would receive 15 years of certificates to 2030.

* A battery could be a stand-alone battery, OR an EV with 'bidirectional' charging capability (the ability to discharge power into the household as well as to charge itself for transport fuel purposes).

*A Virtual Power Plant is many batteries at different locations, orchestrated by a central operating system to behave collectively as one power plant.

Several jurisdictions have introduced no interest loans for home battery storage. The Australian Government could consider implementing this at a national level as an alternative to establishing a Small-scale Renewable Energy Storage Scheme.

1.2. Community Batteries

The Australian Government has pledged to invest $200 million over four years in community batteries through a capped, standalone grants program. This would deliver around 400 community battery systems with a proposed 500kWh capacity each, for a net total of 200MWh of storage.

It may include communities prone to natural disasters, located near the "fringe-of-grid" where it is costly to upgrade and maintain poles and wires serving them, or in areas where the uptake of solar is so high it threatens network stability, leading to the imposition of solar export limits on new solar households, or preventing new solar systems from being installed.

The Victorian Labor Government has committed to investing $42 million to install 100 neighbourhood batteries across Victoria by 2030, with 28 sites already identified (refer to link for further detail: **https://www.danandrews.com.au/news/labor-drives-down-bills-with-100-neighbourhood-batteries)**

The Smart Energy Council encourages other State and Territory Governments to consider similar commitments and note states with lower population density and greater solar irradiance than Victoria would see an even more compelling business case.

The battery may be owned by energy retailers, distribution networks, local councils and community groups or organisations. Should a distribution network owned battery gain access to government support through this program, benefits of the available storage capacity for energy sharing must be fully and transparently shared with communities, to avoid a *"socialisation of costs and privatisation of More generally the challenge for this scheme is to distribute funding where it obtains the best value in terms of enhancing the capability of the grid, decarbonisation and community energy self-sufficiency, rather than simply allowing the funding to flow indiscriminately to stakeholders in an unequitable and unbeneficial way".*

The challenge and context is well stated by the authors of the Renew Economy article: **Neighbourhood Batteries: To bring power to the people, you need to listen to what they want | RenewEconomy**

Community groups, researchers, policy-makers, and businesses all have a role to play in making sure neighbourhood batteries actually improve our energy system. If policy is to have its intended effect and bring power to the people, the clear message sent out this election must be heard – people want fairness, transparency and effective decarbonisation. Policy-makers across state and federal levels must engage with communities, embrace diversity and innovation, and evaluate trials and programs to ensure that new technologies are part of a progressive and just transition.

It is recommended that a clear set of principles be established to guide the location of community batteries.

LARGE SCALE ENERGY STORAGE

To complement the heavy lifting small scale, distributed storage systems will do in the energy transition, large scale storage, connecting at the distribution and transmission substation level, must be expedited.

As discussed, small scale systems are quick to deploy and will ease pressure on the distribution network and focus on short duration network stability, e.g. reducing the collective impact of daily peak demand on the broader network.

Analysis by AEMO suggests 8GWh of 19GWh storage required will be addressed at the small-scale or Distributed Energy Resource level, meaning a minimum of 11GWh of large-scale battery storage is required by 2030 (and the development for much greater volumes of short, mid and long duration storage to be well advanced in anticipation of the needs early next decade).

Large scale systems require investment in recognition of the longer timeframes, these larger projects require to become operational. Large scale systems are essential to address broader stability of the network and in particular the need for mid (4-8 hours) and long (8 hours to 4 days and beyond) duration storage demands to complement wind and solar as it continues to address the retirement of coal generators.

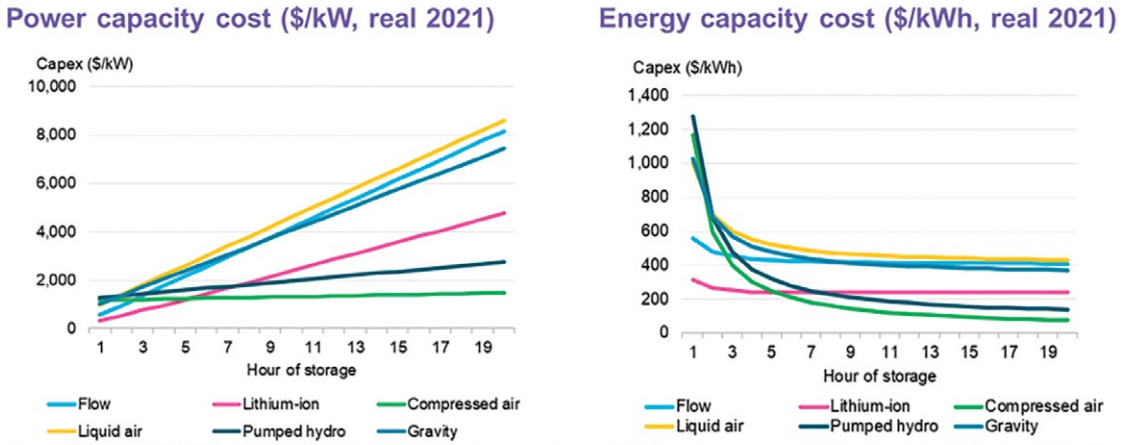
Large-scale storage batteries are considered the most cost-effective solution for short duration storage.

The well-established, but locational constrained pumped hydro technology and emerging solar thermal technology become cost competitive and therefore have a key role to play in addressing demand for longer duration storage.

1.3. Large-scale Battery Storage

Industry/Sector	Event type
Names	Electro-Chemical Cell, includes: Lithium-ion battery, Lead-acid battery, Vanadium flow battery, Zinc-Bromine flow battery.
LCOE	$156-195 / MWh Lithium Ion is the most competitive Battery Energy Storage System (BESS) however there are concerns re lithium supply shortages
Deployment	**1 - 1.5 years construction period from financial close**

Long-duration storage energy capacity costs



Source: BloombergNEF, NREL, Jacobs U.K, PNNL. Note: energy storage costs vary widely depending on geographical location and geological constraints. Above chart shows the typical costs in 2021. For detailed assumptions, see Appendix.

Electro-chemical cell batteries, which will be defined as 'large-scale storage' batteries in this report, are the lowest cost form of storage in the short duration space and remain competitive in the mid duration space. The dominant and lowest cost technology in this space are Lithium-Ion batteries. The Vanadium and Zinc-Bromine flow battery are examples of emerging technologies that become cost competitive in the 4-8 hour duration space before non-large-scale storage battery technologies like pumped hydro and solar thermal come into play.

According to a recent analysis, around 31GW of large-scale storage battery projects are "proposed". The challenge is unlocking investment in the proposed batteries to enable them to obtain approvals, secure financing, meet procurement timeframes to create a steady, incremental penetration of operating battery storage assets by 2030.

Some states and territories have already communicated and legislated policy that specifically supports large-scale battery storage. In order to achieve the volume of large-scale battery storage required by 2030, strong commitments are also required at a national level.

There are several obstacles limiting the investment and delivery of large-scale storage batteries.

1. An absence of markets recognising the value batteries provide to the network

The AEMC is unable to deliver regulatory reform at the pace required to recognise the services storage delivers to the network in increasing the uptake of lowest cost but intermittent energy sources of wind and solar.

Currently batteries obtain a revenue in two markets, the energy market (utilising the spot market price difference to charge themselves in middle of the day when solar derives a low price of energy and discharging in the evening when energy prices are high), and the Frequency Control Ancillary Services (FCAS) market. AEMC has flagged the introduction of new markets like Synthetic Inertia, Fast Frequency Response, but these could potentially take several years to be introduced and investors and banks do not consider them in a projects financial model.

2. Supply Chain Shortages

Adding to challenges on the investment case is price volatility created through global demand on battery manufacturing and the materials required to manufacture them, like lithium ion. This is resulting in the $/KWh for battery pricing increasing, even while technology such as (battery life expectancy) and manufacturing processes improve.

The Australian battery and inverter supplier market is limited and will benefit as more players establish themselves within the market.

3. Approvals timeframes and skills shortages

Well known bottlenecks in the planning approvals and network connection processes and a skills shortage at the professional and trades level affect the large-scale battery industry in the same way that it is impacting the broader renewable energy industry.

The Victorian Government and NSW Government have both made announcements in support of large scale battery storage, with further detail of these schemes forthcoming.

The Smart Energy Council, together with the Clean Energy Investor Group and Climate Action Network Australia, has proposed an Accelerating Renewable Energy Storage Scheme.

The intention of this scheme is to bridge the gap between now and the time when markets are created and the price of the technology improves to make the business cases function independently of Government intervention.

Under the Accelerating Renewable Energy Storage Scheme, the Australian Government, in partnership with State Governments, would undertake a series of tenders for large-scale renewable energy storage projects to meet forecast shortfalls in dispatchable generation and storage. Proponents would bid a floor price for the project's net revenue over a defined life.

1.4. Solar Thermal

Names	Concentrated Solar Thermal (CSP), Hybrid CSP + PV
LCOE	$70-$100/MWh depending on solar radiation and project size
Deployment	2 year construction period from financial close
Existing Policy	NSW: Regarding long-duration energy storage, the government's objectives are to deploy 2GW capacity of infrastructure that meets the state's reliability standard by 31 December 2029 alongside new generation facilities including 8GW in the planned New England REZ and **3GW in the planned Central-West Orana REZ** and 1GW of additional generation capacity.[1]

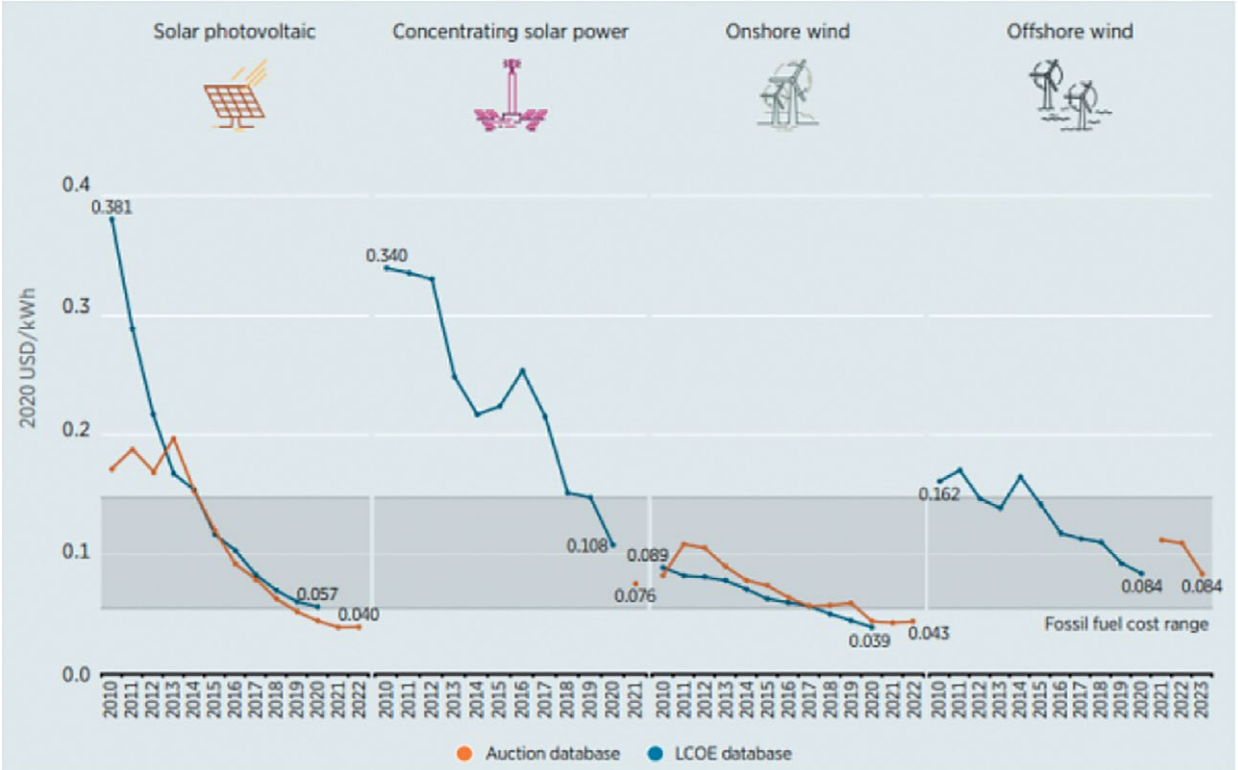
[1] *NSW's 'urgent' electricity infrastructure bill includes 2GW of long-duration energy storage - Energy Storage News (energy-storage.news)*

CSP decouples electricity generation from the arrival of sunshine during the day, creating dispatchable, flexible generation.

CSP uses mirrors to concentrate sunlight by up to 1,000 times its normal intensity. The concentrated sunlight is captured in the form of heat, which is then transferred into a molten salt thermal energy storage (TES) system. This solar energy, which is typically stored for 10-15 hours, is used when required to create steam to spin a turbine, creating dispatchable power at night or anytime there is insufficient sun or wind.

CSP's synchronous generation allows the system to provide frequency control and ancillary services (FCAS) and other network support that is currently provided by coal and gas generators - but with no emissions.

CSP works best in places with high solar insolation rates, making it ideally suited to drive decarbonisation of Australia's electricity and process heat requirements at the right cost. A hybrid CSP and PV plant can produce electricity 24/7. Low cost PV operating during sunlight hours integrated with nighttime energy from CSP offers the best generation mix while bringing down the overall LCOE.



Global LCOEs from newly commissioned, utility-scale renewable power generation technologies, 2010-2020

1.5. Pumped Hydro

Names	Pumped Hydro Energy Storage (PHES)
LCOE	$3,000 - $350,000 MWh Augmentation of an existing project like Shoalhaven and Snowy 2.0 represent the lower range, however new projects could be orders of magnitude more expensive where access to one or both reservoirs is not available.
Deployment	8 – 10 years
Existing Policy	NSW: Regarding long-duration energy storage, the government's objectives are to deploy 2GW capacity of infrastructure that meets the state's reliability standard by 31 December 2029 alongside new generation facilities including 8GW in the planned New England REZ and **3GW in the planned Central-West Orana REZ** and 1GW of additional generation capacity.[1]

[1] NSW's 'urgent' electricity infrastructure bill includes 2GW of long-duration energy storage - Energy Storage News (energy-storage.news)

For PHES, water is repeatedly cycled between a high and low reservoir. The energy stored is in the form of water that can be used to fuel potential future generation.

Pumped Hydro Energy Storage is less responsive than large-scale storage batteries, but comparable with OCGT in capability. It becomes increasingly competitive with the LCOE of large-scale storage batteries at and beyond 8 hours in duration.

Below are status updates of the two significant PHES projects:

- Battery of The Nation (BoTN) – Dependent on Marinus link, which is forecast to be commissioned early 2031.
- Snowy Hydro 2.0 – Forecast to be commissioned by 2027 (TransGrid) to 2029 or beyond.

CONCLUSION AND RECOMMENDATIONS

Australia cannot achieve its renewable energy and emissions reduction targets without a massive ramp up of investment in renewable energy storage.

The Smart Energy Council calls on all Australian Governments to:

- Commit to a Renewable Energy Storage Target or Targets for 2030;
- Ensure policies are in place to support the rapid uptake of all forms of renewable energy storage - household battery storage; electric vehicles as batteries on wheels; community and commercial-scale battery storage; large-scale battery storage; solar thermal; and pumped hydro;
- Commit to an Accelerating Renewable Energy Storage Scheme for large-scale battery storage by the end of 2022; and
- Commit to establishing a strong domestic renewable energy storage industry, from the mining of rare earths to refining, processing and value adding, assembling and manufacturing battery storage systems.

The Smart Energy Council urges the Australian Government to:

- Ensure all relevant government agencies, including the Clean Energy Finance Corporation, the Australian Renewable Energy Agency, the Northern Australia Infrastructure Facility and the Clean Energy Regulator prioritise renewable energy storage at all scales; and to
- Amend the Small-scale Renewable Energy Scheme to establish a Small-scale Renewable Energy ***Storage*** Scheme.

Renewable Energy Storage Acceleration Scheme Proposal

A rapid, targeted and cost-effective firming mechanism to accelerate deployment of utility scale storage in the National Electricity Market

Summary of the Proposal

The Australian Government, in partnership with State Governments, would undertake a series of tenders for large-scale renewable energy storage projects to meet forecast shortfalls in dispatchable generation and storage. Proponents would bid a floor price for the project's net revenue over a defined life, enabling them to obtain low-cost financing generally not available today due to currently missing and perceived uncertainty in storage revenue streams.

On most occasions, the storage project would have net revenue above the floor, resulting in no payments by Governments to the storage project. The scheme would also contain claw back provisions whereby the storage projects would make return payments to government when their net revenues are high thereby reducing costs to the taxpayer.

Proponents will need to sign availability guarantees for projects.

This proposal delivers fast, proven and cost-effective renewable energy storage. Together with support for household, commercial and community renewable energy storage and a Renewable Energy Storage Target, the Renewable Energy Storage Acceleration Scheme provides a framework for delivering sufficient storage to accommodate 82% renewables by 2030.

Advantages of the Scheme

Building on the best features of successful State Government electricity market tendering processes, the Renewable Energy Storage Acceleration Scheme has the following advantages:

- **Fast, proven and targeted** - A simple auction scheme can be implemented much faster than other schemes. There are already valuable learnings, infrastructure and governance arrangements that can be leveraged to fast-track implementation of the scheme. Winners of the tenders will be able to quickly obtain project financing leading to rapid Final Investment Decisions (FID).

- **Improved Energy Security** - The scheme will accelerate more storage into the National Electricity Market (NEM), reducing the chances of market disruptions or supply shortages enabling more variable renewable energy to be installed while maintaining sufficient electricity supply. New battery storage systems could be installed and operating as soon as 18 months after awarding of the tender for well advanced projects.

- **Cost Effective -** Transparent electricity market tendering processes have historically been very competitive, resulting in excellent value for money and selection of the most efficient and well managed projects. There would be no payments from Governments to projects in average or good revenue years and reimbursement payments to Governments in very good years.

- **Low Risk** - While the net revenue floor will be high enough to enable rapid project financing, it will not be high enough to provide adequate returns to project owners. This will encourage project owners to manage the projects to maximise revenues well above the revenue floor. When projects earn revenues above a net revenue ceiling bid in the tender, reimbursement payments would be made to the Governments.

- **Market Benefits** - Each new storage system installed in a State will facilitate higher renewables installation and also reduce wholesale price volatility as batteries charge during periods of low pool prices and discharge during periods of high wholesale energy prices. Reducing wholesale price volatility will exert downward pressure on wholesale, and thereby retail electricity prices.

- **Adaptable** - Running a series of auctions over time creates an opportunity to adjust the scope to address emerging needs of the NEM within the required timeframes of those needs.

Proposed Design Features of the Renewable Energy Storage Acceleration Scheme

1. State Governments, in collaboration with AEMO and the Federal Government, would set a Large-scale Renewable Energy Storage Target in gigawatts for each State and Territory, which would add up to a National Large-scale Renewable Energy Storage Target (LREST).
    - AEMO would publish the level of operating, committed and likely storage projects which would be compared to the LREST for each State.
    - If a shortfall was forecast within the next 3-4 years, a tendering process for additional storage would commence.
    - It is suggested that State and Federal Governments share the cost of any payments, possibly 50/50%.

2. An entity would be designated to run the tendering process; this could be the Clean Energy Regulator, the Clean Energy Finance Corporation, AEMO Services or another entity.
    - The principal variable in the tendering process would be a Net Revenue Floor (such as $40/kW/year-$60/kW/year).

- Proponents would also bid a Net Revenue Ceiling above which 50% of the revenue would be returned to Governments to reimburse them for previous under floor payments thereby reducing the cost of the scheme.
- Proponents could make separate bids for different duration versions of the same project.
    i. For example, a proponent could bid one Net Revenue Floor for a 2 hour battery and a higher Net Revenue Floor for a 4 hour version of the same battery project and Governments could decide which offer they preferred.
- The projects would need to provide quick start, fast ramp rates and be zero-emissions.

3. The scheme would operate with quarterly settlements by comparing the Net Revenue the project received to the Net Revenue Floor.
    - Net Revenue = FCAS revenue + Sale of Energy Exported – Cost of Energy for Charging.
    - If the contracted floor price was, for example, $10/kW/quarter and the project earns, for example, $9/kW for that quarter, it would be topped-up by $1/kW for that quarter.
    - If in the following quarter, the project earned $15/kW, no payments would be due.
    - If in the following quarter, the project earned $40/kW, compared to a contracted ceiling of $30/kW, the project would reimburse the Government 50% x ($40 - $30/kW) = $5/kW (assuming the project had received under floor payments of at least this amount).

To discuss this further, please contact Wayne Smith, External Affairs Manager Smart Energy Council, at wayne@smartenergy.org.au

25 October 2022