

Energy & Sustainability Management Project

Perth, Western Australia



CASE STUDY – Energy & Sustainability Management Project

Agenda

The primary goal of this project was to assist in developing and supporting an Energy and Sustainability Management System (ESMS) to monitor energy, water, gas and waste consumption and greenhouse gas (GHG) emissions through the City.

In pursuit of these objectives, the project plan includes the adoption of an advanced Energy and Sustainability Management System (ESMS) created by CCR.

Background

Located in the southern suburbs of Perth, Western Australia, approximately 45 km southwest of the Perth CBD, this city covers an expansive area of approximately 260 km². With a population of approximately 135,000 residents, it is recognized as one of Australia's fastest-growing regions. The city serves as a vital local government authority for the picturesque southern coastal suburbs of Western Australia.

Aim

- To establish a comprehensive monitoring and analytics system for all utility consumption and greenhouse gas (GHG) emissions,
- Providing access to consumption data of past 20 years.
- Real-time monitoring of solar PV energy production.
- To optimize streetlight energy consumption by closely tracking and analyzing energy consumption data, leading to energy-saving initiatives.
- A Dashboard depicting utility and emissions data, with features for reporting, data management, and analytics
- Scalable system with multi-user access

Challenge


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

Solution

CCR Energy and Sustainability Management System

Network

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

	
Real-Time Monitoring	21 Sites
20 Years of Historical Data	30 Dashboards

Challenges

1. Overcoming the complexities of integrating data from various sources, including utility data and internal records, to create a comprehensive monitoring system.
2. Categorizing city assets for emissions monitoring (Scope 1, 2, and 3) and collecting long-term historical data (10-20 years) on energy, water, gas, fuel, and waste from city archives and utilities, ensuring regular updates.
3. Understand the energy needs of the facility and assess the current solar PV systems and their functioning

Solution

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 Optimization: Monitoring all forms of consumption and GHG emissions, by using utility supplied consumption data and internally collected data e.g. fleet fuel, landfill waste etc.
2. Real-time Solar Monitoring: Live monitoring of energy production from solar PV systems installed at various city facilities.
3. Threshold Alarming and Fault Detection: Facilitating real-time intelligent alerts, complete with email and text message notifications, when thresholds are reached.
4. The solution provides real-time data updates with a 5-second maximum delay, offering customizable base dashboards, and supports advanced analytics, including various data representations like charts, heat maps, area plots, maps with real-time sensor values, comparative analysis, and Sankey diagrams.
5. Efficient Tenant Billing: Our ESMS streamlines comprehensive tenant billing by utilizing meter data and presenting visually appealing, itemized invoices. It offers consumption visualizations, allows for different rates for electrical, water, and gas, and supports time-varying rates, enhancing billing flexibility.
6. Seamless DER Integration: Our system seamlessly integrates Distributed Energy Resources (DER), making it effortless for the city to incorporate renewable energy sources into their energy management strategy. This not only simplifies energy operations but also bolsters sustainability efforts.

Making the City Smarter and Sustainable

The project's successful implementation has catapulted the City into the realm of smart cities, harnessing technology, data, and real-time monitoring to elevate sustainability, operational efficiency, and decision making processes to new heights. This transformative initiative not only represents a pivotal milestone in fulfilling the city's Smart City objectives but also stands as a robust solution to effectively address environmental and efficiency challenges. Furthermore, the Smart Grid system introduced streamlines data collection for advanced analytics, providing invaluable correlation models, real-time alarms, automated workflows, and comprehensive reporting, thus catalyzing a profound enhancement in management and decision-making capabilities.

- Fighting Scope 3 Emissions
- Energy Efficient
- Support COP 21 Climate Action initiatives
- Tenant Billing
- Manage Utilities Efficiently
- Asset Prioritization
- Gap Analysis & Historical Data Comparison
- Effective DER Integration & Management
- Power Monitoring
- Comply with Smart City initiatives

Impact and Key Takeaway

- Collaborating with CCR has brought about a transformative change for the City thanks to the implementation of the Energy and Sustainability Management System (ESMS).
- Cost Savings and Sustainability: The ESMS, with its automation and predictive maintenance, has led to substantial reductions in energy consumption and costs, aligning perfectly with sustainability goals and promoting cost-effectiveness.

This initiative exemplifies responsible corporate citizenship, showcasing the positive impact that businesses can have on their financial performance and the environment by prioritizing energy efficiency.

Future Scope:

The future of this project holds promising opportunities for expansion and innovation. The ESMS system's versatility transcends energy monitoring, with potential applications in air quality management, temperature, water quality analysis, etc. This diversification enhances its value to our establishments and opens doors to innovative possibilities on the horizon.

