DIMO NORWAY

NEW ENERGY-EFFICIENT HYDRAULIC TECH CUTS ENERGY CONSUMPTION BY UP TO 90% ON HYBRID-ELECTRIC FERRIES

Dimo AS and Parker have developed a new energy-efficient hydraulic technology for hybrid-electric ferries. This advance is helping to build cleaner, quieter vessels and improve onboard experience.

CHALLENGE: MEET DEMAND FOR GREEN SHIPPING

Help a car ferry operator develop cleaner, more energy-efficient hydraulics for its new electric ferries and an existing fleet retrofit. Support the customer's goals to optimize energy consumption.

SOLUTION: ENERGY-EFFICIENT HYDRAULIC POWER

Dimo and Parker jointly developed a new, energy-efficient hydraulic power unit solution, the Eco Power Unit (EPU). This combines pump, manifold, accumulator, filter and marine cylinder technologies.

BENEFITS: MORE ENERGY-EFFICIENT, LESS NOISY

Energy-efficiency savings of up to 92%. Noise levels reduced by 20 dB, improving onboard passenger experience. Faster maintenance checks and lower travel costs achieved through remote diagnostics.

> "The customer said that it was the best technical solution for this type of application that they had ever seen. Once installed, we could see that real-world performance was even better than our simulations and that energy-efficiency savings of 92% were being achieved. That is a huge saving and a major step towards delivering greener hydraulic systems."

Stian Garnes, General Manager, Dimo AS

Marine industry: on the cusp of a green revolution

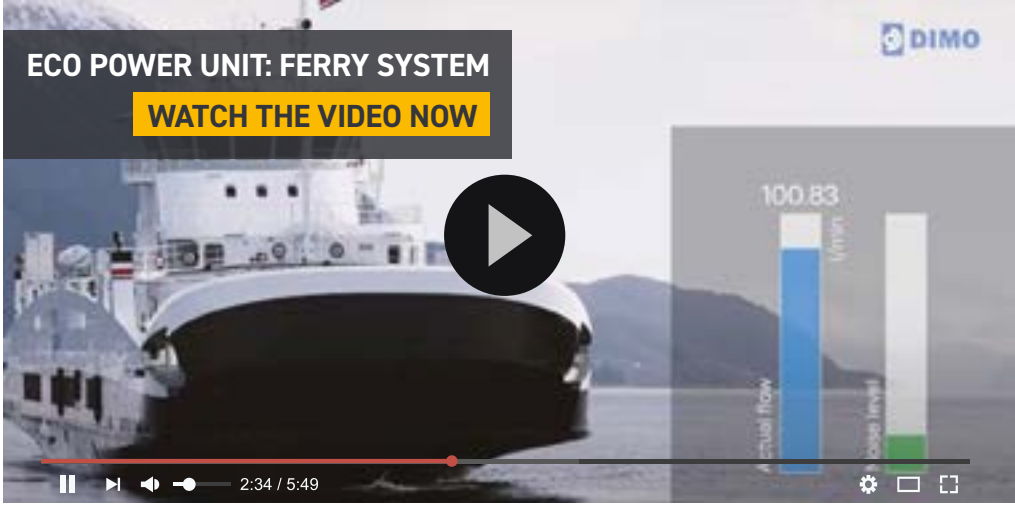
The marine industry stands on the cusp of a green revolution. Stricter near-shore emission legislation and a desire to reduce fossil fuel dependency means ship operators need to adopt more sustainable technologies, such as hybridization and electrification.

For Norwegian system integrator Dimo AS, this transition posed some engineering challenges. “One of our key customers, car ferry operator Fjord1, wanted to build new electric ferries and retrofit their existing fleet with hybrid propulsion technology,” explains Stian Garnes, Dimo General Manager. “This resulted in a request to replace existing hydraulic solutions - based on constant pressure technology - with a cleaner, more energy-efficient means of driving the bow ramp, drive ramp and other hydraulic functions.”

Meet the Challenge

Dimo and Parker engineers collaborated on ideas for a more energy-efficient hydraulic power unit solution, the Eco Power Unit (EPU).

“We explored what a modern hydraulic system might look like,” says Jari Rantanen, Parker Application Development Manager. “It became clear that our technologies could be combined to provide highly energy-efficient marine hydraulics.”



A custom hydraulic manifold system with accumulators also helped minimize flow losses between the hydraulic power unit and actuators.

Energy efficiency of the old and new hydraulic systems was compared using the Parker Drive Creator system simulation tool. Data showed significant energy efficiency improvements, and much lower noise levels, with the new system. Further enhancements included using Parker IQAN electronics to command all hydraulic functions and inverters and enable remote diagnostics.

“We upgraded components from proven industrial applications to withstand harsh marine conditions,” says Jari Rantanen. “Factors such as electric grounding, vibrations, humidity and ambient temperatures were key. With Dimo, we developed a modern electrohydraulic solution that offered many end-user benefits.”

> “Parker is a crucial partner for us, and our long-lasting partnership has allowed new business opportunities.”
>
> Stian Garnes, General Manager, Dimo AS

The new solution included Parker’s market-leading low-noise vane pumps and digital AC30 drives, which cover the flow and pressure needs of commonly used auxiliary power units.

Business results

The EPU solution was adopted on 27 ferries (both retrofit and newbuilds). Its impressive results included:

- Up to 92% less energy consumed compared to traditional hydraulics
- Noise emissions have dropped from 90 dB to 70 dB, improving the onboard passenger/staff experience, as hydraulic systems are no longer audible
- Reduced maintenance time and costs, as maintenance checks/diagnostics are done online
- Lower total cost of ownership, with fewer valves, no cooling requirement and increased component life.

This project led to Dimo securing further orders from ferry, fisheries, and oil & gas vessel owners. The integrator - now seen as the leading hydraulic provider for small and medium-sized vessels and workboats - has an EPU test rig at its Norway headquarters, supporting marine customers globally for customer exhibitions.

“There is so much potential for this technology. We believe there will be strong demand over the long term,” says Stian Garnes, General Manager, Dimo AS. “Parker is a crucial partner for us, and our long-lasting partnership has allowed new business opportunities. We couldn’t have brought this technology to market without the joint effort.”

“It has been exciting to support Dimo on this project,” adds Jari Rantanen. “Parker has the full package of technologies to help our partner deliver a more sustainable future.”