



Photo courtesy of North Sailing.



### What is at stake?

According to 2012 figures from the IEA and Eurostat, the total amount of oil consumed by the Nordic maritime industry is approximately 100.000 barrels per day, or 15,5 million liters.

In the Nordic countries, an average of 0,5-3,5% of the workforce is employed by the maritime industry, according to Eurostat. This means that close to **a quarter of a million jobs are at stake** in addition to a likely several hundred thousand more in derived activities and services associated with maritime and coastal tourism. According to 2012 figures from the IEA and Eurostat, the total amount of oil consumed by the Nordic maritime industry is approximately **100.000 barrels per day**, or 15.500.000 liters. A green shift in the maritime industry addresses environmental challenges and contributes significantly to value creation and employment.

## Green maritime projects in the Nordic countries

Industry in the making

Prepared by:



Nordic Marina is a part of NordBio which is a three year program initiated through the Icelandic chairmanship of the Nordic Council of Ministers in 2014. Nordbio functions as an umbrella uniting a number of different projects and sectors, all with the aim of improving the way we use our resources and minimize our generation of waste.





Stena Germanica. Courtesy of Stena Line.

## Preamble

The purpose of this leaflet is to increase the awareness of activities connected to the reduction of fossil fuel consumption in Nordic waters. The ocean is a fragile ecosystem which is threatened by increased use of fossil fuels and potential increased traffic via the north shipping route around the Arctic. Stakeholders in the Nordic countries are already striving to take a global leading role regarding utilization of green technologies to reduce the consumption of fossil fuels. The shipping industry is important for the Nordic countries' economic sustainability. For the Nordic marine industry to sustain its leading role with innovative technology, it is vital to enhance further the competitiveness of the industry by introducing green(er) technologies reducing fossil fuel consumption and protecting our waters which are vital for other industries such as fisheries, recreation, coastal tourism, etc.

## The challenge

Within the Nordic region there is a thriving business in the making. For centuries, shipping and marine activities have played an important role in the lives of the Nordic populations. In the Viking times all of the energy used for marine transport was renewable. During the last 100 years, however, this has changed and at the present, only a fraction of the transport on the ocean surface is powered by renewable energy. Reducing emissions, therefore, is a great challenge and it is imperative that all key players participate: industry, regulators and policy makers.

The last few decades have seen an awakening regarding land transport. Different options have been tested over the last few years to reduce our dependence on fossil fuels.

Within the Nordic countries there is a large portfolio of projects aiming to reduce fossil fuel consumption in marine applications and also to test new fuels and energy storage to reduce our dependence on fossil fuels. Industries are carefully following new opportunities and regulations regarding emissions. It is likely that green shipping will be a booming industry in the near future. Currently, the maritime industry contributes substantially to the economic growth of the Nordic nations; maintaining its further development and progress requires encouragement and an environment in which it can thrive.

## Green industry in the making

The car industry is comparatively small in the Nordic countries to other industries. However, the Nordic countries, specifically Norway, are leading the introduction of zero emission vehicles (ZEV) and other types of vehicles utilizing environmentally friendly fuels. Since the introduction of a variety of different fuels to land transport, an increased level of expertise has formed within businesses and alternative fuel project participants. Moreover, opportunities have been identified for expansion beyond land vehicles and into marine applications.

Nordic Marina's website ([www.nordicmarina.com](http://www.nordicmarina.com)) lists various green maritime projects, ongoing, future and completed. They cover different fuel pathways, energy storage, new engines, a variety of engineering projects increasing efficiency and the like. Participants are from all industrial sectors, large and small, research and government institutions and even investors. Funding comes from a range of different sources, EU, Nordic, national and private. The projects also touch other key businesses such as fishing, tourism, ferries, recreation, transportation of goods, etc.

Already many of these projects are on a world leading scale with advanced R&D activities generating leading know-how in the field. They touch almost all key elements of a ship, such as:

- **Operational paradigm - efficiency and engineering**
- **Propeller**
- **Engine**
- **Energy storage - batteries, etc.**
- **Fuels**
- **Ship design**
- **Anti-fouling paint**
- **Environmentally friendly scrapping of ships**

To continue on this path, the working environment for the industry must continue to be favorable.

## Competitiveness of future green shipping

Currently, there are opportunities for Nordic industries to continue as a key global actor with regard to shipping. There are a number of issues which need to be addressed so that the industry can continue on this positive path.

- **Regulations, codes and standards**
- **Barriers**
- **Infrastructure must be provided**
- **Funding opportunities**
- **Government policies**

Many of these are to be worked on jointly between industry and government, including the classification firms. In general, this has been working well but there is room for improvement. The Nordic Marina project will in the coming months address many of these topics in cooperation with key stakeholders to support further advancement of the industry.

Emissions and fossil fuel consumption in maritime applications are topics on the agenda of national and international organizations. The Nordic nations have an opportunity to demonstrate how new technologies can be combined with existing know-how in the field to reduce CO2 emissions from shipping and related sectors. Moreover, it is an opportunity to expand the maritime industry into a green territory, setting new standards for the world to achieve. Finally, it is important to keep in mind the maritime industry contributes to local value creation, and has positive regional socio-economic effects. The industry has the capacity to generate many direct and indirect jobs and benefit derived service sectors in addition to other related enterprises.



Photo courtesy of Icelandic New Energy.



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### Examples of alternative fuel projects:

Stena Line:  
Methanol powered ferry

Scandlines:  
Diesel-electric ferry including large battery pack

North Sailing:  
Whalewatching sailboat regenerative hybrid electric battery propulsion

Norled:  
100% battery electric ferry

Norsepower:  
Auxiliary wind propulsion for large vessels

A more detailed list of projects aiming to reduce CO2 footprint can be found at [www.nordicmarina.com](http://www.nordicmarina.com)