



OUR FIRST 50MW GRID-SCALE BESS PROJECT

in Burwell, Cambridgeshire, UK

50 MW | 56.2 MWH BESS



BATTERY ENERGY STORAGE: THE PATHWAY TO RAPID ENERGY TRANSITION

There is a burning case for rapid energy transition. The latest assessment report from the IPCC confirmed that **the Paris Agreement's target of 1.5°C of warming in the 21st century is likely to be exceeded without extreme reductions in emissions** and painted a bleak picture of the implications of 2°C or more of warming. Fortunately, ambitious goals are being set: the **UK is targeting net zero by 2050**, with the goal to reach a **78% reduction in emissions by 2035**. The transition to renewable forms of energy will be vital to reaching these targets and is a priority for households, businesses, and governments looking to rapidly reduce their greenhouse gas emissions.

The role of energy storage in securing a more sustainable future cannot be overstated. While renewable sources of energy such as solar and wind are the most sustainable way of powering the modern world, they are also variable; depending on the time of day or weather, the amount of energy they provide will differ. These fluctuations require our grids to be more flexible, balancing discrepancies in supply and demand. **Energy storage is the answer to this challenge**, as it can make grids more flexible and resilient - it is the missing piece of the energy transition puzzle, and we must invest heavily in storage innovation and capacity. This is already taking place: at the end of 2019 the UK's battery storage capacity was 0.88GWh, but Trina Storage's forecasts suggest that it could be as high as 2.30GWh in 2025.



Why TrinaStorage?



Global footprint with regional presence and expertise



Flexible end-to-end partnerships



Centralised supply chain model for cost optimization, quality, and short delivery time



Industry-leading consultancy and forecasting

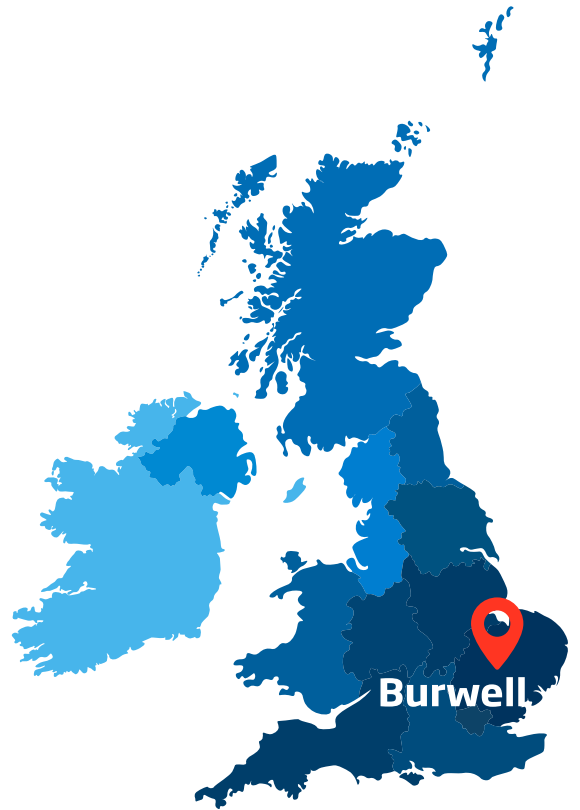


Flexible capacity warranty

50 MW BESS at Burwell, Cambridgeshire

SMS plc, one of the **UK's leading smart energy infrastructure providers**, is on a mission to decarbonise our energy system using data-driven, smart energy solutions. SMS engaged Trina Storage for the supply of **an integrated 50MW grid-scale energy storage system** in Burwell, Cambridgeshire - one of the first of its kind in the UK. Trina Storage's reputation for innovation and performance, coupled with its expertise in building projects made it the right partner for the project.

Of course, there were a whole host of challenges that had to be overcome to deliver the project on time and on budget. Beyond strict compliance with **UK Health & Safety regulations**, challenges associated with **Brexit** mean that there was a shortage in shipping capacity, demanding careful supply chain management to source the required components.



The Solution

Trina Storage provided a comprehensive technical pre-sales consultancy, projecting performance and degradation to ensure the return on investment met SMS's requirements. From there, the company supported planning requirements, designed and supplied the full BESS solution. Project execution and implementation was ensured to the **highest standards**, with Factory Acceptance Tests, Commissioning, and Site Acceptance Tests to ensure that the system is fully operational and compliant with the UK's G99 grid regulations and health and safety requirements.

Operational by the end of Q1 2022, the storage system at Burwell, Cambridgeshire is primarily deployed to provide balancing services to the UK's National Grid. **Trina Storage provides an availability warranty of >= 98%, over 10 years of system performance.** It supports all available revenue generating services in the UK to support the grid with best-in-class frequency response, flexibility, and demand management.

Technology	Lithium ion battery energy storage
Capacity	50MW / 56.2 MWh
Location	Burwell, Cambridgeshire, UK
Status	Operational by end of Q1 2022
Customer	SMS plc
System Usage	Balancing services

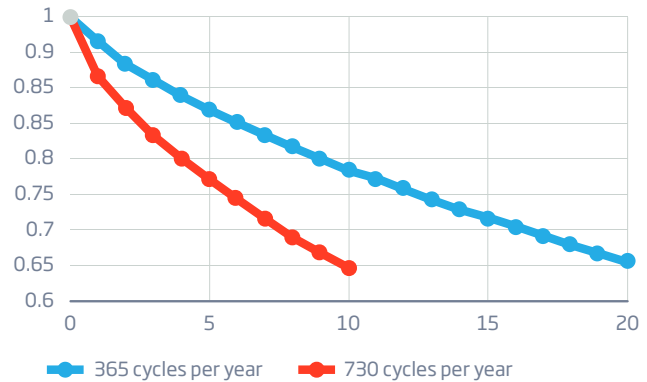


High performance battery storage

The 50MW BESS that Trina Storage has helped SMS deliver at Burwell, Cambridgeshire offers best-in-class performance. The full wrapped system solution, **consisting of 157 pcs of battery racks (372 kWh), 15 PCS units (3.8 MVA), and 15 transformers units (3.8 MVA)**, was designed to maximize system performance as well as extend battery life with safety at the heart of engineering process.

The BESS will provide the grid with **balancing services to address fluctuations in frequency** in addition to energy arbitrage: in the event of a drop in frequency, the storage system can inject power into the grid to stabilize it, or enter discharge mode should the frequency increase beyond the designated band. It can also contend with large generation or consumption drop-outs with a **ramp rate of 100 MW/sec or higher**, meeting the requirements of the Dynamic Containment Service in the UK. **This range of ancillary services ensure improved grid stability, resiliency, and reliability, maintaining a frequency of 50Hz.**

Trina Storage’s technical pre-sales consultancy process involves a deep dive into the impact of a mix of applications and services, forecasting performance and degrada-



tion profiles along a designated number of charging and discharging cycles per day. With thorough analysis of the requirements of not only the throughput but also vital parameters such as C-rate and rest period, **Trina Storage is able to move beyond the current market-default 1 cycle per day capacity warranty.** Trina Storage’s superior understanding of performance and degradation enables the company to maintain the storage system more effectively over time, including informing preventative measures.



Terry Chen
Head of Overseas
Energy Storage Business



At Trina Storage we **think like a battery**, considering performance and ROI at every stage of a project’s planning and execution. We analyse the effect that particular applications will have on a battery over its lifespan and offer **industry-leading warranties** to support our projections. This is because we pride ourselves on forging **end-to-end partnerships with customers** and partners, from Factory Acceptance to Site Acceptance and beyond - SMS Burwell is a fantastic example of that. Together with our customers and partners, **we are dedicated to creating a cleaner, greener, and more sustainable world** while optimising financial returns.

How we work:

-  **Bankability**
A bankable, flexible partner to customers
-  **Sustainability**
Lead energy transition with sustainable storage products and solutions
-  **Simplicity**
Use experience & expertise to intelligently solve complex customer problems
-  **Investment return**
Think like a battery for better performance, life-time, efficiency, reliability, and cost-effectiveness (LCOS-Levelized cost of storage)
-  **Safety**
Ensure the highest safety standards for our customers

Always in control

The BESS is equipped with modular, scalable and reliable Power Plant Controller (PPC) and SCADA according to latest industry standards to control, monitor, and optimize system performance, while also ensuring safety.



SCADA

The BESS employs supervisory control and data acquisition (SCADA) technology according to latest industry standards to control, monitor, and optimize performance. SCADA hardware and software enables **continuous monitoring and control of the plant's equipment, including fault recognition and alarm detection.**

The SCADA solution collects and records of statistical data, with long term storage and processing to **drive intelligent analytics.** This includes the provision of integrated reports, which can inform technical and commercial decisions, **for example enabling revenue streams according to clients' needs.**

PPC

The storage system is equipped with modular, scalable and reliable Power Plant Controller (PPC) for **accurate fault recognition and real time performance monitoring.** This provides effective control of the Battery Management System (BMS) and Storage inverter, providing the storage system with **flexibility and scalability up to hundreds of MW.**

The PPC enables the system to meet the demands of the grid, **guaranteeing compliance** with grid code requirements and plant-specific needs.

Supply chain expertise

Trina Storage used its supply chain expertise to deliver the BESS project efficiently and to the highest standard. The project required close cooperation with bankable suppliers to provide the tier 1 components required for the storage system. Despite disruptions to supply chains associated with Brexit, which made customs clearance and shipping schedules more challenging, Trina Storage's dedicated supply chain and procurement teams worked tirelessly to source quality components, ensuring fast lead times and providing on-site support.

SMS achieved cost optimization on a system level and reduced supply risks, leveraging Trina Storage's group buying power to reliably source components in a supply-strapped market. Thanks to Trina Storage acquiring the right hardware for the right price, the company received a safe, robust, and cost-effective solution on time.

LEADING THE ENERGY TRANSITION THROUGH STORAGE

Trina Storage prides itself on being a **leader in the energy transition**, using its storage solutions to stabilise renewable generation, load, and costs in the long term, **making grids more resilient and flexible**. Working closely with partners, Trina Storage ensures successful integration, strong ongoing partnerships, and a positive environmental impact.



Successful integration

From late Q1 2022, the 50 MW BESS at Burwell, Cambridgeshire will be connected to the grid and operational to support the National Grid with all available revenue generating services in the UK. Trina Storage used its **experience and expertise to intelligently solve complex problems** for SMS, delivering an easy to scale, easy to install, and easy to maintain battery storage system.

Strong partnership model

The delivery of the storage system at Burwell, Cambridgeshire will serve as the basis for a strong relationship between Trina Storage and SMS moving forward. With ongoing maintenance and support, this is only the beginning. Trina Storage's experts forge an end-to-end partnership with customers and partners, reducing complexity, with shorter project delivery times, a higher return on investment over a system's lifecycle, and the flexibility to respond to external factors. This partnership model is based on a pre-planning consultancy, design, installation and commissioning support, a three-tier service package, and an industry-leading flexible capacity warranty.



Positive environmental impact

Trina Storage systems are a good investment financially, but they're also good for our planet's future. The company understands that incorporating battery storage technology into our energy system is the most financially viable option for the safe and successful integration of renewables. This is why new sustainable storage solutions such as the one delivered in Burwell are so important - they are leading the way in the creation of national green infrastructure that supports intermittent renewable generation with a range of balancing and ancillary services.



"Finding the right partner for our energy storage requirements was a challenge. We needed a best-in-class storage system to be delivered in the face of the adversity of Brexit and the COVID-19 pandemic. Trina Storage's industry expertise and reputation for executing projects to the highest standard made us confident that it was the right choice to deliver this BESS. This confidence was well placed: the collaborative pre-planning consultancy process gave us a clear forecast of system performance and degradation - we knew the solution would be reliable and cost-effective throughout its lifecycle, from excellent procurement and supply chain services to predictive maintenance.



Liam Breathnach

Technology Director,
Grid Scale Battery Storage at SMS plc.



TrinaStorage


Leading the Energy Transition through Storage

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