

EXCELLENT YIELD

Fish farm storage system saves costs



PROFILE

Client:

Kvarøy Fiskeoppdrett AS

Industry:

Fish farm

Special characteristics:

Autonomous platform in the Norwegian Sea

Region, country:

Selsøyvær island, Norway

THE BACKGROUND

Aquaculture makes up the fastest growing branch in the global food industry. However, as is the case with any instance of factory farming, aquaculture also has its issues, most of which compromise a given operation's sustainability. The family-owned Norwegian company Kvarøy is seeking to change that. It operates five salmon farms off the coast of Norway and is hoping to rely on modern technology to make its operations more efficient and environmentally friendlier.



THE CHALLENGE

Salmon farms consist of platforms anchored in the sea and cages for animals to swim around in. The platforms are floating pontoons made of concrete or steel where the farm's operations are controlled from.

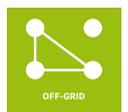
Lighting, sensor technology and feeding systems have been reliant on diesel generators at Kvarøy's fish farms – the one just off the island of Selsøyvær has two large diesel generators and one small one. At least one of them must always be running since there is no power connection onboard. At the same time, the electricity demand fluctuates greatly within the course of a day – at feeding times, the systems require a lot of energy, whereas at other times, only the light on the motorless ship is left shining. Due to long operating periods and poor diesel combustion in the generators, each kilowatt hour of electricity is associated with considerable costs. Additionally, a large portion of the diesel has only been used to keep the engine warm while a small portion actually operates the system. On top of that, any fuel required

has to be transported by boat to the salmon farm, which of course means additional energy and incurred costs.

High-performance energy storage systems would enable more efficient use of the energy provided by the generators and a reduction in the time that the generators are in operation.

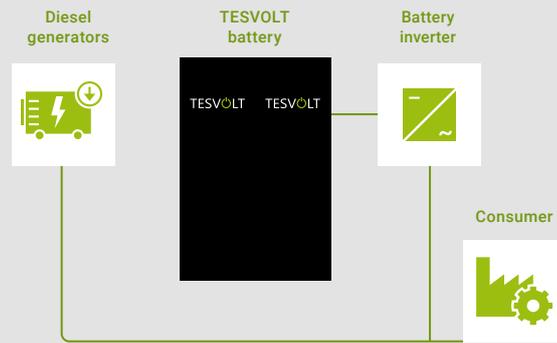
Requirements for a storage solution:

- A powerful storage system with a high depth of discharge and high number of guaranteed cycles to ensure a sustainable and durable investment
- Easy installation and safe operation in a rugged environment



THE SOLUTION

For this unusual operating location, TESVOLT, Kverneland Energi and the breeding facility engineer, AKVA Group, came up with a special battery system solution. With its 120 kW peak power capacity and power electronics from Siemens, the battery system can be monitored and controlled from land over the internet. In only a few hours of full capacity, daytime operation, a diesel generator generates power for the battery storage system that can supply the farm's equipment with electricity for the remainder of the day.



"TESVOLT battery storage systems are the only storage systems on the market that can be fully charged and discharged twice in one day and still maintain their long service life. Many suppliers only enable one storage system charge and discharge cycle per day, which wouldn't have worked for the salmon farm."

Jonas A Kverneland, Technical Manager of Kverneland Energi

"We purchased, installed and forgot about the rechargeable battery. It runs on its own and is totally maintenance-free."

Gjermund Olsen, Managing Director of Kvarøy

THE ADVANTAGES

- **A proximately 60 % reduction in total diesel consumption**

In raising a generation of salmon over a period of 18 months, the company saves between 150,000 and 200,000 euros and also significantly reduces its carbon footprint.

- **Drastically decreased maintenance costs**

The Kvarøy team now only needs to change the diesel generators' oil biannually instead of each month. An oil change takes an entire day and costs up to 1,000 euros, meaning the company has now won back ten working days and saves 10,000 euros per year in oil changes.

- **Improved working conditions**

Since the diesel generators are only in operation for short periods of time (3 hours/day instead of 24), noise levels and vibration effects are lowered and the fish farm produces fewer emissions.

- **Transparent**

The battery system can be monitored and controlled from land over the internet.

- **Durable**

The system boasts an above-average service life of up to 30 years thanks to robust Samsung battery cells and the battery management system, which optimizes cells, modules and cabinets.

PROJECT: FACTS AND FIGURES

Storage system	TS HV
Energy content	158 kWh
Discharge power	120 kW
Cell	Lithium NMC prismatic (Samsung SDI)
Efficiency (battery)	up to 98%
Cycles	6,000–8,000 (0.5C to 1C at 23° C +/- 5° C with a 100% depth of discharge)
Operating temperature range	-10 °C to 50 °C
Battery inverter	Siemens
Installer	Kverneland Energi

TESVOLT AG

Am Heideberg 31 | 06886 Lutherstadt Wittenberg
Deutschland | Germany
Tel. +49 (0) 3491 8797 100
info@tesvolt.com | www.tesvolt.com



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 829877

TESVOLT
THE ENERGY STORAGE EXPERTS