

Kangaroo Valley Battery



AGL Energy Ltd is seeking development consent to construct, operate and maintain a grid scale battery with a capacity of up to 400 megawatts (MW) and up to 1,600 megawatt-hour (MWh) at Kangaroo Valley in NSW.

AGL has recently acquired Firm Power who have been developing a proposed grid scale battery (the Project) adjacent to the existing 330kV Kangaroo Valley Substation along Bendeela Road in Kangaroo Valley, New South Wales. The location of the proposed battery is approximately 150 kilometres south of Sydney and 80 kilometres southwest of Wollongong in the Shoalhaven LGA. AGL will own and operate the up to 400 megawatts (MW), up to 1,600 megawatt hour (MWh) battery, which will consist of battery modules and connection infrastructure, as well as any required road and access upgrades.

Large batteries are an orderly arrangement of battery units and inverters, with associated electrical and data cabling, and on-site connection infrastructure. The battery packs are enclosed in custom designed, dust and waterproof units made of steel. The units are light coloured to reflect heat and each unit has its own internal thermal management system.

Batteries offer numerous benefits that enhance energy efficiency, reliability, and sustainability. They help stabilise the grid by balancing supply and demand, reducing power outages and voltage fluctuations. The storage of excess energy enables the delivery of a steady energy supply even when generation is low.

Additionally, grid-scale batteries support peak load management, reducing strain on the grid and minimising the need for costly infrastructure upgrades. Batteries provide backup power during outages, delivering energy security for homes, businesses, and critical facilities. Batteries also facilitate the integration of renewable energy into the network, reducing reliance on fossil fuels and lowering carbon emissions.

Why locate a battery at this site in Kangaroo Valley?

The proposed site for the Kangaroo Valley Battery has excellent proximity to the Transgrid 330kV switching station, which has capacity for firming infrastructure and provides for robust connection to the electricity network. The site is also largely cleared of native vegetation and has flat to undulating topography. The proposed site has natural vegetation screening in all directions which will reduce the visual impact of the project.

Where does the stored energy come from?

The energy for the Battery comes from the National Electricity Market (NEM), including nearby generators such as:

- Capital Wind Farm, to the south-west
- the nearby Shoalhaven Pumped Hydro power station

Excess energy from any of these facilities and the grid could be stored in this battery. This depends upon the direction of power flow, which is driven by supply and demand in the region and varies throughout the day and night.

What is the expected timeline of the proposed battery?

The Kangaroo Valley Battery is currently in the planning and development stage. AGL expects that the Environmental Impact Statement (EIS) that is being prepared, will be submitted to the Department of Planning, Housing and Infrastructure (DPHI) by the end of 2025. The community will be given the opportunity to comment on the Project during the public exhibition phase following the submission of the EIS. If the Project is approved by DPHI and the Federal Environment Minister, AGL expects to reach a financial investment decision by 2027.



If the project proceeds there will be a pre-construction phase where management plans are developed and then it is expected that construction will commence in 2027. Battery projects take between 18-24 months to be constructed. Assuming all external approvals are obtained, AGL predicts that the battery will be operational by 2028.

How many and how big would the battery units be?

Both the size and number of battery units would be dependent upon the supplier and manufacturer selected. The following table provides examples, based on two main suppliers in the Australian market and current technology.

	Supplier A	Supplier B
Dimensions (per unit)	2.44 m (L) x 2.23 m (W) x 3.3 m (H)	8.8 m (L) x 1.65 m (W) x 2.785 m (H)
Maximum energy capacity	~ 720 kilowatt hours	3916 kilowatt hours
Battery type	Lithium-ion phosphate	Lithium-ion phosphate
Estimated number of units	~ 2200 units	~ 410 units

Battery technology is evolving rapidly, which means there will likely be a range of options available at the time of technology selection.

What type of battery technology will be used?

There are known, as well as emerging, battery technologies that would be considered for the Project.

Type	Description
Lithium-ion	<p>There are diverse lithium-ion battery formulations, including nickel, manganese, cobalt and iron phosphate. Lithium-ion phosphate batteries are common across Australia.</p> <p>Each battery unit contains numerous interconnected battery cells that operate much like a typical battery, where chemical reactions across an anode and cathode create an electrical flow.</p>
Lithium-ion polymer	<p>Currently under investigation as an alternative to standard lithium-ion batteries, the polymer battery may improve energy density, improved stability and better overall performance.</p>
Vanadium redox flow ('Flow' batteries)	<p>Another potential alternative to lithium-ion batteries are flow batteries which store energy in liquid electrolytes held in external tanks, such as those based on vanadium. Electrolyte solutions are pumped through chambers in a fuel cell, where their oxidation state changes when in contact with electrodes. This results in the flow of electricity when electrons and ions pass through a membrane.</p> <p>They take up more space than lithium-ion batteries for the same storage capacity, however can be readily scaled up by increasing the tank capacity. Currently undergoing trials, flow batteries may be in commercial operation by the end of 2026.</p>
Sodium-ion	<p>This technology involves the movement of sodium ions between positive and negative poles, creating a charge. Although not widely commercialised, these batteries may become available in the near future, as they have a range of benefits. These include abundant supply and easier extraction of source material.</p> <p>Like flow batteries, sodium-ion batteries require more space to achieve the same storage capacity as lithium-ion batteries. Research and development of this technology is ongoing.</p>

Battery storage technology is continuously evolving. Research and development are primarily focussed on improving energy density, product lifespan, noise, safety, repurposing and recycling.

What is the lifespan of the Kangaroo Valley Battery?

As mentioned above, battery technology is advancing all the time. Currently the expected lifespan of battery modules is 20 years. After 20 years, a new development application to extend the life of the project may be sought and the battery will be refurbished. Otherwise, the project will be decommissioned, where the battery components will be recycled and the project site rehabilitated to pre-development conditions.

Will the Project prevent or minimise power outages in Kangaroo Valley?

As a transmission-scale project that connects to the Kangaroo Valley switching station, the Kangaroo Valley Battery will provide firming and support resilience at the regional, not local level. Construction of the Kangaroo Valley Battery will not impact on any proposal by residents or government to seek to strengthen the local network by the installation of a community battery.

How does a grid scale battery differ from a community battery?

Community batteries are smaller in scale, generally up to five megawatts, and store excess energy generated by small-scale renewable energy systems, such as rooftop solar. This energy is stored locally and does not automatically supply the broader electricity network. It is then available to the community at times of lower generation, such as in the evening, and can also be supplied at the network-scale if supply exceeds local demand.

How will biodiversity be impacted by this Project?

Preliminary ecological studies were conducted to identify threatened species and other ecological values. The NSW Government's Biodiversity and Conservation Science Group reviewed these studies to define the required detailed investigations for the Environmental Impact Statement (EIS). The preliminary biodiversity assessment and requirements are available on the Major Projects website, [Kangaroo Valley Battery Energy Storage System](#) page. Further ecological studies are being carried out, and a Biodiversity Assessment Report is being prepared for the EIS. AGL will seek to avoid and minimise impacts and put in place mitigation measures. Biodiversity offsets (conservation actions intended to compensate for residual impact on biodiversity) will be used only as a last resort.

Does AGL use local ecologists to undertake biodiversity studies?

[Ecoplanning](#), an ecological consultancy headquartered in Woonona, within the Illawarra region, undertook the preliminary ecology studies and prepared the Preliminary Biodiversity Assessment. Whilst Ecoplanning are undertaking the detailed biodiversity assessment for the Project, AGL is currently investigating opportunities to collaborate with Kangaroo Valley-based ecologists in the development of the EIS.

How will transport and road safety be managed?

A preliminary route assessment has been prepared to understand how oversize-overmass vehicles will access the site. This is publicly available on the Major Projects website, [Kangaroo Valley Battery Energy Storage System](#) page.

AGL must undertake a detailed Traffic and Transport Assessment for the EIS, which will be considered by Transport for New South Wales, the Shoalhaven City Council and the Kangaroo Valley community. Impacts such as traffic generation, escort requirements and worker transportation will be analysed. Effects on traffic routes and site access will be assessed to understand the capacity and condition of roads, road safety and intersection impacts.

AGL is required to detail mitigation and management measures to address adverse impacts. These may include road or intersection upgrades, as well as road repairs throughout and following construction. This process will involve consultation with road authorities and the community.

If the Project is approved, a Traffic Management Plan will be prepared prior to construction. This would be implemented during construction to ensure safe vehicle movements and minimise the impacts of construction traffic on the local community.

Can equipment be safely moved down Barrengarry Mountain, Moss Vale Road?

Some potential route options require that oversize-overmass vehicles transport equipment down Moss Vale Road. How this may be achieved safely, while minimising disruption to road users, will be considered as part of the detailed assessments described above.

All possible access options will be assessed, other than the Hampden Bridge, which is of significant historical value and subject to load restrictions and will not form part of any route.

How will the site be accessed? Bendeela Road or Old Bendeela Road?

Site access is yet to be determined and will form part of the transport and road safety studies. AGL understands that there are differing views amongst the Kangaroo Valley community with respect to the appropriate access point and will continue to consult with the community as data from the technical assessments becomes available.

How many workers and vehicles will be travelling to the Project site during construction?

If the Project is approved, it will create up to 60 jobs during the peak construction period. Construction is expected to take up to 24 months, with a peak period of four-five months. Two to three ongoing, operational roles will be created; subsequently, operational traffic will be minimal.

Measures to minimise worker and equipment delivery traffic will be included in the transport and safety studies, as well as the Traffic Management Plan. This could include such measures as using buses to transport workers and requiring deliveries to occur outside of peak travel hours.

AGL will continue to consult with the Shoalhaven City Council, Transport for New South Wales and the community to identify key concerns and suitable approaches to minimise impacts.

Will the Project have noise impacts on the Kangaroo Valley's environment?

Noise and vibration impacts will mainly occur during construction due to earthworks, battery assembly, and vehicle movements. The battery may also produce noise from its cooling fans, similar to an air conditioning unit, during operation.

A Noise and Vibration Impact Assessment will be conducted as part of the EIS. AGL must measure existing background noise levels and assess how the project will affect the area's noise environment, considering both construction and operational noise.

Noise impact varies by location due to factors like background noise, terrain, and weather. If noise levels exceed limits, mitigation measures will be put in place to protect nearby residents.

AGL will keep the community informed and work with landowners to address any potential impacts.

Does the Noise and Vibration Assessment consider effects on wildlife?

Sensitive receivers include both humans and local fauna, which may be affected by noise and vibration generating activities. Subsequently, AGL will assess any such impacts on wildlife.

Any noise and vibration impacts that may affect wildlife will be considered in the Biodiversity Development Assessment Report. This will include the identification of mitigation measures where impacts are likely to occur.

Will the battery increase bushfire risk? How will it be protected from bushfires?

Battery projects implement multiple layers of protection against fire. This protects both the surrounding environment and the battery asset.

Batteries are equipped with Battery Management Systems that monitor and regulate voltage, current, power limits, cooling systems and temperature in real-time. Batteries are also fitted with inbuilt fire suppression systems, which detect abnormal operating conditions and initiate shut down to reduce fire risk.

Non-combustible fire barriers are installed within each battery unit, with minimum separation distance requirements between containers, minimising the risk that a fire could spread to other units. Each row of battery units is separated by a gravel or paved surface area, with the entire facility surrounded by an Asset Protection Zone, or buffer to any adjacent vegetation. The size of this zone is determined by vegetation type and other requirements, such as the Australian Standard and New South Wales Rural Fire Service Planning for Bushfire Protection guidelines.

A battery is required to undergo extensive testing prior to commissioning and the commencement of operation. This ensures a project is operating safely prior to connection to the electricity network. Battery facilities also undergo regular maintenance throughout their operational life.

Should the Project be approved, a Fire Emergency Management Plan will be prepared in consultation with the Rural Fire Service and Shoalhaven City Council. It must operate in compliance with the conditions of any approval, relevant guidelines and the Australian Standard.

Will the Project impact views across Kangaroo Valley?

The site is surrounded by natural screening vegetation, however some of the Project may be visible from neighbouring properties and elevated areas. There are a range of measures to minimise visual impacts, including, for example, vegetation screening and painting battery units to blend into the surrounding landscape.

Transmission towers may also be visible from surrounding areas, should the Project connect to the switching station using the current transmission easement. The current 330kV, single-circuit steel towers are 30 metres tall. If AGL is granted permission by Transgrid to upgrade these towers for the Project, they would be replaced with double-circuit steel pole towers approximately 40 metres tall.

AGL is investigating alternative connection options, including the installation of an underground cable. The most suitable option will be dependent upon a number of factors, including approval by Transgrid.

How will waste from the Project be managed, including when the Project is decommissioned?

An assessment of all waste generated by the Project will be undertaken as part of the EIS. This will include consideration of how waste can be avoided, minimised, re-used or recycled, as well as appropriate disposal measures. A Waste Management Plan will be prepared, encompassing the construction and operational phases of the Project.

Prior to decommissioning, a Decommissioning Management Plan will be prepared and approved. This outlines the procedures for dismantling and removing infrastructure and materials, and rehabilitation of the site to its pre-existing condition. This will include measures for dealing with waste materials.

Many battery manufacturers offer take-back programs, enabling the recovery or recycling of components. Recycling technology exists for the metal components of lithium batteries, as well as ancillary materials, such as steel and concrete.

Non-recyclable components are disposed of in accordance with regulations. End-of-life batteries require special handling and transport by certified operators, to minimise the risk of fires and chemical leaks. These are processed at specialist facilities and disposal must comply with health and safety legislation.

How will the Project benefit the community?

AGL is committed to investing in the communities where our projects are located, to provide long-term benefits and opportunities for community members. The identification of benefits is undertaken in consultation with the community, Traditional Custodians and local government.

The Project will deliver social and economic benefits to the community during construction and operation. During construction, benefits are likely to include jobs, local industry participation and increased local and regional spending by the construction workforce. Transport companies, accommodation providers, restaurants, and other service industries are also expected to see increases in business throughout construction.

A Community Fund will also be established with the Shoalhaven City Council that will be delivered from construction and during operations. Funding priority areas of this community fund will be based on engagement with Kangaroo Valley community members. Consultation with Shoalhaven City Council will occur, to ensure that benefits are delivered in accordance with local community objectives.

Benefit-sharing will be consistent with the New South Wales Government's [Benefit-Sharing Guideline: Guidance for large-scale renewable energy projects](#). This will deliver benefits to neighbours, the community (through a Council or AGL managed fund) and/or community-led programs.

Is the Project associated with the proposed Origin Energy Shoalhaven Hydro expansion project?

No. AGL who will be developing this battery project is not an entity of, or in any other way associated with Origin Energy.



1800 039 600



AGLCommunity@agl.com.au