TERRITORY
BATTERY

Community Information Booklet

NEOEN

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1800 966 103

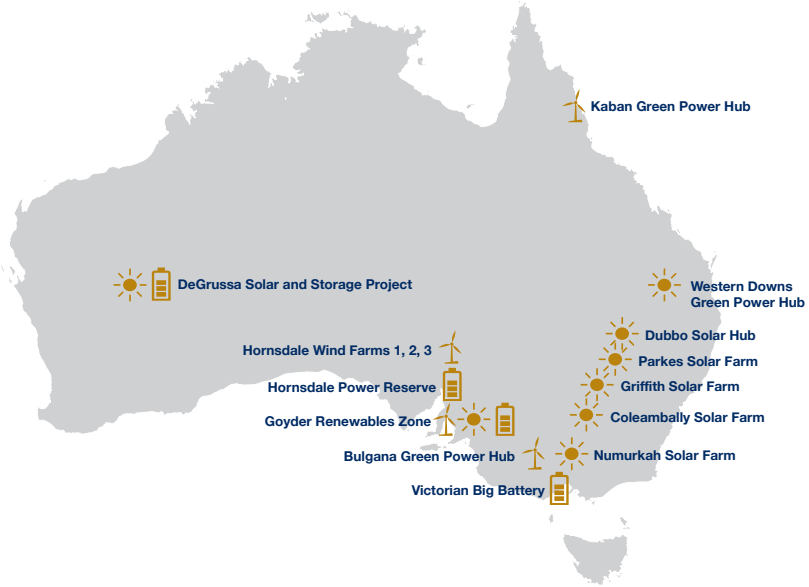
NEOEN

GLOBALLY

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

We operate across renewable energy technologies including solar, wind and storage in Europe, the Americas, Africa, and Australia.

Neoen's total capacity in operation and under construction is currently 5.4 GW and we are aiming for 10 GW by the end of 2025.



LOCALLY

Neoen Australia began operations in 2012. Over the last ten years the company has initiated the development of more than 2.5GW 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.

NEOEN

Learning Hub

Take your students on a journey of discovery into the wonders of electricity and renewable energy

Create dynamic, engaging lessons

The Learning Hub covers the basics of electricity, through to the environmental and social impacts of renewable and non-renewable energy sources.

Curriculum-aligned videos, resources and classroom activities give you everything you need to create dynamic, engaging lessons for your students.

Each topic features a comprehensive set of teacher notes, giving you flexibility to build the lessons best suited for your classroom.

The Learning Hub was developed by Neoen to strengthen engagement with regional communities around renewable energy projects.

Perfect for the Australian Curriculum

Grade 5 & 6

Upper Primary

Topics include:

Why do we use electricity?

Could the world run out of electricity?

Can you store electricity in a bottle?

Grade 7 & 8

Lower Secondary

Topics include:

How can sunlight charge my phone?

Why is wind a renewable energy resource?

How can solar energy power the night?

Interested?

Learn more!

neoenlearning.com

NEOEN

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

AUSTRALIA'S LARGEST BIG BATTERY

VICTORIAN BIG BATTERY

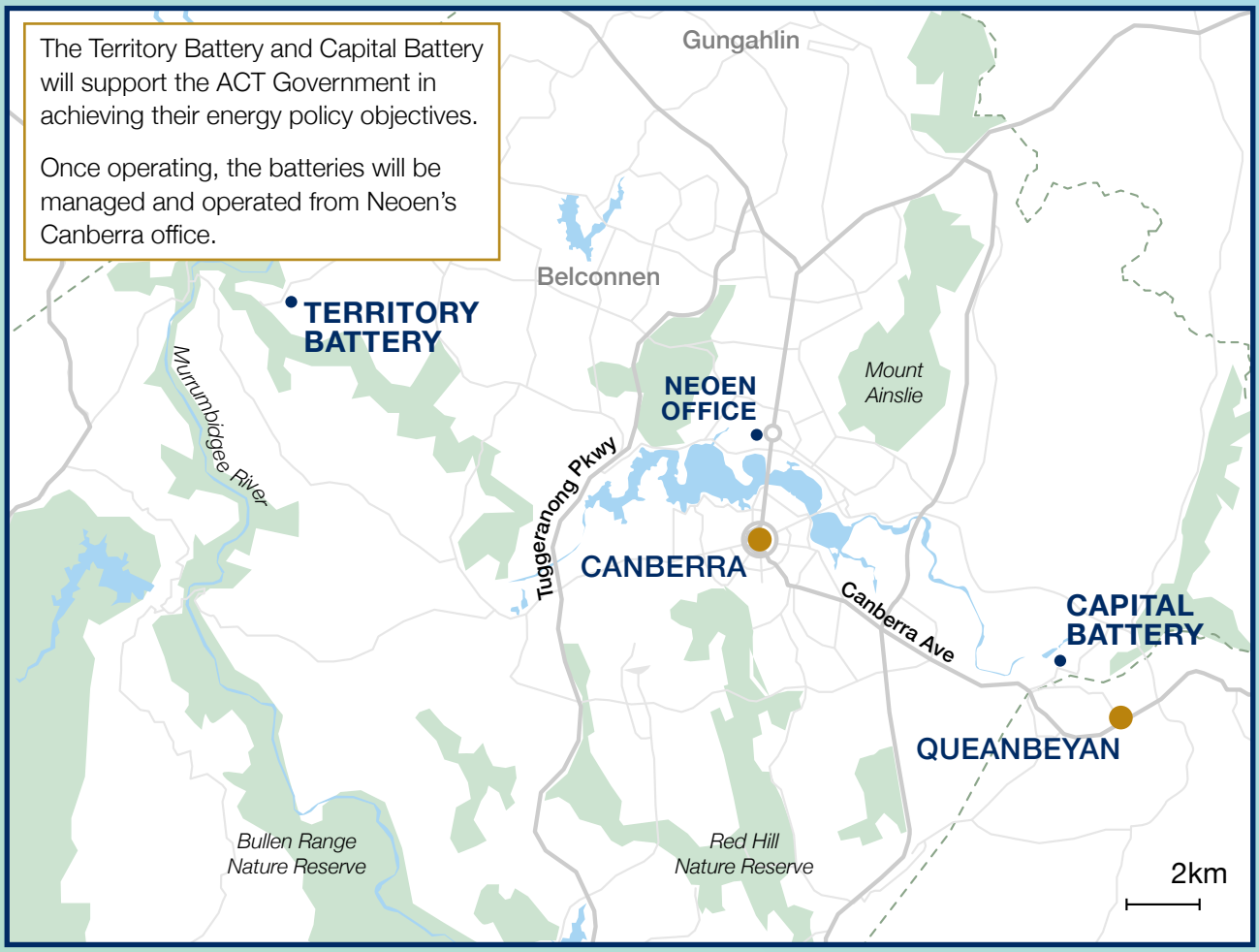
- Up to 300MW Lithium-ion battery located next to Moorabool substation in Geelong
- Owned and operated by Neoen
- Installed and maintained by Tesla

TOOK LESS THAN TWELVE MONTHS TO BUILD

CONTRIBUTING TO VICTORIA'S **40% RENEWABLES TARGET BY 2025**

- Enabling more wind and solar, now the cheapest forms of power
- Allowing more power to flow into the state, increasing competition and pushing electricity prices down
- Helping to avoid blackouts and the associated costs

OUR BIG BATTERIES IN THE ACT



Capital Battery

The Capital Battery is a 100MW stand-alone battery currently under construction. It is approximately 3km south of Fyshwick and 3km north of Queanbeyan.

It will be capable of storing up to 200MWh of energy with up to 2 hours of power in reserve.

50 MW was committed as part of the ACT Government's 2020 renewable energy auction, with a further 50 MW yet to be contracted.

Territory Battery

The Territory Battery is a stand-alone battery facility with up to 300MW capacity. It will be located directly south of the Stockdill substation, approximately 3km south of Holt and 15km northwest of the Canberra CBD.

The battery will provide a predictable supply of electricity to the grid through its ability to dispatch energy during peak times of demand.

Neoen understands that the ACT Government is committed to renewable energy and has set ambitious targets for obtaining power from renewable sources and achieving total carbon neutrality by 2060.

TERRITORY BATTERY FACTS & FIGURES

Up to
300MW
power capacity

Up to
600MWh
energy storage

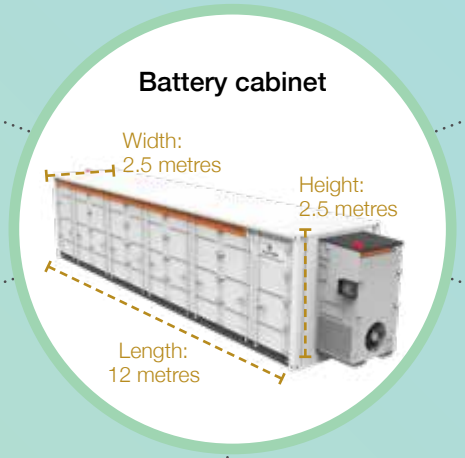
Which equates to up to 2 hours of energy charge and discharge

BATTERY 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

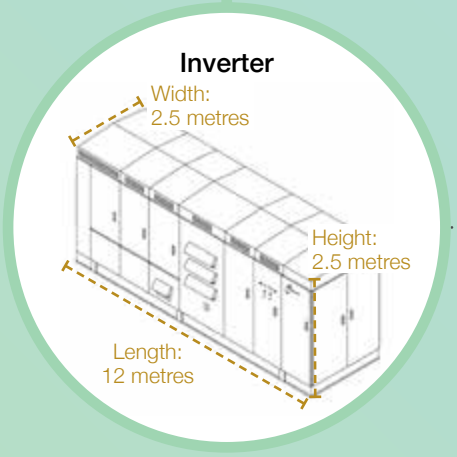
Will use an industrial inverter to convert DC power to AC when discharging (vice versa when charging)



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



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

CONTRIBUTION TO

Neoen and CIT established the Renewables Skills Centre of Excellence in 2018. The Centre provides practical training in renewables.

Education & research

TIM

ANU Battery optimisation

CIT Cyber Skills Training

Coleambally/CIT collaboration

Innovation

GWO training

CIT Renewables Centre of Excellence

Hydrogen futures

The Hornsdale Power Reserve (SA's Big Battery) was developed and is managed out of Neoen's Canberra office.

Degrussa Solar & Battery Operation

SA Big Battery

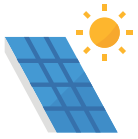
100 MW ACT Battery

ANU Grads & placements

Solcast project

Capital Battery

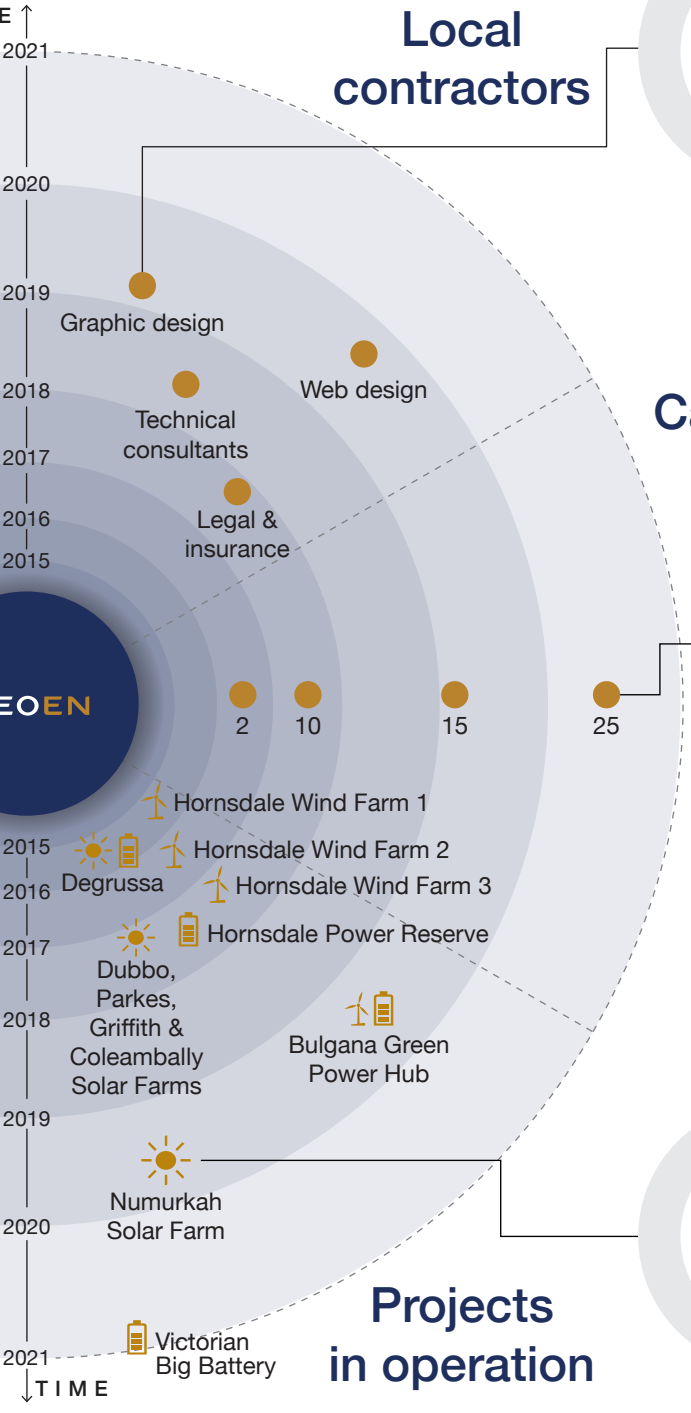
Neoen partnered with Canberra based startup, Solcast and ARENA to provide solar forecasting to AEMO.



Community co-investment

Renewables ecosystem

THE ACT SINCE 2015



Local contractors

Neoen started contracting with local designer Hillary Lang in 2018. As a result, Hillary was able to quit her full-time job and become a small business owner.

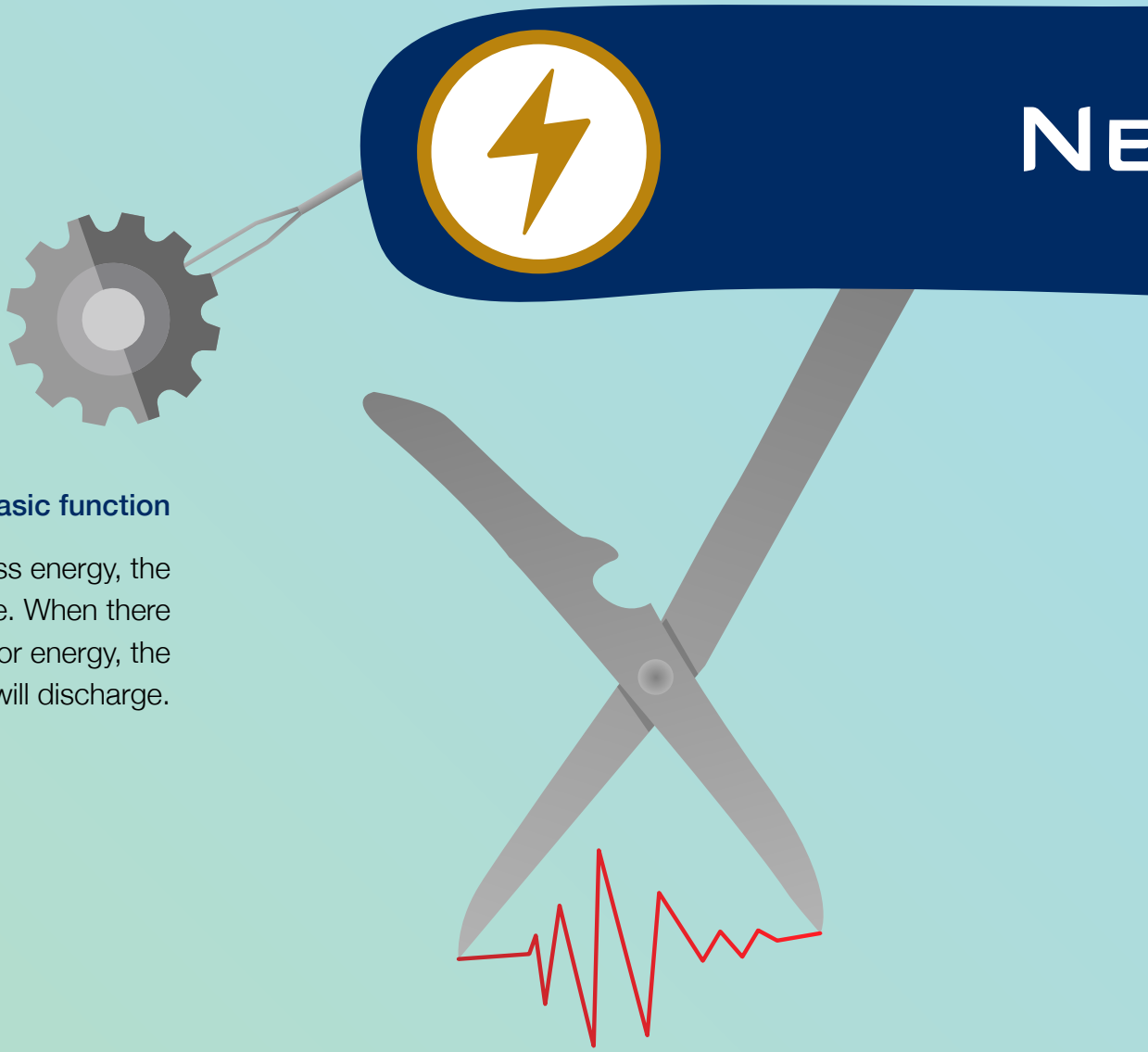
Canberra staff

There are now over 30 staff working in Neoen's Canberra office, representing 11 nationalities. The company is continuing to grow and the office will expand in 2022.

Projects in operation

Neoen own and operate a total of 13 wind, solar and storage projects. These are all managed 24/7 from Neoen's Operation Control Centre in Canberra.

WHAT CAN A BIG



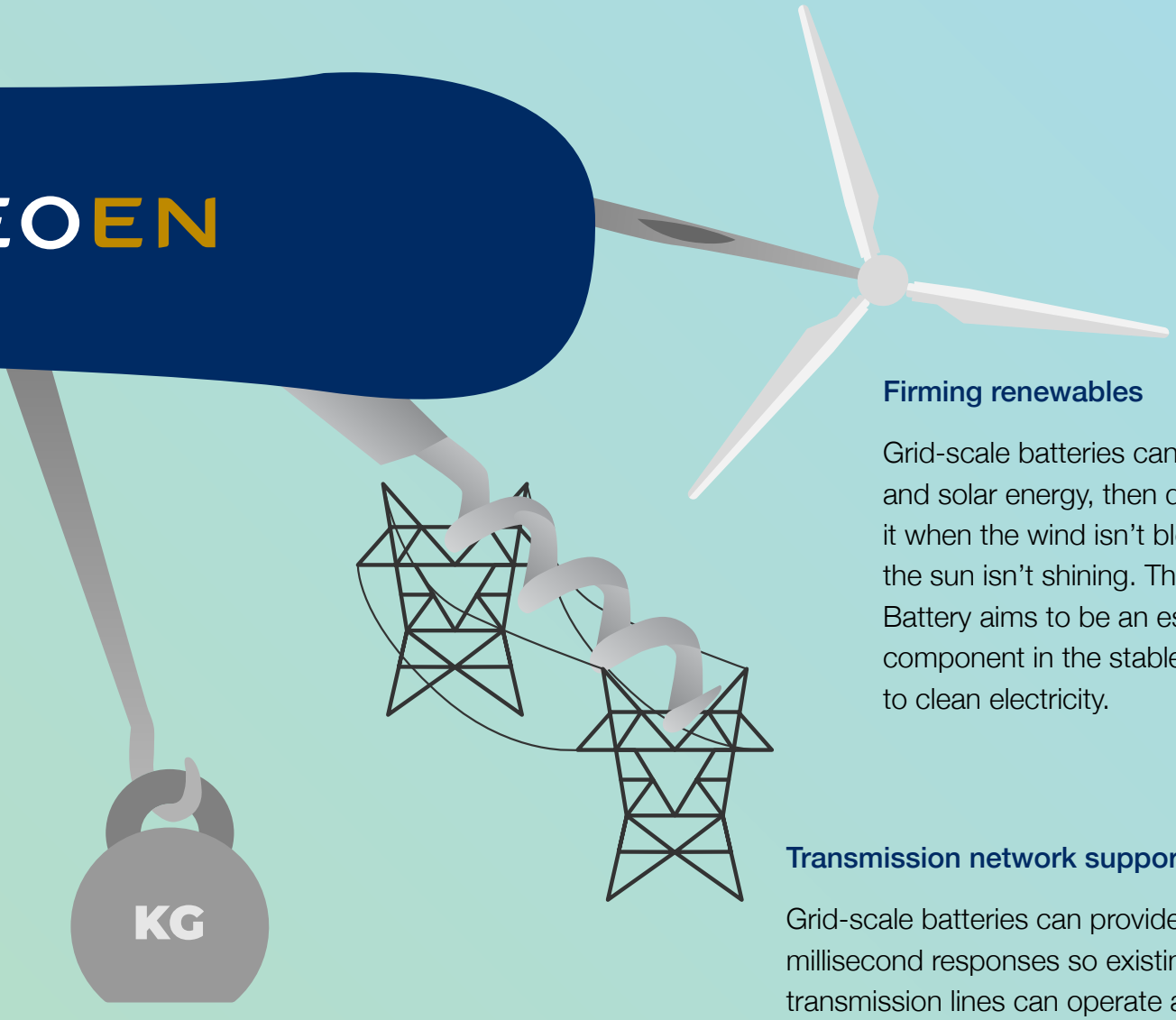
Basic function

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 requires frequency control services. The battery discharges electrical power into the network in response to frequency changes. The battery can lower the cost of these service markets which results in lower electricity prices for everyday consumers.

BATTERY DO?



Inertia

As with vehicle suspension on an uneven road, inertia services are essential for stabilising the grid. The advanced power inverters associated with a big battery can emulate the inertia services that are currently provided by an ageing fleet of fossil fuel power plants. This service is currently being trialled at our Hornsdale Power Reserve.

Firming renewables

Grid-scale batteries can store wind and solar energy, then discharge it when the wind isn't blowing and the sun isn't shining. The Territory Battery aims to be an essential component in the stable transition to clean electricity.

Transmission network support

Grid-scale batteries can provide dynamic millisecond responses so existing transmission lines can operate at full capacity. Like adding another lane to a freeway, the battery can unlock additional capacity on existing transmission networks – saving customers millions of dollars in expensive transmission line upgrades.

TERRITORY
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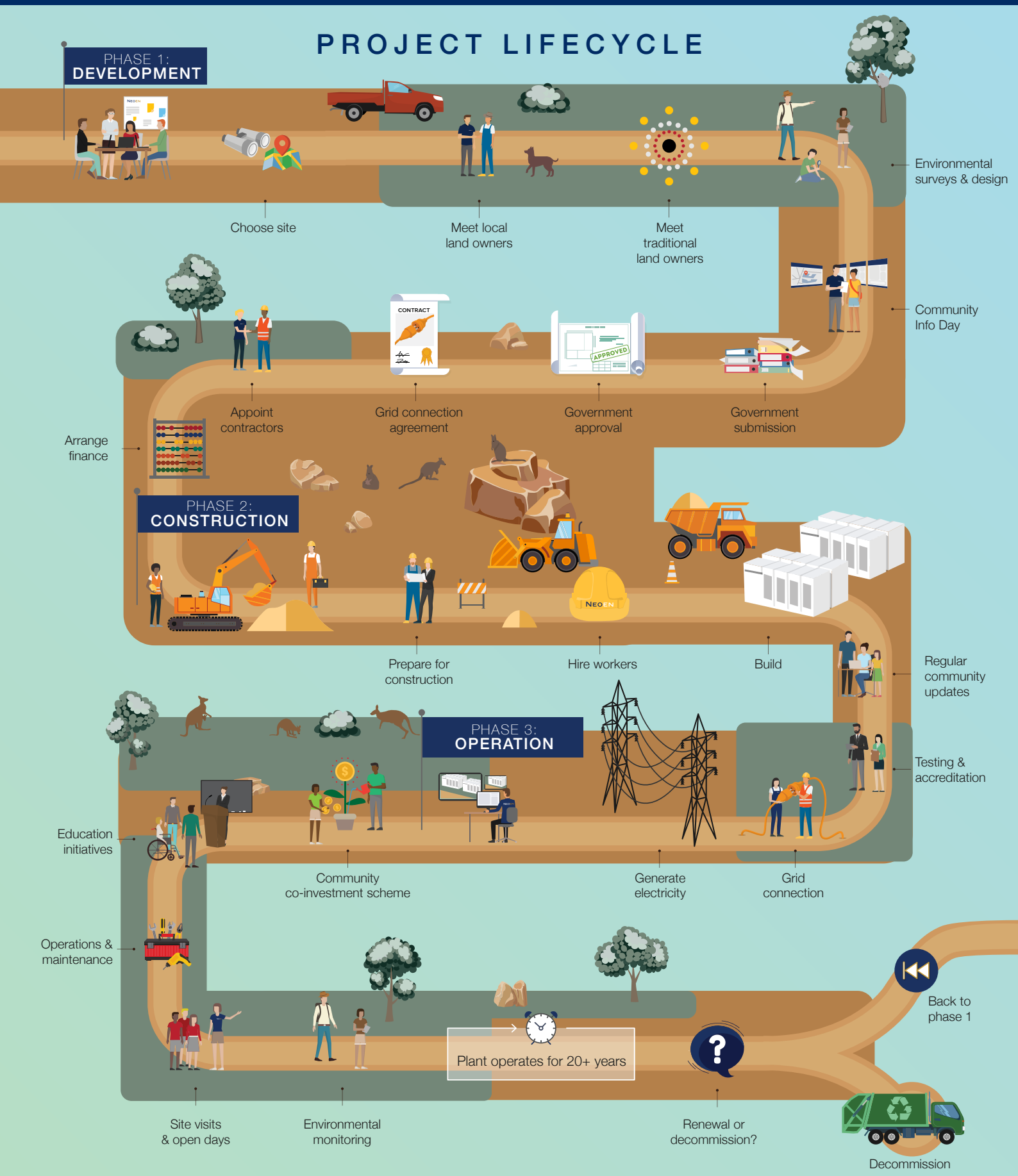
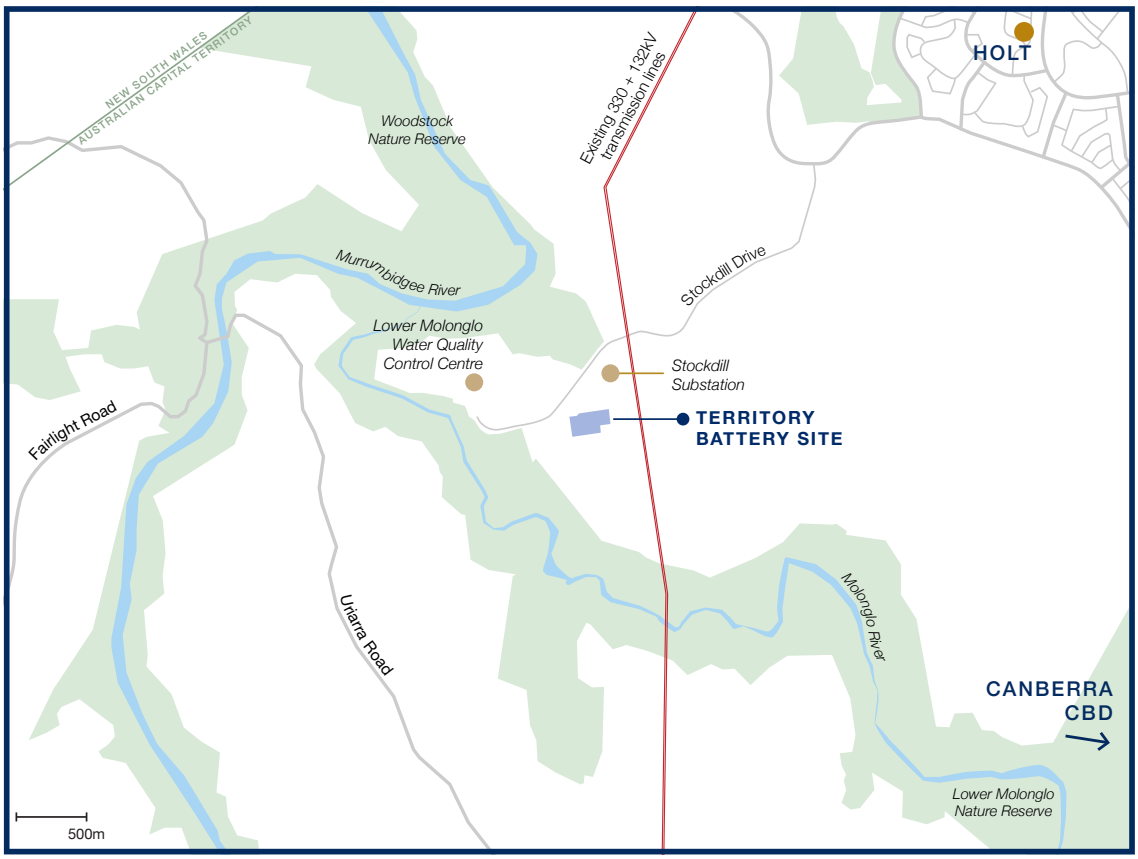
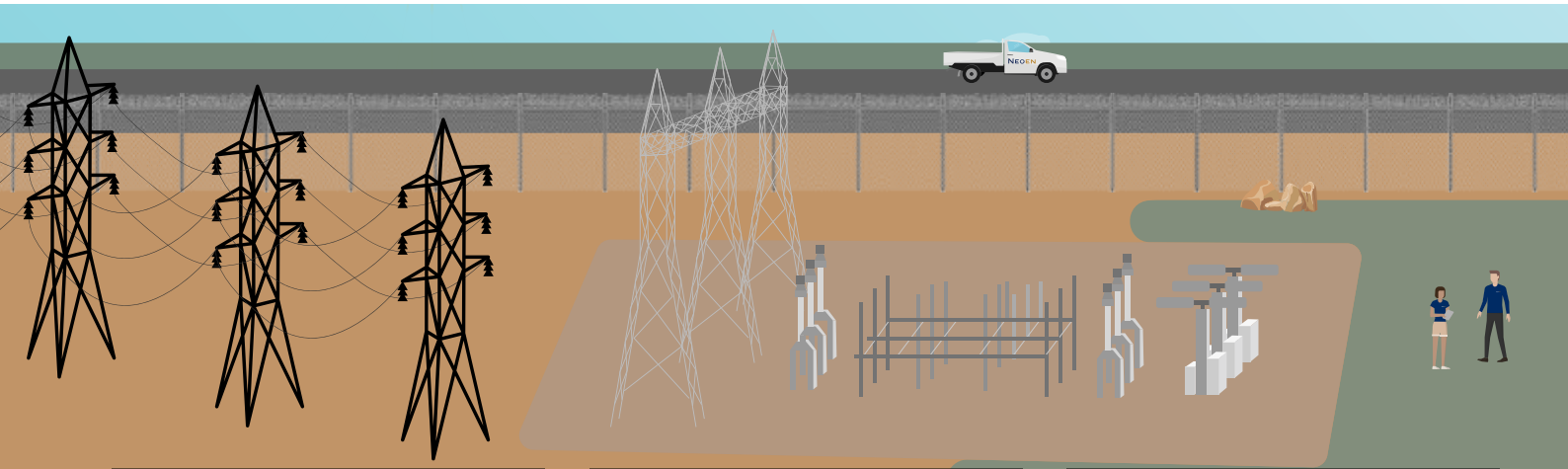


CHOOSING THE SITE





1) Good grid location

The Territory Battery will be centrally located in the national electricity grid in the ACT, connected to the backbone of the southern-NSW electricity network.

2) Proximity to substation

It will connect into the Stockdill Substation at a high voltage of either 132kv or 330kv. This minimises voltage losses and the amount of electricity infrastructure (e.g. cabling) required for the project.

3) Site history

Studies of the proposed site location have found little to no presence of cultural artefacts. Studies found presence of significant ecology systems, and the projects footprint has been sited to minimise the disturbance on the local environment.

GRASSLAND IMPACT

umwelt
Environmental & Social Consultants

Neoen engaged Umwelt to conduct fine-scale ecological field surveys in October 2021 to January 2022.

Our objective is to minimise the disturbance of the Territory Battery on threatened ecological communities.

The ecological impact assessment confirmed that the Territory Battery would impact 3.99ha of the White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands (box-gum woodland).

To compensate for significant residual impacts to Box-Gum Woodland, Neoen will establish and fund the management of an offset. Neoen has identified land in the ACT and surrounds that contains box-gum woodland that would be suitable for the offset.

The offset will be delivered in accordance with the Commonwealth and ACT Environmental Offsets Policies.

FAUNA IMPACT

The ecological impact assessment involved vegetation zone mapping, plot assessment, threatened fauna habitat assessment and mapping, targeted surveys, and impact assessments for:

- Golden sun moth (*Synemon plana*)
- Pink-tailed worm-lizard (*Aprasia parapulchella*)
- Superb parrot (*Polytelis swainsonii*).

No golden sun moths or superb parrots were recorded during the ecological surveys.

Habitat for pink-tailed worm-lizard was identified in the field surveys, and two individuals were recorded in moderate-high quality habitat.

These habitat areas were mapped out and the Territory Battery's footprint has been designed to intentionally avoid these habitats and minimise disturbance.

ABOUT STORAGE

Q1. What technology is being used for the project?
The Territory 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 up to 300MW battery will cover just under 8ha of land. This includes roads and easements for grid connection.

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).

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
- Virtual inertia

The ACT Government is committed to renewable energy and has set ambitious targets for obtaining power from renewable sources and achieving total carbon neutrality by 2060. The Territory Battery will support the ACT in achieving its renewable vision.

Q4. What is the life cycle of the Territory Battery?
Current battery technology comes with an industry-leading 15-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. Will the battery increase the risk of fire?
All of the medium voltage and high voltage cabling associated with the battery is underground, protected from extreme weather and external shorts. Perhaps the biggest fire risk is to the north and east of the battery site, where the existing above-ground high voltage power lines connect the Stockdill substation to customers in the electricity network. Here the battery contribution to fire risk will be positive: the Territory Battery will install lightning conduction structures that will help to reduce the risk of lightening strike on these existing transmission towers.

Q7. 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

Q8. Are there any health risks?

The Territory 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.

Q9. 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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