

Clean Shipping

A Priority Area of the EU Strategy for the Baltic Sea Region



Photo: Peter Dam

**Actions and activities in the Baltic Sea Region
to become a model region for clean shipping**

Did you know

.....about shipping in the Baltic Sea and the environment

...Shipping is the most efficient and environmentally friendly mode of transport measured in emissions per ton of cargo.

...Maritime transport constitutes the backbone for trade in the Baltic Sea Region. At any given moment, there are more than 2 000 ships operating in the Baltic Sea and the amount of traffic and the size of vessels is growing.

...The Baltic Sea is severely polluted. However, most of the pollution is caused by land based human activity, but maritime activity contributes to the pollution through e.g. air emissions from engines and waste water from passenger vessels.

...The Baltic Sea States are leading actors in shipping. A few examples: vessels registered in Denmark account for 10 per cent of all world trade; the Baltic Sea is one of the seas best connected with ferry routes and some of the world's largest and most modern cruise liners are being built in Finland.

...In order to limit pollution from shipping from 2015 onwards, new regulation requires vessels sailing the Baltic Sea to reduce their emissions of sulphur oxide (SO_x) to 0.1 % from 1 % allowed today. As for nitrogen oxide (NO_x) emissions, regulation is expected to come into effect in the coming years.

...These requirements force ship owners to use more expensive fuel types, when sailing in the Baltic Sea Area. This threatens the competitiveness of ship transport compared to road transport, and ultimately a modal backshift could happen, moving cargo from ship to the more polluting road transport.

...The maritime sector in the Baltic Sea Region has strong competences for developing environmentally friendly solutions that could turn the environmental challenges into commercial possibilities. By combining our strengths, we can turn the Baltic Sea Region into a laboratory for maritime clean-tech, in order to become "a pilot region for clean shipping".

...One of the solutions is to change to less polluting fuel types e.g. liquefied natural gas (LNG). Emissions from LNG driven ships are almost free of sulphur and nitrogen particles, reducing CO₂ emissions by approximately 15 %.

...Research is being carried out regarding the use of renewable fuels such as methanol, which can be produced from the waste of the forest industry. However, the required infrastructure for production and distribution of such new fuels is not available.

...Apart from emissions shipping also has an environmental impact via different types of waste and sewage released to the sea. New regulation forbidding almost any discharge of waste to the sea has entered into force, and discharge of untreated sewage from all passenger ships is prohibited from 2018. This necessitates the development of appropriate installations in ports.

Green ship MT Annelise Theresa, photo: Herning Shipping

The Baltic Sea Region

- a model region for clean shipping

The European Union Strategy for the Baltic Sea Region (EUSBSR) was adopted by the European Council in October 2009 and is Europe's first macro-regional strategy.

The Strategy aims to save the Baltic Sea, to connect the region better and to increase prosperity, by reinforcing cooperation as well as promoting a more balanced development of the Baltic Sea Region. The Strategy contributes to major EU policies such as EU 2020 and reinforces regional integration. The Strategy is divided into several priority areas, among those the Priority Area on Clean Shipping. The overall vision of this Priority Area is to make the Baltic Sea Region "a model region for clean shipping".

The Danish Maritime Authority serves as Priority Area Coordinator and has the task of facilitating a policy dialogue and developing Flagship Projects of mutual benefit in the area on behalf of the other Baltic Sea States, while assuring that activities are anchored all through the region.

At the same time, the Baltic Sea is environmentally fragile due to its shallow, semi-closed waters and densely populated shores. Shipping affects this fragile environment through air emissions, illegal and accidental discharge of oil, hazardous substances and other wastes as well as through the introduction of alien organisms via ships' ballast water.

A series of new regulations which will reduce the environmental impact of shipping in the Baltic Sea has been adopted, and more is expected to follow. The environmental regulations help speed up the conversion of the maritime sector towards cleaner and greener shipping, but also create challenges to a sector which has been severely affected by the financial crisis in recent years.

It must be kept in mind that shipping is indeed a very effective mode of transport when measured in emissions per tonne of cargo; and thus increased shipping can be a part of the region's response to overcoming transport congestion and facilitating more trade.

Historically, the countries around the Baltic Sea have been leading players in shipping, and even today these countries have a strong influence on maritime affairs globally. The Baltic Sea Region therefore has the potential to deliver substantial input to making shipping cleaner. A common understanding and an innovative approach means that the region can easily serve as a laboratory and test-bed for new developments. This work has already started, which the results from the Flagship Projects presented in this pamphlet demonstrate. The Priority Area on Clean Shipping looks forward to welcoming more such innovative projects to take these results further.

Copenhagen, August 2013



Francis Zachariae, Deputy Director General

Danish Maritime Authority

Concrete results and recommendations from successfully completed Flagship Projects

“ELIMINATION OF DISCHARGES OF SEWAGE FROM SHIPS”

The aim of the HELCOM Member States to reduce the input of nutrients into the Baltic Sea from passenger ships was achieved as the International Maritime Organization (IMO) designated the Baltic Sea as a Special Area for sewage under MARPOL Annex IV. All passenger ships operating in the Baltic Sea Special Area will be required to treat their sewage prior to discharge into the sea, or alternatively deliver it to a port reception facility. It will be mandatory for new and existing passenger ships to comply with the anti-discharge regulations by 2016 and 2018, respectively. The process of having the Baltic Sea designated as a Special Area for sewage was as follows:

- Proposal by HELCOM Member States to the IMO to designate the Baltic Sea as a Special Area for sewage discharges from passenger ships.
- The HELCOM Member States led by Finland initiated a process in the IMO.
- Final adoption at the 62nd session of the IMO Marine Environment Protection Committee (MEPC) in July 2011, designating the Baltic Sea as the first Special Area for sewage in the world.

The Special Area status will be enforced when the HELCOM member states notify the IMO that adequate reception facilities for sewage are available in their passenger ports.

*Lead partner: Baltic Marine Environment Protection Commission (HELCOM).
Finalised: 2011.*

“CONDUCT A FEASIBILITY STUDY ON LNG INFRASTRUCTURE FOR SHORT SEA SHIPPING”

The competitiveness of short sea shipping is put under great stress with the coming cuts in the allowed sulphur content in bunker fuel and limitations on emissions of nitrogen oxides. Engine manufacturers have started to offer liquefied natural gas (LNG) as an alternative to oil, but this alternative requires an infrastructure of LNG filling stations. LNG is a climate- and environmentally friendly fuel that is to be made competitive through an effective infrastructure and good framework conditions. This has been the aim of a major project in which, inter alia, a wider North European partner representation, ports, several large energy companies and industrial companies participated. The purpose of the project was to develop recommendations for how to establish an infrastructure facilitating the use of LNG as a ships' fuel. However, other important areas have also been identified. The project's recommendations concentrate on five main areas:

- Bunkering of ships with LNG.
- Economic and financial conditions.
- Safety, technical and operational conditions.
- Permits for an infrastructure ashore.

The infrastructure project, covering Northern Europe, is part of a larger project that also contains a pilot project connecting Norway and Denmark through two newly built cruise ferries (Fjordline A/S) fuelled by LNG.

Leader of the project: Danish Maritime Authority.

Finalised: June 2012.

Final results: www.dma.dk/news/Sider/Finalreport.aspx



“IMPROVE THE WASTE HANDLING ON BOARD AND IN PORTS”

The Baltic Master II project developed a new and innovative universal adapter for handling sludge water from ships. The sludge adapter proved to be a practical solution for improving waste management in ports. It serves as a connector between the wide varieties of couplings on ships and in the ports. By means of the adapter, oily residue (sludge water) can be easily transferred from the ship and taken care of by the port, just as the legislation demands.

The overarching approach of the Baltic Master II project was to address issues from a local and regional perspective using cross-border and cross-sectoral collaboration in order to find viable hands-on solutions to global problems. The sludge adapter is a bottom-up example of how EU projects can result in practical hands-on innovation. The network and part of the results from the Baltic Master II project will continue to be developed in the framework of the Baltic Maritime Science Park (www.bmsp.se) with the ambition to advance clean shipping in the Baltic Sea Region even after the completion of the Baltic Master II project.

Lead partner: Region Blekinge.

Finalised: January 2012.

Final results: www.balticmaster.org



*Removal of oily water.
Photo: BalticMaster II project*

Clean shipping is ...

... a vision to make maritime transport greener, which can be achieved by means of new technology and changed behaviour on board. It requires the concerted efforts of multiple measures, of which the most common are described here.

SOLID WASTE

Ship-generated solid waste and cargo residues constitute a significant environmental threat if dumped in the sea or released unprocessed.



SEWAGE AND GREY WATER

Wastewater from toilets, showers, laundry and cooking on board contains harmful nutrients and bacteria. Nutrients in sewage, such as nitrogen and phosphorus, promote excessive algal blooms, which consume oxygen in the water and can lead to fish kills and destruction of marine life. Wastewater should be collected and treated in ports.

SHORESIDE ELECTRICITY SUPPLY

The provision of shoreside electrical power to a ship while in port allows a vessel to turn off its engines. Shoreside power saves fuel while in port and reduces air pollution.



EXHAUST

Unprocessed exhaust emissions from ships' engines containing harmful NO_x, SO_x, and CO₂ constitute a significant source of air pollution.

BRIDGE

A vessel's environmental performance is closely connected to the way it is operated and maintained. Modern technology, such as e-Navigation, can assist the helmsman in taking the right decisions and allow the vessel to optimize its route dynamically while sailing, thus helping the vessel to minimize its fuel consumption.



SCRUBBER

Equipment installed on board a vessel for extracting dangerous particles from the exhaust of oil fuelled engines. Most scrubbers generate a new kind of waste that most ports are not yet ready to receive.

ANTI-FOULING

Coating applied to the hull of a vessel in order to slow down the growth of organisms that naturally attach to the hull. New types of paint can reduce the water resistance.



BILGE WATER

Oil often leaks from a vessel's engine and machinery spaces or from engine maintenance activities and mixes with water in the bilge. Oil and gasoline can harm fish and wildlife and pose threats to human health.



HULL DESIGN

An optimal design of a vessel's hull can help make the ship more efficient and save fuel.



FUEL

Most vessels use oil for propulsion. Heavy fuel oil contains much sulphur, which is harmful to the environment. Today, it is possible to design new or convert existing vessels to operate on less polluting liquefied natural gas (LNG) and research is carried out on the use of renewable fuels.



PROPELLER

Optimization of propeller design and location can help improve the fuel economy of a ship.



BALLAST WATER

Ballast water is used to control a vessel's stability and trim. Stabilizing ballast water is taken on in the coastal waters where a vessel unloads cargo, and is discharged at the next port of call in the waters of a different region. Ballast water can contain invasive species which are moved to a region where they do not belong. This can cause damage to the marine environment. Ballast water can be cleaned if the required equipment is installed.



Ongoing Flagship Projects

“PROMOTE MEASURES TO COLLECT SHIP GENERATED WASTE”

The Baltic Sea already has a mandatory delivery and ‘no special fee’ system for reception in ports of waste from vessels based on HELCOM Conventions and Recommendations. These require functional port reception facilities targeting especially oily wastes from engine rooms, sewage and garbage. The designation of the Baltic Sea as a Special Area for sewage under MARPOL Annex IV in 2011 requires further upgrades of port reception facilities for sewage by 2015. The HELCOM Member States have agreed to a Roadmap indicating the necessary upgrades to priority passenger ports to ensure adequacy of reception facilities. An ongoing dialogue with ports, the shipping industry and wastewater treatment plants aims for a common understanding of the technical and operational aspects of sewage delivery to port reception facilities.

Leader of the project: Baltic Marine Environment Protection Commission (HELCOM).

Expected finalisation: 2015.

Further info: www.helcom.fi



“INTRODUCE DIFFERENTIATED PORT DUES DEPENDING ON THE ENVIRONMENTAL IMPACT OF SHIPS”

The aim is to set up economic incentives for ships to produce low emissions, manage wastewater and ballast water in a sustainable way, and use environmentally friendly technologies. There are different – and very often complex – port/fairway dues systems in the Baltic Sea countries. Economic incentives have a potential to bring about the greatest results when implemented in a larger geographical area, not limited to a specific port or country.

Leader of the project: Baltic Marine Environment Protection Commission (HELCOM).

Further info: www.helcom.fi



Photo: Danish Shipowners' association

“PROMOTE MEASURES TO REDUCE EMISSIONS FROM SHIPS AND ENHANCE THE DEVELOPMENT FOR SHORESIDE ELECTRICITY FACILITIES OR FOR EMISSION TREATMENT IN ALL MAJOR PORTS AROUND THE BALTIC SEA”

Measures to reduce emissions from ships should be promoted, inter alia through economic incentives in order to come to a level playing field. This Flagship Project consists of two major activities.

CLEAN BALTIC SEA SHIPPING

A core objective of CLEANSHIP is to abate the eutrophication of the Baltic Sea by reducing nitrogen emissions to the air and water from ships. Another major objective is to facilitate for the Baltic Sea Region to become a model region for clean shipping, adhering to existing and coming international regulations and standards. This is done by presenting a broad spectrum of tools and solutions to ports and the shipping industry for them to refer to as ‘best practice’ examples. At the core of CLEANSHIP is therefore the preparation of pilot studies, including supporting analyses, and the harmonisation and standardisation of an environmentally related infrastructure:

- Environmental Port Index.
- Environmentally differentiated port dues.
- Alternative fuels in shipping, LNG.
- Shoreside power supply.
- Port reception facilities for sewage from ships.



*Shore-side electricity supply in the Port of Trelleborg.
Photo: Clean Baltic Sea Shipping*

Leader of the project: Port of Trelleborg.

Expected finalisation: September 2013.

Further info: www.clean-baltic-sea-shipping.eu



“Baltic Sea cooperation for reducing ship and port emissions through knowledge- & innovation-based competitiveness”

The challenge for Baltic Sea shipping in coming years is to adjust to the stricter regulations on exhaust emissions, notably IMO MARPOL Annex VI and its implementation through the EU sulphur directive, requiring more stringent control of sulphur emissions from ships and, consequently, increased expenses and need for investments.

The BSR InnoShip project provides practical models and tools for estimating the economic implications of the required emission reductions as well as voluntary measures and economic incentives for low emission solutions on the local and national as well as the Baltic Sea level.

For instance, a ‘best practice’ manual has been produced within the project, and the project has launched an interactive platform on clean shipping, ‘Clean Shipping Currents’ (cleanshippingcurrents.eu). It gives easy and fast access to information on clean shipping to relevant stakeholders and policy makers. Furthermore, the project facilitates the implementation of alternative fuels and level playing field solutions.

*Leader of the project: The Baltic Institute of Finland.
Expected finalisation: 31 December 2013.
Further info: www.baltic.org*



“INDEXING THE ENVIRONMENTAL IMPACT OF VESSELS (CLEAN SHIPPING INDEX – REAL TIME, QUANTIFIED INSIGHT INTO THE ENVIRONMENTAL PERFORMANCE OF SHIPS)”

Cargo owners increasingly influence the logistic chains for their goods. The drivers are efficiency and costs, but also reliability and sustainability. In the Clean Shipping Index database ships and ship owners are ranked in accordance with their environmental performance based on parameters such as emissions of CO₂, SO_x and NO_x, the use of chemicals and waste and water control. In order to minimize their corporate environmental footprints, cargo owners can use the information available from the Clean Shipping Index when procuring sea transport. Close to 50 shipping companies are already involved in the project, including e.g. Volvo, H&M, Philips and Akzo Nobel, and nearly 2000 vessels are indexed. The intention is to expand the cargo owner network and attract more shipping companies and simultaneously extend the concept to other parts of Europe with a view to becoming a self-sustaining organisation in 3-5 years.

*Leader of the project: Clean Shipping Network Association.
Expected finalisation: 2015.
Further info: www.cleanshippingindex.com*



“MARINE COMPETENCE, TECHNOLOGY AND KNOWLEDGE TRANSFER FOR LIQUIFIED NATURAL GAS IN THE SOUTH BALTIC SEA REGION (MARTECH LNG)”

The project aims to ensure that knowledge of LNG technology is transferred to the countries in the region that are currently building LNG terminals. It is important to facilitate capacity building and to transfer knowledge on the topic to companies in the region, in order to secure that future LNG development and maintenance could take place locally. The project addresses the potential supply chain of small- and medium-sized enterprises in the region that have an opportunity to gain competence in LNG technology during the construction of LNG terminals as well as scientific institutions. The anticipated result is a regional cluster with competence on LNG that can utilize business opportunities offered in the emerging LNG market.

*Leader of the project: Klaipeda Science and Technology Park, Lithuania.
Expected finalisation: December 2014.
Further info: www.golng.eu*



Bunkering of LNG in Port of Stockholm, Photo: AGA



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For further information about the EU Strategy for the Baltic Sea Region:
www.balticsea-region-strategy.eu