"Ensuring Energy Reliability: Using Battery Energy Storage Systems (BESS) for Effective Backup Solutions"



### Application : Backup power for Critical Operation for a Fish factory located in Arabian Peninsula

#### **Project Name : Fish Factory**

System Capacity : 1.5MW,1MWh

# **Project Overview**

In a fish factory operating with an unstable grid, diesel generators, and a PV solar plant, maintaining consistent and reliable power is crucial for ensuring the smooth functioning of critical operations.

The intermittent power supply from the grid and the reliance on diesel generators often lead to operational challenges, including frequent outages, high fuel costs, and inefficiency.

Integrating Enercap's ENPACK system, the factory gains a robust solution for reliable power.

The stored energy can be used to power critical loads without relying on diesel generators, significantly reducing fuel consumption and costs.

Moreover, during periods of grid instability or failure, Enercap's ENPACK system ensures uninterrupted power supply by automatically discharging stored energy, maintaining smooth operations. The system also optimizes energy usage by seamlessly integrating with the factory's existing energy infrastructure, offering a hybrid solution that balances solar, grid, and diesel power.



# Challenges Faced by Before Introduction of BESS

- **Unreliable Power Supply**
- **High Diesel Generator Dependency**
- **Fuel Cost Volatility**
- **Inefficient Energy Use**
- **Environmental Impact**
- **Energy Management Complexity**
- **Limited Operational Control**
- **Potential Product Loss**









## Enercap Solution – Introduction of ENPACK System

- > Stable Power Supply
- Reduced Diesel
  - Dependency
- Lower Fuel Costs
- > Optimized Energy Usage
- ➢ Reduced Environmental
  - Impact



- Enhanced
  - Operational Control
- > Minimized Risk of Product Loss
- > Energy Independence from Grid
- Efficient Energy Management

# Mode of Operation of the ENPACK

Mode	PV	BESS	Grid	Load	
MODE 1	<b>PV ON</b>	BESS SOC <100%		Load < PV power	1. P\ 2. E>
MODE 2	PV ON	BESS SOC ≤100%		Load > PV power	1. P then BES set S 2. W simu supp to th then
					1. G
MODE 3	PV OFF	BESS SOC ≤100%	Grid ON	Load < Grid capacity	1009
MODE 4	PV OFF	BESS SOC ≤100%	Grid OFF	Load < Grid capacity	1. Bl start 2. D



#### **System Operation**

V supplies load xcess PV energy charges BESS till SOC 100%

V + BESS supplies load till BESS SOC set Value (Range: 5 to 15%); in the grid (If ON) supplies the load, simultaneously PV charges the S till SOC  $\leq$  100% or if the Grid is OFF BESS supplies load till BESS SOC and then; DG supplies load.

/hen PV finishes and grid is ON, grid supplies load and ultaneously charges the BESS till SOC 100%. If grid OFF the BESS plies load till BESS SOC set Value (Range: 5 to 15%); then switches ne DG to supply the load Or if grid OFF and BESS SOC 5% to 15% n DG supplies load (DG capacity 1000kVA)

rid supplies Load and charges the BESS simultaneously till SOC %.

ESS supplies load till BESS SOC set Value (Range: 5 to 15%); then ts DG and switches to DG to supply to the load

G supplies Load (DG capacity 1000kVA); till PV or grid is ON

# Conclusion

In conclusion, the integration of Enercap's ENPACK System has significantly transformed the operations of the fish factory, providing a reliable and sustainable energy solution.

Before the ENPACK Solution, the factory faced challenges due to an unstable grid, high dependency on diesel generators, and inefficient energy management, which led to increased operational costs, environmental impact, and risks to product quality. However, with the introduction of ENPACK, the factory now benefits from a stable power supply, optimized energy usage, and a reduction in diesel consumption.

Furthermore, the factory has successfully reduced its carbon footprint and operational costs while enhancing its overall energy efficiency. The ability to manage energy demand through load shifting, peak shaving, and backup power has not only improved financial performance but also contributed to sustainability goals.

Enercap's ENPACK System has provided the factory with greater control over its energy usage, ensuring consistent operation, safeguarding products, and allowing for a more resilient and cost-effective energy infrastructure. With ENPACK, the factory is now positioned for a more reliable, efficient, and eco-friendly future.

