Smart Grid Project

WA, Australia

Climate Change Response
Providing Sustainable Solutions

Introduction

The innovation and testing centre, spanning 51 hectares, has been strategically positioned just 40 kilometers north of the Perth CBD in Western Australia. It was specifically designed for activities such as testing, research and development, and training related to autonomous, remote operations, and robotic systems and equipment. The facility has three large test beds, which are regularly being utilized by a range of industries to develop and showcase their products and services in a real-world environment.

Aim

- Furnishing fundamental hardware, connectivity, and establishing an analytical foundation.
- Guaranteeing scalability across connectivity, monitoring, analytics, and automation.
- Initial emphasis on augmenting energy efficiency.
- The analytical layer provides valuable facility insights through advanced analytics, customized reporting, Artificial Intelligence, and effortless integration with third-party applications, as required..

Challenge

- Stronger monitoring, reporting and verification system
- Integrated Network Development
- Agility and Scalability

Solution

CCR Smart Grid

Network

Modbus, Bacnet, 4GLte, LoRa, LoRaWAN, Ble

Climate Change Response	
Advanced Analytics	**15** Sites
15 Meters	**65** Parameters types

The Smart Grid

The project aimed to boost efficiency, cut costs, decrease emissions, and optimize operations within the facility.

1. Five key sites were selected to be equipped with a network of 15 electrical meters. These meters provide real time data on 65 parameters per minute, greatly enhancing facility monitoring capabilities.
2. Spanning over 10 hectares of land, CCR enabled an efficient smart network infrastructure that enables real time management and monitoring across all three test beds within the facility.
3. The delayed system guarantees the seamless display of data and analytics through the web-based no-code dashboard, all in strict compliance with ISO standards.
4. The dashboard provides invaluable insights into the facility's energy status, incorporates predictive mainte nance algorithms for fault detection, and issues smart alerts for proactive management.

Climate
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Results Delivered

Savings

> AU $800,000 over 10yrs*

Scope for Expansion

Anticipated throughout 2025
- Conducting thorough data analysis across a spectrum of parameters.
- Employing methods for tracking and monitoring individuals' activities.
- Supervising and maintaining control over environmental conditions, including atmosphere, lighting, and temperature.
- Implementing comprehensive environmental monitoring and management practices.
- Creating a digital twin for enhanced system visualization and analysis.
- Managing and maintaining open spaces and associated resources.
- Striving for the development of a Net Zero Infrastructure while further integrating Distributed Energy Resources (DER).
- Harnessing the power of Artificial Intelligence (AI) and Machine Learning (ML) to derive insights and perform data analysis.
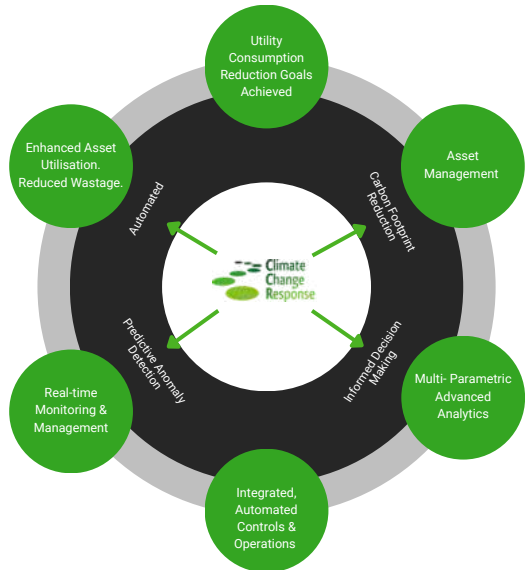
Success Criteria

- Achieved ahead of schedule.
- Successfully integrated a comprehensive system with smart monitoring, control, and analytics technology.
- Delivered value in alignment with project objectives.

* Figures based on opportunities identified & captured to date

Adopting the Smarter Tech

The facility, in collaboration with CCR, is pioneering a Smart future by deploying a comprehensive end-to-end system. Unlike traditional approaches, this system leverages wireless connectivity to monitor connected meters and sensors, facilitating automation and AI-driven modelling. It seamlessly amalgamates data from multiple origins and employs techniques to offer precise insights tailored to achieve distinct efficiency and management objectives. This intelligent system simplifies data collection for analytics, featuring correlation models, alert systems, automation, and reporting capabilities that significantly elevate the efficiency of management and decision-making processes.

- Automated Energy Management
- Advanced Analytics
- Efficiently Integrate Renewables Into Existing Networks

- Facilitate Green Energy Financing Compliance
- Reduce Carbon Emissions

Cutting −Edge Tech by CCR

The cutting-edge Smart system is far more than just a data collection and dashboard display solution. It leverages the formidable potential of Big Data analytics in conjunction with advanced Artificial Intelligence and Machine Learning capabilities. These Big Data models take a proactive approach, initiating preventive measures rather than reacting to issues as they arise.

The facility set out with the objective of optimizing energy management, which in turn facilitated more effective planning and informed decision-making. Through real-time issue detection, continuous monitoring, and immediate reporting, they not only reduced costs but also made substantial strides toward achieving their Net Zero target.

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Carbon: Decarbonising Council Operations

Merely tracking emissions isn't enough to address decarbonization. CCR incorporates Industry 4.0 technologies into a versatile platform, providing actionable insights to reach Net Zero.

IoT | AI | ML | Big Data Analytics | Edge- & Cloud Computing

- Tracked 45,000+ tCO2e emissions in 10 years.
- AI and ML identify carbon hotspots in real-time.
- Accurate Carbon Budget for Net Zero targets.
- Automated quarterly emissions reports for sustainability.