

TAKING SAFARI LODGES OFF-GRID ENVIRONMENTAL & ECONOMIC BENEFITS



CASE STUDY

This case study aims to provide you with a detailed overview of the benefits of operating a fully off-grid lodge or maintaining grid connection as a backup facility only. Following a detailed analysis of a lodge's typical energy usage, we developed a Solar PV & Storage-dominated hybrid energy system that significantly reduced the business' energy expenses.

KEY BENEFITS OF A HYBRID ENERGY SOLUTION



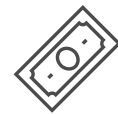
ANNUAL OPEX SAVINGS
POST HYBRIDIZATION:

82%



CO2 EMISSIONS
AVOIDANCE:

329 T/YEAR



PRICE PER KWH:

\$ 0.37



MAX SYSTEM OUTPUT:

144 KW



CAPEX:

\$ 752K



PAYBACK PERIOD:

3.6 YEARS

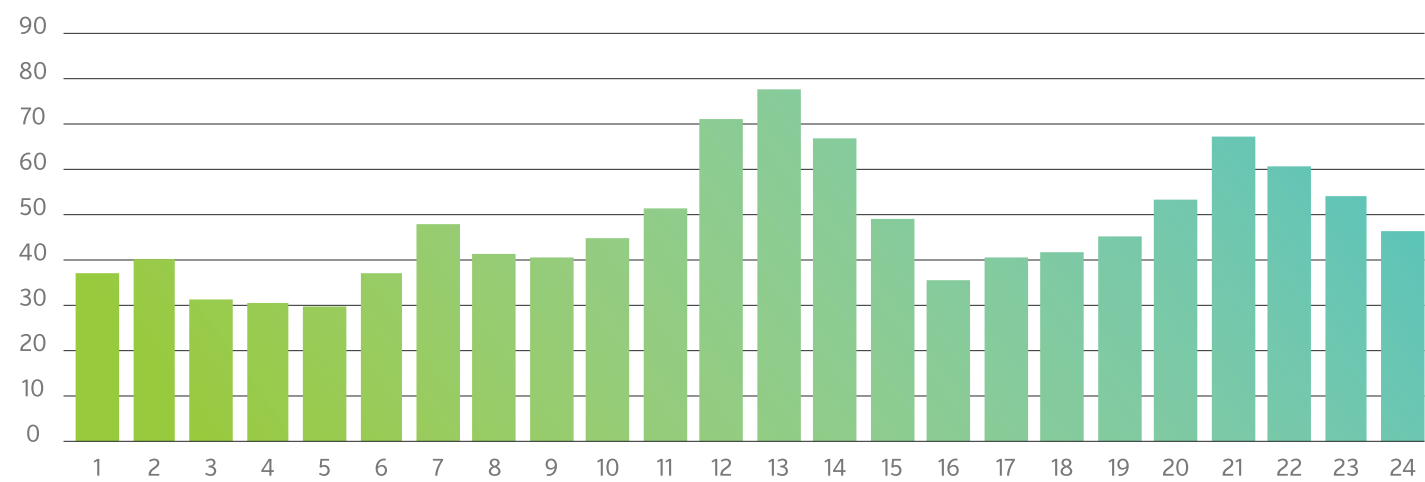
THE EXERON SYSTEM

The Exeron hybrid management system is being used extensively in a range of Commercial & Industrial off-grid applications. It can manage multiple energy sources, including PV panels, battery storage, grid (if available), diesel generators and wind turbines. Due to the system's smart controls, scalability, modular architecture, easy installation and extreme reliability, we are able to provide our clients with significant OPEX savings compared to diesel-powered generation.

When developing hybrid projects, our aim is to fully utilize the renewable energy potential available on site. We strive to minimize the use of diesel generators and do so only when absolutely necessary – several consecutive bad weather days, higher-than-expected continuous loads or in the unlikely event of system malfunction. In most cases, Exeron-based systems reduce diesel-powered generation in the range of 80 - 98%. This feature comes with a number of benefits: immediate reductions in energy OPEX, noise pollution and CO2 emissions, amongst others.

AVERAGE SYSTEM LOAD

In our analysis, we present data for a lodge located in South Africa with a higher-than-average load factor where the average peak load reaches 80 kW close to midday and the system's average base load is around 50 kW (see Graph 1).



Graph 1. Average 24-hour demand profile

Our system powers a kitchen, cool room, air conditioners, pool pumps, and a variety of standard appliances. It can handle a peak load of 144 kW.

OUR SOLUTION

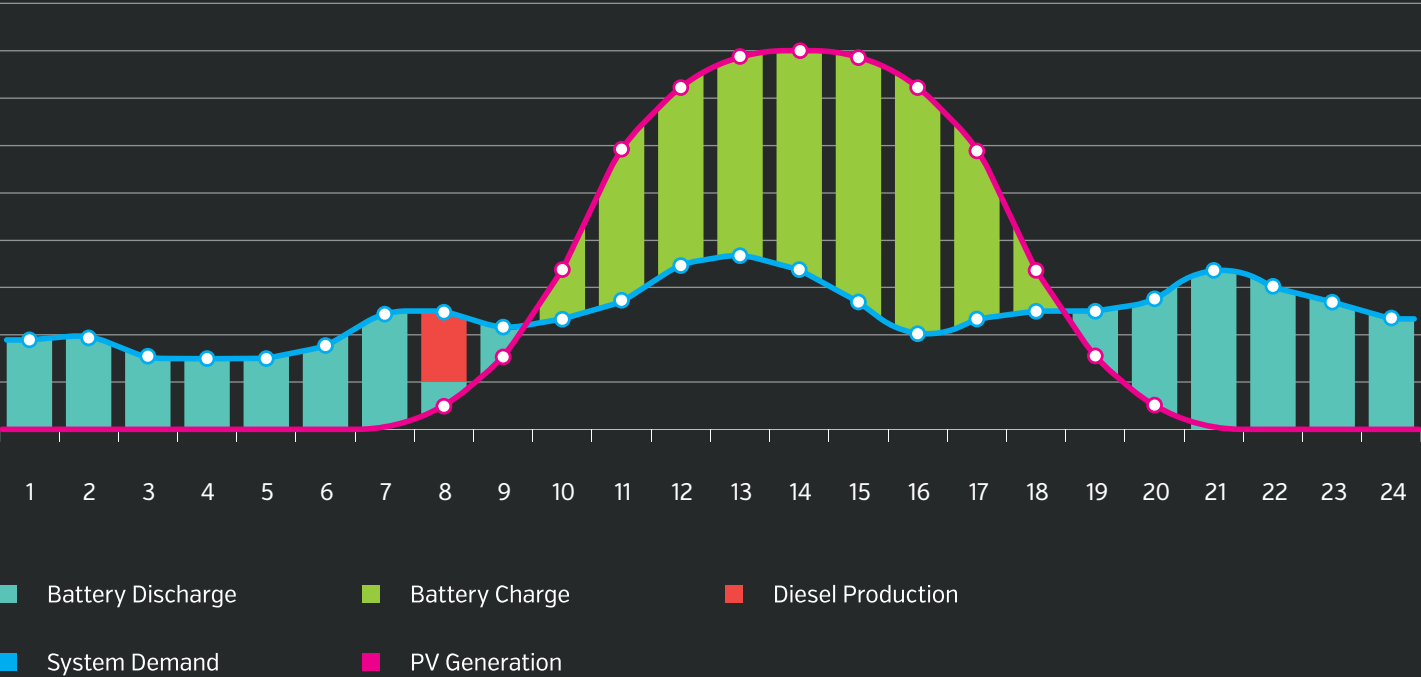
The lodge's average annual electricity consumption is 419,058 kWh. This demand is met by the following Exeron configuration:

- 250 kWp solar PV panels: 125 Exeron SML2000 MPPT charge controllers
- 600 kWh of usable energy storage [1,300 kWh nominal capacity in the case of a lead-acid solution]
- 144 kW maximum output power: 48 Exeron I3000B inverter modules
- 160 kVA backup diesel generator: 80 Exeron ML2000 DG charge controllers
- 10 Exeron FX cabinets

	Exeron	Diesel
Price per kWh	\$0.37	\$0.62
Annual OPEX	\$47,480	\$259,816
CO2 emissions	39 t/year	368 t/year
Diesel consumption	14,722 l/year	139,686 l/year
Renewable Energy Component	89.46%	0%

The total cost of our solution is \$752,000 with a short payback period of 3.6 years. In addition to the above, our system brings in a number of added long-term benefits – significantly reduced manhours for diesel generators' servicing; low maintenance costs; reliable power supply 24/7.

EXERON PRODUCTION & CONSUMPTION PROFILE



Additional Benefits:

- Integrated web server for remote monitoring of all system parameters
- Monitoring of solar radiation, wind, weather conditions
- Intelligent automated diesel generator control (start, stop, loading)
- Plug & Play and hot swappable power modules
- Complete protection of all electrical appliances (in case grid is connected)
- Smart prioritization of power sources (PV, battery, grid, diesel genset)
- Military certified – guaranteed operation in harshest ambient conditions
- CAPEX reduction – modular design ensures effortless upgradability with zero installation costs
- Easy to install and maintain with small footprint and light architecture
- Unmatched reliability – built-in redundancy and load sharing ensure zero system downtime

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