

# Solar PV Sharing Embedded Network

## WA, Australia



### CASE STUDY – Apartment Complex

#### Agenda

The agenda includes showcasing innovative governance models designed for the seamless integration of shared solar PV, battery, and monitoring systems. Central to the solution is the implementation of a community-based energy cooperative

#### Apartment Complex

These apartments in Western Australia, proudly stand as the first One Planet Community recognized apartment development in the region. Nestled within the internationally acclaimed One Planet Community, they are a sustainable oasis within Fremantle's One Planet City. This two-story complex epitomizes innovation with state-of-the-art solar PV rooftop panels and advanced solar battery storage systems, underpinned by government support for sustainable living. The Apartment Complex sets new standards for eco-conscious living in Western Australia.

#### Aim

- Establish governance models facilitating the efficient deployment of shared solar PV, battery, and monitoring systems within medium-density apartment complexes.
- Improved energy efficiency, cost reduction, and equitable access to the advantages of renewable energy sources.
- Enhance the energy security and resilience of medium density apartment communities through the development of governance structures for shared energy resources.
- Strive for scalability and replicability in various urban settings by designing adaptable frameworks, including shared solar PV systems.

#### Challenge

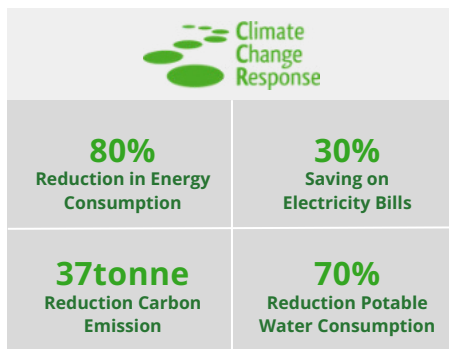
- Ownership and Accountability
- Technical Compatibility
- Lack of regulatory frameworks in place

#### Solution

CCR's Shared Solar Solution

#### Network

Modbus, Bacnet, 4GLte, LoRa, LoRaWAN, BLE



## Challenges

- 1. Ownership and Accountability:** Defining clear ownership and accountability structures for shared energy resources can be challenging, as it may involve multiple stakeholders with differing interests.
- 2. Technical Compatibility:** Ensuring seamless integration of various solar PV and battery systems in a shared infrastructure while maintaining technical compatibility and performance can pose technical hurdles.
- 3. Regulatory and Legal Frameworks:** Navigating complex regulatory and legal frameworks to establish governance models that comply with local laws and regulations for shared energy generation and distribution may be a significant challenge.

## Solution

- CCR's solution integrates a 50kW PV solar system with a 100kW Inverter System and a 150kWh battery, prioritizing meticulous technical alignment for peak efficiency and compatibility.
- Our no-code dashboard effectively manages individual apartment energy and water usage data, ensuring data privacy and security with robust data management solutions.
- The system navigates complex legal and regulatory frameworks to establish peer-to-peer energy trading capabilities within the strata setting, complying with electricity market regulations and applicable laws.
- Real-time measurement and monitoring of power and water consumption empower residents to make informed, sustainable choices, promoting greater energy efficiency.
- The solution streamlines tenant billing and provides transparent consumption and cost data, simplifying the process for all stakeholders.
- By storing excess solar power in the battery for evening use, residents can significantly reduce energy costs, avoiding expensive grid purchases during peak hours.
- Our holistic approach incorporates solar PV panels, battery storage, and blockchain technology for a comprehensive and sustainable solution.

## Execution

The implementation process was a well-structured endeavor aimed at promoting sustainable living and improving residents' quality of life. Our journey began with a strong emphasis on integrating shared solar panels, advanced battery systems, and cutting-edge monitoring technologies, all underpinned by innovative governance models. This phase demanded rigorous technical alignment to guarantee seamless compatibility and optimize operational efficiency. In addition, we introduced block-chain technology alongside AI and ML enhancements to meet the required objectives and provided a user-friendly no-code dashboard.

- AI and ML Algorithms
- Predictive Maintenance
- Blockchain Technology
- Solar Performance
- Smart Alerts

## Challenges

- 1.Successful installation of shared solar and battery infrastructure, enabling seamless Peer-to-Peer Energy trading.
- 2.Significant reduction in reliance on utility-based resources.
- 3.80% reduction in community energy use through solar adoption.
- 4.Valuable insights into resource usage patterns.
- 5.Sustainable community with better quality of life.
- 6.24/7 visibility into their gas, electricity, and water consumption, fostering informed and sustainable behaviours.
- 7.Effective tenant billing and management.

## Impact and Key Takeaway

The collaboration with CCR has ushered in a transformative era for the Apartments. It has achieved nationwide recognition as a pioneering example of sustainable living.

- The project established a sustainable living environment, reducing reliance on traditional utilities and promoting eco-conscious practices.
- Residents gained tools and knowledge to actively manage and trade their solar energy, enhancing their quality of life.
- The project's data collection supports research collaboration, offering valuable insights for broader sustainability initiatives and innovation

## Future Scope:

The future scope for this project includes expanding to other communities, leveraging emerging technologies, deepening community engagement, sustaining research collaboration, advocating for supportive policies, enhancing energy independence, measuring environmental impact, and addressing broader community well-being aspects. The goal is to evolve into a model for sustainable living that adapts to changing needs and serves as an inspiration for similar initiatives elsewhere.

