



POLISH AND NORWEGIAN CITIES
together for climate and energy



EV AMPERE, SOGNEFJORD

THE WORLD'S FIRST ZERO EMISSION ELECTRICAL CAR FERRY

Sector: Transport

Timeframe: 2012 – 2015

Location: Sognefjord area, Norway



PROJECT BACKGROUND

Passenger and car ferries in Norway are normally operated by ship-owners winning bids from municipalities, counties and/or the national (state) road administration.

This project is the result of a competition launched by Norway's Ministry of Transport and Communications in 2011 to develop an environment-friendly ferry for providing service on the link between the two villages. Norled won the competition, which granted the company the concession rights to operate in the route through to 2025. The new vessel established the viability of operating electric-powered ferries in 50 ferry routes within Norway and beyond.

PROJECT DESCRIPTION

The advanced vessel operates on a 5.7 km crossing in the Sognefjord between the villages of Lavik and Oppedal, and is part of the E39 highway. It is the World's first of this size.

The ferry is designed as a catamaran with two aluminium hulls. It is 80 m long and 21 m wide. It accommodates up to 120 cars and 360 passengers. Compared with traditional steel, aluminium hulls significantly reduce weight; the ship is only half as heavy as a conventional ferry.

LED lighting, solar panels and a heating, ventilation and air conditioning (HVAC) system with a waste heat recovery system are featured on board for low-energy consumption. Electric instant water heaters are also featured on board.

The ferry has two onboard 450 kW electric motors, one of them driving the thrusters. The propulsion system allows an operating speed of 10 knots. The lithium-ion batteries with an overall output of 1,000 kWh and a weight of 10 tonnes power the motors. The batteries are recharged during the 10 minutes loading and unloading time of each trip from the charging stations located at each shore and directly from the local hydroelectric-powered grid at night. A 260 kWh battery is also located at each shore to give fast power supply to the vessel while it recharges.

PROJECT RESULTS

In 2005 the introduction of five natural gas (LNG) fuelled 212 car ferries in Western Norway reduced NOx-emissions equal to emission from 100,000 average cars. Today ferries and busses all over the country run on LNG and biofuel. The next step now is electrification. Electric busses and ferries are now introduced in transportation systems all over Norway.



The new environment-friendly ferry on the Sognefjord annually replaces the use of one million litres of diesel and offsets 570 t of carbon dioxide and 15 t of nitrogen oxide emissions compared to conventional ferries in service on the same route. The Ampere was granted the esteemed "Ship of the Year" award in an international trade show in September 2014.

Hybrid and plug in hybrid ferries are now introduced in more ferry and boat connections. The next 100 % electrical ferry will operate from 2017. Internationally, these projects set the course for carbon-free shipping.

MORE INFORMATION

YouTube video:

www.youtube.com/watch?v=a6Lp-qV9ZJU-
World's first zero emission electrical car ferry

Ship technology database:

www.ship-technology.com/projects/norled-zero-cat-electric-powered-ferry/

SIEMENS presentation:

www.siemens.com/innovation/en/home/pictures-of-the-future/mobility-and-motors/electromobility-electric-ferries.html

Energy system fact sheet:

www.corvusenergy.com/marine-project/mf-ampere-ferry/

Maritime fact sheet (Fjellstrand ship yard):

www.fjellstrand.no/flyers/flyer_1696.pdf

"The Tesla of the sea" (article):

www.na-weekly.com/featured/the-tesla-of-the-sea/