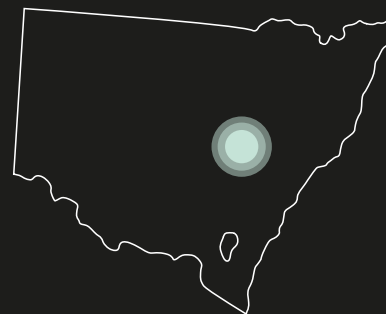


# Phoenix Pumped Hydro

Renewable Energy from ACEN



## Project Introduction

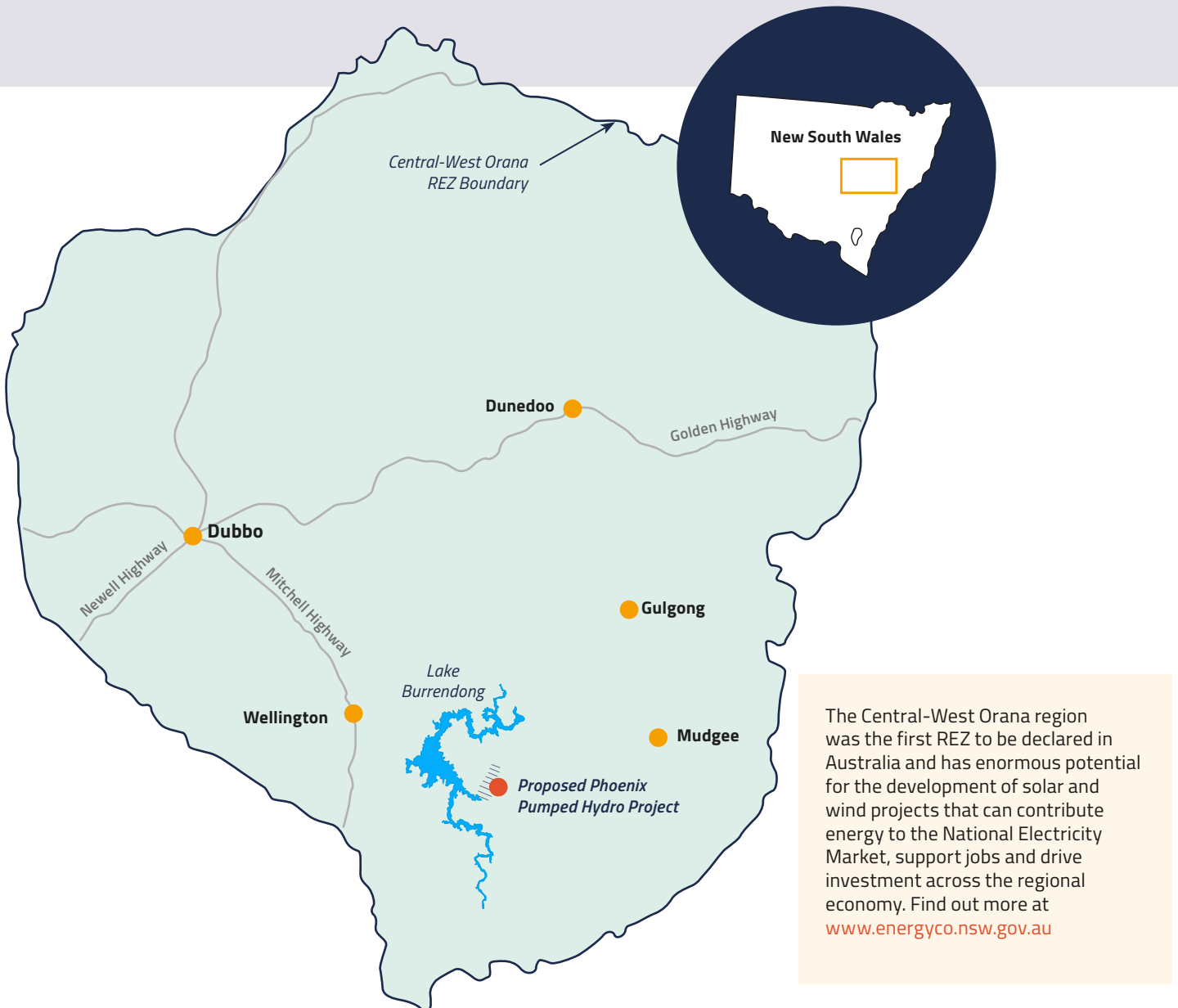


# Large-scale, long duration energy storage

**ACEN Australia is proposing to develop an 800MW, 12-hour pumped hydro project 35km west of Mudgee, within the NSW Government's Central-West Orana Renewable Energy Zone (REZ).**

The REZ is made up of several proposed renewable energy generators including wind and solar that will provide a low-cost source of energy for consumers.

Phoenix Pumped Hydro will firm these renewables by providing large amounts of long-duration storage to keep the lights on even when the sun isn't shining, and the wind isn't blowing.



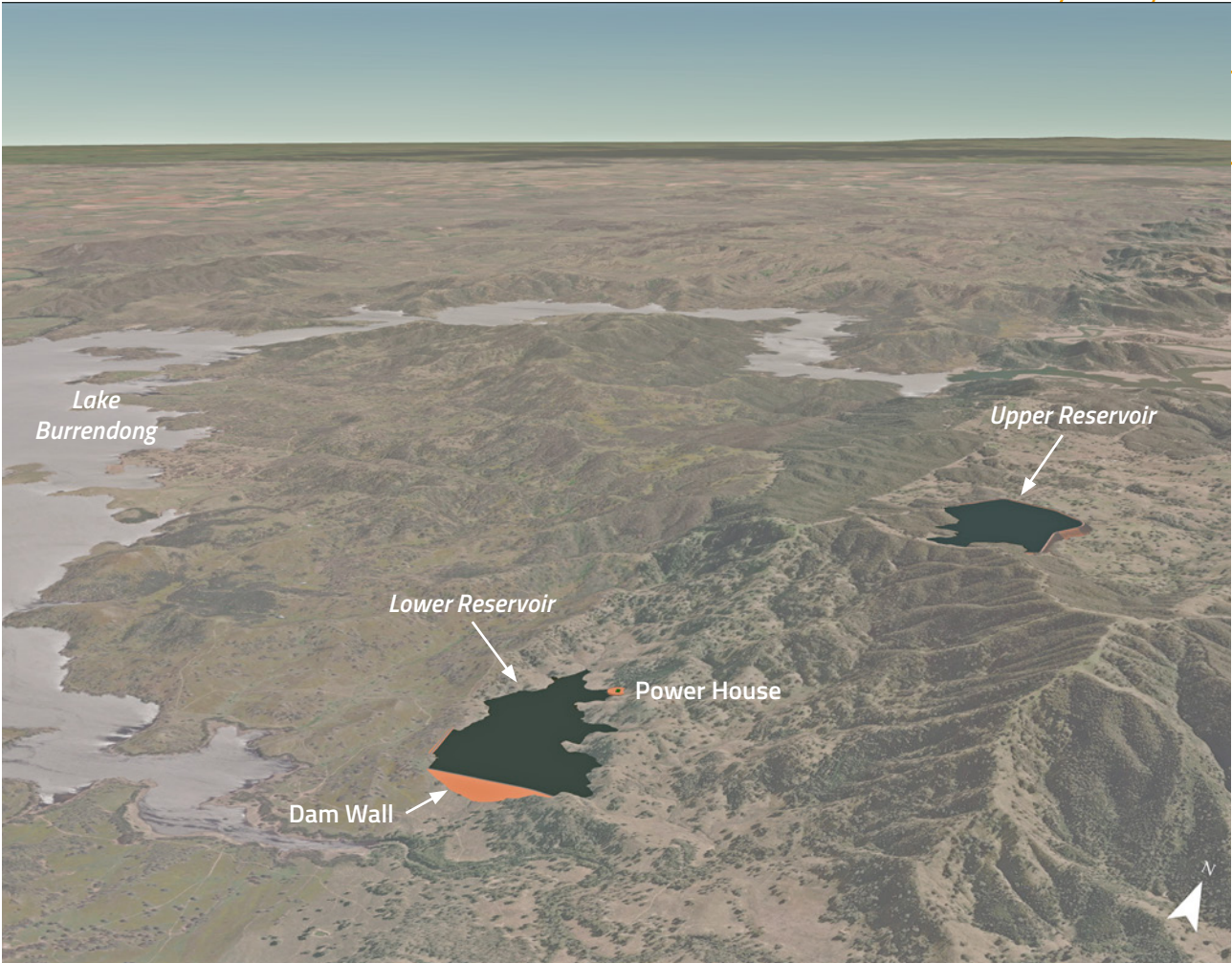
## Acknowledgement of country

ACEN Australia acknowledges the resilience and knowledge of the Traditional Custodians of this nation. We pay our respects to elders past and present, the many Aboriginal people that did not make their elder status and to those that continue to care for country.

# Project overview

Phoenix Pumped Hydro is targeting an installed capacity of over 800MW and 12 hours of storage capable of delivering up to 9,600MWh of energy.

The project will have purpose built, off-stream, upper and lower storage reservoirs connected by a tunnel or pipeline to a powerhouse containing pump-turbine units.



## Reservoirs

An upper and lower storage reservoir will be constructed, each with a surface area of approximately 50ha and capable of holding up to 15,000ML of water, or 1% of Lake Burrendong. The upper reservoir will be 350m higher than the lower reservoir.

The dedicated storage reservoirs will be off-stream, separate from Lake Burrendong and have minimal interaction with existing waterways.

During construction, the project will source water from Lake Burrendong and once operational, the project will reuse the same water over and over again, requiring only minor top-ups to replace evaporation losses over time.

## Powerhouse

A powerhouse will be located at the lower reservoir containing the pump-turbine units and associated equipment required to pump water and generate electricity. The powerhouse will contain multiple reversible pump-turbines, for an installed capacity of over 800MW.



## Transmission line

Phoenix Pumped Hydro will require connection to the NSW electricity network.

This connection will occur either at the existing 330kV network between Wellington and Mount Piper or the new transmission infrastructure being considered as part of the Central-West Orana REZ.

## Site selection

Renewable energy is rapidly moving ahead in Australia but storing energy for later use is key to embedding it into a reliable national electricity supply. There are a range of social, environmental and economic factors that guide site selection. The key benefits of the Phoenix Pumped Hydro project include:



Located within the NSW Government's Central-West Orana REZ, offering energy storage solutions to support several nearby wind and solar assets



Located within existing cleared agricultural land and sparse woodland



Dedicated off-stream storage reservoirs, minimising aquatic and riparian impacts



Suitable options for connection to nearby transmission network

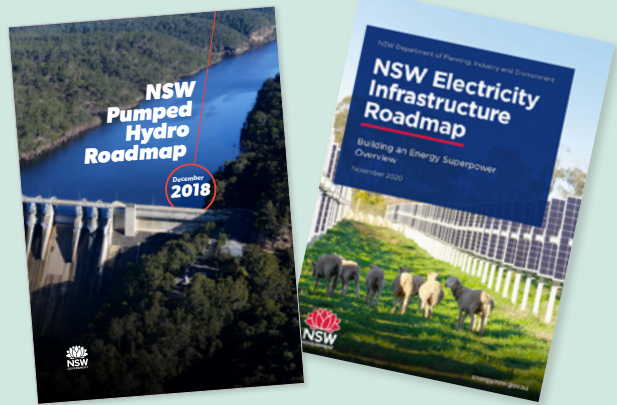


Proximity to regional centres such as Mudgee, coupled with easy vehicle access to the powerhouse and both reservoir sites.

# Why we need Phoenix Pumped Hydro

The NSW Government has released the [NSW Electricity Infrastructure Roadmap](#) - its plan to transform the state's electricity system as ageing coal-fired generation plants retire through the coordination of investment in transmission, generation and storage.

It is expected that on-demand electricity generation will play a significant role in the state's energy future, and as such, the [NSW Government's Pumped Hydro Roadmap](#) has also been developed. This Roadmap encourages private sector investment in pumped hydro projects that will deliver the long term, large-scale energy storage that is vital for the state's energy system.



## Supported by



Following a competitive selection process, Phoenix Pumped Hydro has been identified by EnergyCo and WaterNSW as an important project that will support NSW energy security, help replace retiring coal-fired generation capacity and importantly support the achievement of the NSW Government renewable energy objectives that are outlined in the NSW Electricity Strategy. The project is being supported by both EnergyCo, through its \$50 million Pumped Hydro Recoverable Grants Program and WaterNSW through its Renewable Energy and Storage Program.

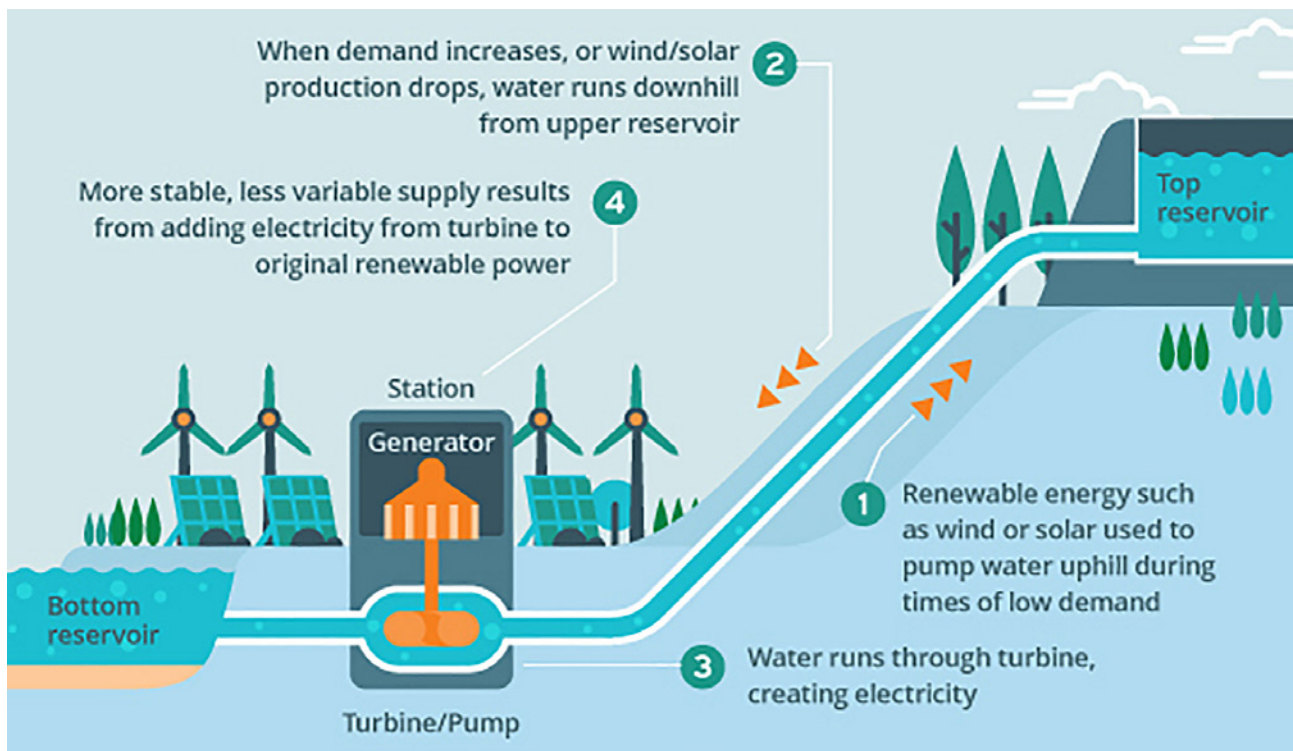
## How pumped hydro technology works

*"Pumped hydro storage systems are the most mature electrical energy storage systems available. They are dispatchable with rapid response times,*

*which means they are well placed to balance electricity demand and provide backup for variable renewable energy generation."*

**Dr Alan Finkel**

Independent Review into the Future Security of the National Electricity Market



Source: <https://arena.gov.au/blog/what-is-pumped-hydro-and-how-does-it-work/>

# Sharing in the benefits

As NSW embraces the opportunities a growing renewable energy industry brings, ACEN Australia understands the importance of sharing in the benefits that our projects can provide.

## Regional economic development

We have a commitment to employ and buy regional where we can so we can keep the benefits in the region. Our approach to maximising opportunities for regional participation is centred on the following key areas:

With such a significant construction investment, it is anticipated there will be many opportunities for local businesses, Indigenous businesses and social enterprises to be involved.

Due to the size of the project and the skill set required, it is likely that specialised workers from outside the region will be needed on the project.

Detailed social and economic impacts studies will be undertaken however preliminary studies so far indicate the NSW gross regional product will increase by around \$1.5B over an eight year period, with employment estimated to peak at 2,200 full time equivalent jobs.



Prioritise the procurement of goods and services from regional and Indigenous businesses, and social enterprises



Prioritise workforce participation opportunities for regional and Indigenous groups through employment, training and job pathways

**\$1.8b**

estimated construction value



Up to **500** full-time jobs at peak construction



Up to **50** operational jobs for 50 years



### VALUE Community enhancement and resilience

**FOCUS** Activities that enhance communal lives, cohesion, and resilience through improved access to technologies and economic opportunities.



### VALUE Education and work

**FOCUS** Activities that provide or enhance education, training and employment resources and opportunities.



### VALUE Reconciliation

**FOCUS** Activities that address Indigenous disadvantage, promote shared understanding, and respect for culture, and promote reconciliation.



### VALUE Environment

**FOCUS** Activities that support communities to improve environmental resilience and stewardship.



## Community benefit funding



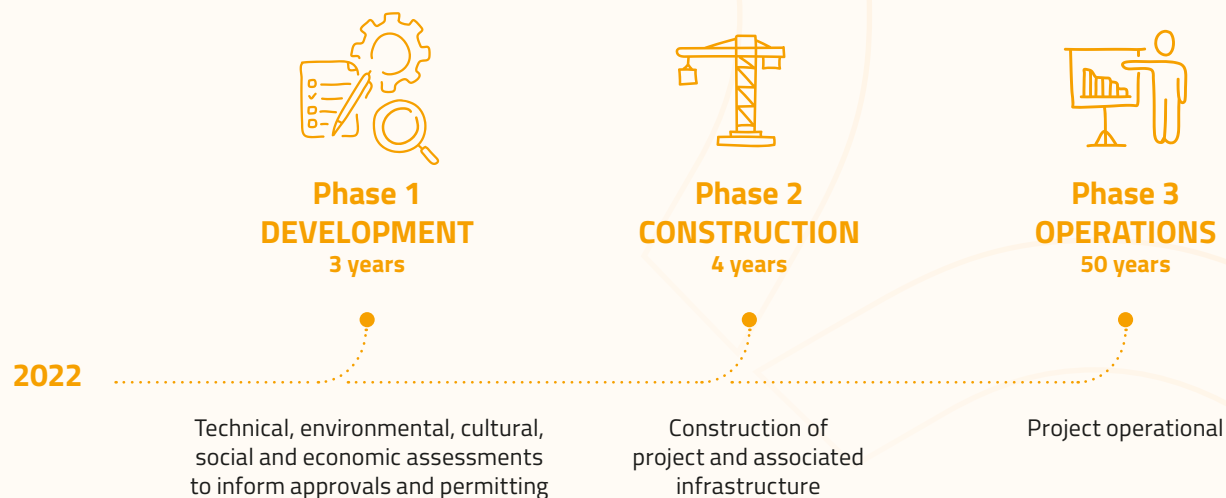
We understand that community expectation for benefit sharing has shifted, and rightly so. We believe that benefit sharing goes beyond making cash-based contributions, and towards legacy investments delivered in partnership with communities.

Our approach to benefit sharing for the project will be informed by identified local needs, priorities and aspirations, and we will be seeking input from community, stakeholders and government on what this looks like as the project progresses.

We support the United Nation's Sustainable Development Goals, with investments prioritised for initiatives and partnerships that deliver benefits in at least one of ACEN Australia's value areas.

# Project lifecycle

The project will be assessed as a State Significant Development under the *NSW Environmental Planning and Assessment Act 1979*



## ACEN in the Central-West Orana Region of NSW

ACEN Australia has several renewable energy projects located in the Central-West Orana region of New South Wales in development or ready for construction.

Five REZs in NSW were introduced by the Australian Energy Market Operator (AEMO) in 2018 as a way of identifying 'high renewable resource areas' based on their potential to deliver additional clean energy to the National Electricity Market (NEM) and support the transition away from coal-fired generation. These locations also benefit from existing energy resources such as hydro and wind and have established grid infrastructure close by. For more information on the Central-West Orana REZ, visit [www.energyco.nsw.gov.au/renewable-energyzones/centralwest-oranarenewableenergy-zone](http://www.energyco.nsw.gov.au/renewable-energyzones/centralwest-oranarenewableenergy-zone)

### Birriwa Solar

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- In development
- 600MW solar and battery project
- 20km south-east of Dunedoo, in the Birriwa district

### Stubbo Solar

Renewable Energy from ACEN

- Approved for construction
- 400MW solar and battery project
- 10kms north of Gulgong

### Aquila Wind

Renewable Energy from ACEN

- Early planning
- 350MW wind project
- Near Mount Aquila, south-east of the township of Stuart Town

### Valley of the Winds

Renewable Energy from ACEN

- In development
- 800MW wind project
- 5km south-west of Coolah Valley

### About ACEN Australia

ACEN Australia is the platform representing ACEN's renewable energy assets in Australia. It includes several solar, wind, battery, pumped hydro and energy storage projects across New South Wales, Tasmania, Victoria and South Australia in development and construction.

Our aim is to provide low cost, clean electricity in a socially and environmentally responsible way, using innovative technology solutions. With 50+ employees and growing, our people are located in Tasmania, New South Wales and Victoria.

The Phoenix Pumped Hydro project has received support from WaterNSW as part of its Renewable Energy Storage Program and EnergyCo through the Pumped Hydro Recoverable Grants Program. The views expressed herein are not necessarily the views of the NSW Government. The NSW Government does not accept responsibility for any information or advice contained herein.

# Phoenix Pumped Hydro

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## Engagement, contact and feedback

### Understanding community views

**We want to make an enduring and positive contribution.**

To achieve this, we work closely with host landowners, neighbours, Aboriginal partners and the wider community to help us gain a detailed understanding of the benefits and impacts associated with the project.

We want the project to be a valued and long-term part of the local community for decades to come.

### Contact us



1800 570 847



[info@phoenixpumpedhydro.com.au](mailto:info@phoenixpumpedhydro.com.au)



[www.acenrenewables.com.au](http://www.acenrenewables.com.au)