Developing an Embedded Network

Western Australia

Climate Change Response
Providing Sustainable Solutions

CASE STUDY – Government Building

Agenda

The agenda encompasses the creation of an embedded network and the development of innovative governance models tailored for the seamless integration of shared solar PV, battery, and monitoring systems.

Introduction

Located in the Perth district of Western Australia, the facility was actively seeking opportunities for shared solar and excess power trading within the building,

Aim

- Establish governance models for efficient deployment of shared solar PV, batteries, and monitoring system within the building
- Enhance energy security and resilience within the building through proper governance structures for shared energy resources.
- Focus on scalability and adaptability in diverse urban settings.
- Include shared solar PV systems and intra-building energy trading between floors.

Challenge

- Ownership and Accountability
- Technical Compatibility
- Lack of regulatory frameworks in place

Solution

CCR's Shared Solar Solution in partnership with Power Ledger's µGrid

Network

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

Climate Change Response

$11,000 Saving Per Annum	**50 kW+** Solar PV
Smart Inverter System	**20%** Reduced Emission

Challenges

1. Lack of defined clear ownership and accountability structures for shared energy resources by that accommodate the interests of multiple stakeholders.
2. Technical hurdles related to seamless integration of diverse solar PV and battery systems within a shared infrastructure.
3. No automated systems to effortlessly manage and trade electricity at fair value.

Solution

1. The project features a robust infrastructure, including a single three-phase 30kVA with 40KW PV on the roof and 3 x three-phase 10kVA inverters with 12KW PV on the roof.

2. The system successfully navigates complex regulatory frameworks, enabling the establishment of peer-to-peer energy trading capabilities within the strata setting, while adhering to electricity market regulations and applicable laws.

3. The solution simplifies tenant billing processes and offers transparent consumption and cost data, making it easier for all stakeholders to understand and manage their energy expenses.

4. Our holistic approach includes the integration of solar PV panels, battery storage, and Power Ledger's blockchain-based grid technology to create a comprehensive energy solution.

5. The provided dashboard effectively manages individual apartment energy and water usage data, ensuring data privacy and security with robust data management solutions.

6. By storing excess solar power in the battery for evening use, tenants can optimize their energy consumption. Additionally, the system enables the trading of excess energy between different floors, enhancing energy efficiency.

Execution

The project execution was meticulously planned to enhance sustainable living and elevate the quality of life for residents. We successfully deployed 19 smart energy meters, integrating them with CCR's Edge gateway and configuring them alongside the necessary solar PV and battery inverter systems. These components were seamlessly integrated with PowerLedger's cutting-edge smart technology.

This phase demanded rigorous technical alignment to ensure flawless compatibility and maximize operational efficiency. As a result, we delivered a smart energy sharing solution, setting a new standard for sustainable urban living.

1. AI and ML Algorithms
2. Predictive Maintenance
3. Smart Alerts
4. Energy Trading
5. Blockchain Technology

Results Delivered

1. Cost-Efficient Energy Savings: Enabled residents to save on energy costs by providing detailed insights into usage data.

2 Enhanced Sustainability: Elevated the sustainability of the development by granting access to afford- able, renewable electricity.

3. Increased Visibility: Improved visibility over energy consumption for more informed decisions.

4. Revenue Opportunities: Created potential revenue streams for building managers through effective energy management.

5. Efficient Tenant Billing: Streamlined tenant billing and management processes for smoother operations.

6. Resource Usage Insights: Generated valuable insights into resource usage patterns, facilitating better resource allocation and conservation effort

Impact and Key Takeaway

CCR's collaboration Power Ledger has brought about a profound transformation, ushering in a new era of sustainable living through the establishment of an embedded network.

- Through this project, we've created a sustainable living environment, diminishing our reliance on traditional utilities and fostering eco-conscious practices among tenants.
- This initiative has empowered tenants with the tools and knowledge to actively manage and trade their solar energy, significantly improving their quality of life.
- Furthermore, the project's data collection has not only supported research collaboration but also provided invaluable insights for broader sustainability initiatives and innovation, leaving a lasting positive impact on the community and beyond.

Future Scope:

In the future, the project envisions expanding to other communities, embracing emerging technologies, fostering deeper community engagement, sustaining research collaboration, advocating for supportive policies, achieving greater energy independence, measuring environmental impact, and addressing broad- er aspects of community well-being. Our overarching goal is to evolve into a sustainable building model adaptable to changing needs and inspiring similar initiatives elsewhere, while also providing added incentives for solar installation in new developments to promote sustainable energy practices and cost savings.