


# DEAKIN UNIVERSITY





Deakin University was established in 1974 and today hosts 60,000 full-time students in five campuses across Victoria State, Australia. Ranked in the Top 1% of universities worldwide\*, Deakin is known for its world-class research and teaching programs. Deakin consumes 52.5 GWh of electrical energy per year.

## The ambition

DEAKIN UNIVERSITY'S VISION IS TO BE A LEADER IN SUSTAINABILITY AND CLIMATE CHANGE MITIGATION. THIS AMBITION IS SUPPORTED BY A GOAL TO BECOME CARBON NEUTRAL AND USE 100% RENEWABLE ENERGY BY 2025.

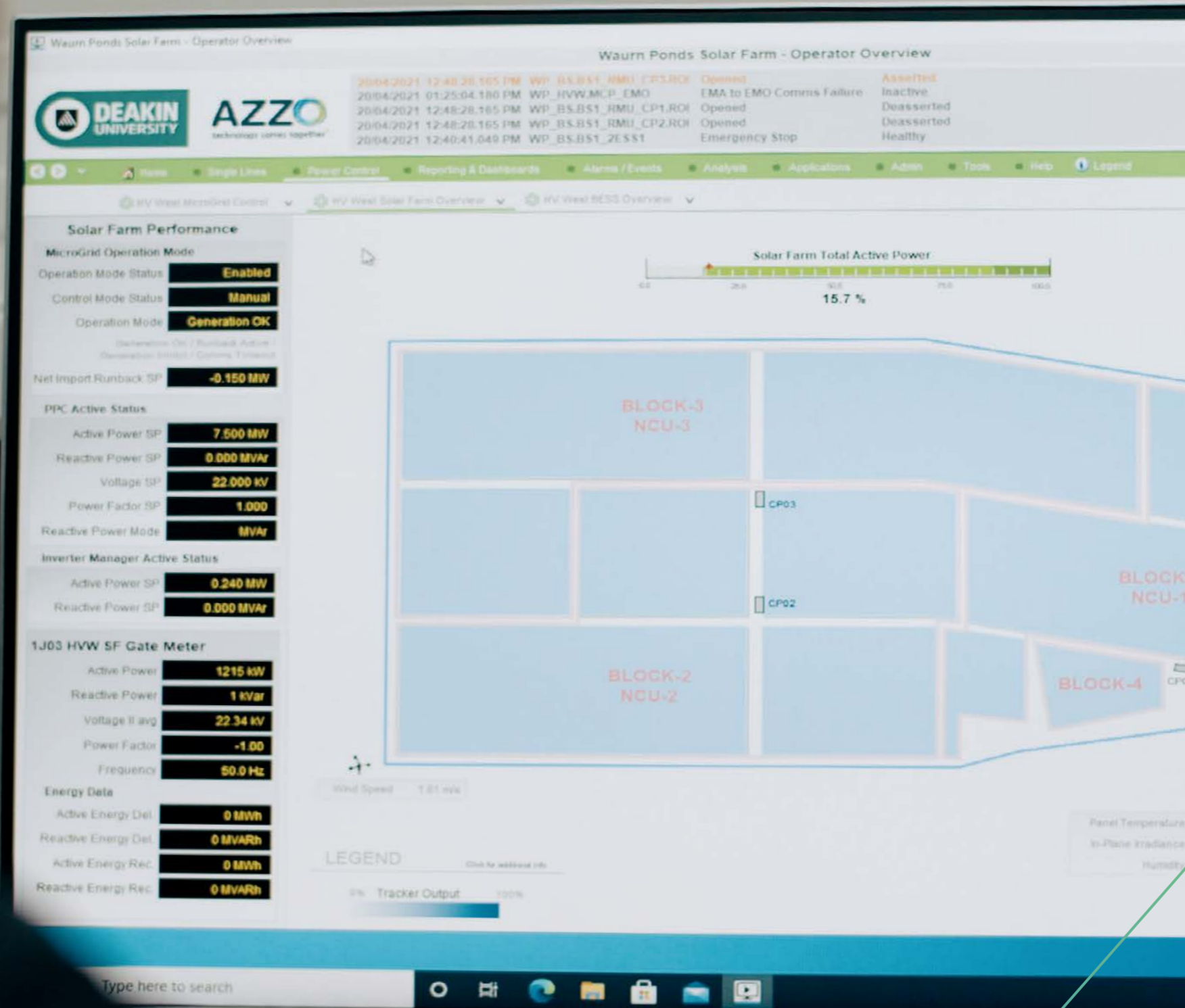
As a key lever to deliver on carbon neutrality, Deakin University decided to build a renewable microgrid. The Waurin Ponds campus was selected for the site because it is the center of Deakin's energy research, providing a diversity of opportunities that can simulate broader community and city environments. It is also part of the Geelong Future Economy Precinct which is a key enabler of the region's economic transition.

Aside from proven expertise in working with universities, AZZO is an industry leader in solar farm operations maintenance platforms, with extensive experience in power distribution and energy management systems.

Embarking on a project of this size required a strong network of partners. The Engineering, Procurement and Construction (EPC) principal contractor was Next Generation Electrical (NGE) with Beon Energy Solutions providing the HV substation. In selecting a partner for the design and implementation of the microgrid monitoring and control systems, NGE selected AZZO based on our successful background delivering numerous large scale projects with expertise and proficiency on HV network connections and power automation.



**2022 PROJECT OF  
THE YEAR**  
DIGITAL POWER  
CHAMPIONS SUMMIT



## The solution

THE DEAKIN RENEWABLE MICROGRID WAS A \$23 MILLION INVESTMENT, BECOMING OPERATIONAL IN APRIL 2021. COVERING 36 ACRES AND GENERATING 7.25 MW PEAK POWER, THE SYSTEM INCLUDES 23,000 GROUND-MOUNTED TRACKING PV MODULES, 833 ROOFTOP PV MODULES AND MULTIPLE BATTERY ENERGY STORAGE SYSTEMS (BESS) INCLUDING A 2MWH LITHIUM IRON PHOSPHATE BATTERY. THIS MAKES IT THE LARGEST MICROGRID AT ANY AUSTRALIAN UNIVERSITY.

To monitor and control this microgrid, AZZO designed and deployed its EnergyX IoT Platform, containing 15,000 data tags from 90 IoT devices, integrating all DER controllers, metering and electrical equipment into a single user experience. The system tracks total generation and consumption in real-time and supports multiple orchestration modes: automatic, manual and Distributed Network Service Provider (DNSP) control.

## Future proof

Many other functions are centralized into the EnergyX IoT Platform including tracker management, power quality analysis, weather monitoring, solar performance validation, and Supervisory Control and Data Acquisition (SCADA) of the campus power distribution network.

In the future, EnergyX will be used to enable Deakin to participate in the energy markets, including access to the Frequency Control Ancillary Market.



## Bringing technology together

The Schneider Electric product portfolio was deeply integrated into the digital architecture, with ION meters and Easergy relays featured at the device level. EcoStruxure Microgrid Operation was a core component for edge communication and control, while EcoStruxure Microgrid Advisor was used for predictive microgrid optimization.

Other integrations included the use of Nextracker solar trackers and SMA inverters.

The EnergyX monitoring and control functions are setup to leverage Microsoft Azure for future operations.

With these best-in-class components and sub-systems, AZZO was able to deliver on some key technical objectives, including the integration of the High Voltage (HV) network with the solar and BESS systems to support complex interlocking schemes with PLC control including motorized isolators and breakers.



**AZZO IS KNOWN FOR BRINGING THE BEST TECHNOLOGIES TOGETHER TO ACHIEVE CUSTOMER GOALS AND THE DEAKIN MICROGRID PROJECT WAS NO EXCEPTION.**



ANOTHER KEY TECHNICAL OUTCOME WAS SEAMLESS USER MANAGEMENT ACROSS ACROSS THE OPERATIONAL TECHNOLOGY (OT) AND INFORMATION TECHNOLOGY (IT) NETWORK AND DIRECTORIES.

This allowed university researchers to access data securely and seamlessly. AZZO also implemented a redundant communications network to ensure availability.

The most promising outcome from bringing all this technology together was the creation of a digital twin of the microgrid. The digital twin ingests historical and live data, allowing the university to validate performance and detect deviations from expected operation. In the future, Deakin will use the digital twin to simulate and test alternative operating scenarios.



## Results

NOW SUPPLYING 12 GWH ANNUALLY TO WAURN PONDS, THE RENEWABLE MICROGRID PROVIDES 54% OF THE CAMPUS ENERGY USAGE. IN TOTAL, THE MICROGRID HAS REDUCED DEAKIN UNIVERSITY'S ANNUAL CARBON EMISSIONS BY 12,000 TONS.

Additionally, the microgrid is the core of a research and technology platform for energy innovation. It also supports education and training for future energy professionals and provides a basis for community learning.

## Premium professional

"Deakin's Renewable Energy Microgrid started a new era of sustainability and energy management for Deakin University, and also represented a project that was vastly different to the more traditional projects typically delivered by our internal project delivery team... The system integrator role was considered more critical than normal to ensure seamless interfacing, nil interruption during commissioning and failsafe ongoing operation.

AZZO rose to this task amazingly well not only from a technical expertise perspective, but also from a stakeholder identification and management perspective for both system integration and data management. The value-adds AZZO provided were a critical part of the project success. Based on this approach and system knowledge, AZZO was also pivotal in supporting development of Deakin's Microgrid Digital Twin Model, a key research and education tool used in conjunction with Deakin's Microgrid."

◀ **ADAM FLETCHER**  
Project Manager  
Deakin University

# AZZO

technology comes together<sup>®</sup>

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see what we can  
do together

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