96%

drop in CO_2 emissions from Molslinjen's three Fanølinjen ferries

ENGINEERING TOMORROW

Case story | VACON® NXP family

Navigating **sustainable change**

The situation

Molslinjen, Denmark's largest domestic ferry company, operates nine routes including that between Esbjerg and Fanø, transporting approximately 1.8M people along this particular passage every year.

To reduce its carbon footprint without causing a major ripple effect, Molslinjen decided to introduce an emissionfree, fully electric ferry to its Esbjerg-Fanø route.

With Danfoss helping steer the company into greener waters.

The challenge

The challenge to continue providing a reliable service while reducing emissions led Molslinjen to commissioning Denmark's first commercially viable, fully-electric ferry – named Grotte.

To succeed, the new ferry would have to live up to a lot of requirements: from being able to charge quickly while in port, to matching the power capacity of its sister ferries – all while generating zero emissions.

At fifty meters long and 14 meters wide, Grotte was commissioned and built with help from Danfoss, Vest-El A/S and Hvide Sande Shipyard

The solution

Danfoss supplied Grotte with inverters and two 375 kW propulsion electric motors. The set-up was split over two main panels. Each panel runs independently of the other and consists of the following:

- VACON® NXP DC/DC Converter for DC/DC battery control
- VACON® NXP air-cooled drives to control liquid-cooled motors
- VACON® NXP DCGuard for internal DC busbar protection
- VACON® NXP Grid Converter to supply power to AC voltage systems that control navigation, sub systems and lighting

By providing the above **power conversion technology**, Danfoss proved key in helping Molslinjen meet its green goals – generating electric propulsion from Grotte's engine room while installing a vessel charging system at Esbjerg Port complete with charging tower.

The outcome

On October 1, 2021, with power capacity of 1,107 kW/h and a maximum speed of roughly 20 kph, Grotte embarked on her maiden voyage.

On top of this, with the vessel charging system at Esbjerg Port providing charging capacity of 2,600 kW – powered by green energy – Grotte can easily recharge during her seven-minute stopovers.

Thus, alongside her two sister ferries, both of whom use fossil-free biofuel, Molslinjen's Fanølinjen ferries are as close to being CO_2 neutral as possible – with an expected 96% reduction in annual emissions compared to their fossil-fuel counterparts.

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