

Factsheet

BELLONA
EUROPA



Taking the electric revolution to the seas

Photo credit: Sverre Hjørnevik

Shipping is one of the **fastest growing sources of CO₂ emissions**, currently responsible for about 2.5% of global emissions. Like aviation, international shipping emissions are excluded from the Paris Climate Agreement, and are inadequately addressed under existing UN conventions and EU legislation. The European Commission forecasts that EU-related ship CO₂ emissions will increase by between 50% and 250% by 2050, compared to 1990 levels¹. This calls for urgent measures to be introduced at European and global level to cut shipping emissions if we are to halt global temperature rise below 2°C. In addition to its heavy carbon footprint, shipping is also a **major source of local air pollution** in Europe. By 2020, it could produce more nitrogen oxides (NO_x) than all land-based sources of emissions combined. In harbour cities, ship emissions have become a dominant source of pollution in particular when considering fine particulate matter (PM) emissions². With increasing global trade and transport, the emissions from shipping and maritime transport, should no longer be overlooked.

A quiet revolution is taking place. Some sailing boats, pleasure crafts, ferries and even large ships are scuttling their diesel engines and going for battery electric drive. The electric revolution is moving to the seas! Battery electric ships will mean no CO₂ emissions, no air pollution and a smoother journey for passengers. The advanced battery technology, improved performance and growing shore power infrastructure are revolutionising the way ships are powered.

Electric ships: get on-board today

Bellona with North Sailing worked together to redevelop "Opal", now an electric ship used for tourism in fragile Arctic areas, for silent whale safari near Iceland and Greenland. When under sail the novel system turns the propeller into an electricity generator, charging the on-board batteries.

Car and passenger ferries on the Norwegian fjords are turning to silent battery electric drives. The first electric ferry 'Ampere' was commissioned only 2,5 years ago, now more than 30 new-built

electric and hybrid-electric ferries are being commissioned for operation on the Norwegian coast. It's not surprising that electric drive is becoming the norm, a joint Bellona-Siemens study showed that 7 out of 10 ferries in Norway would see significant cost savings with full electrification³.



Sailing quietly on batteries through Arctic environment with Opal. Photo credit: North Sailing

Even large cruise ships are joining the electric move. Norwegian coastal express 'Hurtigruten', famous from slow TV on the west coast of

Norway, is developing “Arctic Explorer” electric battery hybrid cruise vessels⁴, while ‘Color Line’, operating between Norway and Sweden, will launch the world’s largest electric battery hybrid vessel to transport 2,000 passengers and about 500 cars from 2019⁵.

Both large ships can be powered 100% by on-board batteries, avoiding the need to use polluting engines near shore when coming to and leaving port. Deploying advanced technology in the real world is moving the bar for environmental and stewardship standards in northern waters. Together with Bellona, ‘Hurtigruten’ now advocate for all ships to turn off their engines while sailing in and out of harbour cities, ban the use of heavy fuel oil and making it obligatory to connect to shore power.



“Arctic explorer” will take cruise passengers to Norwegian ports without disturbing the local environment.
Photo credit: Hurtigruten

Shore power – turning off the fossil, charging up the future

Electrifying sea transport starts on shore with “shore-side electricity supply”. Shore power in simple terms, allows ships to turn off polluting engines while at berth and instead connect to an electricity supply. As around 90% of the ports in Europe are located in major cities, ships with engines on in port areas brings large air pollution sources directly to population centres. In addition to drastically cutting local damaging air pollution and CO₂ emissions, shore power also helps avoid noise and vibrations from ships which otherwise pose significant disturbance to harbour city life quality.

A growing network of ports with shore power is already aiding the breakthrough of battery electric ships. Ships moving from port to port can not only turn their engines off, but charge large

battery packs for the next journey. Larger European shore power networks could spark an ocean transport electrification revolution. More ports with shore power will enable more battery electric ship journeys from port to port.

Shore power is expanding throughout the North Sea and Baltic regions of Europe. In Hamburg, Altona Cruise centre has successfully deployed the first shore power for cruise ships in Europe, with a record conversion from 50 to 60 Hz⁶. Also Rotterdam, Gothenburg, Kiel, Lübeck, Oslo, and Bergen all already provide shore power. Shore power is expanding rapidly in Norway with some 35 projects in the pipeline⁷, not least due to the demand to charge forthcoming battery electric hybrid ships.

On a whole Europe is lagging. Deployment of shore power is mandated in various parts of the US and Asia. Yet still, cities such as highly polluted London have avoided shore power for a new inner-city cruise ship port development⁸. If European countries continue to drag their heels with shore power, not only will city residents face health impacts of air pollution, but the European shipping sector will not be able to capitalise on its lead in battery hybrid ship propulsion. European ship yards can ill afford to be left out of the battery electric shipping revolution.



Join the electric revolution with Bellona:
<http://bellona.org/work-areas/transport>

1 https://ec.europa.eu/clima/policies/transport/shipping_en

2 <https://www.eea.europa.eu/publications/the-impact-of-international-shipping>

3 <http://bit.ly/2qBkwlr>

4 <https://www.hurtigruten.com/about-us/news/new-hybrid-explorer-ships/>

5 <https://ulstein.com/news/2017/color-line-signs-loi-on-the-worlds-largest-hybrid-vessel>

6 <http://sie.ag/2qBsP73>

7 <http://bit.ly/2s8NIOH>

8 <http://bit.ly/2rfcjeU>