WISA Award: Supporting Documentation for NGE/CFB Solar Facility

Video summary:

Casella Family Brands Solar Farm (youtube.com)

CFB's Net-Zero by 2050 Goal and Initiative Overview

In pursuit of a Net-Zero by 2050 goal, CFB conducted a thorough evaluation of both Scope 1 and Scope 2 greenhouse gas emissions to identify crucial areas for reduction. The analysis revealed that electricity consumption at our Yenda site was the predominant contributor, accounting for roughly 65% of the combined Scope 1 and 2 emissions. Determined to make a substantial difference and highlights our unwavering dedication to our Net-Zero emissions pathway, we sought to invest in a solution that promises significant impact. After conducting an exhaustive energy audit, CFB made the strategic decision to generate our own renewable electricity. Identifying an available parcel of land, we established a cutting-edge 5.7MW solar farm. NGE was appointed to design and construct the solar farm. The facility is equipped with advanced technology, including an intelligent algorithm that optimises the positioning of panels throughout the year for maximum energy production. It now fulfills 35% of the Yenda site's electricity demands. Functioning as a zero-export system, it interfaces with CFB's refrigeration plant, dynamically adjusting output in response to solar generation levels to ensure efficient utilisation.

Challenge Addressed and Evidence of Outcomes Met

- The solar farm is a clear action in CFB's commitment to Net-Zero. It supports 35% of the largest sites' energy needs and is key in reducing greenhouse gas emissions by 50% by 2030 and achieving Net-Zero by 2050.
- The 5.7MW facility is capable of generating 11.53 GWh of clean electricity per year. This will offset 7800 tonnes of greenhouse gas emissions.

Environmental Benefits

- The facility is capable of generating 11.53 GWh of clean electricity per year. This will offset 7800 tonnes of greenhouse gas emissions which is equivalent to planting 325,000 trees.
- Native species planting around the solar farm site to promote ecosystem health.

Industry Benefit

- Tangible contribution to Wine Australia's Emissions Roadmap to reduce the sector's greenhouse gas (GHG) emissions by more than 40 per cent before 2030.

Regional Advantages

- Multi-million-dollar investment in the region and subsequent media coverage delivering prosperity and positive sentiment.
- Up to 50 contractors at the highest point staying in the town of Golbourn for the duration of the job boosting local hospitality, hardware stores, etc.
- Up to 6 local companies contracted for work on the solar farm.

Industry Leadership

- Sets a benchmark for industry sustainability practices.

Supply Chain Impact

- CFB now contributes to the emissions reduction targets set by our customers and importers.
- Responding to increasing demands for transparency, we now deliver tangible results on emissions reduction targets, fostering sustainability throughout the supply chain.

Collaboration and Partnership

The project was orchestrated with collaboration from NGE, external consultants, stakeholders, and internal leaders at CFB. A working group of experts and consultants was established to ensure diverse perspectives. Internally, Winery & Brewery managers, Engineering, Commercial, Communications, and Sales teams convened weekly for inclusive project planning meetings, fostering open dialogue and consultation throughout the project.

NGE facilitated consultations with the local council and the community, prioritising minimal impact on the neighbouring properties.

Being a generational family business and so heavily committed to the Riverina, it was evident from the moment we started working with John and his team that we would need to pay extra attention to the impacts on the community and the land.

The site selection was critical to the project's success. Due to the sheer size of the manufacturing plant and the amount of energy it depends on, there was not enough available roof capacity to even come close to covering the load during sunlight hours. We needed to find an appropriate site that could accommodate a ground-mount system. However, once we jumped off the roof onto the ground, we needed to be respectful of the challenges that brought.

We needed to ensure that native bushland was not significantly impacted and that neighbouring properties experienced low visual impacts from the solar farm. We achieved this by utilising existing bushland and the Murrumbidgee Canal as screening. We carefully researched to ensure we did not disturb significant areas of the Wiradjuri people.

As the site is near Griffith Airport, we ensured that the positioning of our racking system and solar panels would not create any possibility of glint and glare for pilots.

Site access was improved to ensure that construction traffic could safely enter the site without impacting the local area.

We ensured that the NSW Rural Fire Services had endorsed access and construction drawings in the case of emergency.

This comprehensive approach, both internally and externally, highlights how diversity of thought and collaboration among the core team and key stakeholders were key to success.

We worked with leading panel provider, Trina Solar, to implement cutting-edge solar solutions, coupled with innovative tracking technology. This enables Casella Family Brands to harness the power of the sun on an unprecedented scale. This collaboration exemplifies our commitment to driving sustainable development and reshaping the future of renewable energy in Australia.

Innovation - Nature of Initiative

The initiative signifies an innovative approach to how CFB manages energy consumption. Operating as a zero-export system, we have developed a sophisticated interface that communicates with CFB's fridge plant, adjusting output based on solar generation levels. It is initiated continuous reviews aimed at identifying energy-efficient solutions to reduce our reliance on the grid. We've also augmented solar capacity by installing a second solar system. This will provide 30% of the energy demand for the site's wastewater treatment facility.

Innovation – 2P Tracking System

This solar farm marks a paradigm shift as it's the first in the entire Asia Pacific region, to fully integrate Vanguard 2P trackers with these large format low voltage 650W modules. This combination results in significant savings on electrical components and installation labour, and a significant levelized cost of energy (LCOE) reduction as more large-size modules in longer electrical strings, and therefore more overall generation capacity, can be mounted on each tracker.

Benefits	
A multidrive system designed for optimal performance, similar to Formula 1, uses wind tunnel testing to pressure the tracker and ensure the structural integrity of these large structures withstand the most intense wind conditions.	Up to 30% angle adjustability
The Smart Tracking algorithm uses machine learning to maximise energy gain on cloudy days with diffuse irradiance and minimise row-to-row shading losses.	Up to 8% generation gain with bi facial panels
The two-in-portrait (2P) configuration and 4-string-per-row configuration allow for more modules per tracker and fewer piles installed compared to a (1P) system.	Up to 120 modules per tracker Up to 45% less piles per project
Due to increased clearance between tracker rows and from ground to panel, it is easier to perform vegetation management and co-locate the solar and agriculture for or even low-growing crop cultivation (as rows are completely accessible with tractors)	At 90 degrees the panels are 2.5m compared to 1.2 for 1P System When at 55 degree the highest point is 4.4m

Innovation – Custom Interface

A custom-designed interface to manage usage demonstrates innovation and efficiency of clean electricity usage. The control centre tracks total generation and consumption in real-time and supports multiple orchestration modes.

ROI

- Substantial progress towards Net-Zero by 2050 target.
- Cost savings achieved 35% reduction in electricity bills.
- Employee engagement with sustainability is enhanced, ensuring integration of CFB's Net-Zero Emissions pathway into every role, driving collective responsibility and action.
- Key stakeholder engagement was achieved through a switch-on launch event, where we showcased CFB's sustainability goals and actions to industry peers, suppliers, financial partners, customers, and media, fostering collaboration and support.
- NG/E presented at the switch-on event showing the company's capabilities and expertise to a influential audience of stakeholders.
- Enhanced corporate reputation for both companies was achieved through 118 pieces of positive media coverage with a reach totalling 104,712,833.

- Both companies have been asked to speak at events such as Solar and Storage Live 2025.

Supporting Evidence

Images show plot of land and the construction stages of the 5.7MW solar facility. The facility was designed to maximise generation based on the plot of land available.

Pie chart shows supply in real-time (orange 26.7% solar energy [KWh] and blue 76.3% grid energy [KWh])