

Overview

Western Australia's utility-scale battery storage facility, the Kwinana Battery Energy Storage System Stage 2 (the KBESS2 project) became operational in late 2024. Located at the Kwinana Power Station, KBESS2 is Synergy's second large-scale battery energy storage project in the South West Interconnected System (SWIS). With a capacity of 200MW/800MWh, the system stores excess energy generated from rooftop solar panels during the day and releases it during peak demand in the evening.

KBESS2 plays a significant role in stabilising WA's power grid and supporting the state's transition to renewable energy.



The brief

Teck Global was engaged as an engineering and integration specialist to supply outdoor kiosk substations, to support the delivery of KBESS2.

The kiosk substations needed to be capable of delivering continuous full rated load on a site located in a corrosive coastal environment affected by dust, salt laden winds, high temperatures and high humidity. KBESS2 also had to be delivered and operational within nine months from award.

The project at a glance

Client: Synergy

Scope

- Design, supply, manufacture and test eight outdoor kiosk substations compliant with industry standards and codes

Teck global solution

- Design and integration to identify interfaces and provide a tailored technical solution
- 8 Ring Main Unit (RMU) kiosks
- 8 kiosk substations
- Custom-built, corrosion-proof outdoor enclosures for RMUs and switchboards

Outcomes

- Quality solution delivered on time, to specification and on budget
- Built in WA with majority of components sourced through local supply chain, supporting Australian businesses



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Our approach meant we were able to streamline construction, reduce on-site labour, and minimise the time required for commissioning while maintaining high standards of quality and safety.”

David Zucaro, Managing Director, Teck Global

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The challenge

This was a project of significant scale with a tight schedule. With eight power groups and 288 battery units across the facility, KBESS2 is approximately the size of four soccer fields.

“Tight timeframes meant scheduling was paramount. Our project management coupled with close supplier relationships, regular communication and focus on the outcome allowed Teck Global to meet client expectations on both the delivered product and the aggressive schedule,” said David Zucaro, Managing Director, *Teck Global*.

By working with a strong network of suppliers and forward-planning, Teck Global was able to secure long-lead equipment while working on the switchboard and system design.

The solution

Leveraging local capability and supply chain

Teck Global worked with project partners, Siemens, APS Industrial, Exnovo, Trivantage Manufacturing, and GHD to design and deliver a fit-for-purpose power solution. The technical components included batteries, inverters, switchrooms and kiosks.

Teck Global supplied Ring Main Units (RMUs) to manage load distribution and ensure a consistent supply of electricity. As a Siemens Value added Partner we were able to complete the RMU design in parallel with initial fabrication. Integration of the RMU tiers protection relay wiring and CT installation, as well as testing, were completed locally to deliver a warranted product that met schedule requirements.

“As a turn-key project partner, we manufactured and assembled switchgear and kiosk switchroom products in our Perth-based workshop to reduce the integration and testing time, and risk on site. This allowed for continuous improvement of the design and ensured we delivered exactly to customer expectations.”

Bringing an operational lens

The success of the project extended beyond the delivery and installation of high-quality product. Bringing an operational lens to the solution design was key to the project’s success.

“We developed an overarching solution bringing all the component parts together, maintained schedule, managed integration and ran operational user training.”

“When we take on a project, we think beyond the technical component requirements and construction, and consider the user’s operational needs. By focusing on the outcome, we were able to deliver a sustainable, user-friendly solution.”

David Zucaro, Managing Director, Teck Global

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Our strong relationships with supply chain partners made for a smooth project delivery. Each partner demonstrated professionalism and a shared commitment to the project's success.

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David Zucaro, Managing Director, Teck Global

Collaboration is key

Teck Global is committed to establishing mutually beneficial relationships with project partners when working with suppliers to deliver the end solution.

Working collaboratively with the project team from Synergy and GHD and suppliers APS, Siemens, Trivantage Manufacturing and Exnovo, Teck Global designed and refined requirements as they evolved – delivering the base scope whilst maintaining scheduling.

“We lived our values on this project. We worked closely with key stakeholders to understand their needs, and provided value through collaboration.”

To manage multiple suppliers, Teck Global implemented solid change management processes, were open to flexibility, and had early and regular communication with all involved, all the way through the project.

synergy

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SIEMENS



Strategic partnerships leverage expertise

Battery energy storage systems are important to achieving successful energy transition, and the right technology partnerships are critical to their operations.

“Siemens has been part of critical infrastructure and energy projects in Australia for 152 years”, said Asad Khan, General Manager – Systems, Siemens Smart Infrastructure Electrification and Automation.

“Accelerating the energy transition requires the best technology combined with local expertise, know-how and an ecosystem of strong partners such as Teck Global who is a certified Siemens Value Added Reseller partner. For the customers this means involvement of the right people in early stage planning. The result is smoother product delivery and project timelines,” said Khan.

“Teck Global handled the design and production of the low-voltage cabinets locally, while the main Siemens components were sourced from our advanced manufacturing facilities in Germany and around the world. The end result was faster delivery of the high-quality switchgear to the client,” he said.

“Australia has aggressive energy transition and decarbonisation targets and I’m glad that we can play an important role in this next phase of Australia as we become a low carbon economy. Our nation is responsible for just 1% of the world’s emissions, but with the right collaborative approach combined with the best technology, we can contribute beyond 1% when it comes to decarbonising the world. It starts right here and I’m really pleased that we could do our part in WA’s largest BESS to date,” said Khan.



Similarly, the collaboration between Teck Global, APS, Trivantage Manufacturing and Exnovo was crucial to the project's success.

Trivantage Manufacturing supplied eight Segura Low Voltage (LV) Main Switchboards for installation within Teck Global's custom-built kiosks. These switchboards were equipped with automatic transfer controls to ensure seamless generator connection in the event of a mains power outage, and to supply auxiliary power to the system.

"A key success factor was our partnership with APS for Siemens switchgear and the efficient delivery of multiple similar LV switchboards. Our early collaboration with Teck Global during the tender stage allowed us to optimise the switchboard design. This included conducting a detailed heat study to ensure smooth integration within the kiosks," said Allan Brownlie, National Product Manager, Trivantage Manufacturing.

Throughout the project, engineering teams from Trivantage Manufacturing and Teck Global had weekly meetings and responded promptly to design changes - the partnership further cementing the combined engineering expertise across Australia.

Working closely with Trivantage Manufacturing, APS helped reduce the time required to design the switchboard, and offered a complete solution resulting in a smaller footprint and lower cost outcome. As the Siemens Master Distribution Partner for industrial low voltage electrical and automation products in Australia, APS worked with Siemens Australia and Germany to ensure swift product delivery that was to specification, to Australian standards and met safety requirements.

"Safety is a priority, especially on projects of this scale. By ensuring compliance with AS/ ZS 61439 - the Australian standard - Trivantage Manufacturing was able to deliver their type-tested assembly, and minimised safety risks associated with electrical failures on-site, while enhancing reliability," said Ernest Van Niekerk, Electrical Products Business Manager, APS.

According to Van Niekerk, local expertise, delivery teams and having certified professionals on the ground is crucial to delivering BESS projects.

Australian transformer manufacturer, Exnovo supplied the transformers for the project. These were essential for integrating the BESS into the grid, enabling efficient, safe energy storage and distribution to maintain network stability.



The combined local expertise on this project shows that we're well equipped to deliver more projects like this in the future, leveraging our technical capabilities, certified team, and robust network of suppliers for locally sourced products.

David Zucaro, Managing Director, Teck Global



As one of only two companies in Australia certified to supply enhanced protection transformers compliant with FM Approval Standard 3990 and AS/NZS 60076, Exnovo was also involved in kiosk integration design and provided advice on the installation requirements.

"By working with Teck Global and using the raw 3D model, we were able to implement design modification changes to fit the transformer inside the enclosure and achieve a millimetre-perfect interface with the BUSDUCT," said David Ong, Managing Director Exnovo.

"We worked well together. Having trusted supply partners, a local team, open communication, and everyone aligned on the project objectives meant we could pre-empt and address issues quickly and deliver to specification. We saved a lot of time, delivered a more compact and reliable solution," he said.

Commenting on the future of BESS projects, Ernest Van Niekerk from APS said BESS projects are going to have a significant, positive environmental impact in Australia as we aim to reduce carbon emissions.

"Achieving this requires innovation, collaboration and partnerships, where we draw on local expertise and supply chain. Projects like these demonstrate that we have capability to set benchmarks around the world, and go beyond our sustainability targets to deliver best in class solutions," said Van Niekerk.

"To have a project of this scale and magnitude with highly regarded local companies delivering an end-to-end solution, paves the way for future BESS projects which are critical to Australia's sustainability and economic goals," he said.

About Teck Global

Teck Global is an Australian-owned engineering firm specialising in supplying kiosk substations and transportable buildings for energy, rail and electrification. Established in 2014, Teck Global aims to be the project partner of choice for this market. With a focus on safety, delivery and quality, we have shown that we can scale to meet the emerging demands of our clients.