

BESS+PV for relief & empowerment

Bringing reliable electricity to remote areas remains a hurdle. Traditional grid infrastructure is expensive to extend, leaving many communities without access. Solar power combined with Battery Energy Storage Systems (BESS) offers a promising solution, providing a dependable source of electricity for remote areas.

Remote islands communities often face challenges with accessing reliable electricity. Power grids are far too expensive to extend to these far-flung areas, and liquid fuel supply for traditional power generation is hard to obtain, leaving residents with limited or even nonexistent power options. However, Battery Energy Storage Systems (BESS) combined with solar power offer a beacon of hope.



Pic 1. PV in remote area

Solar panels can capture clean energy during the day, but sunlight is obviously unavailable at night. This is where BESS comes in. These battery systems act as a giant power bank, storing excess solar energy during the day for use at night or during cloudy periods.

With BESS, remote communities can benefit a dependable source of electricity, allowing them to power lights, life appliances, medical clinic, and even small

businesses. This not only improves quality of life but opens doors for development of education, healthcare, and economy in these underserved regions.

Disaster recovery. Another case, In the aftermath of a disaster, restoring power quickly is crucial for communities struggling to recover. Rapidly deployed photovoltaic (PV) + BESS systems can be a lifeline in these situations. Designed for easy setup and minimal expertise, these solar panel kits can bring back some level of power to affected areas within a short timeframe. It can then be used for essential services like powering medical equipment, communication systems, and lighting in temporary shelters, helping communities get back on their feet.

Rapid Deploy PV

Bringing electricity to remote or disaster areas has traditionally been a slow and expensive process due to the challenges of logistics and site condition. This is where rapidly deployed photovoltaic (PV) systems offer solution.



Pic 2. Rapid deploy solar PV

These prefabricated, foldable into compact packing, solar panel kits are designed for ease of deployment, requiring minimal technical expertise for installation. This allows small amount of working crew or even some lighttrained local residents to quickly set up the system, bringing a source of clean energy to the area within a short time.

The design also provides the capability of rapid repacking. In some areas where **hurricanes or**

maelstroms are prone to strike, the design allows for rapid dismantlement, providing safety to the equipment.

Movable BESS

In the face of disaster or for remote regions struggling with a lack of permanent infrastructure, Mobile Battery Energy Storage Systems (BESS) offer a powerful solution. Unlike traditional generators, that relies on constant fuel supplies, a sufficiently sized BESS+PV can allow continues supply of power.

These compact and self-contained units are designed for rapid deployment. They can be easily transported by truck, wagon, or LCT boat, reaching hard-to-access locations. Once on-site, mobile BESS can be quickly activated, providing immediate electricity.



Pic 3. Movable BESS 200kwH

Rapid Deployment: Speed and simplicity of deployment is essential for remote area and disaster impacted community as it offers support during hardship.

Relief of fuel supply: By reducing or even subsequently eliminating the needs of liquid fuel supply from mainland to generate electricity, this would allow to focus fuel supply on other needs such as logistics transportation, food production, or industry recovery.

Reference:

http://www.idcseychelles.com/news/seychelles-desroches-island-runningon-90-percent-solar-energy-drawing-praise https://sustainsolar.co.za/en/products/sustain-flex/



At Renoz Energy we focus on delivering leading edge technology into battery energy storage application

Microgrid Block Solution



Battery Energy Storage

The Battery Energy Storage System (BESS) is often referred as the muscle of microgrid systems. It provides the essential strength and flexibility needed to maintain the stability and reliability of the microgrid. Just as muscles store energy and provide power for movement, BESS stores electrical energy and releases it when demand peaks or when the primary energy sources are unavailable.

This capability is crucial for balancing supply and demand, smoothing out intermittent renewable energy sources like solar and wind, and ensuring a continuous power supply. BESS also supports critical load management, frequency regulation, and voltage control, making it a powerful component that enhances the resilience and efficiency of microgrid operations.

Containerized **Modular Batteries System**



Rack System Solution

Telecom & IT



SOHO hazardous zone

Power Conditioning System

The Power Conditioning System (PCS) is the heart of a microgrid system. It plays a critical role in ensuring the stability and efficiency of the microgrid by managing the flow of electricity from the intermittent renewable generators to the grid. These generators either can be photovoltaic (PV), wind, hydropower, CAES, or even traditional gensets.

In the Island or off-grid mode, the PCS includes inverters, controllers, and other components that convert the DC power produced by the renewable generators into AC, which then supplied to the grid and finally onto household appliances.

In the hybrid system, it synchronizes generation with grid frequency, and provides smoothing functions to safeguard the system reliability. By intelligently managing energy production and demand, the PCS optimizes the use of renewable power, making it a key component in the transition towards sustainable and resilient energy systems.



POWER CONVERSION SYSTEM

PWS1-500KTL **Bi-directional storage inverter** Offorid & Interactive mode 30kW - 1.7MW Scalable blocks 150-1500VDC 380/400VAC 3Ph+N SCADA/DER controlled & EMS



PWG2-50/100K Hybrid inverter 45kW - 1.7MW Scalable blocks 250-830VDC MPPT Input 380/400VAC 3Ph+N Output SCADA/DER controlled & EMS



Bi-directional inverter 30kW/45 (summable) 150-750V Charging 700-830V DC bus 400±15V AC

Intelligent Transfer Switch 100kVA 1ph 220/230VAC 3ph 380/400/480VAC TN-C-S, TN-S, TT, TN-C Grid SCADA/DER controlled & EMS

PV charger module 45kW (summable) 250-830V PV side 700-830V DC Bus MPPT *3