



DHYBRID ENERGY STORAGE SOLUTIONS

Renewable Energies in industry applications: case study Cambodia

Informationsveranstaltung Kambodscha – 15.9.2020

DHYBRID
OUR POWER. YOUR ENERGY.

INTRODUCTION OF DHYBRID

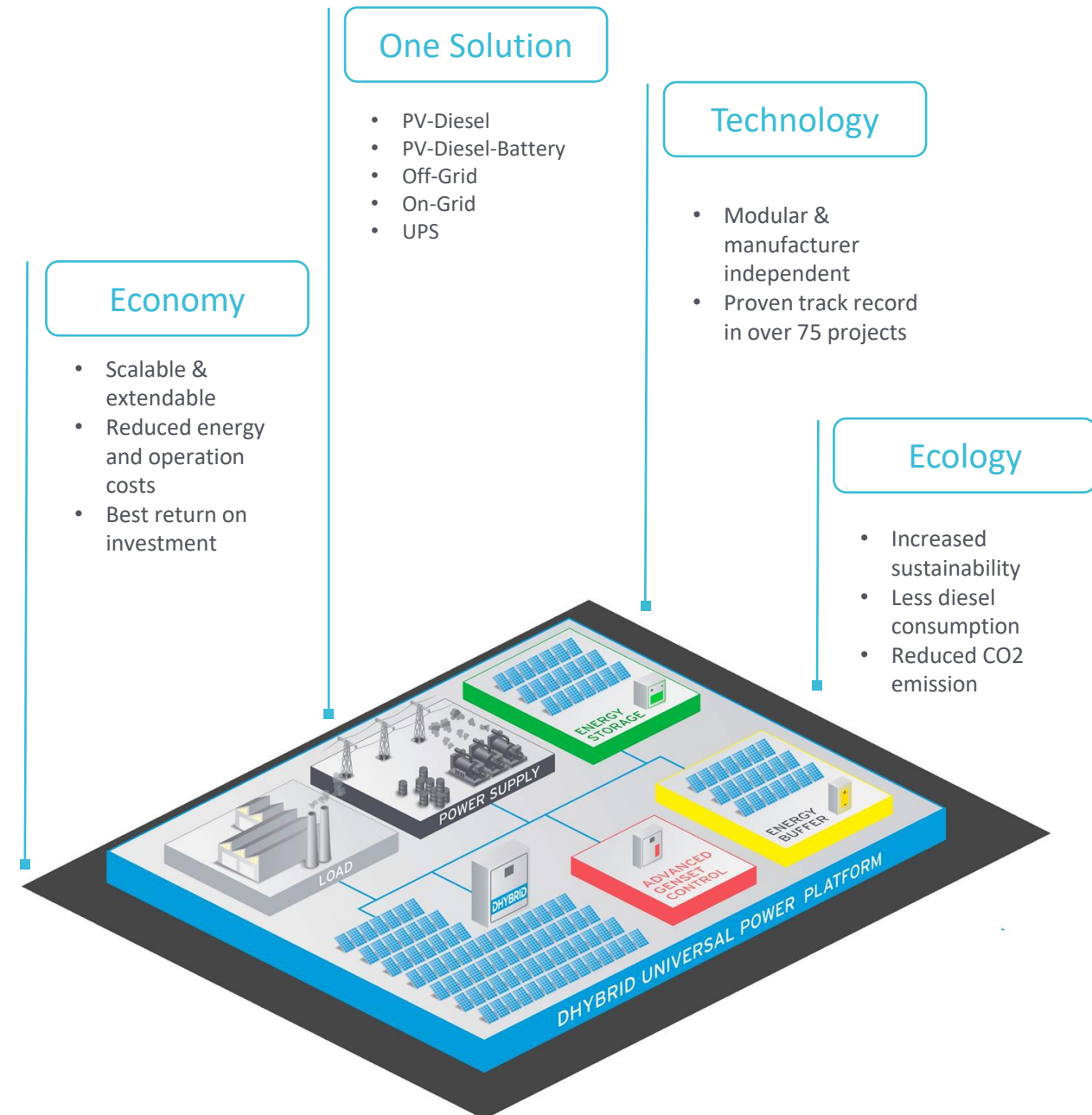
- DHYBRID is the leading provider of renewable energy concepts and smart-grid solutions for islands, resorts and industry.
- DHYBRID provides tailored solutions from energy management systems up to fully integrated renewable energy projects to significantly reduce the energy consumption and carbon footprint of our clients.



DHYBRID UPP | ENERGY MANAGEMENT SYSTEM

The DHYBRID Universal Power Platform (UPP) is a modular energy management and microgrid control solution. The DHYBRID UPP is manufacturer and technology independent and allows the implementation of different energy sources into one economic and sustainable hybrid power supply.

The modular approach of the DHYBRID UPP ensures economic viability of hybrid projects at any stage of the transition from conventional into 100% renewable energy generation.



OUR SOLUTION PORTFOLIO

- Engineering made in Germany
- Customized Energy Management System (EMS) with lithium ion batteries
- Containerized battery energy storage systems (BESS) with following functions
 - Off-grid / micro-grid operation
 - Seamless switch over between on-grid and off-grid operation
 - Peak Shaving
 - Energy Shifting
 - Ramp Rate Control of Diesel generators
- Low voltage power distribution with motorized breakers, protection and metering
- Diesel genset integration & with active DG control, remote start / stop

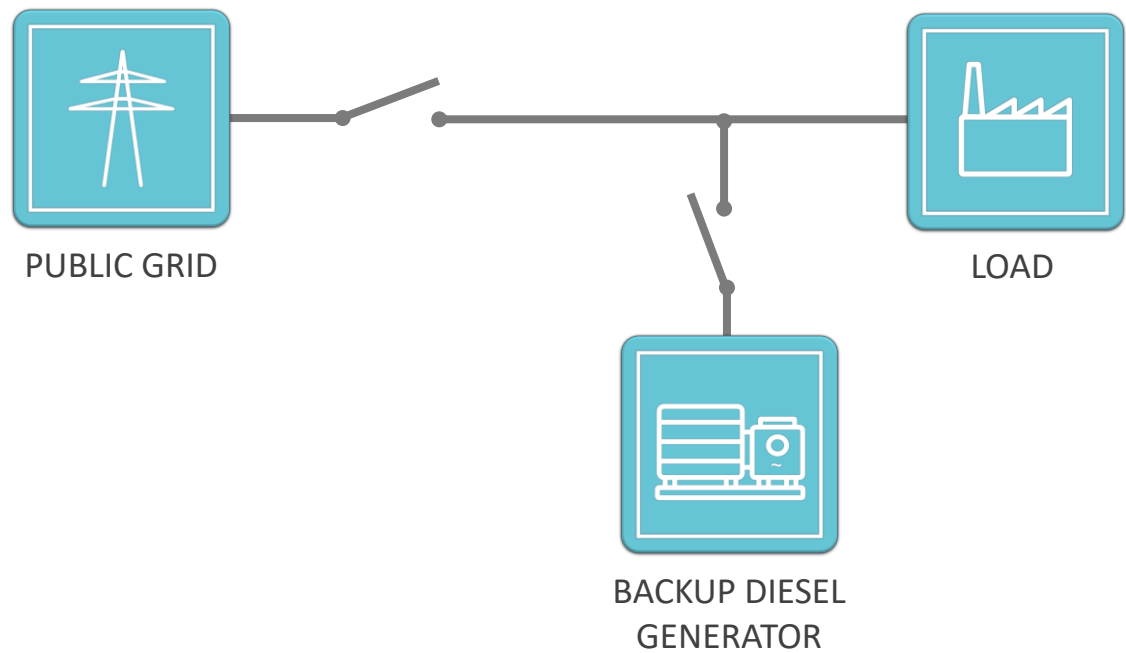


DHYBRID UPP | CAMBODIA INITIAL SETUP

- No reliable power supply, many power outages
- No automatic switch over from grid to diesel generator
- Power demand exceeded power supply
- Low level of power quality
- Pollution and CO2 emissions

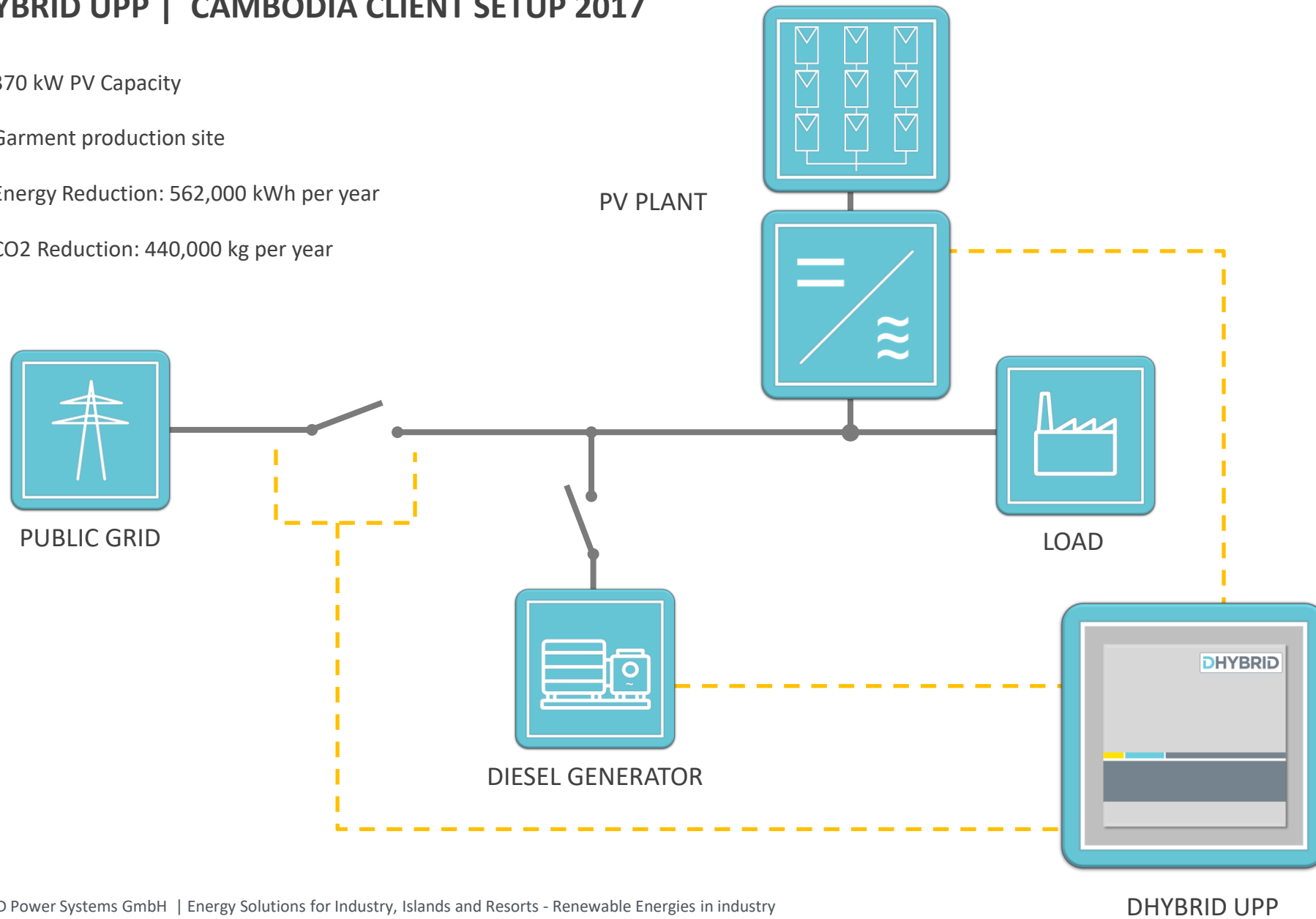


DHYBRID UPP | CAMBODIA INITIAL SETUP



DHYBRID UPP | CAMBODIA CLIENT SETUP 2017

- 370 kW PV Capacity
- Garment production site
- Energy Reduction: 562,000 kWh per year
- CO2 Reduction: 440,000 kg per year



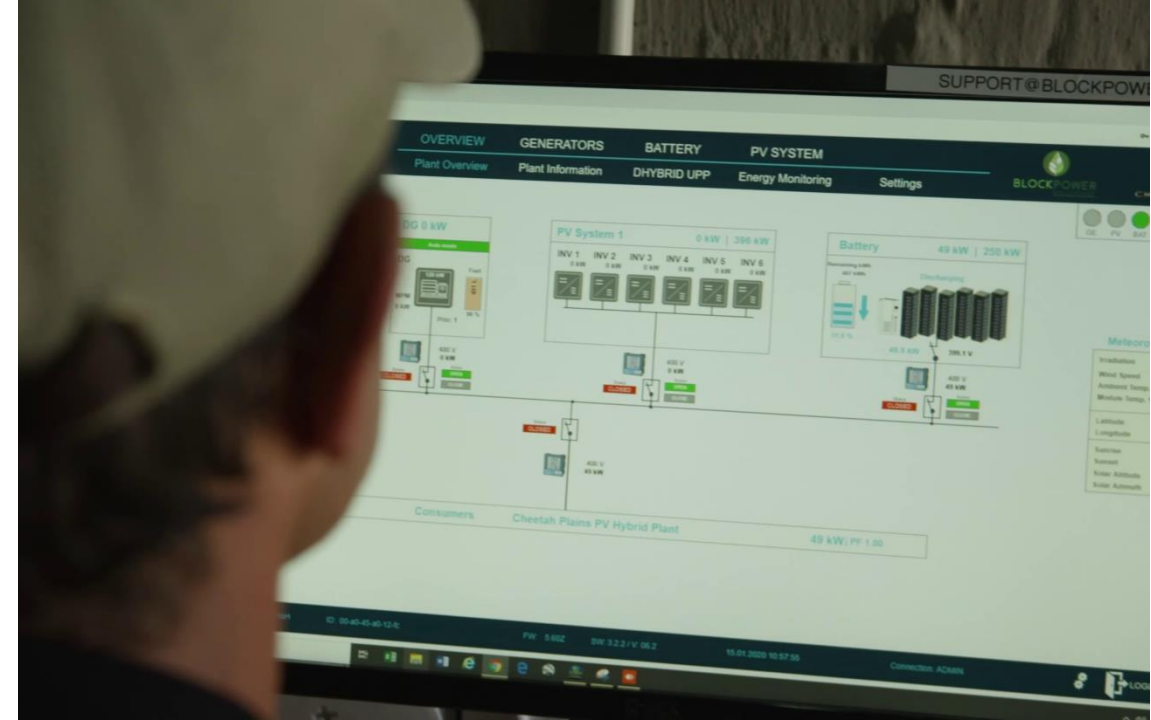
DHYBRID UPP | KEY FUNCTIONS

DHYBRID UPP Main Controller “The Brain”

- Installed in Control Room
- Collects data from:
- DHYBRID Interfaces
- PV Inverters
- Diesel Generator and Weather Station
- Load measurement
- Monitors and Controls the complete Hybrid System

DHYBRID UPP SCADA Computer

- Real-time monitoring of the entire system
- Active Control of MDB Breakers
- Adjustment of Settings
- Remote Access by DHYBRID
- Push of data of all selected equipment and sensors to the web portal



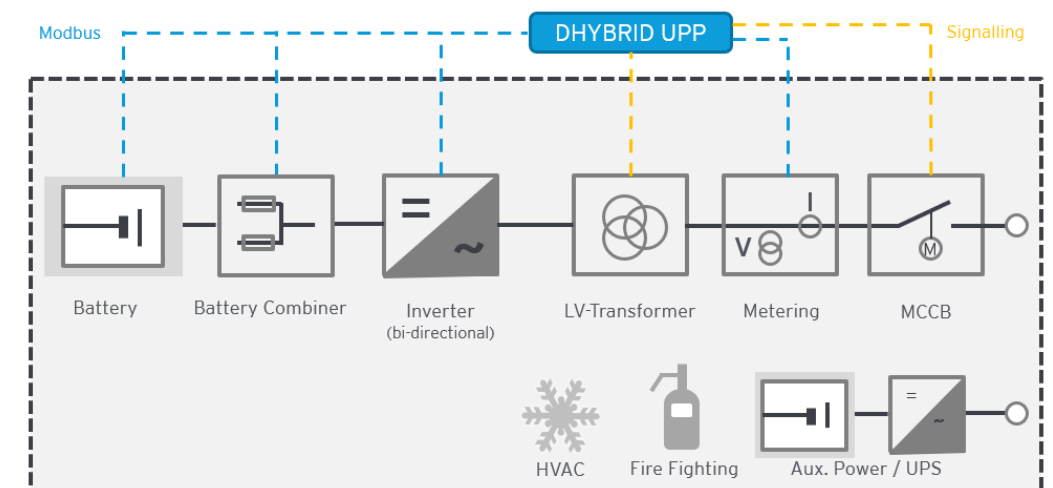
THE INTEGRATION OF DHYBRID BATTERY CONTAINER

Operation modes:

- PV-Diesel
- On-Grid - PV
- Off-Grid - PV-Diesel
- With BESS

Success factors for the integration of Renewables and BESS

- Optimized usage of BESS (for long lifetime)
- Correct sizing of battery and inverter
- Wide range of functionality (peak shaving, energy shifting, spinning reserve, ramp rate control)
- Extendable system design
- Flexible operation philosophy
- Multiple charging scenarios
- Manufacturer independent design



REFERENCES

Location: South Africa
Application: Luxury Game Lodge
PV: 300 kWp
BESS: 250 kW / 1,027 kWh



Location: Maldives
Application: 26 Islands Utility
PV: 2,000 kWp
BESS: 2,500 kW / 2,000 kWh



Location: Senegal
Application: Utility Power Station
PV: 1,860 kWp
BESS: 2,000 kW / 2,000 kWh



REFERENCES

Location: St. Vincent and The Grenadines

Application: Private Island

PV: 1,700 kWp

BESS: 500 kW / 1,000 kWh



Location: Somaliland

Application: Utility

PV: 350 kWp

BESS: 250 kW / 305 kWh



Location: Somaliland

Application: Utility

PV: 200 kWp

BESS: 250 kW / 265 kWh



REFERENCES

Private Island Caribbean

- PV: 1,700 kWp
- BESS: 500 kW / 1MWh
- Operation Type: Type A + Type B
- Commissioned: 2017

Key Project Information:

- Luxury private property island
- Own airport and power company
- Solar on 3 different locations distributed across the island
- PV / Diesel / BESS operation
- Integration into existing LV distribution grid on the island



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