



## Background

Situated on the banks of a tributary of the Grumeti River, in the secluded western section of the Serengeti National Park, &Beyond Grumeti Serengeti River Lodge boasts breathtaking views and unparalleled sightings. Due to its far-flung location, there are very few lodges in this pristine section of the park, and access is limited.

Using the natural bow shape of the river and paying homage to the circular forms of a traditional Maasai manyatta, the lodge unfolds to reveal an understated sense of luxury, with operations driven by ethics of sustainability and respect for the natural environment.

In 2023, the lodge underwent a full renovation to modernize the guest facilities. New Southern Energy has been building solar systems for the &Beyond group for over 10 years and being contracted to develop an off-grid solar plant marked NSE's first project in remote Tanzania.

## Objectives

Developing the solar system was done as part of the greater renovation and upgrade of the &Beyond Grumeti Serengeti River Lodge. The key objective was to install an off-grid solar system that would enable the lodge to enjoy energy independence, provide hot water, operate seamlessly and silently, while being out of sight of guests.

Several site-specific requirements needed to be considered while developing this solar system:

- Access to the lodge is limited and challenging. All components needed to be consolidated in Kenya before trucked into the reserve over great distances.
- There is a strict permitting system that needs to be adhered to.
- Construction needed to take place with utmost reverence for the natural space including no pollution, no noise, and no disruption to trees or natural fauna.

## Quality management

Careful planning and meticulous logistics were central to the development and construction of this solar system.

Working in a reserve of this nature leads to unpredictable challenges such as during the build, rains flooded the access bridge, preventing access to the lodge. NSE's team were able to navigate these conditions without compromising the quality of the system or the turnaround time.

Over 400 metres of cabling was used for this system to meet the visual and space requirements.

The energy system is complemented with a water heating system, generator and battery.



↑ 150 kVA | 267kWh Rolls Royce BESS

## Solar solution

In order to empower &Beyond Grumeti to reach energy independence, an off-grid solar system was designed for this lodge. The 83.7 kWp | 150kVA | 267 kWh BESS system features 180 x Jinko Solar 460Wp panels which convert sun radiation into electrical energy, as well as 2 x SMA inverters, namely; STP 2000TL and Core 1 50-40.

The system was installed on the roof of the staff quarters, with one additional roof built to support the quantity of panels needed. Additionally, standalone powered water heat pumps were installed for the guest rooms and a centralized solar water heating system were installed for back-of-house facilities. A generator and battery system carry the load during evenings.

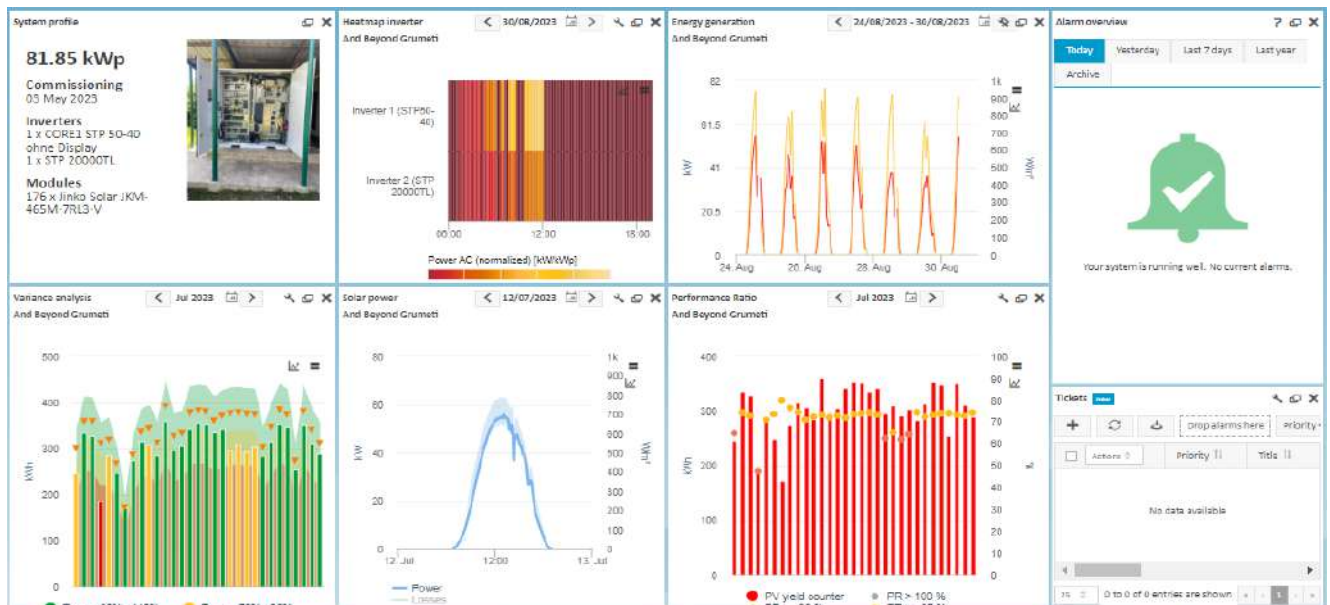


↑ 83.7 kWp Rooftop Solar Installation

## System performance

The site was completed in June-23. The system has saved the site 28.48 MWh in its first 3 months alone. Similar savings are expected annually in future.

The system's performance is monitored and controlled through a master controller, which can also communicate with the inverters. All of the data is logged and saved in cloud-based storage. Furthermore, the performance can be monitored in real time via a smart phone app.



The plant is currently overperforming by 5% compared to simulated value. Inverter production on both sections of the plant is consistent on a clear day.



↑ 50 kWac SMA Inverter Installation

## Operations and Maintenance

New Southern Energy manages the operations and maintenance of this solar plant. The system's performance is monitored daily and should any faults occur, technicians are dispatched to rectify it swiftly.

The panels are kept clean at all times to ensure optimal performance.