

**Siemens AS**

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The image shows a Siemens Energy Storage System (ESS) installed in a rack. The system consists of several modules, including a large black battery pack in the foreground, a grey control unit, and two tall cyan modules. The rack is made of metal with perforated sides. The Siemens logo is visible on the front of the battery pack and on the cyan modules.

**SIEMENS**

*Ingenuity for life*

# Energy Storage System

Raise safety. Lower emissions.  
Reduce costs.

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# Siemens Energy Storage Solutions

## Raise Safety. Lower Emissions. Reduce Costs

Energy-storage solutions (ESS) from Siemens are creating more agile, profitable and sustainable vessels. Whether it's a new build or a refit, a hybrid or an all-electric vessel, these battery-based energy storage solutions are helping redefine modern ship propulsion.

## Driven by experience

Siemens has a wealth of experience and expertise with propulsion solutions for all-electric and hybrid vessels. Many of its most recent deliveries incorporate energy storage, including the world's first:

Battery-powered car-passenger ferry – Ampere for shipowner Norled

Large hybrid car-passenger ferries – six battery hybrids for Scandlines

LNG-hybrid car-passenger ferry – M/F Fannefjord for Fjord1

Hybrid offshore construction vessel – Edda Freya for Østensjø Rederi

Hybrid offshore supply vessel – Edda Ferd for Østensjø Rederi

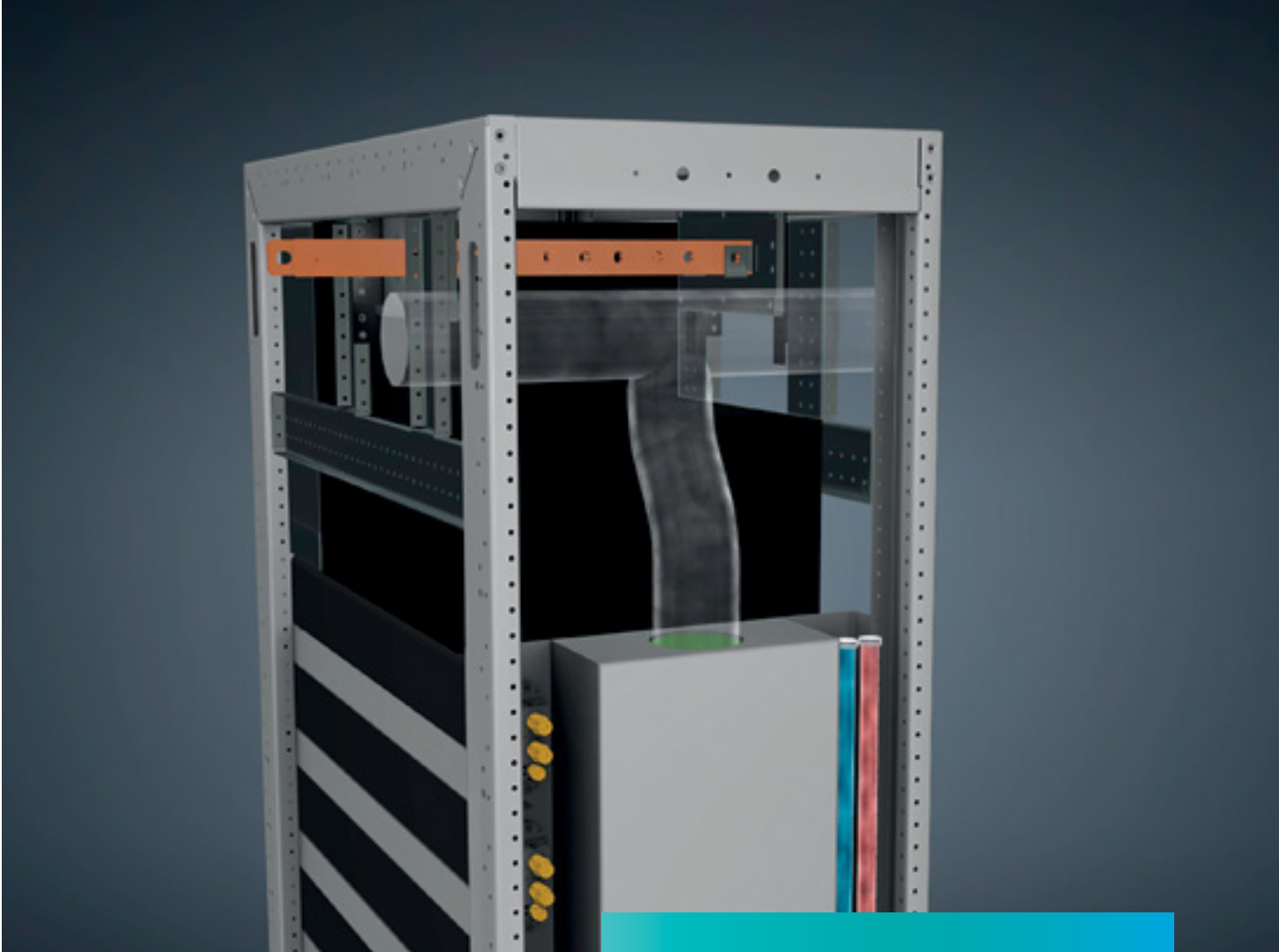
Battery-powered fish-farm workboat – ELFrida for SalMar

Battery-powered fishing vessel – Karoline for Øra AS

Siemens seamlessly integrates energy storage into a vessel's propulsion system to improve performance, whether vessels are run on batteries, gas, dual-fuel or diesel engines. Specifically, Siemens energy-storage solutions:

- Reduce emissions to help shipowners comply with environmental legislation
- Save fuel through efficient engine use by enabling peak shavings at times of high demand
- Increase vessel responsiveness as battery-powered propulsion systems react instantly
- Lower operational costs by storing and using regenerated energy and cheaper shore supply
- Increase safety with a back-up energy reserve that keeps systems running if failures occur
- Reduce maintenance costs by lowering engines' running hours
- Give passengers and crew a more comfortable passage by cutting noise pollution and vibration
- Support the vessel's and shipping company's green profile and make the vessel more sustainable
- Help future-proof the vessel and increase resale value
- Are supported through Siemens' training programs and global service network





### Siemens launches own advanced battery systems

Siemens combines its unique experience and competence in the maritime and oil and gas sectors with proven expertise in electrical engineering and electronics to deliver advanced battery systems ideally suited to both all-electric and hybrid energy-storage solutions. These unique, custom-designed systems deliver a number of benefits.

Siemens advanced battery systems are produced at the company's center of excellence for all-electric and hybrid propulsion solutions in Trondheim, Norway.

### Unique, custom-designed systems deliver a number of benefits:

- Long-lasting, high-performance operation from water-cooled battery modules
- High degree of safety and reliability with voltage and temperature monitoring of individual cells
- Easily scalable to suit small and large vessels alike
- Fast-charging capability saves time and increases efficiency
- Noise-resilient design for smoother running
- Optimum maintenance and control through remote diagnostics using Siemens Mindsphere
- Meet highest HSE requirements during installation, commissioning and operations
- Easily integrated in Siemens and other proprietary energy storage solutions

