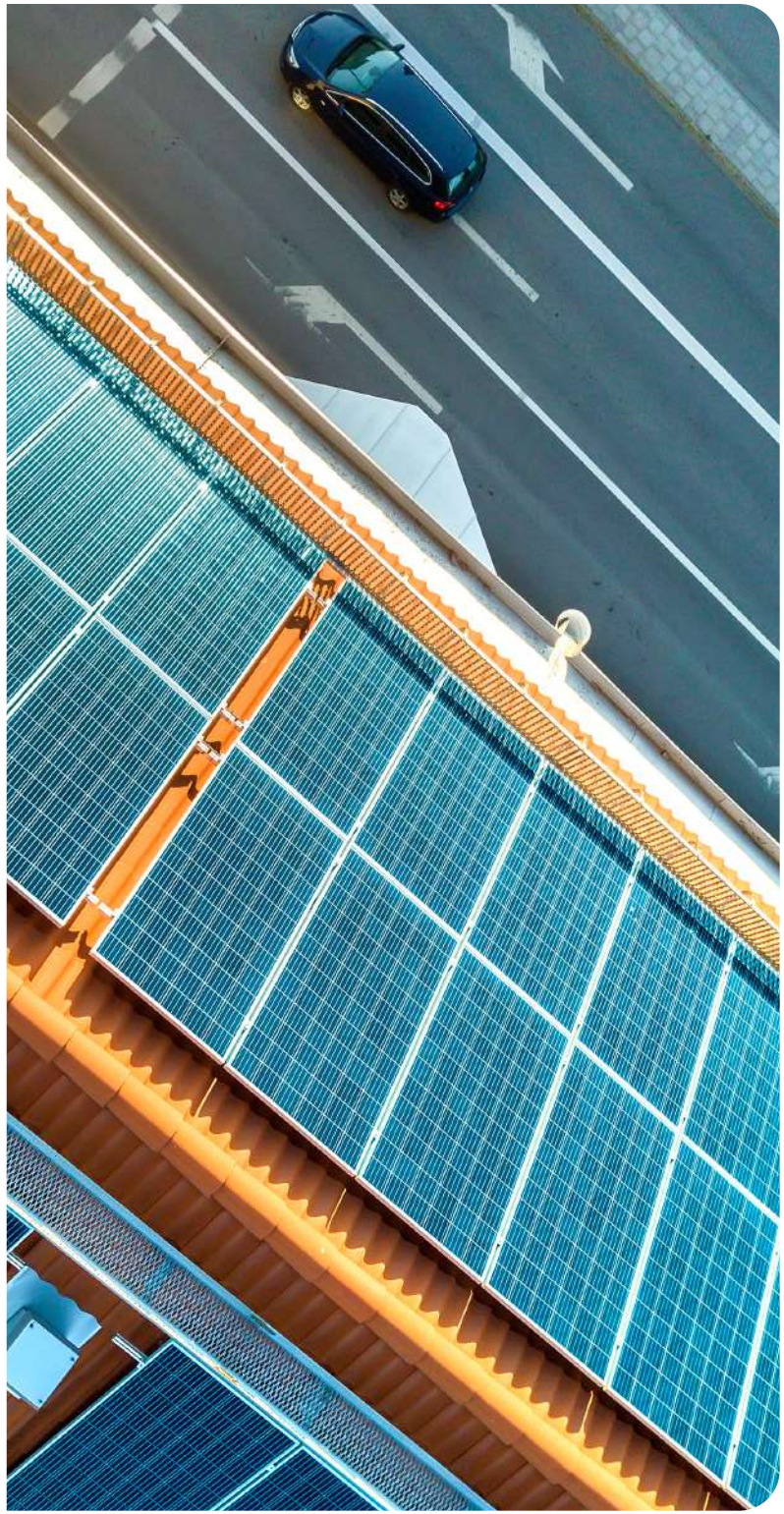
EcoPhi

Optimizing Grid-tied PV Systems combined with Diesel Generators

In South Africa

2023 - Ongoing



Background

In countries with either planned or unplanned power outages, PV systems are often combined with Diesel generators to make sure that they are running smoothly during grid blackouts.

Having several energy sources within one system increases its complexity which makes it more difficult to manage all components at the same time.

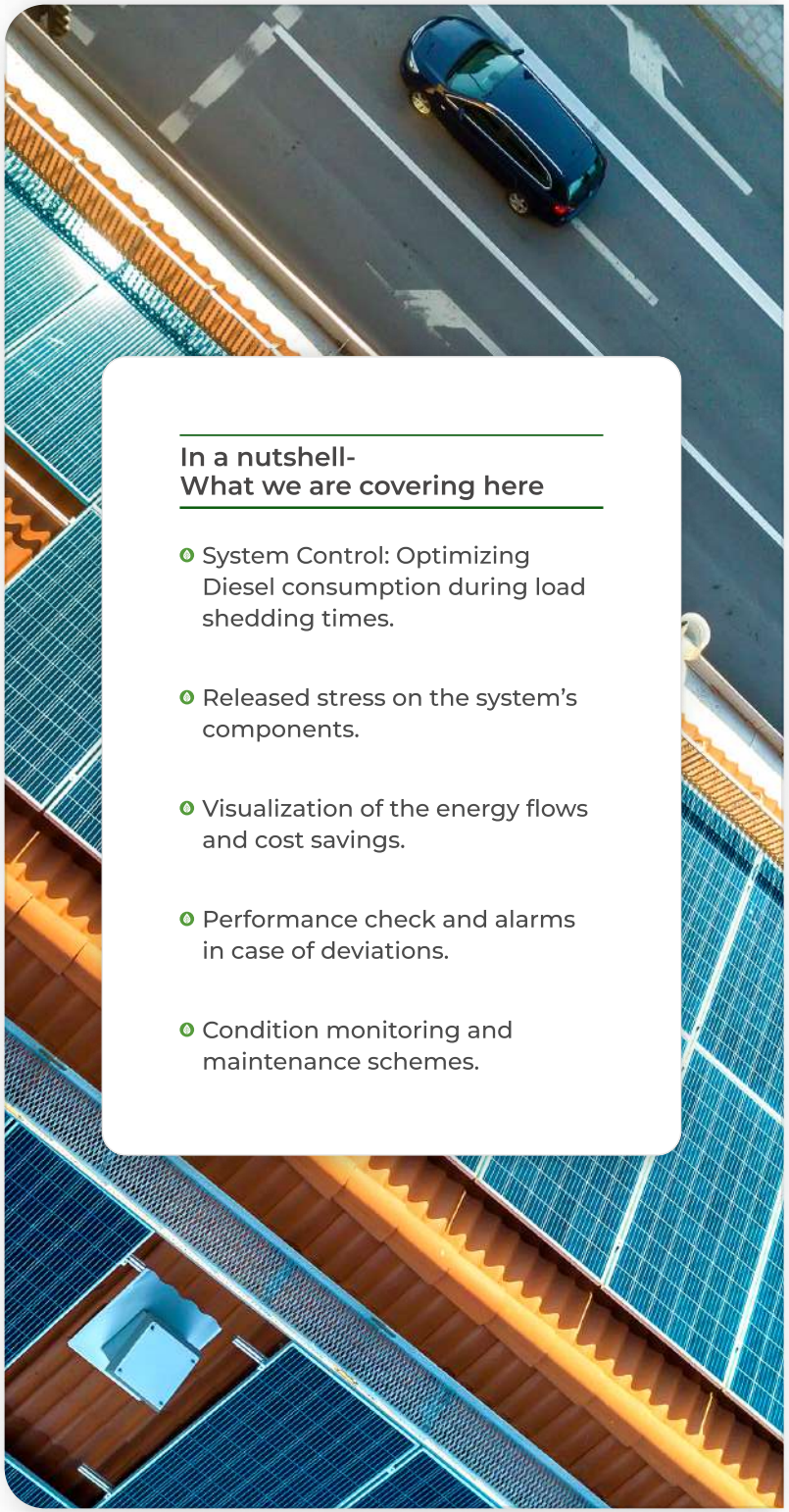
This case study explains in one example, how the EcoPhi solutions can optimize such kinds of systems. It shows how operational costs are being reduced by optimizing grid and fuel consumption.

System Facts

- Residential complex in Johannesburg
- Implementation partner: ANES
- Owner: Lancet
- 3x 100kW SunGrow Inverter (110kWp)
- 2x 500 kVA Dieselgensets

EcoPhi Components & Features

- EcoPhi Pro Box
- EcoPhi Energy Meter (Grid)
- Irradiation Sensor
- Hybrid System Optimizer
- Platform: Fleet Overview, Condition Monitoring, Alarms



In a nutshell-
What we are covering here

- System Control: Optimizing Diesel consumption during load shedding times.
- Released stress on the system's components.
- Visualization of the energy flows and cost savings.
- Performance check and alarms in case of deviations.
- Condition monitoring and maintenance schemes.

In detail

Grid Limitation and Fuel Saving Mode

In this case in particular and in several countries in general, regulations prohibit feeding excess solar power back into the grid. This limitation presents a challenge for maximizing solar energy utilization while complying with local regulations.

The EcoPhi Pro Box addresses this issue reliably. It continuously monitors grid consumption and controls the inverters (both PV and battery) to limit grid consumption. This limitation is by default set to 0.0 kW but can be customized as per individual requirements, e.g. if maximum feed-in levels are set on a contractual base.

The **Power Regulation** feature in this case provides the ability to dynamically adjust solar power generation. When the PV power exceeds the demand, the system intelligently scales down the power generation to align with the consumption needs.

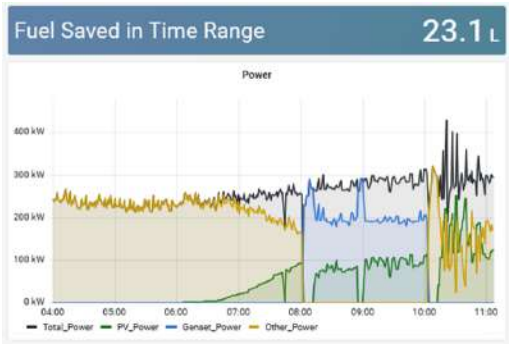


Diagram: Diesel saving with the EcoPhi Fuel Saver

In order to reduce reliance on generators in the case of a power outage, the **Fuel Saving Mode** is automatically activated. In this mode, the EcoPhi Pro Box intelligently controls the inverters to ensure that the generators provide a specific percentage of needed power. This specific percentage is strategically set to balance efficiency and power needs and can be adjusted through the platform.

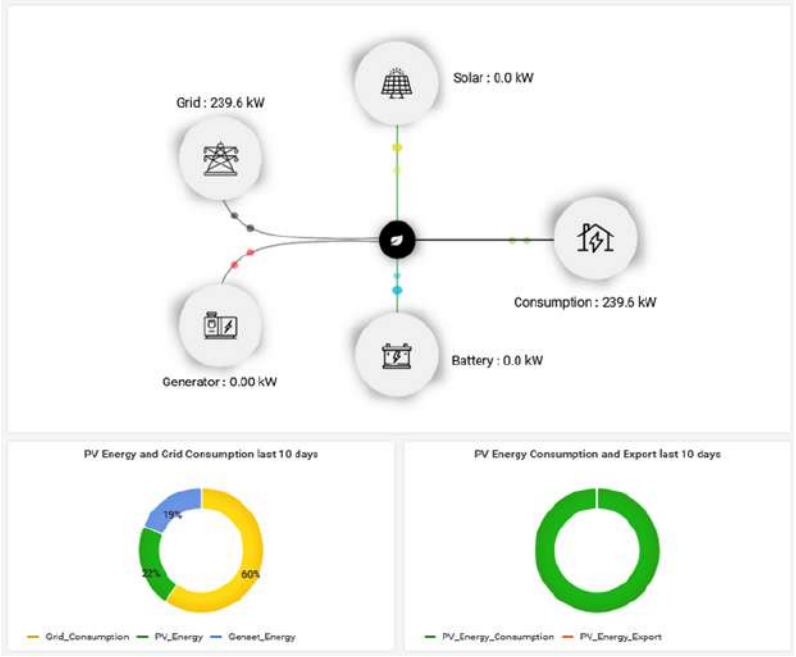
The EcoPhi Pro Box stands out in the case for its ability to integrate and optimize various components, including **generators and inverters from different manufacturers** within one system. This flexibility enhances overall system efficiency and adaptability.

In detail

Monitoring and Display of System Performance

In addition to optimizing its operation, the system continuously compares the output of the solar panels with the actual solar radiation received. Should there be significant discrepancies between the generated solar power and the potential output as indicated by the measured solar radiation (possibly due to issues like damaged solar modules, dirt accumulation, or component failures), an immediate alert is triggered.

The system's comprehensive visualization on a unified dashboard allows for rapid analysis of all its components. This not only facilitates quick identification of any issues but also enables the quantification and comparison of savings achieved through the system's operation.



How did the EcoPhi Solutions Enhance Efficiency and Savings

EcoPhi's Impact

EcoPhi's innovative solutions are designed to optimize grid and diesel consumption, leading to significant cost savings. In this use case, our approach enabled **saving up to 280 liters of Diesel per week**, amounting to substantial savings over a six-month period.

Key Features and Benefits

- Multiple Diesel Generator Management: EcoPhi excels in managing numerous Diesel generators operating in load demand mode.
- Solar PV Efficiency: We ensure the efficient use of Solar PV systems, even when multiple generators are in operation.
- Advanced Monitoring: Our system provides string-level data per inverter, facilitating quick and accurate fault identification.
- Alert System: The integration of email and SMS alerts empowers O&M managers with fast response times to address potential issues.
- Centralized Dashboard: Customers now have the advantage of accessing all system data on a single dashboard, enabling them to track savings and system performance effectively.
- Remote Control Adjustments: Adjustments to control parameters can be made remotely, enhancing flexibility and response time.

Why Choose EcoPhi as Your Partner

- Integration Expertise: EcoPhi specializes in integrating multiple components within a system, ensuring a seamless operation.
- Manufacturer Independence: We offer solutions that are independent of manufacturers, tailored to meet our customers' unique requirements.
- Flexible Adaptation: Our control and software solutions are adaptable to both system and customer needs.
- Comprehensive Solutions: We provide an all-in-one package, including monitoring and control boxes, sensors, controls, cloud platform features, and customized adjustments.
- Global Experience: With experience in various green energy projects across over 30 countries worldwide, EcoPhi stands as the ideal partner for your energy projects.

Get in touch with us

Don't hesitate to get in touch with us and get more details on how we optimize systems like this one or other use cases.

EcoPhi
EMPOWERING CLEAN TECHNOLOGIES

www.ecophi.io
+49 721 18126741
contact@ecophi.de

The RES Project South Africa is supported by the German Federal Ministry for Economic Affairs and Climate Action as part of the Renewable Energy Solutions Programme of the German Energy Solutions Initiative.

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Supported by:
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