KULULEKA INDUSTRIAL PARK CASE STUDY

IJIKA SOLAR SOLUTIONS

Executive Summary

Ijika Solar Solutions and Solarvest have installed a solar energy system at Khululeka Industrial Park, aiming for sustainable energy solutions. The system, designed to produce 2.3MWh of energy per day, includes 1MWh of battery storage. Key components include Attess Hybrid Inverters (2 x 150kW), Attess Auto Transfer Switches (2 x 150kW), Freedom Won HV Batteries (2 x 500kWh), Canadian PV Modules (608 x 595wp), and an Automatic Generator (275kVA). These components convert DC power from solar panels into AC power, which is commonly used in homes and businesses. The high-capacity Freedom Won HV Batteries provide storage for generated power, ensuring availability during periods of low solar production or high demand. The Canadian PV Modules harness solar energy and serve as a backup power source. The ATESS platform monitors the solar system's performance and status, ensuring optimal system operation. The solar panels were installed using a ladder lift and rigging team, and a diesel generator was installed in a sound attenuated canopy. This project showcases the potential of renewable energy sources like solar energy as a sustainable alternative to traditional energy sources, demonstrating the significant power they can provide and paving the way for future sustainable practices.

System Components

The solar energy system comprised several key components, each playing a crucial role in the overall functionality and efficiency of the system:

- Atess Hybrid Inverters (2 x 150kW): These inverters were responsible for converting the DC power generated by the solar panels into AC power, which is commonly used in most homes and businesses.
- Atess Auto Transfer Switches (2 x 150kW): These switches helped manage the flow of electricity between the different power sources and loads, ensuring optimal use of the generated power.
- Freedom Won HV Batteries (2 x 500kWh): These high-capacity batteries provided a substantial amount of storage for the generated power, ensuring availability during periods of low solar production or high demand.
- Canadian PV Modules (608 x 595wp): These photovoltaic modules were responsible for harnessing solar energy, converting it into usable electrical power.
- Automatic Generator (275kVA): This generator served as a backup power source, automatically starting and stopping based on the available solar and battery power.

Economic Impact

The successful implementation of this project has allowed Khululeka industrial park to operate without any reliance on the national electricity grid for its 12 factories within the park. This independence not only reduces costs but also contributes to environmental sustainability by reducing carbon emissions associated with traditional energy sources.

Performance and Monitoring

The performance and status of the solar system are monitored via the online ATESS platform. This allows for real-time tracking of energy production and consumption, ensuring optimal operation of the system.

Planning and Permitting

The planning phase involved submitting the system single line diagram and system details to the local supply authority (Umhlathuze Municipality). A site inspection was carried out with the local engineer, ensuring that all safety standards and regulations were met before approval was received to commence with the installation.

Design and Engineering

The system design was carried out by Wayne Lehmkuhl in conjunction with product supplier Anton Loriet from Solarvest. Their expertise ensured a well-designed system that maximizes efficiency and power output.

Implementation

The implementation process was meticulously planned and executed. The solar panels were installed using a ladder lift, which was moved along the saw tooth roof for hoisting. The rigging team fixed the solar panels to the mounting structure in a landscape arrangement. The two 150kW hybrid inverters and 500kWh batteries were placed in the existing plant room and connected to the Main LV Electricity Panel. The diesel generator was installed in a sound attenuated canopy outside the inverter room and connected via the Atess ATS Control units.

Weather Conditions

The installation took place during a dry spell in Empangeni which allowed the team to work on the roof without delays. This ensured a smooth installation process and minimized potential weather-related issues that could have hindered progress or damaged equipment.

Conclusion

This project is an excellent example of how renewable energy sources can be harnessed to provide substantial amounts of power. It demonstrates the potential of solar energy as a viable alternative to traditional energy sources, paving the way for more sustainable practices in the future.