

# GREAT WESTERN BATTERY

## Community Information Booklet

NEOEN



[greatwesternbattery.com.au](https://greatwesternbattery.com.au)



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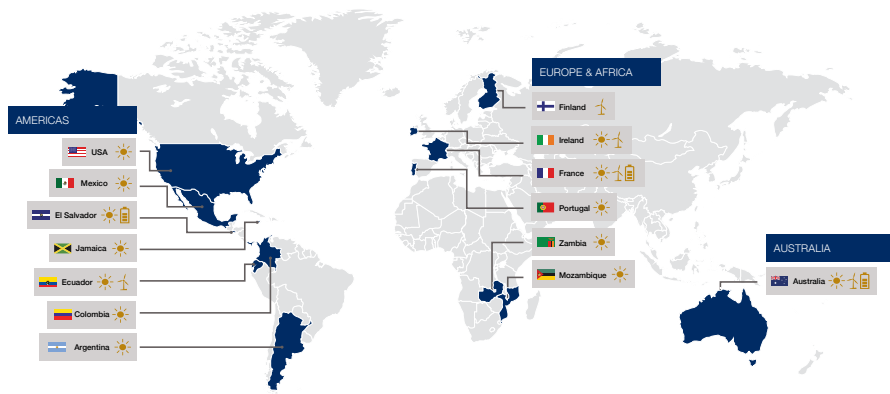


## GLOBALLY

The company is headquartered in Paris, France, and has two Australian offices – in Sydney and Canberra.

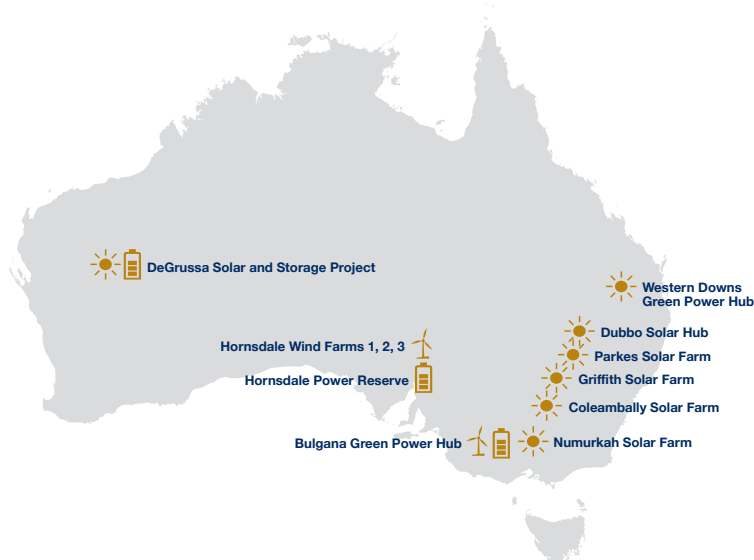
We operate across renewable energy technologies including solar, wind and storage in Europe, Central America, Africa, the Middle East and Australia.

Neoen's total capacity in operation and under construction is currently over 3 GW and we are aiming for more than 5GW by 2021.



## LOCALLY

Neoen Australia began operations in 2012. Over the last eight years the company has initiated the development of more than 1.5GW of solar and wind projects through organic growth, local partnerships and strategic acquisitions.



Neoen produce clean electricity from renewable sources such as sunlight and wind using mature, tried and tested technologies. We are also leaders in energy storage.

# WORLD'S FIRST BIG BATTERY HORNSDALE POWER RESERVE



FIRST STAGE  
TOOK LESS THAN  
SIX MONTHS TO  
BUILD

- 150MW Lithium-ion battery located next to Hornsdale Wind Farm
- Owned and operated by Neoen
- Installed and maintained by Tesla

- Provides grid stability services
- Saved SA energy consumers over \$150 million in its first two years
- Now testing grid scale inertia services in a world-first



REDUCES RISK  
OF BLACKOUT  
IN SOUTH  
AUSTRALIA





## DELIVERING CHEAPER ENERGY FOR INDUSTRY



### LAVERTON STEELWORKS VICTORIA

Laverton Steelworks have agreed to take power from Neoen's 128 MW Numurkah Solar Farm under a 15-year deal. GFG Alliance's Executive Chairman Sanjeev Gupta said the deal would help lower energy costs at Laverton.



### DEGRUSSA MINING WESTERN AUSTRALIA

DeGrussa is the largest off-grid solar battery storage project in Australia. It powers a gold and copper mine in remote WA. Commissioned in June 2016, it provides a solar and storage solution to the majority of the mine's daytime electricity requirements, offsetting up to 20% of total diesel consumption annually.



### NECTAR FARMS VICTORIA

Bulgana Green Power Hub, consisting of 196 MW of wind backed by a 20MW battery, is co-located with agri-business Nectar Farms to provide secure and affordable energy. Nectar Farms is using the latest in hydroponic glasshouse and plant technology to create a 10 hectare state of the art facility and over 130 local jobs.

## DELIVERING CHEAPER ENERGY TO RETAILERS



### **ENERGY AUSTRALIA** *COLEAMBALLY SOLAR FARM*

Providing energy output of 100 MW of the 150 MW solar farm for 12 years.



### **SIMPLY ENERGY** *PARKES & GRIFFITH SOLAR FARM*

Providing 100% of the energy output of the two solar farms for 13 years.



### **ACT Government** *HORNSDALE WIND FARM*

Providing 100% of the energy output of the 309 MW wind farm for 20 years, powering ACT's transition to 100% renewables.





## WHAT DOES A BIG BATTERY LOOK LIKE?

### HORNSDALE

POWER RESERVE

Our 150MW battery outside Jamestown, SA  
co-located with Hornsdale Wind Farm



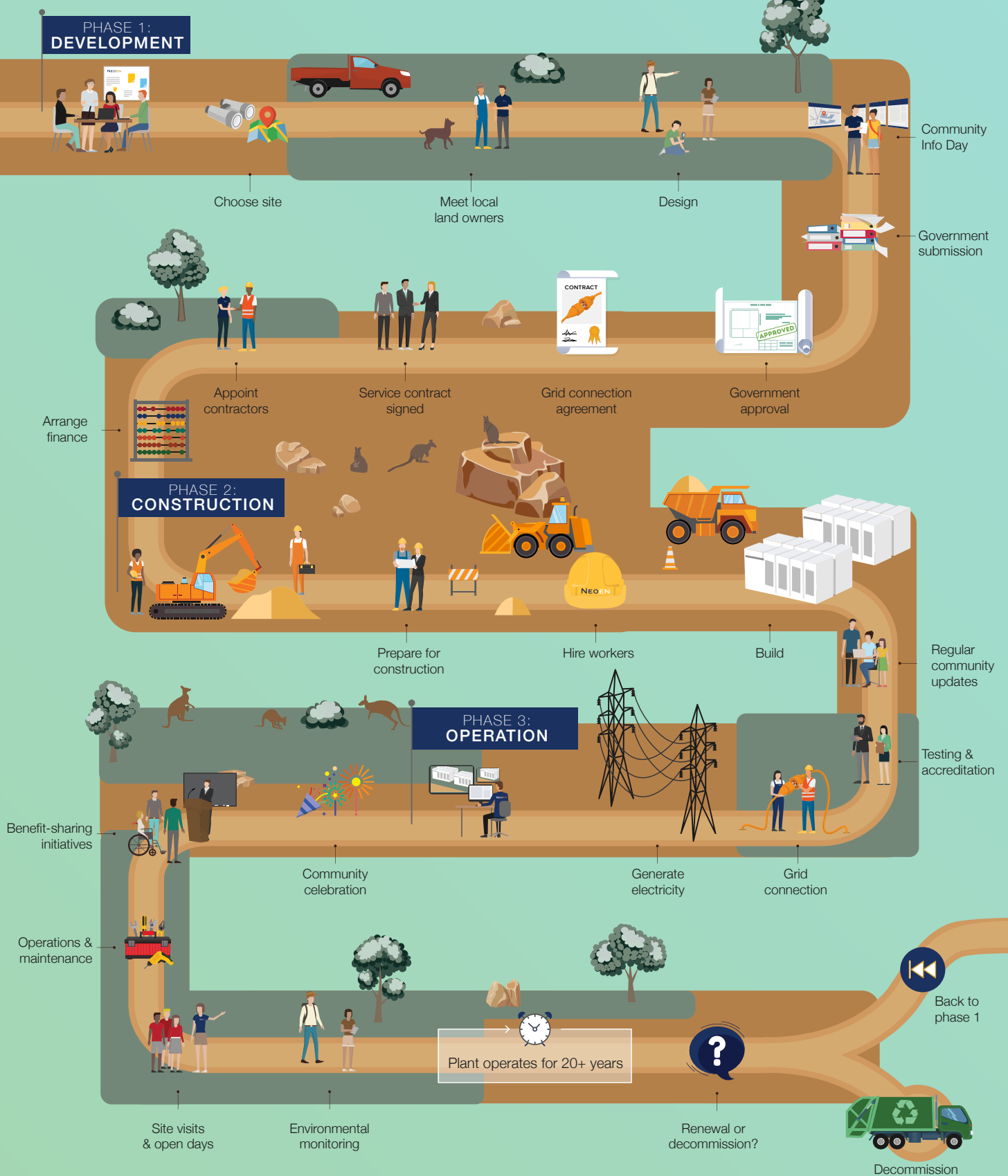
### VICTORIAN

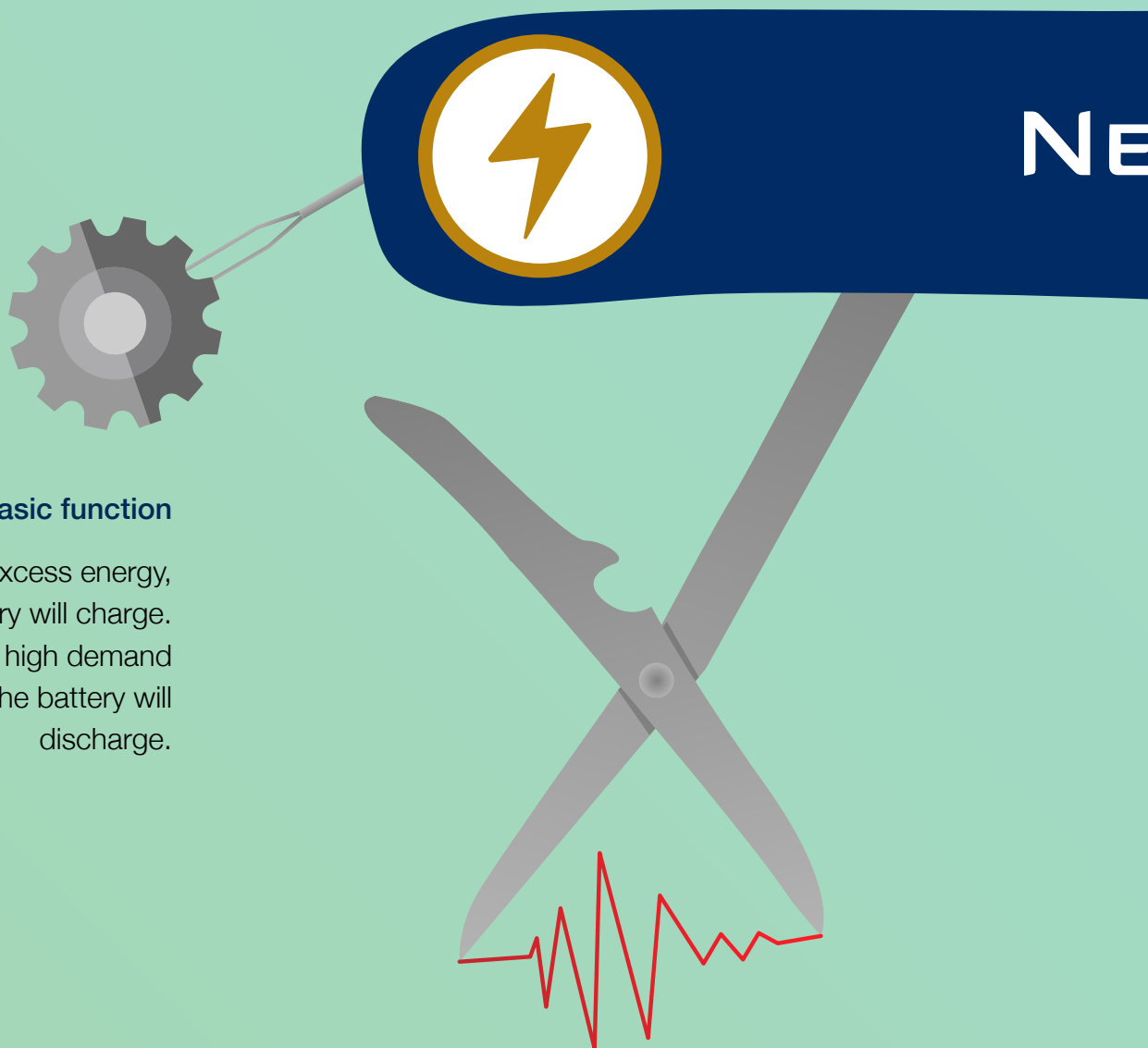
BIG BATTERY

Our 300MW battery near Geelong, Victoria  
that is currently in development



# PROJECT LIFECYCLE





### Basic function

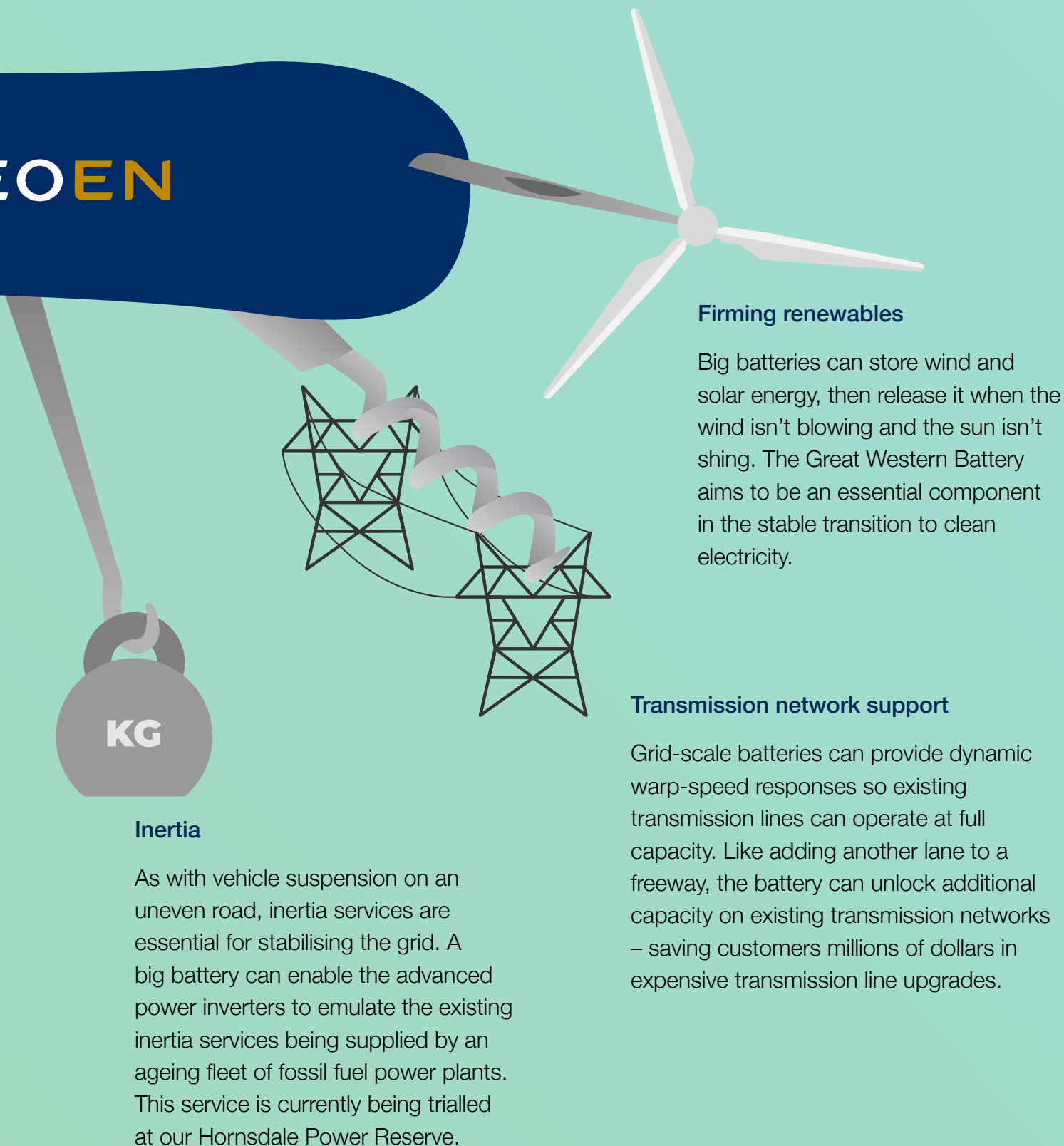
When there is excess energy,  
the battery will charge.  
When there is high demand  
for energy, the battery will  
discharge.

### Frequency support

To maintain the stability of the system, the grid has frequency control. The battery injects electricity in response to frequency changes. The battery will also add competition to the markets which helps reduce consumer electricity prices, helping to reduce electricity costs.



## BATTERY DO?



## FACTS & FIGURES

### GRID-SCALE ENERGY STORAGE SYSTEM



**500MW**  
power capacity

yet to be contracted



**1,000MWh**  
energy storage

Stores an industrial amount of energy,  
discharges quickly on demand



**70,000 x**  
more capacity than a household battery

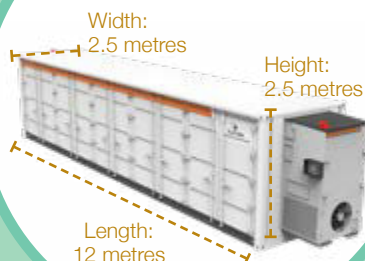
### THE TECHNOLOGY

Battery packs are enclosed in custom designed, dust and waterproof 'cabinets' made of galvanised steel. Cabinet colour is white or light coloured to assist with heat management and each cabinet has its own internal thermal management system.

Will conform to electricity  
industry standards

Will use an industrial inverter  
to convert DC power to AC  
when discharging (vice versa  
when charging)

#### Battery cabinet

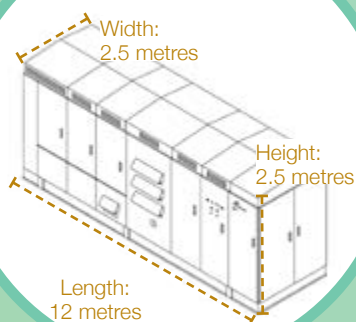


Likely to be lithium-ion  
battery packs enclosed  
in steel cabinets, similar  
to shipping containers

Will meet all safety and  
bushfire risk requirements

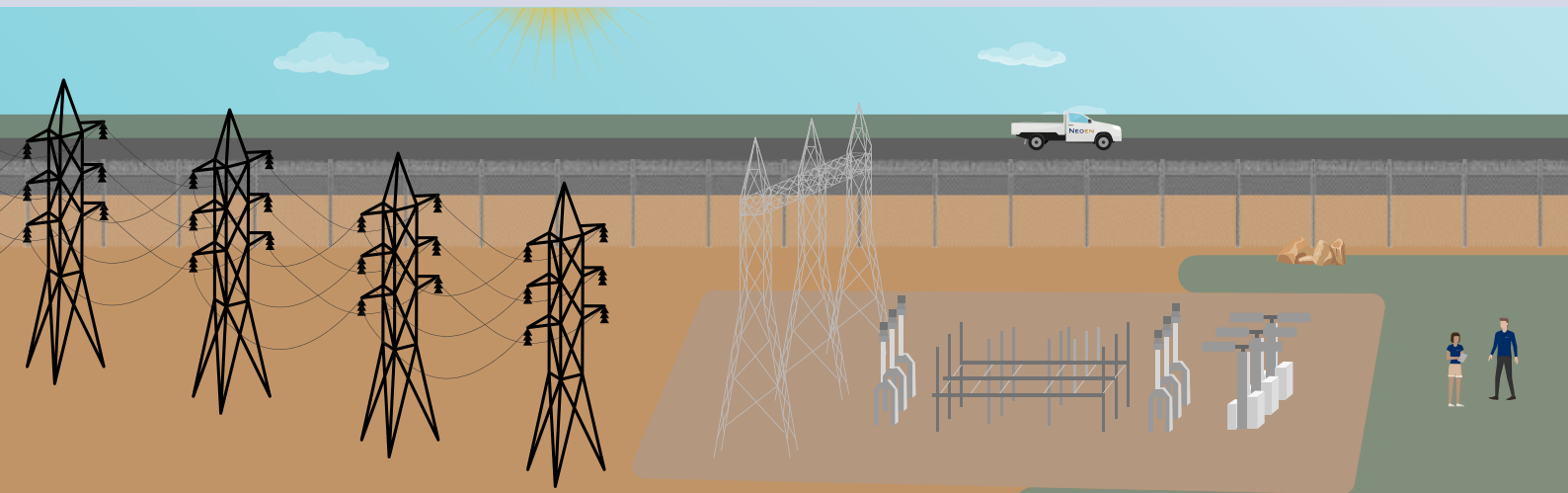
Battery brand to be determined

#### Inverter



Inverters are made from galvanised steel, and may  
exist as one single 20ft container or a few outdoor  
cabinets on concrete slabs.

## CHOOSING THE SITE



### 1) Good grid location

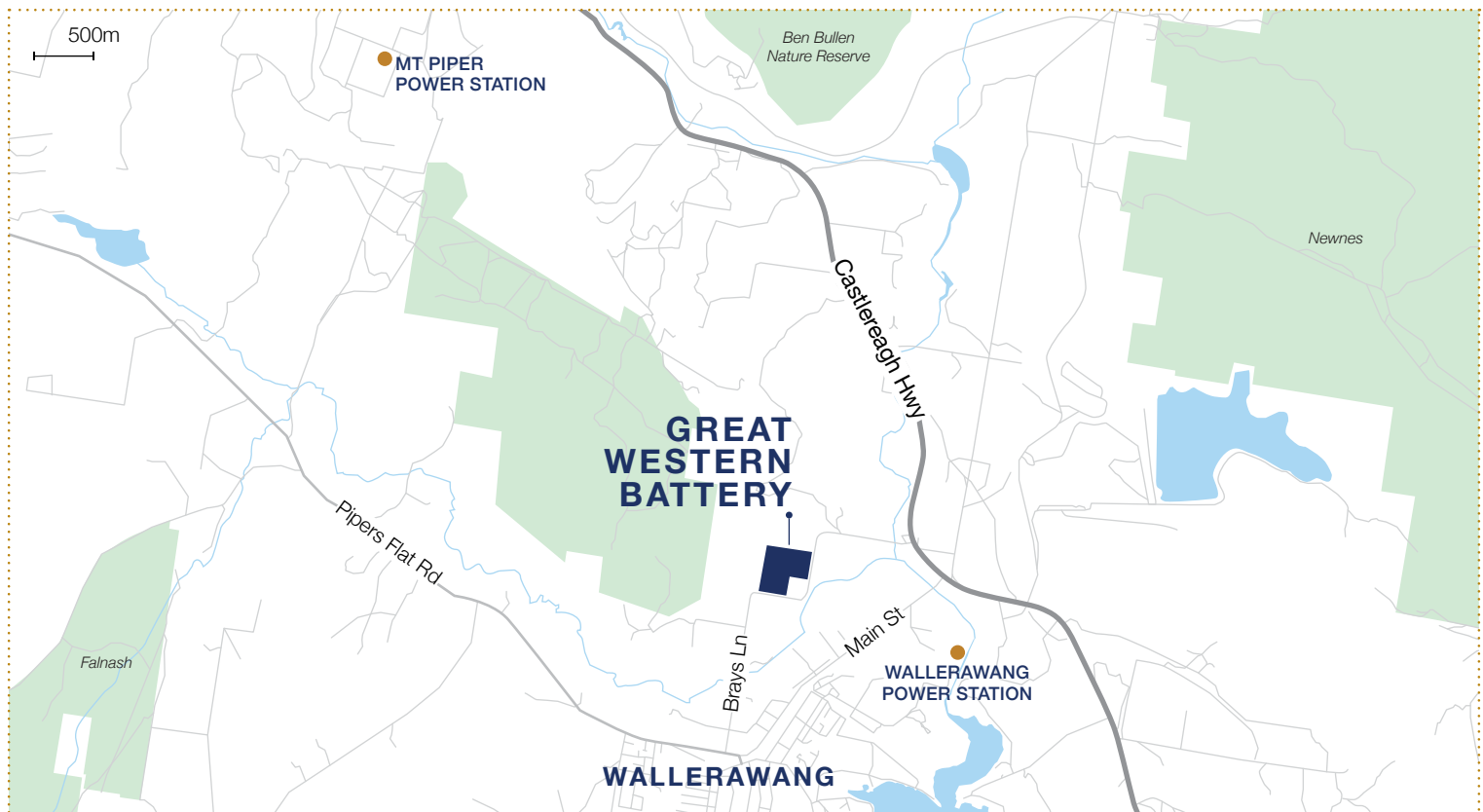
The Great Western Battery is located in a central part of the NSW electricity network, linked multiple high voltage lines.

### 2) Proximity to substation

It will connect into the Wallerawang substation at 330kV. This minimises voltage losses and the amount of electricity infrastructure such as cabling required for the project.

### 3) Site history

Studies of the proposed site location have found little to no presence of significant ecology systems and cultural artefacts, reducing potential impacts on the local environment and cultural heritage.





## WE OWN & OPERATE OUR PROJECTS

### Great Western Battery

The Great Western Battery will be managed from Neoen's 24/7 Operational Control Centre in the Canberra, which currently operates our 11 existing projects across Australia. This office coordinates with local maintenance contractors for safe, effective and compliant operations.

### Neoen's Portfolio

Neoen develops renewable energy projects to own and operate them – not to on-sell them. With over 1GW of operating projects connected to Australia's National Electricity Market (AEMO), our asset and operations team play an important role in managing our power plants.



Our Operational Control Centre oversees our interactions with the National Electricity Market: a wholesale electricity market which spans the eastern and south-eastern coast of Australia.

The market works as a pool or spot market, where power supply and demand are instantly matched via a centrally coordinated dispatch process overseen by the Australian Energy Market Operator.

## COMMUNITY BENEFITS



### Community benefit fund

The funds would be allocated to local community projects through a competitive annual grants process.



### Educational resources

Develop educational resources for local schools to support learning about renewables and our future energy system.



### Local tourism

Develop a local tourism initiative centred on batteries or renewable energy



### Possibility to invest

Community co-investment is common overseas and just starting in Australia



### Tell us your ideas

To submit your ideas, please fill out our online survey:

**[surveymonkey.com/r/greatwesternbattery](https://surveymonkey.com/r/greatwesternbattery)**

### ABOUT STORAGE

#### Q1. What technology is being used for the project?

The Great Western Battery will utilise lithium-ion units and associated equipment from leading manufacturers. These manufacturers are selected through a separate competitive tender process.

In principle, the facility will be an orderly arrangement of battery cabinets, inverters and control systems including electrical and data cabling. The battery packs are enclosed in custom designed, dust and waterproof 'cabinets' made of steel. The cabinet colour is white or light coloured to assist with heat management and each cabinet has its own internal thermal management system.

#### Q2. How big will it be?

Once completed, the 500MW battery will cover around 5 hectares of land. It will be no higher than 2.5 meters.

#### Q3. What are the benefits of battery energy storage?

In making the transition from fossil fuels to 'baseload' renewables, the ability to store and dispatch energy will play a key role. Pumped hydro is an example of longer-term storage; that is, suitable for storing energy and releasing it over days or weeks. However, pumped hydro has a relatively slow 'ramping' time and is less suitable for providing rapid-response services to grid contingency events such as outages or heat waves (with high demand created by air-conditioning). Battery storage, such as Tesla's lithium-ion Powerpack technology, fills this key short-term role.

These are some of the functions a grid-scale lithium-ion battery may be expected to perform:

- Network security services including
- Frequency Control Ancillary Services, and Network Loading Control Ancillary Services

- System Restart Ancillary Services
- Arbitrage (spot market trading)
- Peak shaving
- Block/load shifting
- Renewable firming and smoothing

The NSW Government is committed to renewable energy and has set ambitious goals with the new Electricity Roadmap. The Great Western Battery aims to support the effort of the NSW Government in achieving its renewable vision.

#### Q4. What is the life cycle of the Great Western Battery?

Current battery technology comes with an industry-leading 15-20 year warranty. The batteries still retain most of their capacity at this time, and will be able to operate beyond it depending on market conditions and other factors.

#### Q5. How is the battery reducing costs for consumers?

Battery storage can reduce costs for consumers in 3 ways:

- Supporting more wind and solar, which are now the cheapest forms of power
- Increasing competition in ancillary markets and pushing electricity prices down
- Helping to avoid blackouts and the associated costs

#### Q6. What happens to the batteries when they reach the end of their life?

We make a commitment that all above-ground infrastructure is removed and the site rehabilitated when a project ceases to operate. After removal, most of the material in the batteries is reclaimed or recycled with over 60% recovered for re-use.





## HEALTH & CULTURE

**Q7. Are there any health risks?**

The Great Western Battery is using similar technology to the batteries that are increasingly installed in homes, just on a larger scale. There are no known health risks associated with properly maintained large-scale battery installations.

**Q8. Is the project reducing air quality?**

Monitoring of dust levels during construction is a basic requirement of each project. Dust generating activities are assessed during windy conditions and are stopped and rescheduled where adequate control of dust generation cannot be achieved.

Visual observation of machinery is undertaken during site inspections as well as daily pre-start checks which ensure all machinery has appropriate emission control devices, is in good working order, and is maintained correctly.



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