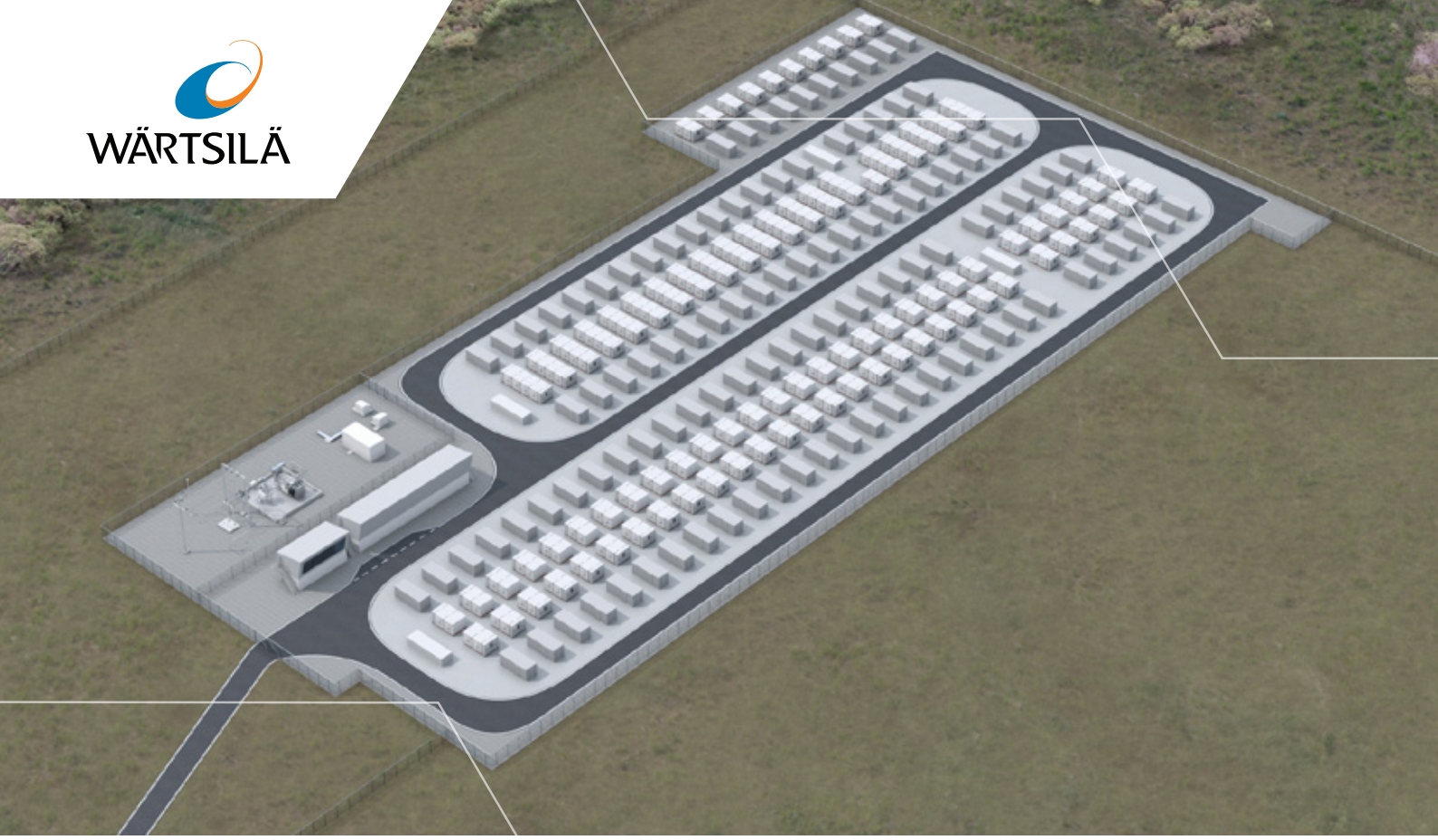

BRINGING SOUTH AUSTRALIA ONE MAJOR STEP CLOSER TO A 100% RENEWABLE ENERGY GRID

A path to a greener, renewable-led energy future

South Australia has a unique opportunity to swiftly decarbonise and transition to full renewable integration with its unparalleled renewable energy sources. Flexible capacity is vital for the state to reach its 100% renewable energy target by 2030, supporting Australia's net-zero emissions target by 2050. Energy storage is an efficient means for balancing renewables and maintaining the stability of the grid. Wärtsilä's 250 MW / 250 MWh grid-scale battery at AGL Energy's Torrens Island Power Station in South Australia is a significant development that will advance the nation's path to decarbonisation.

Wärtsilä's 250 MW / 250 MWh energy storage system will support the growth of renewables and be the first battery constructed as part of AGL's targeted 850 MW national battery pipeline. AGL is one of Australia's leading energy companies, operating the country's largest electricity generation portfolio. Its portfolio accounts for approximately 20% of the total generation capacity within Australia's National Electricity Market. AGL's grid-scale battery plans will play a key role in Australia's transition to cleaner energy. The Torrens Island battery is a first step towards AGL's plans for a low-carbon industrial **Torrens Island Energy Hub** that will support renewable energy generation in South Australia.

"We are investing in the highest standards for energy storage technology performance, reliability, and safety. Therefore, we are looking for global leaders in energy storage technologies, such as Wärtsilä. This project will support South Australia's energy transition, providing essential capacity when renewable generation is impacted and during periods of high demand, showcasing that we're taking a leading role in reshaping the energy future."

Markus Brokhof,
Chief Operating Officer, AGL Energy

THE CHALLENGE	WÄRTSILÄ'S SOLUTION	BENEFIT
• Balance the intermittency of renewables • Maintain grid stability and provide affordable electricity to consumers • Meet net-zero target and transition to cleaner energy	• Supply an advanced storage system to flexibly maintain grid reliability • Maintain system strength, network stability, and energy security with the GEMS Digital Energy Platform • Provide virtual synchronous generation, enabling fast response times and future-proofed assets	• Support the growth of renewable energy sources • Enable adaptation to changing market conditions • Provide firming capacity and reduce spinning reserve requirements

SITE SIZE:
250 MW / 250 MWh

SITE LOCATION:
South Australia, Australia

APPLICATIONS:
Renewables+

SCOPE OF SERVICES:
Engineering, procurement and construction (EPC)

DELIVERY:
2023

Ensuring reliability in a renewable-driven power system

In 2018, Wärtsilä signed an engineering, procurement, and construction (EPC) contract for the **Barker Inlet Power Station (BIPS)** engine power plant located on Torrens Island. The main role of the plant is to ensure reliability in the South Australian power system by providing balancing capacity to manage the variability from renewables. Energy storage can take care of short-duration balancing, while engine power plants can balance variable renewables for a longer duration. This hybrid combination of gas-fuelled combustion engines and energy storage will play an increasingly important role in Australia's energy future, and also elsewhere around the globe.

Flexible capacity with energy storage

The Torrens Island grid-scale battery will provide grid support and firming capacity to assist AGL's broad portfolio of renewable generation assets. The flexible capacity provided by the Torrens Island battery delivers an efficient means for balancing the supply of energy from renewable sources, thereby supporting the stability and reliability of the grid. This will enable AGL to adapt to changing market conditions, with an initial one-hour duration that can be expanded to up to four-hours duration in the future.

The battery is designed to also provide grid-forming and black-start capacity to AGL's asset portfolio. Initially, it will operate in grid-following mode before switching to grid-forming mode (so-called virtual synchronous generation known as "VSG") at a later stage. This will enable very fast response times to changes in grid voltage and frequency, thereby allowing the battery to contribute to system integrity and grid strength. This will become increasingly critical for high renewable networks. In addition, the advanced inverter technology coupled with the GEMS Power Plant Controller platform will enable the supply of system restart and ancillary services, future-proofing the Torrens Island energy storage facility. The system will be delivered on a full EPC basis.

GEMS Digital Energy Platform—the brain of the system

The complex solution is supported by the **GEMS Digital Energy Platform** and its Power Plant Controller. The sophisticated technology helps to maintain system strength, network stability, and energy security. GEMS' ability to integrate weather forecasts and match available generation to changing load requirements with the help of predictive analytics, enables the software to orchestrate an energy mix that prioritises the use of renewable generation while using energy storage to improve power quality and reliability. It also reduces spinning reserve requirements.

A forerunner on the path to decarbonisation

Enabling South Australia to reach 100% renewables is all about achieving power system balance. That is exactly what is accomplished with the Torrens Island battery; integrating renewables optimally to maintain grid reliability, while providing an affordable electricity supply for the consumers. Low-emission firming technology, such as batteries, will play a leading role in driving Australia's energy transition towards a more sustainable and decarbonised energy infrastructure.

RELATED RESOURCES

AGL and Wärtsilä advance frame agreement with first energy storage project on path to grid decarbonisation

Wärtsilä selected as a preferred supplier for AGL Energy's up to 1,000 MW grid-scale energy storage plans

Article: Australia's renewable capacity set to grow with smart energy management & storage solutions

Wärtsilä energy storage technology

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03/2022 / Bock's Office