



**ZERO POINT
ENERGY**



CASE STUDY

Empowering sustainability and operational savings:

A comprehensive **solar PV** solution for a leading
shopping centre in Pretoria, South Africa

PROPOSED BY :

Farah Saloojee
Marketing Manager

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OVERVIEW

Zero Point Energy is a specialised commercial and industrial renewable energy company based in Johannesburg. We were tasked with providing a solution for a shopping centre to reduce operational electricity bills and ensure an integrated solar power solution with the centre's existing diesel generator.

PROJECT DETAILS



- Installer: Zero Point Energy
- Installation Date: Aug - Sept 2024
- Location: Tshwane, Gauteng
- 400 kW Huawei grid-tie inverter capacity
- 500 kWp solar capacity (910 solar panels)
- AC and DC electrical and earthing works
- 630 kVA diesel generator integration
- System has remote monitoring functionality
- Comprehensive electrical and structural engineering design
- Adherence to OH&S act safety and health and environmental compliance

CLIENT BACKGROUND



The client is a large commercial shopping centre located in Pretoria, South Africa, which houses several high-profile tenants, including anchor tenant Checkers. With its large energy consumption due to extensive HVAC systems, refrigeration, and lighting, the shopping centre was seeking a reliable, cost-effective solution to reduce its dependence on City of Tshwane's electricity supply, reduce diesel consumption during power outages, and contribute positively towards sustainability goals.

OBJECTIVES

The primary objectives for the initial project were to:

- Reduce electricity costs by generating renewable energy on-site.
- Minimize reliance on the national grid. Ensure reliable power during peak shopping hours.
- Integrate seamlessly with the mall's existing diesel generator.
- Following the success of the initial phase 1 (400kW solar PV) in 2023, the client aimed to further enhance energy savings by expanding the system in phase 2 during 2024 (100kW solar PV).



CHALLENGES

This project required addressing the centre's high energy demands, seamless system integration, and strict compliance standards to ensure an efficient and reliable solar PV solution.

- **High Energy Demand:** The shopping centre required a robust energy solution due to the large energy load from its tenants.
- **Space Constraints:** Efficient use of the available rooftop area, internal road crossings and utilities rooms, for solar panels, cabling and equipment was critical to meeting the energy demand.
- **Seamless Integration:** The system had to be integrated with the existing 630kVA diesel generator and have a good traffic management plan, requiring careful coordination during installation to avoid disruptions to the mall's operations.
- **Compliance:** The project needed to meet SANS, NRS, and municipal SSEG standards while ensuring the system was aligned with OH&S regulations.

DESIGN & INSTALLATION

For both phases of the project, the Zero Point Energy team worked closely with the client to ensure that installation activities were carried out without disrupting mall operations. The initial rooftop solar panel installation was completed in just over a week, followed by DC cabling and inverter installation. The system was tested and commissioned by the end of October 2023. The add-on installation in 2024 followed a similar, efficient process, with successful commissioning completed in September 2024.

SOLUTIONS

INITIAL INSTALLATION OCTOBER 2023

The initial installation, completed in October 2023, involved a custom-designed 402kWdc solar PV system:

- **Solar PV System:** 728 high-performance solar panels with a total capacity of 402kWdc were installed to generate renewable energy for the mall.
- **Inverters:** Four 100kW grid-tie inverters were deployed, providing 400kWac inverter capacity to efficiently manage and convert the solar energy.
- **Diesel Generator Integration:** The system was integrated with a 630kVA diesel generator to provide backup power during peak demand or grid outages.
- **Electrical and Structural Design:** Comprehensive electrical, mechanical, and structural engineering designs were carried out, ensuring safety and optimal performance.
- **Monitoring and Control:** The system included advanced remote monitoring, billing metering, and a custom 630A main distribution board with NRS 07-2 compliant grid monitoring for automatic disconnection.
- **Compliance:** The installation adhered to all necessary safety, health, and environmental compliance standards under the OH&S Act, ensuring long-term system reliability.

ADD-ON INSTALLATION SEPTEMBER 2024

Based on the success of the initial project, the client commissioned an additional 500kWp solar PV system in 2024 to further reduce electricity costs. This expansion included:

- **Solar Capacity Increase:** The new installation brought the total solar capacity to 902 solar panels, summing to a total of 500kWp for the upgraded system.
- **Inverter and Generator Integration:** The existing 400kW Huawei grid-tie inverters were re-used, and the existing diesel generator was re-integrated to work seamlessly with the expanded system.
- **Energy Efficiency:** With the combined system, the client could power all operational needs during sunlight hours and significantly reduce diesel fuel spend.
- **Monitoring and Optimization:** Remote monitoring functionality was extended to the add-on installation, allowing the client to track the system's performance and energy savings in real time.

RESULTS

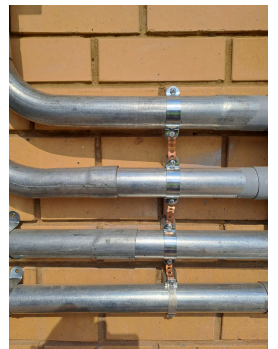
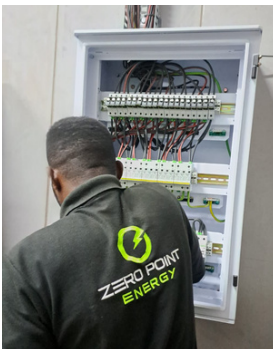
Our hard work paid off with an average of 43% decrease in client's monthly grid electricity usage, from the first month.

INITIAL INSTALLATION - COMPLETED DECEMBER 2023

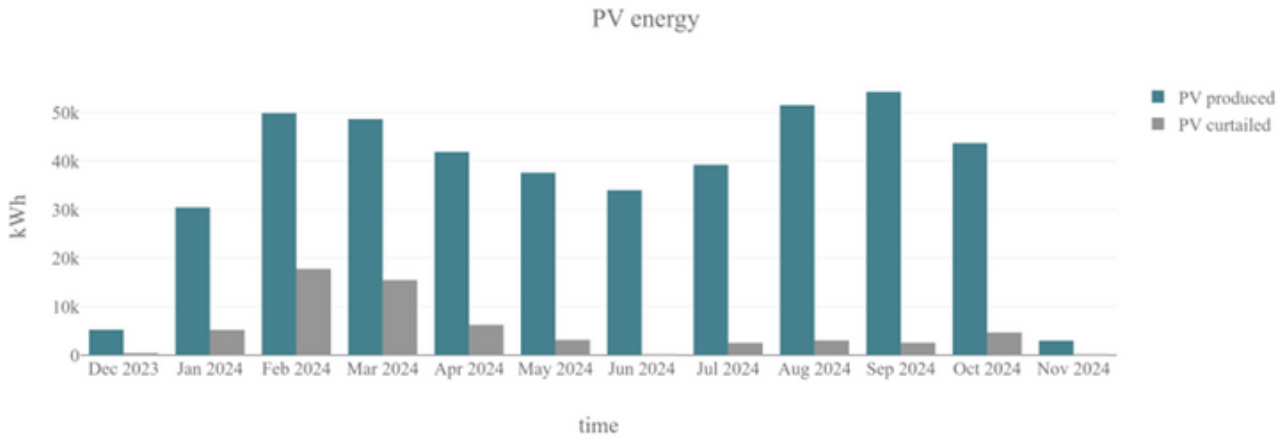
The 402kW solar PV system produced 282 MWh of electricity in total over 7 months, significantly reducing the mall's electricity consumption from the grid and saving the client in excess of R485 000 over the period. The system provided cost savings, reducing the client's electricity bills and enhancing sustainability significantly.

ADD-ON INSTALLATION - COMPLETED AUGUST 2024

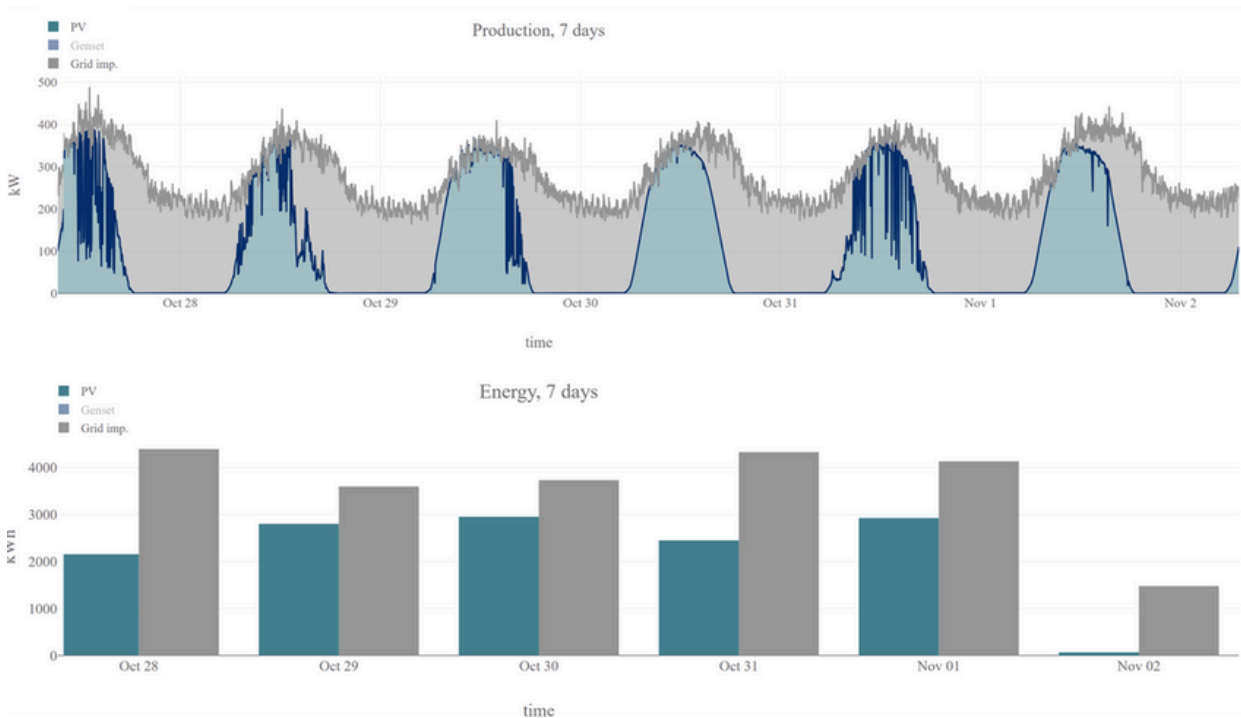
The expanded 500kWp system further increased energy production, resulting in monthly savings of up to R85,000 per month on the City of Tshwane electricity bill. The diesel generator's fuel consumption was also reduced, adding to the overall cost efficiency.



SYSTEM FEEDBACK



Power graph (kW) showing solar production for a typical week where solar covered the full daytime electricity consumption requirement of the shopping centre in recent October 2024 week.



Energy graph (kWhr) shows the split between solar production and utility imported electricity from City of Tshwane. Approximately 43% of all electricity sourced from solar power, with grid utilized only at nights

Through this two-phase solar PV installation, the mall has made significant strides toward sustainability, reducing its reliance on grid electricity and contributing to South Africa's broader renewable energy goals. With Zero Point Energy as a trusted partner, the client is well-positioned to continue this journey toward a greener, more energy-efficient future.



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CONTACT

Inspired by this success story?
Get in touch with us to start your journey to renewable energy



www.zpenergy.co.za



info@zpenergy.co.za



011 593 4449