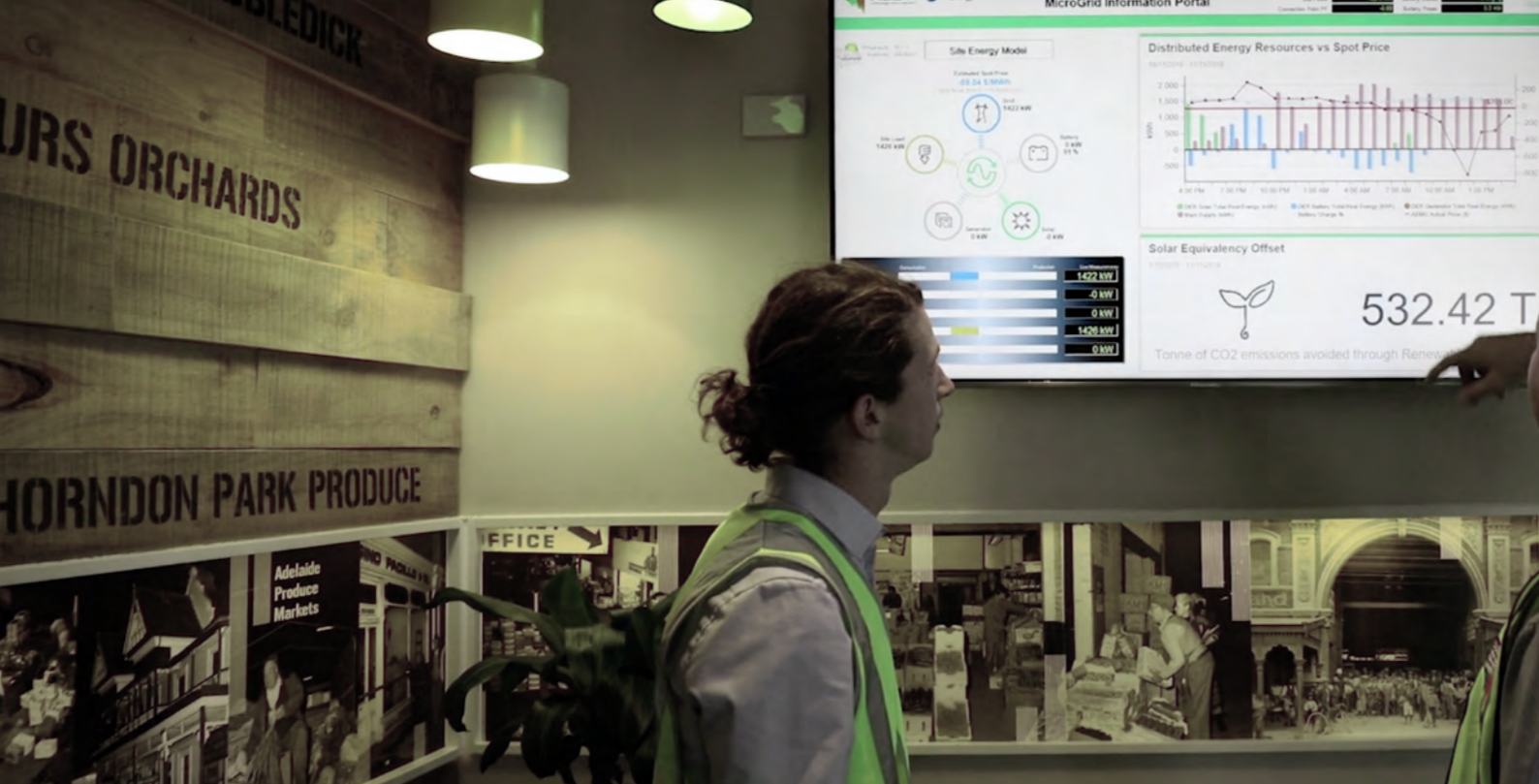


SOUTH AUSTRALIAN PRODUCE MARKET





Overview

With over 250,000 tons of fresh produce traded every year, the South Australian Produce Market (SAPM) is the state's primary produce market. 45 wholesalers, 60 growers and hundreds of retail operators come together at the 50-acre market, with over \$550 million worth of transactions each year.

Key to maintaining operations and productivity is a reliable and efficient electrical network. And at no time in the market's history was this

more evident than at the end of 2016. A state-wide power failure in South Australia brought businesses, workplaces and homes to a standstill. In a matter of hours, the SAPM lost over \$2.5 million in spoiled produce.

The blackout and its effects really crystallized both Angelo Demasi, the market's CEO, and AZZO's thinking. That power production had to be brought on to SAPM's site.

Our long-standing relationship with the South Australian Produce Market has led to lots of mutual benefits.

Over the years of working together, we were able to show our client that as their business grew, their energy resiliency risk and costs didn't have to.

Today, this facility is a microgrid – producing its own sustainable, reliable energy and selling it on the open spot market for energy retailers to buy and re-sell.

Key features

With facilities covering 50-acres, the South Australian Produce Market (SAPM) is the largest of its kind in the State.

AZZO began working with SAPM to reduce its load through energy management. With the addition of the microgrid, we've reduced its energy demand by 3.8 Million megawatt hours per annum – a net saving of aud\$3.4 Million over 10 years.

Thanks to the autonomous way in which the microgrid is managed, the market has reduced its annual greenhouse gas emissions by 32%, with virtually no intervention.

The challenge

The majority of power usage at the market goes into its refrigeration and air conditioning units. Rather than contracting electricity, SAPM is exposed to the National Electricity Market (NEM). This is open to the vagaries of supply and demand, as this is where Australia's power generators sell electricity, and retailers buy it.

Furthermore, the Australian Energy Monitoring Operator (AEMO) decides which generators around the country will be deployed to meet demand in the most cost-effective way.

The goal is to match electricity production with consumption, with spare capacity in reserve if needed.

In the case of the South Australian energy blackout, this reserve was initially being used to supply other parts of the country, and when it was deployed, it was too late for businesses like SAPM.

Clearly, SAPM needed a solution that would allow them to be both on-grid and off-grid – able to switch power sources for the most cost-effective option – while ensuring reliability. They also needed a solution that would allow SAPM to charge its tenants for the power they used. Both these objectives required intelligent metering and monitoring, along with an overarching control system.

The solution

The challenges faced by SAPM are not dissimilar to those faced by thousands of operators in the fresh produce industry throughout the US. Especially in states like California, which can be subjected to public safety shutdowns and rolling capacity blackouts.

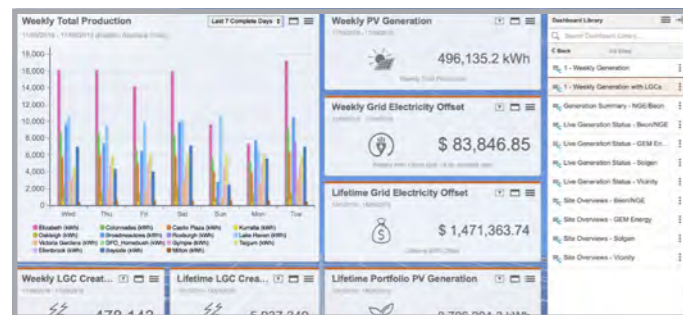
To help SAPM meet these kinds of challenges, AZZO brought together all four of our key strengths – Energy Management, Electrical Engineering, Power Automation and Software Development.

Operation of the microgrid is achieved through AZZO's EnergyX Orchestration Suite, utilizing Schneider Electric's EcoStruxure architecture, Microsoft Azure and AZZO's own digital services. The base Edge layer connected devices include power quality meters, programmable logic controllers, edge control switches, intelligent circuit breakers, medium voltage protection relays, industrial PCs and touch panel computers.



WE WANT TO ENSURE WE CAN CONTINUE TO PROVIDE AFFORDABLE FRESH PRODUCE ON A LOCAL AND GLOBAL PLATFORM. THIS INITIATIVE MEANS WE CAN ACHIEVE THAT IN AN ENVIRONMENTALLY FRIENDLY AND COST-EFFICIENT MANNER USING A WORLD-LEADING INNOVATIVE SOLUTION.

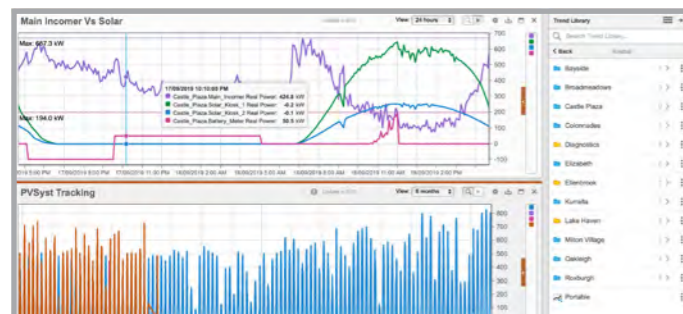
ANGELO DEMASI
Chief Executive Officer, SAPM



GENERATION TRACKING AGAINST LGC, CARBON, AND REVENUE BALANCES



SITE LAYOUTS WITH LIVE GENERATION AND CONSUMPTION POINTS FOR REAL-TIME AND PUBLIC DISPLAYS



HIGH SPEED REAL-TIME AND HISTORICAL DATA ANALYSIS



SITE AND MULTIPLE DER STATION PERFORMANCE RATIO TRACKING WITH CUSTOM UTILITY GRADE WEATHER STATIONS

The connected devices are monitored and controlled at the Edge layer by a cloud-hosted instance of Power Monitoring Expert as the energy monitoring and historian solution. Active Edge layer energy control and automation is performed by Power SCADA Operation, which autonomously controls the electrical distribution equipment and Distributed Energy Resources.

Optimized orchestration of the microgrid operation is planned at the analytical layer by a cloud based EcoStruxure Microgrid Advisor AI platform, which evaluates many factors such as weather, PV production, energy pricing, fuel pricing, projected loading and generation capacity. These determine the optimum utilization of the resources based on programmed use cases.

AZZO's engineering staff, with a thorough understanding of the SAPM electrical systems, developed the switching

schemes, operational use cases, communications network topology, system programming and design coordination with the project team.

With the EnergyX Suite as a foundation, AZZO's digital services team integrated multiple disparate systems and technologies to enable successful orchestration of the microgrid. Custom reporting was created to indicate energy purchased or sold to and from the grid. Data from weather stations, battery controllers, generator controllers and PV inverters were aggregated together to create a central view of the entire operation of the microgrid from one centralized, cloud-hosted system. All while maintaining a safe and Cybersecure system.

AZZO's EnergyX Mission Control fleet management solution ensures that all computers, servers, PLCs, network communications are functioning properly and provides centralized alarming.

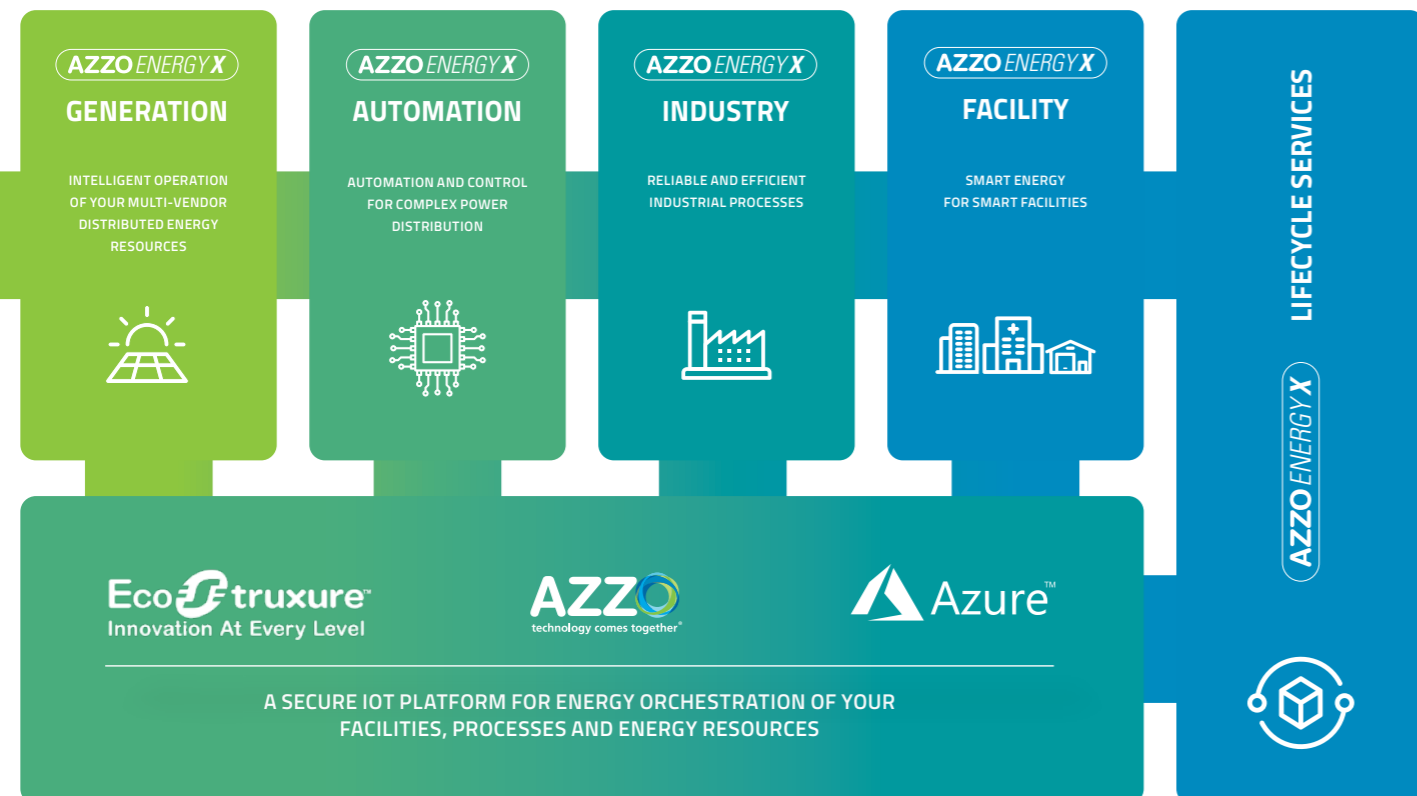


Results

BEING A MICROGRID, THE RESULTS SPEAK FOR THEMSELVES. SAPM HAS NO UNPLANNED OUTAGES SINCE INSTALLATION, A MAJOR IMPROVEMENT IN RELIABILITY AND RESILIENCY.

AT THE SAME TIME, TARIFF SHIFTING STRUCTURE THAT AZZO INTRODUCED ALLOWS THE PRODUCE MARKET TO BUY AND SELL POWER ON THE SPOT MARKET. NOT ONLY HAS AZZO HELPED OUR CLIENT BECOME ALMOST ENERGY AUTONOMOUS AND INDEPENDENT FROM THE GRID – WE’VE HELPED TRANSFORM SAPM FROM BEING AN ENERGY CONSUMER, INTO AN ENERGY PRODUSER

AZZO ENERGYX ORCHESTRATION



This has seen the produce market reduce its maximum energy demand by 3.8 million megawatt hours per annum – a net saving of AUD\$3.4 million over 10 years.

Of course, there are also significant environmental benefits. Thanks to the microgrid, the market has reduced its annual greenhouse gas emissions by 32%.

What’s more, achieving these results requires no human intervention. The market’s managers simply walk into the control room each morning and see for themselves, the efficiencies that our system has created overnight.

- A higher level of electrical reliability – particularly important when the market deals with over five million pounds of fresh and perishable produce each year
- A far lower cost for the electricity that the SAPM facilities need to consume to operate
- Financial benefits from tariff shifting structure that AZZO has designed
- If the spot market is high, the system will maximize the Distributed Energy Resources that are available and export as much energy as it can
- However, if the market dips very low, it will actually BUY as much power and energy as it can – and store what it doesn’t need now, to use it later
- This means our client is virtually energy autonomous and able to operate independently from the grid

“ As energy becomes more democratic, AZZO provides the voting booth. ”

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AZZO

technology comes together[®]

Contact us to
see what we can
do together

AZZO (USA)
330 Changebridge Road
Suite 101, Pine Brook
NJ 07058
USA
+1 973 575 5032

AZZO (AUSTRALIA)
B22, 6 MAB Eastern Promenade
Tonsley
SA 5042
Australia
+61 1300 00 2996

solutions@azzo.com
azzo.com

