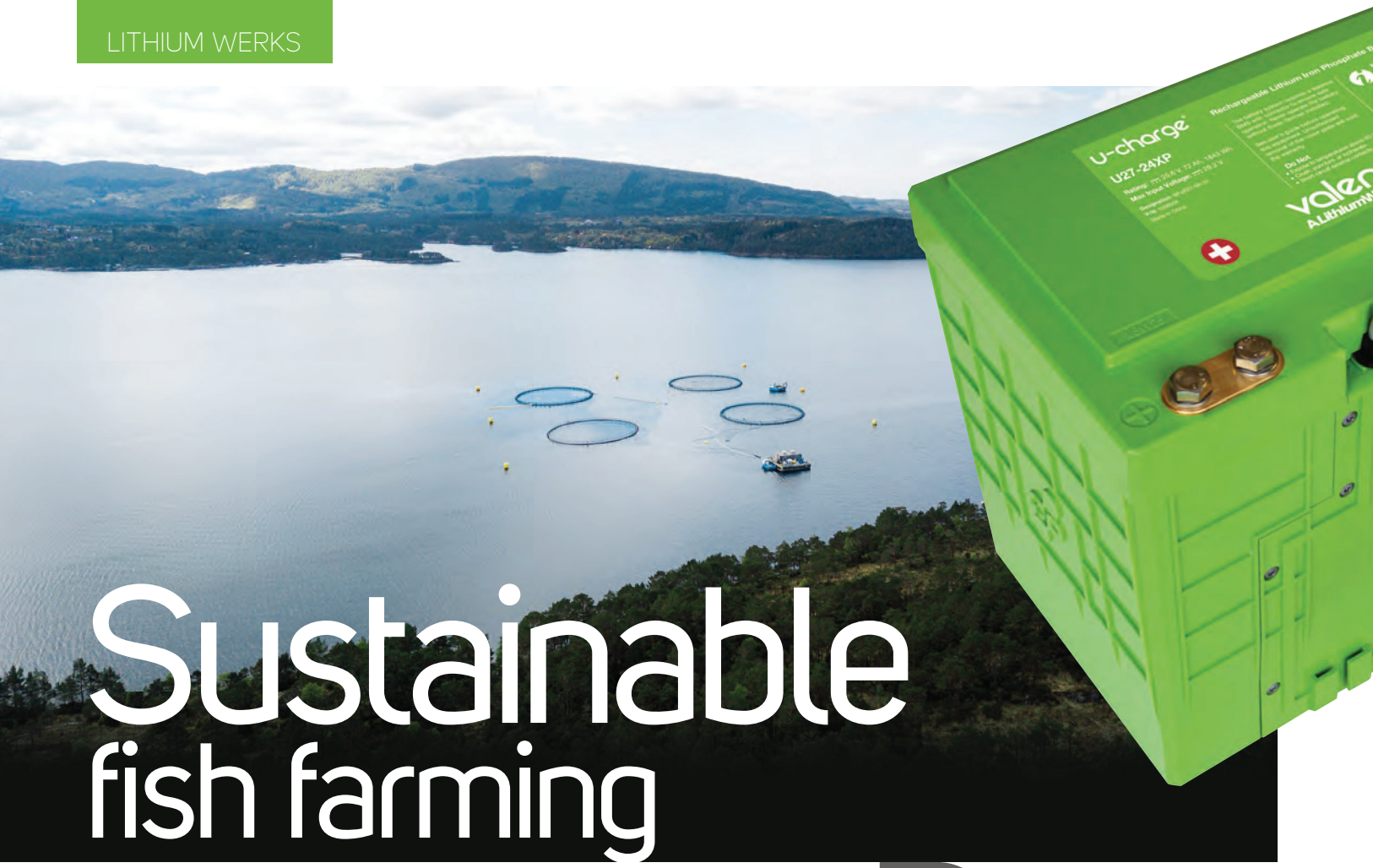


Sustainable fish farming

Lithium iron phosphate battery technology promises to reduce the impact of aquaculture on Earth's precious oceans

WORDS: **OLIVER ATKIN**

The planet's oceans are at a critical moment. The scale of human impact on aquatic life is becoming more apparent and is now being felt every day by communities who depend on the largest natural resource. Whether it is damage caused by industrial waste and fossil fuel pollution, or chronic over-fishing, it appears that drastic steps need to be taken to reduce human impact on this fragile ecosystem. Coupled with an ever-rising population, which acquires a varying percentage of its calorific intake from fish and other ocean life, it is clear that steps need to be taken to find a balance between feeding global population, remaining economically competitive and minimizing ecological damage.

Aquaculture offers one alternative to traditional industrial fishing practices. Breeding, rearing, feeding and harvesting fish in a contained location removes the need for large, diesel-powered trawlers to be sent out to sea. Reducing active fishing trawler numbers also reduces negative by-products of industrial fishing, such as pollution, bycatch, habitat destruction and the amount of derelict fishing gear left behind.

Currently, in Europe, aquaculture accounts for 20% of all fish production and employs around 70,000 people directly. Each year there has been a 7% increase in aquaculture capacity. The long-term employment and food production possibilities offer key economic drivers for further investment in the industry; however, for the industry to truly thrive, sustainability issues must be addressed.

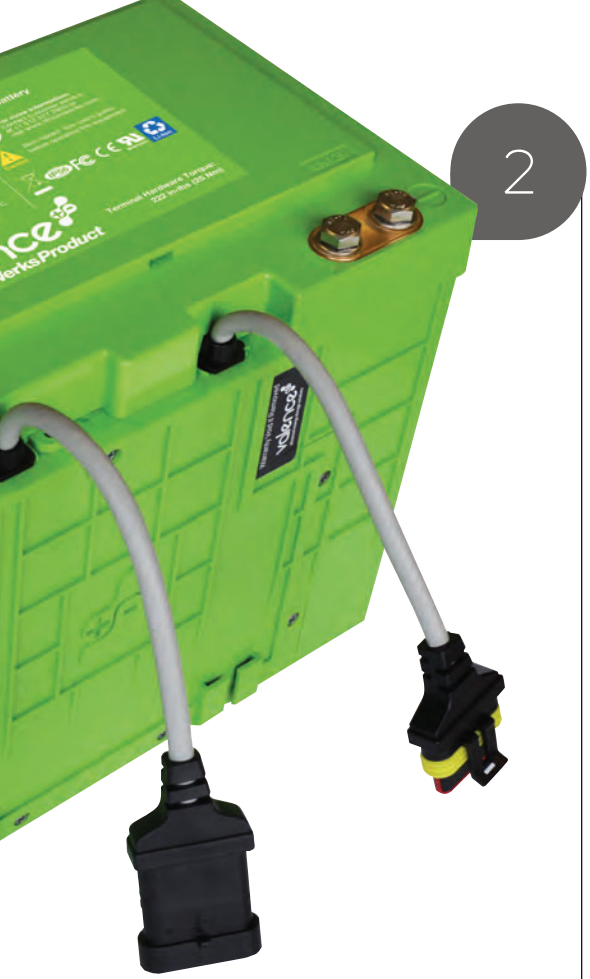
No more diesel

From a sustainability point of view, drawbacks emerge from aquaculture's use of diesel generators for processes such as feeding, lighting and security. Lithium Werks has developed lithium iron phosphate battery technology to be used in aquaculture and other marine sectors to reduce, and even eliminate, the use of diesel.

Using Lithium Werks' U-charge batteries, progressive fish farms have created localized energy storage systems that are tailored to their voltage and runtime needs. These systems range from 96kWh to 150kWh and are located at several places along the Norwegian coastline.

In Bergen, Norway, for example, a rack of 54 U27-24XP batteries provides 100kWh of energy on a feeding barge, allowing the diesel generators to be run for shorter periods of time and at higher efficiencies, thereby saving significant fuel and reducing emissions on the barge.

The overall carbon footprint of the aquaculture system is reduced in the short and long term. Battery banks are essential for minimizing generator startups at, for example, feeding times. The more startups a generator carries out, the more maintenance is required, and ultimately, the shorter the lifespan of the engine. Reducing the rate at which diesel engines fail and need replacement will dramatically decrease the overall environmental ramifications of the maritime industry.



1. An aquaculture fish farm off the Norwegian coastline in Bergen

2. A single Lithium Werks U-charge U27-24XP LFP battery module

3. One of the company's representatives assesses a battery bank on a vessel

Finding a feasible solution

Lithium Werks' modular design offers aquaculture the flexibility needed to add an electrified system to improve upon one based solely on fossil fuels. While reducing emissions is becoming a more important factor when implementing any changes, the viability of the solution and return on investment will continue to be the main driver for change. Decreasing the maintenance and replacement of diesel engines, through the use of batteries, reduces the overall operational costs of the fish farm. Furthermore, Lithium Werks' customers have seen a reduction in diesel usage by up to 70% after implementing Lithium Werks-based systems.

Lithium Werks chooses to use lithium iron phosphate (LFP) over nickel manganese cobalt (NMC) due to the longer lifespan and robust nature of LFP chemistry. Having the availability of continuous power throughout the entire lifespan is paramount for fish farms and is achieved using LFP solutions. Electrical systems are heavily relied upon to maintain the health and functionality of the farm, thus requiring the backing of powerful, safe and reliable batteries.

> "Reducing the rate at which diesel engines fail and need replacement will dramatically decrease the overall environmental ramifications of the maritime industry"

Another advantage of using Lithium Werks batteries is that they do not use cobalt. Abstaining from the use of cobalt brings several benefits.

Firstly, the global electric vehicle market (which relies heavily on cobalt-based lithium batteries) is developing rapidly. NMC cell supplies are largely being directed toward that, instead of other markets. Using LFP provides greater confidence that long-term cell supply will not be suddenly cut off or diminished in favor of the lucrative EV sector.

Secondly, sources of cobalt have been scrutinized recently after evidence emerged about questionable mining methods being used to extract cobalt. Many battery companies are striving to reduce the amount of cobalt they use in their cells; Lithium Werks uses zero cobalt from the offset.

Thirdly, LFP systems carry a higher standard of safety in the event of thermal runaway when compared with NMC. Housing a powerful, large-scale lithium battery system on a self-contained marine vessel carries certain risks should the system experience any damage, either from internal or external sources. The system could be exposed to severe weather while at sea, or even be involved in an accident with other marine vessels. In any dangerous event, a Lithium Werks system provides the confidence to operators that its inherently safe chemistry reduces the risks associated with propagation.

Aquaculture demonstrates to worldwide food production that even the most traditional of industries, such as fishing, can be revolutionized for this modern and fragile world. Lithium Werks says that it showcases through electrification and sensible technology how aquaculture can also be a safer, more sustainable and economical alternative for communities.

COBALT-FREE BATTERIES FROM LITHIUM WERKS FOR THE MARINE SECTOR

Lithium Werks is renowned for its powerful, safe and long-lasting batteries.
Fully scalable modular systems for applications such as
Aquaculture and Electric Ferries.

CERTIFICATES GAINED :

TYPE APPROVED PRODUCT DNV·GL MARITIME

ABS TYPE APPROVED PRODUCT

We enable our customers to reduce their environmental impact and maintenance costs, while maintaining the performance and lifespan of marine technology.

Contact us to see how we can support you on your next project.

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