

Smart Grid Project

Western Australia



CASE STUDY – Smart Grid Project

Agenda

The main objective of this project was to aid in the establishment and maintenance of an Energy and Sustainability Management System (ESMS). This system will oversee and track energy, water, gas, and waste usage, as well as greenhouse gas (GHG) emissions across all City sites.

To achieve these goals, the project plan incorporated the implementation of an advanced Energy and Sustainability Management System (EsMS) developed by CCR.

Background

Situated in metropolitan Perth, this local government area spans 17.62 km² and currently hosts around 38,000 residents. Projections suggest its population will swell to 56,000 by 2036 and could surpass 100,000 by 2050, marking it as one of Australia's fastest-growing metro regions. Renowned for its transformation into a sought-after inner-city locale, it offers residents close proximity to the CBD, scenic Swan River foreshore, and the vibrant Burswood entertainment precinct.

Aim

- Develop a comprehensive utility management system enabling effective management of electricity, water, gas and fuel.
- Monitoring of two 100 kW solar PV systems at Aqualife and the Administration Building, alongside the design and supervision of three additional 100 kW SPV systems.
- To design a personalized carbon emissions dashboard equipped with reporting, data management, analytical tools, and scalability for future expansion, accessible by multiple users simultaneously.

Challenge

- Stronger monitoring, reporting and verification system
- Data Categorization and Collection
- Adept solar PV System Assessment and Implementation

Solution

CCR's Smart Energy and Sustainability Management System

Network

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

 Climate Change Response	
Real-Time Data	Advanced Solar Portfolio
20 Years of Historical Data	30+ Parameters

Challenges

1. Navigating the intricacies of integrating data from diverse sources, including utility records and internal data, to establish a comprehensive monitoring system.
2. Categorizing the Town's assets for emissions tracking (Scope 1, 2, and 3) and gathering historical data on energy, water, gas, fuel, and waste from town archives and utilities, ensuring ongoing updates.
3. Evaluating the existing solar PV systems, identifying sub-metering requirements, and designing relevant new systems for the required locations.

Implementing CCR's Smart Energy Management

As an integral part of our solution, CCR introduced a cutting-edge Energy and Sustainability Management System (ESMS) tailored to address the unique challenges. This ESMS boasts a range of distinctive features:

1. Continuous Energy Monitoring and Enhancement: Real-time tracking of energy data with transparency into the City's water, gas and emissions data on the same platform.
2. Real-time monitoring of two 100 kW solar PV systems at Aquatic Center and the Administration Building enabling informational insights on the system's operations.
3. Designing, implementing, and managing three new 100kW solar PV systems while integrating solar management into the same platforms.
4. Integrated advanced analytics and AI based predictive modelling for comprehensive analysis and informed resource planning.
5. Predictive maintenance and fault detection for immediate alerts in case of anomalies enabling immediate maintenance, thus preventing system breakdown
6. CCR's ESMS provides both agility and scalability, allowing for the seamless integration of additional components and the inclusion of multiple sites on the same dashboard as needed in the future. This capability ensures that the town can readily adapt to smart solutions, enhancing its overall sophistication

Result Delivered

The implementation of CCR's ESMS has catalyzed a remarkable transformation, propelling the Town towards becoming a smart, sustainable, and climate-conforming urban hub. The integration of solar PV systems has bolstered their clean energy generation, reducing their carbon footprint and reliance on fossil fuels. Furthermore, the personalized carbon emissions dashboard has empowered the town to meticulously track and manage greenhouse gas emissions, driving sustainability initiatives and climate action.

- Multi-parametric analysis and AI-based insights
- Smart capabilities can incorporate comprehensive tenant billing
- Comply with Smart City initiatives
- Support COP 21 Climate Action initiatives
- Scope 1,2 and 3 emissions through a personalized emissions dashboard
- Effective monitoring, management and control of the City's solar portfolio
- Real-Time Monitoring and Management
- Supporting UN SDGs

Impact and Key Takeaway

The project's results yield three key takeaways that collectively transform the town into a model of innovation and sustainability.

- The integration of solar PV systems has sparked a renewable energy revolution, significantly reducing reliance on conventional power sources while lowering costs and carbon emissions.
- A comprehensive sustainability approach, encompassing resource optimization, clean energy generation through solar, and meticulous carbon emissions monitoring, underscores the Town's commitment to a greener and more environmentally responsible urban environment.
- The town emerges as a leader in the smart city movement, setting an example for technological sophistication, energy efficiency, and environmental responsibility that inspires others to follow suit.

Future Scope:

The successful implementation of the project has opened doors to a broader spectrum of applications, including air quality management, temperature control, EV charging, smart traffic management and water quality analysis to name a few. This diversification not only enhances the value of the Town's facilities but also unveils a world of exciting, innovative possibilities on the horizon. The journey toward a greener and smarter future has only just begun.

