



enerstore

HIGH CAPACITY HYBRID POWER SYSTEM
FOR EFFICIENT USE OF RENEWABLE ENERGY



HID EUROPE
ENERGY SOLUTIONS

Renewable Energy



Power on Demand

The enerstore 7000 provides a **CONSTANT POWER SYSTEM** by combining PV Power, Wind Power and energy storage to substitute diesel generated energy

PV power can be directly connected via an intelligent string box

This turnkey energy solution comes with Switchgear, Medium Voltage Transformer, Battery Charger and Inverter, Load Management System and up to 368 HITACHI AVRLA Battery Cells 1500 Ah.

The enerstore container is constructed for any field installation and is able to provide areas with continuous and independent energy.

It is designed to operate in combination with PV Systems, Wind Turbines and Diesel Generators for Smart Grid as well as Off Grid Solutions.

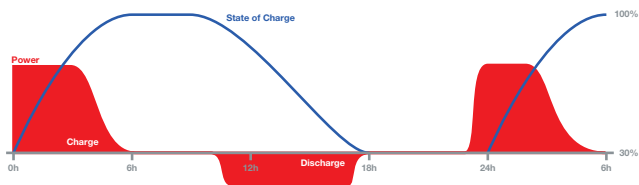




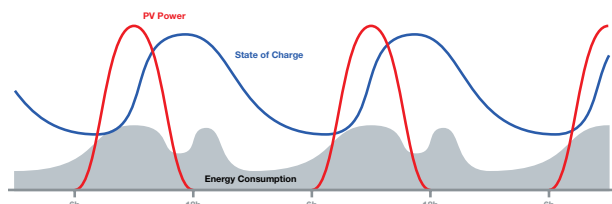
Optimized for daily charge / discharge application

The **enerstore System** is already equipped with a fully functional PV inverter and therefore the PV modules can be connected directly.

Daily charge / discharge application



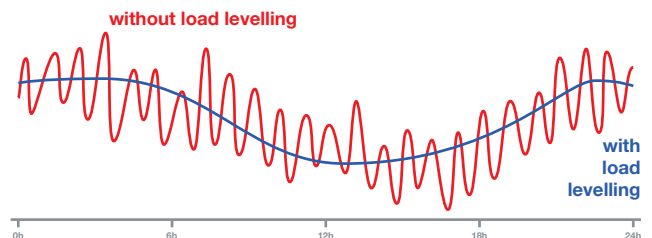
Off Grid Solution with PV and Diesel Generator back up



Optimized for frequent load changes

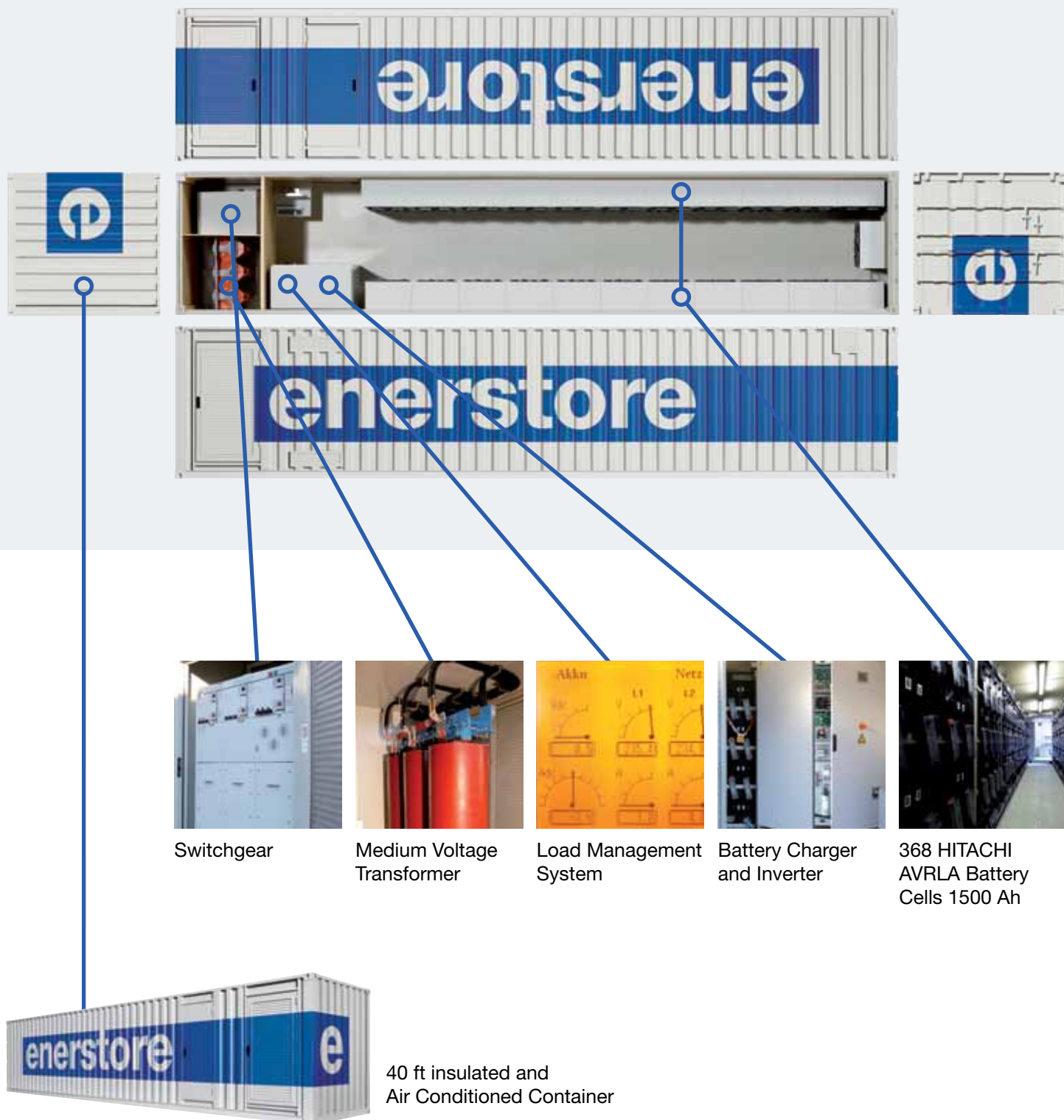
Peak Shaving in combination with wind power

Grid Stabilization / Frequency Control
Reactive Power Control
Peak Shaving



The enerstore Container

Basic System Configuration



The system is supplied as a turnkey container which can be connected directly to the grid. The available energy per system is 600 – 700 kWh. Larger sizes are reached by connecting the systems in parallel.

One container can provide electric energy for 24 hours for up to 500 single family homes.

Technical Characteristics

Electrical Data

Battery capacity	1,104 kWh
Energy	700 kWh (100 kW @ 7h)
Power	100 - 400 kW depending on SOC
Cycle	4,500 min.
Service life	13 - 17 years
Energy over service life	3,150,000 kWh min.
Overall efficiency	app. 80 %
Grid Voltage	400 V to 36 kV

General Data

Ambient temperature	-20 °C ... 45 °C (14 °F ... 113 °F) / Others on request
Maximum altitude	4,000 m above sea level / above 1,200 m derating in power
Cooling type	Fully climatized
Minimum air quality	Class 3S2 / According to EN60721-3-3
Protection class	IP54
Size	40 Ft container
Dimensions (L x W x H)	12,192 mm x 2,338 mm x 2,591 mm
Weight	< 55,000 kg
Container colour	RAL1001 Different colours on request
EMI	Complies EN61000-6-2, EN61000-6-4
Grid quality requirements	Complies VDEW requirements
CE-conformity	Complies

Features

Medium voltage switchgear	
Modbus TCP interface	Control / monitoring interface over Ethernet

Options

Software	Free software tool for easy start-up
Battery monitoring	Provides detailed battery status data

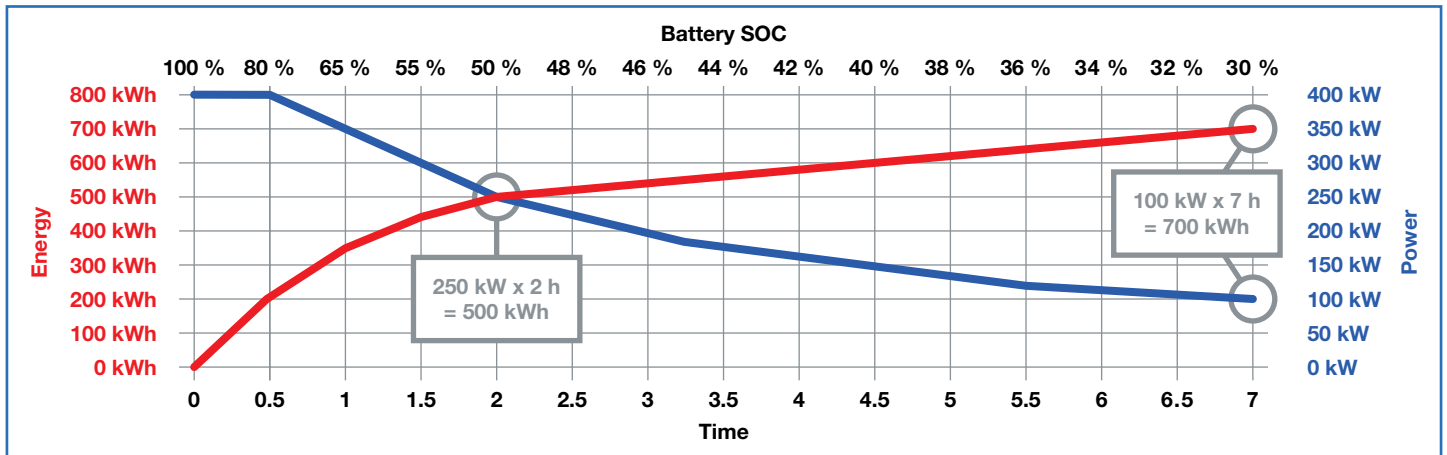
Specifications are subject to change without notice.

Discharge Power vs. Discharge Energy

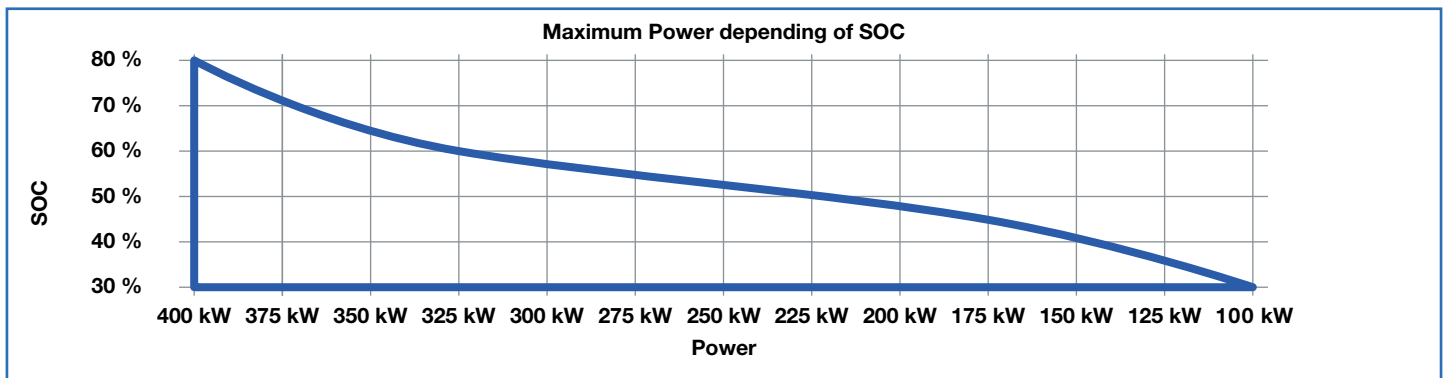
Constant Energy if DOD = 100%

Power	Duration	Energy	Remaining	Total Energy
50 kW	15 h	750 kWh	0	750 kWh
100 kW	7 h	700 kWh	0	700 kWh
160 kW	3.5 h	560 kWh	100 kW @ 1.4 h	700 kWh
250 kW	2 h	500 kWh	100 kW @ 2.0 h	700 kWh
300 kW	1.5 h	450 kWh	100 kW @ 2.5 h	700 kWh
350 kW	1 h	350 kWh	100 kW @ 3.5 h	700 kWh
400 kW	0.5 h	200 kWh	100 kW @ 5.0 h	700 kWh

Discharge Characteristic with Constant Energy



Performance Diagram



The energy storage system can be completely discharge (SOC = 30%) with a power of 100 kW. If by extracting higher power the discharge limit is reached, the remaining energy can be extracted by reducing the discharge power.

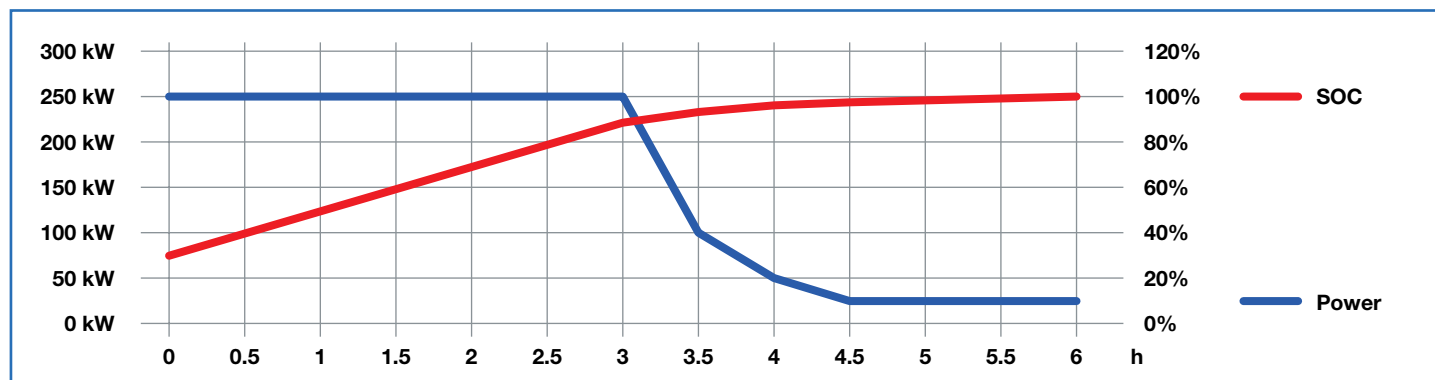
The cycle life of 4,500 complete cycles (DOD 100% - 30% - 100%) is specified at a charging power of 115 kW max. This is equivalent to a charging current of 150 A. Under this charging method the system can be completely charged within 10 hours maximum.

The charging method generally is depending on the application. We basically distinguish between grid connected systems and PV Hybrid systems used in Off Grid systems.

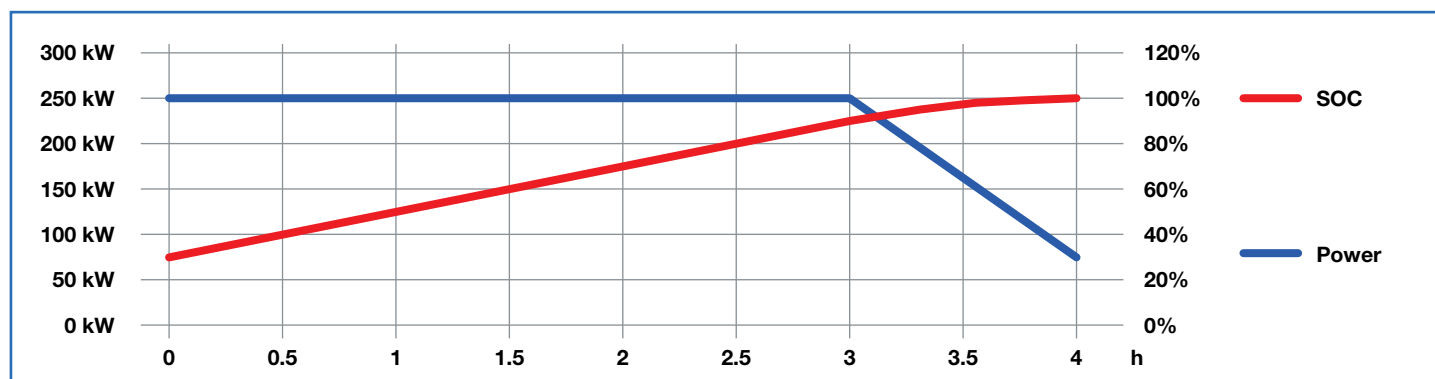
For **grid connected systems** we apply multistep charging according to the below diagram. Charging time under this method is about 6 hours.

For **island / off grid systems** we apply a simple U/I curve in order to absorb a maximum of available energy. Maximum charging power under this method is 270 kW. Provided that there is sufficient energy available the system can be fully charged within less than 4 hours.

Grid connected charging



Maximum charging by PV power



Every 14 days the system will perform an equalizing charge which will take app. 16 to 18 hours.

Constant Power Systems



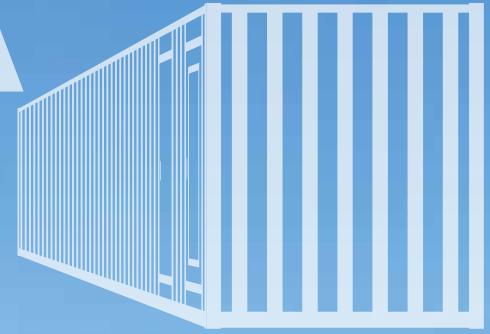
Diesel Generator
8 - 10 hours

Cost
450 - 800
USD / MWh

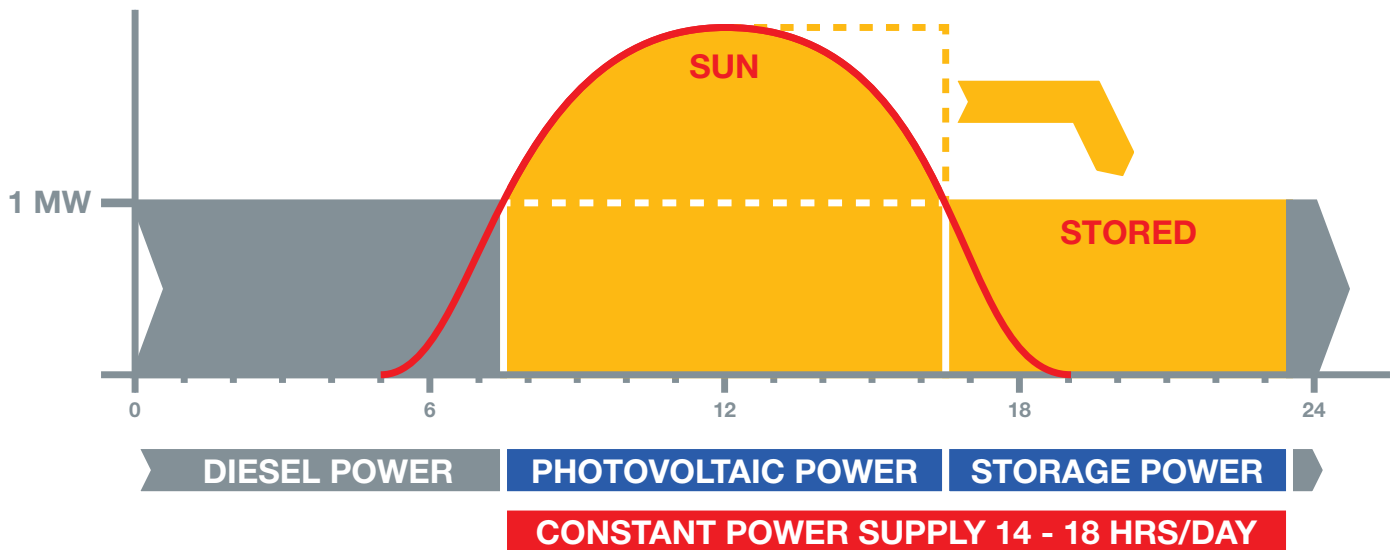


PV-System
7 - 8 hours

Cost
250 - 300
USD / MWh



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5 - 7 hours



Diesel Generator ON

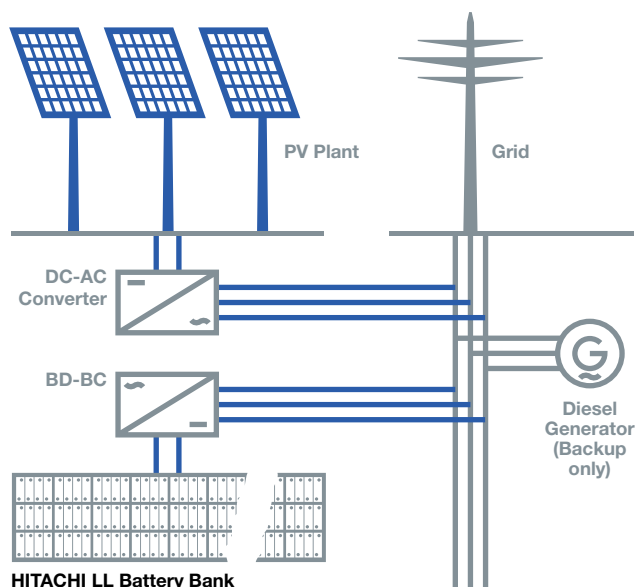
Diesel Generator OFF - No CO₂ emissions

Constant Power	0.1 - 100 MW
Energy	1.5 - 1,500 MWh / day
Energy Costs	250 - 300 USD / MWh
CO ₂ Reduction	1,000 kg / MWh
System Service Life	13 - 15 years without battery exchange 25 - 30 years with battery exchange

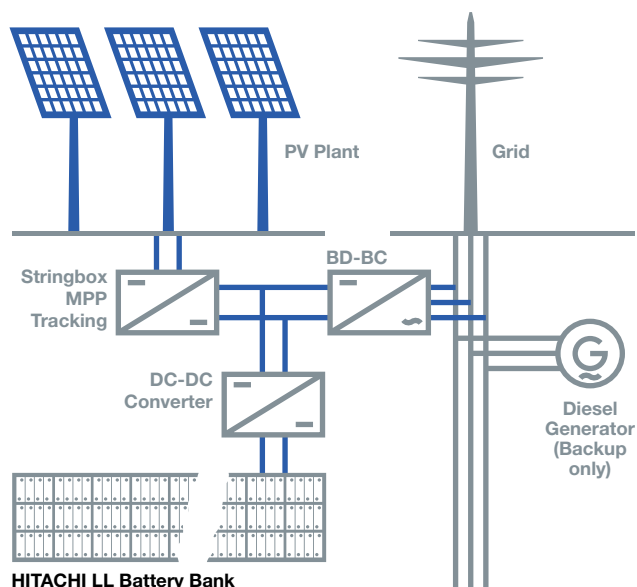


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Configuration A



Configuration B



Island Power Systems



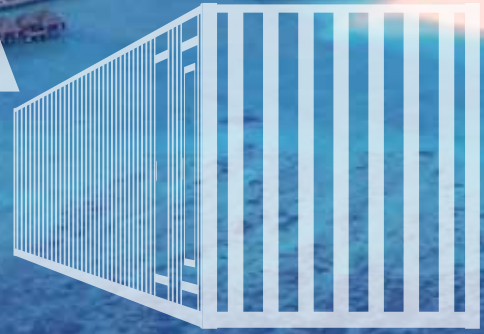
Diesel Generator
6 - 8 hours

Cost
450 - 800
USD / MWh



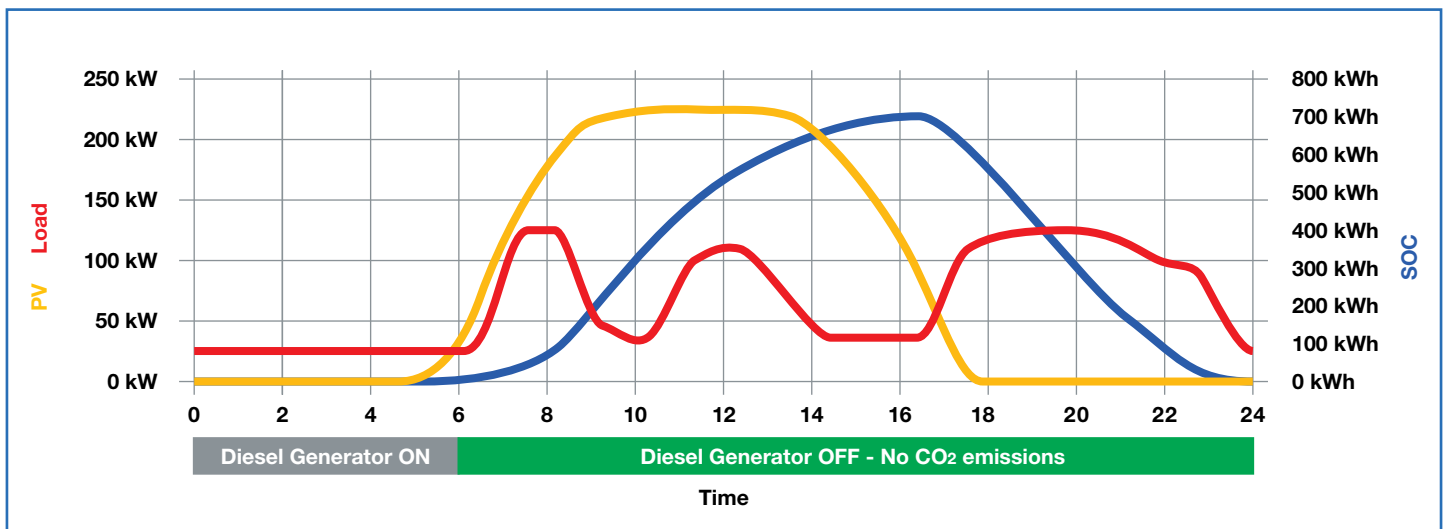
PV-System
8 - 9 hours

Cost
250 - 300
USD / MWh



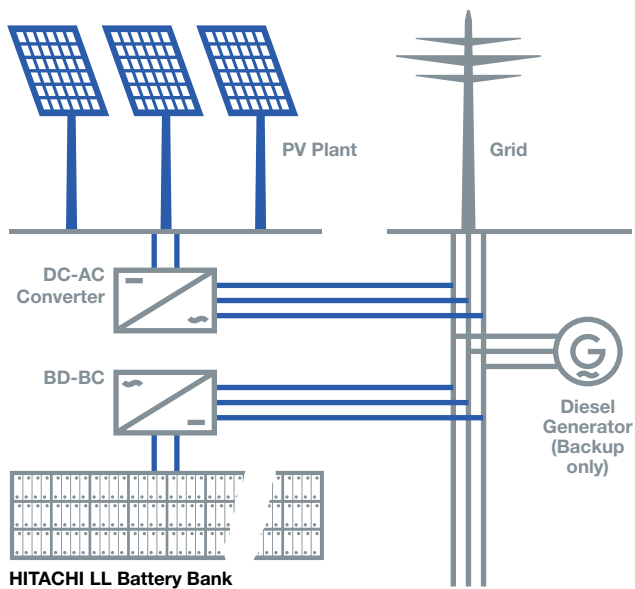
enerstore
8 - 9 hours

Island Power System Characteristics

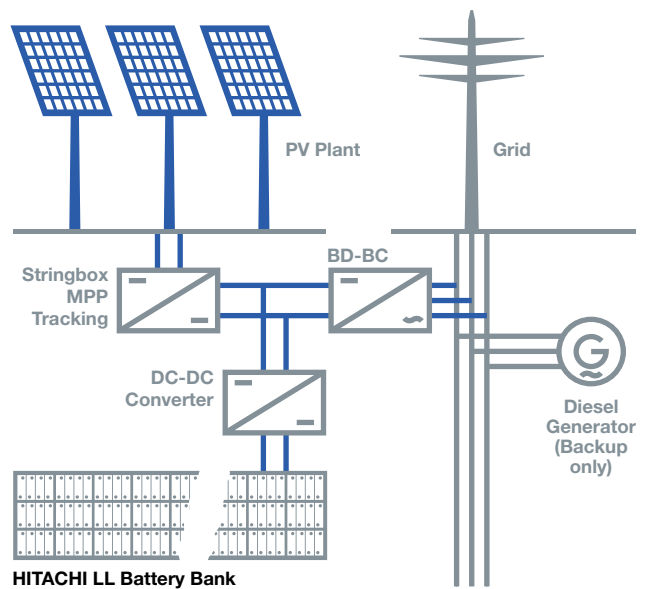




enerstore Configuration A



Configuration B



HID EUROPE

HYBRID ENERGY SOLUTIONS

HID Europe is an engineering company focused on high quality energy storage. We provide bespoke solutions for energy producers/utilities, communities and all methods of renewable energy implementation.

We only use proven products and components that guarantee sustainability, and state of the art environmental responsibility.

The relationship with our customers and partners is built on trust and long-term partnerships. We promise the best individual service and support with every product we sell.

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