GPG
Naturgy Group

Tarrone

Battery Energy Storage System **(TBESS)**

Frequently Asked Questions

GPG
Naturgy Group

Basics on Grid-Scale Battery Energy Storage Systems

Tarrone

Battery Energy Storage System (TBESS)

What is a Grid-Scale Battery Energy Storage System (BESS)?

A Grid-Scale Battery Energy Storage System (BESS) is a large-scale energy storage solution used to store electrical energy on the power grid. It consists of battery systems that can store energy from renewable sources (like wind or solar) or from the grid and discharge it when needed to stabilise supply and demand, improve grid reliability, and reduce the need for fossil fuel-based peaking power plants.

How does a BESS work?

A BESS stores electrical energy in batteries during periods of low demand or high generation (e.g., when solar or wind generation exceeds demand). The stored energy can then be discharged back into the grid during periods of high demand or when renewable generation is insufficient.

What types of batteries are used in grid-scale storage?

The most common types of batteries used in grid-scale storage are:

- Lithium-ion (Li-ion) batteries
- Sodium-sulfur (NaS) batteries
- Flow batteries (e.g., vanadium redox flow batteries)
- Lead-acid batteries (less common)

Why is BESS important for the grid?

BESS provides several key benefits:

- **Grid stabilisation:** It helps balance supply and demand, ensuring consistent electricity supply.
- **Renewable energy integration:** It allows for better integration of intermittent renewable energy sources by storing excess energy.
- **Frequency regulation and voltage support:** It provides ancillary services to help maintain grid stability.
- **Peak shaving:** It reduces the need for peaking power plants, which are typically more expensive and polluting.
- **Backup power:** BESS can provide backup power during grid outages.

What are the advantages of using a BESS over traditional energy storage methods?

- **Faster response time:** Batteries can discharge power within milliseconds, which is faster than traditional power plants.
- **Scalability:** BESS can be easily scaled up or down depending on energy needs.
- **Environmentally friendly:** Many BESS options, especially lithium-ion, are more environmentally friendly than fossil fuel alternatives.
- **Cost-effective:** Over time, the cost of battery systems has decreased, making them more competitive with traditional energy storage.

How long can a BESS store energy?

The duration for which a BESS can store energy varies depending on the technology used. Lithium-ion batteries typically provide 1-4 hours of energy discharge, while flow batteries and other types may provide longer durations. The duration of storage is also affected by the system's size and design.

How a Grid-Scale BESS is maintained?

BESS requires regular maintenance to ensure optimal performance and to extend the lifespan of the batteries. Maintenance tasks include:

- Monitoring battery health and performance.
- Keeping batteries within temperature and humidity range.
- Replacing or recycling degraded batteries.
- Updating software for system management and optimization.

Can a BESS be used for emergency backup power?

Yes, a BESS can be configured to provide emergency backup power during grid outages. However, the duration and amount of backup power available depend on the capacity of the system and the design of the backup system.

What is the lifespan of a Grid-Scale Battery Energy Storage System?

The typical lifespan of a grid-scale BESS is around 10 to 20 years, depending on the type of battery used, usage patterns, and maintenance practices.

What are the environmental impacts of a BESS?

A BESS helps reduce fossil fuel reliance and lower greenhouse gas emissions. However, environmental concerns exist regarding the mining and disposal of materials used in batteries, like lithium, cobalt, and nickel. To address these concerns, ongoing efforts focus on improving battery recycling processes and developing more sustainable battery chemistries to minimize environmental impact.

Can BESS improve the reliability of the electricity grid?

Yes, by providing frequency regulation, voltage support, and fast-response power, a BESS can significantly improve the reliability of the grid, particularly during times of system instability or high demand.

GPG
Naturgy Group

About Tarrone BESS

Tarrone

Battery Energy Storage System (TBESS)

What is the Tarrone BESS project?

The Tarrone BESS is a new energy storage project by Global Power Generation Australia (GPG Australia), built near the Tarrone Terminal Station in the Moyne Shire (Victoria) to absorb excess energy and discharge it when the network needs it. It is a stand-alone project not tied to any wind farm and can provide up to 200MW of energy for 2 hours. It is currently undergoing permitting process and grid assessment.

How will the Tarrone BESS work?

Tarrone BESS will work by charging itself from excess energy in the grid when there is too much power being generated, such as during the day and then discharging the energy back into the grid when there is a need for further generation, such as at night. Due to the technology of the BESS, it can provide a range of support services to the grid and other energy projects across Victoria, so it will be able to work on-demand throughout the year (subject to its available stored energy) ensuring Victorians have access to power when they need it.

How does the Tarrone BESS benefit the nearby community?

Like many other battery projects in Australia, the Tarrone BESS will be able to provide several services of benefit to the local communities.

- The primary focus of the BESS will be storing energy from renewable energy projects such as Ryan Corner and Hawkesdale wind farms and the grid during the day, then discharging it when there is low generation, helping to ensure there are no power outages due to a lack of generation.
- Tarrone BESS will also be able to provide stability services to the network operators, ensuring that the network is operated in a safe mode and enabling more projects to generate throughout the day and night.
- GPG Australia will implement a Community & Stakeholder Engagement and Benefit Sharing Plan specifically tailored for the Project according to the local community and First Nations´ needs.
- The Project will provide enough stored energy each day equivalent to approximately 24,000 average size Victorian household electricity needs.
- Creation of local jobs for construction phase (i.e. civil works, earth works and electricians etc) and additional jobs during the operation and maintenance of the facility.
- Increased demand for local goods, accommodation and materials during the construction phase.

How will the contractors access to the Project?

Based on lessons learned during the construction of the Ryan Corner and Hawkesdale Wind Farms and the feedback received from the Moyne Shire Council, GPG Australia is proposing all traffic and contractors to travel to site along Tarrone North Road from Woolsthorpe-Heywood Road (C176) and enter the site through a new created entrance alongside the eastern border of the project land.

Does the Tarrone BESS generate noise?

Due to the Project being enabled 24/7, the system components used for cooling the equipment will likely generate some noise emissions throughout the day and night. GPG Australia engaged a specialised acoustic consultant to assess noise levels generated from the BESS, in order to consider any potential noise emissions associated with the proposed use, which may impact on residences located nearby. In accordance with the methodologies applicable in Regional Victoria, these are some of the potential noise control strategies including:

- Ensuring inverter units and battery modules are fitted with suitable manufacturer noise reducing kits.
- Configuring battery storage container´s air conditioning units to maximise noise shielding in the direction of residences.
- Constructing acoustic barriers around the proposed inverter units.

What is the fire risk at Tarrone BESS?

The Tarrone BESS has been designed with the latest in fire prevention, management software and design techniques to minimise fire risk.

The first line of defence will be the battery modules, which will have state of the art management systems that will be monitoring the individual racks holding the cells. This system will be able to disconnect, isolate and shut down the module in the case of any detected failure of the protective systems. The battery racks will be stored in IP (Ingress Protection) rated insulated cabinets designed to contain overheating issues. The battery modules are also equipped with ventilation systems to expel potential gas build ups to prevent further risk.

The design of the Project has been optimised to create wide setbacks between battery module clusters to minimise the risks of fire moving between the batteries or other electrical components and ensure a suitable firebreak on all sides of the Project from neighbouring properties. A water storage tank will be installed at the main site entrance to ensure easy access for local fire fighting services.

As part of the Project's integrated Asset Management approach, the site is managed 24/7 by Global Power Generation Australia's dedicated control room at our Australian headquarters in Canberra.

What procedures are in place if there is a bushfire?

A comprehensive Bushfire Emergency Response Plan is being developed in consultation with the Victorian fire authorities. When completed the management plan will be reviewed and endorsed through the planning process. These will include firefighting procedures and suitable water availability in the event of an emergency. GPG Australia have completed the design of the Project to maximise the setback from the facility to nearby properties and access to on-site water tanks in the event of an emergency.

What are the emergency procedures for Tarrone BESS?

A plan endorsed by the Victorian Minister of Planning will be developed in consultation with all relevant emergency services and will be contained within the Bushfire Emergency Response Plan, a section of the Environmental Management Plan. Prior to commercial operations, all staff and local firefighting services will be invited to the site to comprehensively train on the site-based emergency equipment and procedures to ensure their familiarity and safety in the event of an emergency.

Is there any health risk related to Tarrone BESS?

The battery will use similar technology to the batteries that are being increasingly installed in homes, just on a larger scale. There are no known health risks associated with properly maintained large-scale battery installations. GPG Australia will ensure the latest technology is deployed in the ongoing operation and maintenance of the Project, to catch any potential risks such as damaged or overcharged cells early and deal with them in a safe and responsible manner.

- Minimal radiation emission: Battery storage systems, including those approved for installation in Australia, are not considered a source of significant radiation due to the chemicals and technology involved in their operation.
- Chemical hazard: The primary chemical hazard associated with a battery energy storage system, particularly in lithium-ion batteries, is the potential for leakage of the electrolyte fluid. The battery modules and their internal battery racks will be monitored by highly sophisticated software during its operational lifetime to detect any leaks or other chemical risks.
- Release of toxic gases: A battery energy storage system (BESS) can release toxic gases, if damaged, faulty, or overcharged. To minimise this risk, GPG Australia has been working with their potential suppliers to ensure all products that could be installed on site comply with the current safety standards, that deal specifically with energy storage system protection.

GPG Australia has been in contact with government agencies such as EnergySafe Victoria and the Department of Planning and Transport from the Project´s initial stages to ensure that we deliver a project to the highest standards of safety and quality.

GPG
Naturgy Group

Tarrone

Battery Energy
Storage System
(TBESS)