Microgrid solution in Johannesburg

Providing uninterrupted power supply

Uninterrupted power supply is critical for Africa and it is specifically important for our commercial industries and factories to operate – even during the event of load shedding. By integrating renewable energy resources like sun, wind and hydro into the power grid, the potential loss of power can be avoided. Our solution serves the power demand of the facility by using renewable energy, even in the event of load shedding.

It has full on- and off-grid functionalities and prioritizes renewable energy before using the existing diesel generators. This environmentally friendly solution contributes to a reduction of carbon emissions, substantially reducing the operational cost of the industrial complex.

Longmeadow, Johannesburg, South Africa

The microgrid solution in South Africa is constructed for the 96,000-square-meter Longmeadow facility that is hosting Hitachi Energy South Africa's headquarters as well as manufacturing facilities. It consists of a 1 MVA/380 kWh e-mesh™ PowerStore™ and e-mesh control, which together with a 750 kW rooftop photovoltaic (PV) field have been added to the existing backup solution. The microgrid technology deployed at Longmeadow is fully containerized and pre-designed for this type of application.

Benefits

Uninterrupted power supply

The e-mesh PowerStore and Control solution enable continuity of electricity supply even when the main grid is disrupted. The supply also maintains its stability during transitions from grid to island operation. By utilizing this technology buildings, plants and factories can be kept running as normal through any power outage enabling increased productivity, security and cost efficiency.

Integration of renewables – leveraging the “power of the sun”

The solution optimizes renewable energy contribution to the facility and reduces the CO₂ emissions by over 1,000 tons/year. The innovative system with fully grid-connected and off-grid functionalities helps maximize the use of clean solar energy and ensures uninterrupted power supply. It provides cost-effective access to high-quality power while minimizing environmental impact by reducing the use of diesel generation.
Reliable power wherever and whenever it is required

e-mesh PowerStore ensures reliable power availability, grid stability, and the highest possible penetration of renewable energy into the existing grid, together with an intelligent control system for both grid-connected and off-grid systems.

**Rooftop PV plant**

The e-mesh Control system is a specially designed distributed control system that ensures efficient and reliable power flow management in order to reduce consumption of grid electricity and fuel. It optimizes the use of renewable energy while also guaranteeing optimum loading and spinning reserve in fossil fuel generators. The system is modular and the distributed logic enhances reliability and scalability for any future expansions.

**PowerStore**

The e-mesh PowerStore's main purpose is to stabilize the power systems against fluctuations in frequency and voltage. In order to maintain the voltage and frequency, the system stabilizes electricity networks by rapidly absorbing/injecting power. The battery used includes state-of-the-art inverters and virtual generator control software, and is applicable to isolated grids or in grid support mode.

**Remote service**

A cloud-based remote service system is used for operations and maintenance.

### Facility details

<table>
<thead>
<tr>
<th>Facility details</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Longmeadow Business Estate, Johannesburg, South Africa</td>
</tr>
<tr>
<td>Facility type</td>
<td>Industrial</td>
</tr>
<tr>
<td>Factory and office space area</td>
<td>96,000 m²</td>
</tr>
<tr>
<td>Rooftop solar photovoltaic (PV) field</td>
<td>700 MWp Solar PV</td>
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<tr>
<td>e-mesh PowerStore battery</td>
<td>Rating 1 MVA / 380 kWh</td>
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<td>Year of commissioning</td>
<td>2016</td>
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<tr>
<td>Site attributes</td>
<td>1,750 meters above sea level; average ambient temperature 15.9 °C</td>
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</table>

Reliability Power wherever and whenever it is required

Fossil fuels  
Renewables

PowerStore

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Hitachi Energy
Brown-Boveri Strasse 5
8050 Zurich
Switzerland

www.hitachienergy.com

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