



Image courtesy Horizon Power

CPS National design, supply, install and commission 1MW solar PV system as part of Australia's largest distributed energy resource (DER) microgrid

OVERVIEW

Horizon Power is a Government Trading Enterprise which generates, distributes and retails electricity to over 100,000 residents and more than 10,000 businesses in regional towns and remote communities across Western Australia. The Horizon Power service area is vast, covering approximately 2.3 million square kilometres, which means Horizon Power services the biggest area with the least amount of customers in the world. For every 53.5 square kilometres of terrain, Horizon Power have one customer.

Project Scope

CPS National was engaged by Horizon Power to design, supply, install and commission a 1MVA solar photovoltaic (PV) system adjacent to the new Onslow Power Station, located near the township of Onslow in Western Australia.

Project Overview

Horizon Power undertook what was set to be Australia's largest distributed energy resource (DER) microgrid in Onslow WA. The Onslow DER Project connects traditional energy sources with distributed solar and battery solutions to maximise the amount

of renewable energy in Onslow. At the completion of the project, the Onslow microgrid included a mix of distributed renewables, modular gas-powered generation and battery storage aimed at achieving a high level of renewable energy supply throughout the town.

The implementation of the Onslow DER project was split into two stages.

Stage One included the construction of a gas-fired modular power station and a new transmission line, zone substation and distribution network extension. This work was completed in July 2018 and has commenced servicing the immediate electricity needs of the Onslow community.

PROJECT OVERVIEW

Client: Horizon Power

Location: Onslow, Western Australia

PROJECT SCOPE

Design, supply, installation and commissioning of a 1MW solar PV farm

UNIQUE FEATURES

- Design and installation both reflected the extreme conditions experienced at the site, including extreme heat, cyclonic conditions and a corrosive environment.
- Installation and commissioning required minimal impact on the adjacent Onslow Power Station which was critical to maintaining a reliable power supply to the Onslow township.
- On completion the Onslow DER Project will be one of Australia's largest distributed energy resource (DER) microgrids with a very high level of renewable energy penetration.

Stage Two commenced in October 2018 and involved the installation of a centralised 1MVA solar farm adjacent to the new power station, a battery energy storage system at the zone substation, distributed solar PV systems across the system and distributed batteries across the system.

Construction of the Stage Two centralised infrastructure is now complete with the 1MW Battery Energy Storage System (BESS) located at the zone substation being energised onto the Onslow network in May 2019. The Solar Farm located adjacent to the power station was energised in June 2019.

Challenges

Working next to an operating power station - minimising any disruption to the Onslow power station operation was at all times a key concern for CPS National throughout the project. Achieving this was one of the key factors in the success of the project.

Design considerations for extreme site conditions

The project site is in a cyclonic area (Wind region D) and is subject to very high ambient temperatures and a corrosive environment. Because of these challenging conditions, a key part of the design process was the selection of suitable equipment to ensure the long term reliability of the system.

Extreme heat

In order to meet the customer's delivery time frame, CPS National needed to complete the installation over the summer months which is a period of extremely high temperatures. There were extended periods where the site crews worked in temperatures over 40 degrees C, with a maximum of 47.2 degrees C being recorded. As the installation work was mostly outdoors, the project team had to carefully manage the wellbeing of staff and subcontractors to minimise the potential impact of heat exhaustion and fatigue.

Cyclonic conditions

Onslow is located in the Pilbara region of WA which can experience severe tropical cyclones from November to April. CPS National developed contingency plans for responding to extreme weather which was activated during the project to safely shut down and evacuate the site during a cyclone event.

The Result

CPS National is extremely proud to have delivered a high quality project which is contributing to the success of the innovative Horizon Power Onslow DER Project.

The project was significant because:

- The Solar Farm was installed and commissioned with minimal impact on the adjacent Onslow Power Station which was critical to maintaining a reliable power supply to the Onslow township
- There were significant challenges in overcoming installation issues caused by extreme heat conditions and cyclonic weather
- The site installation and commissioning was completed with zero lost time injuries.



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The solar farm was built adjacent to gas-fired modular power station