



GREEN GUIDE

ANNEX 1

Good practice examples in line with the 5 Es



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Introduction

The “ESPO Green Guide; towards excellence in port environmental management and sustainability” introduces a common framework for port authorities to respond to their environmental challenges under 5Es; Exemplify, Enable, Encourage, Engage and Enforce. As mentioned within the Guide:

“The European port authorities aim to continuously work towards improving their environmental performance through focused action on:

1. **Exemplifying;** *Setting a good example towards the wider port community by demonstrating excellence in managing the environmental performance of their own operations, equipment and assets*
2. **Enabling;** *Providing the operational and infrastructural conditions within the port area that facilitate port users and enhance improved environmental performance within the port area*
3. **Encouraging;** *Providing incentives to port users that encourage a change of behaviour and induce them to continuously improve their environmental performance*
4. **Engaging** *with port users and/or competent authorities in sharing knowledge, means and skills towards joint projects targeting environmental improvement in the port area and the logistic chain*
5. **Enforcing;** *Making use of mechanisms that enforce good environmental behavior by port users where applicable and ensuring compliance”*

This framework is applied to five selected environmental issues that are being addressed within the Guide, namely air quality, energy conservation and climate change, noise management, waste management, and water (both consumption and quality) management. Within the main text of the Guide this is done in a generic way by mentioning potential response options under the 5 Es. This online annex of good practice examples supports and complements the ESPO Green Guide by providing evidence of the good work that is being done by European port authorities.

The annex is meant to be dynamic and will be updated overtime to reflect on further response options by port authorities. The current version 2 of the annex consists of 76 good practice examples provided by 26 European port authorities from 12 countries as summarised on the table below.



	Port	Country
1	Antwerp	Belgium
2	Ghent	Belgium
3	Aalborg	Denmark
4	Kalundborg	Denmark
5	Tallinn	Estonia
6	Hamina Kotka	Finland
7	Helsinki	Finland
8	Rauma	Finland
9	Turku	Finland
10	Dunkirk	France
11	Le Havre	France
12	Nantes	France
13	Bremen / Bremerhaven	Germany
14	Hamburg	Germany
15	Piraeus	Greece
16	Amsterdam	Netherlands
17	Groningen	Netherlands
18	Rotterdam	Netherlands
19	Setubal	Portugal
20	A Coruna	Spain
21	Valencia	Spain
22	Gothenburg	Sweden
23	Stockholm	Sweden
24	Trelleborg	Sweden
25	Ystad	Sweden
26	Dover	United Kingdom

The structure of the annex follows the five selected environmental issues. Then, per each issue, the provided good practice examples are classified under the 5 Es. A colour coding is applied to the different Es for better presentation purposes: **Exemplify**, **Enable**, **Encourage**, **Engage** and **Enforce**. It should be noticed



that the provide examples often address more than one E. In those cases a selection is made regarding the most relevant E under which to classify the example under question. A classification selection is equally made for examples that target more than one environmental issue.



Air quality management





Summary of port contributions

The table below summarises the port contributions in the field of air quality management in order of appearance.

	Port	Exemplify	Enable	Encourage	Engage	Enforce
1	Hamburg	+				
2	Trelleborg	+			+	
3	Tallinn	+				
4	A Coruna	+			+	
5	Turku	+				
6	Helsinki	+	+	+		
7	Piraeus	+			+	
8	Rauma	+				
9	Dover		+			
10	Gothenburg		+		+	
11	Stockholm		+	+		
12	Antwerp		+			
13	Ystad	+	+		+	
14	Trelleborg		+		+	
15	Le Havre			+		
16	Rotterdam			+		
17	Bremen			+		
18	Hamburg			+		
19	Gothenburg		+	+	+	+
20	Antwerp			+		
21	Gothenburg		+		+	
22	Rotterdam		+		+	+
23	Bremen	+	+		+	
24	Stockholm	+			+	
25	Rotterdam				+	

Exemplifying; setting the good example when managing own operations

Port of Hamburg, Germany

Contact Person: Hendrik Hollstein

Position: Deputy of Environmental Strategy

Email: hendrik.hollstein@hpa.hamburg.de

Environmental issue: **Air quality / Energy conservation and climate change**

Response: **Exemplify**

Sulphur-free fuel for port authority vessels and floating equipment

Within the frame of a pilot project the HPA's fleet of ships and floating equipment has been switched over to operation on sulphur-free fuel. The trial produced positive results in terms of consumption, maintenance and technical retrofit requirement. As a result use of sulphur-free fuels has now become a permanent policy. This also serves to set an example for other vessels used in port-internal infrastructural transportation. HPA goes act as a prime mover, thus also contributing to the overall political objective of improving air quality in the whole of Hamburg.

Illustration:



Port of Trelleborg, Sweden

Contact Person: Göran Hall

Position: Manager Vehicles & Vehicle Maintenance

Email: goran.hall@port.trelleborg.se

Environmental issue: **Air quality**

Response: **Exemplify / Engage**

State of the art terminal tractors

Our newest terminal tractor (Kalmar 618i) equipped with an engine which as standard complies with EU Step 3B. To considerably improve the environmental performance we have mounted Ad Blue catalyst and particulate filter, which will reduce emissions of PM by almost 100%. This means Step 4 and the aim is to fulfil Euro6 requirements. After evaluation we expect that another 3-4 of our terminal tractors will get this equipment during 2012. Since 2010 we have equipped our terminal tractors with a Unikat particulate filter (an ongoing project in close cooperation with the supplier).

Illustrations:





Port of Tallinn, Estonia

Contact Person: Ellen Kaasik

Position: Head of Quality and Environmental Management Department

Email: e.kaasik@ts.ee

Environmental issue: **Air quality**

Response: **Exemplify**

Air quality management system in Muuga Harbour – two automatic monitoring stations coupled with modelling system.

Monitoring stations are measuring VOC, aromatic hydrocarbons (BTEX), hydrogen sulphide (H₂S), sulphur dioxide (SO₂), nitrogen oxides (NO_x) and fine particulate matter (PM₁₀) concentrations and meteorological conditions. If levels of these pollutants exceed predefined levels the harbour master, operators, inspectors, local authorities and port authority in the harbour will be notified automatically by e-mail and measures will be taken to reduce emissions (decreasing pumping rate, ceasing operations etc). There are guidelines for each of the operators listing possible actions depending on the wind speed and direction. Wind data is used in order to notify only those operators which could possibly contribute to emissions causing elevated levels in ambient air at monitoring stations.

In case of exceeding of the limit values in the monitoring stations, backward Gaussian dispersion modelling is carried out to identify locations of possible pollution sources in the harbour. Operators in these locations will provide log files of their actions during these pollution episodes in order to improve measures for future situations. The monitoring data is presented online. The automatic dispersion modelling is carried out every hour and modelling results are presented online in the form of pollution maps.

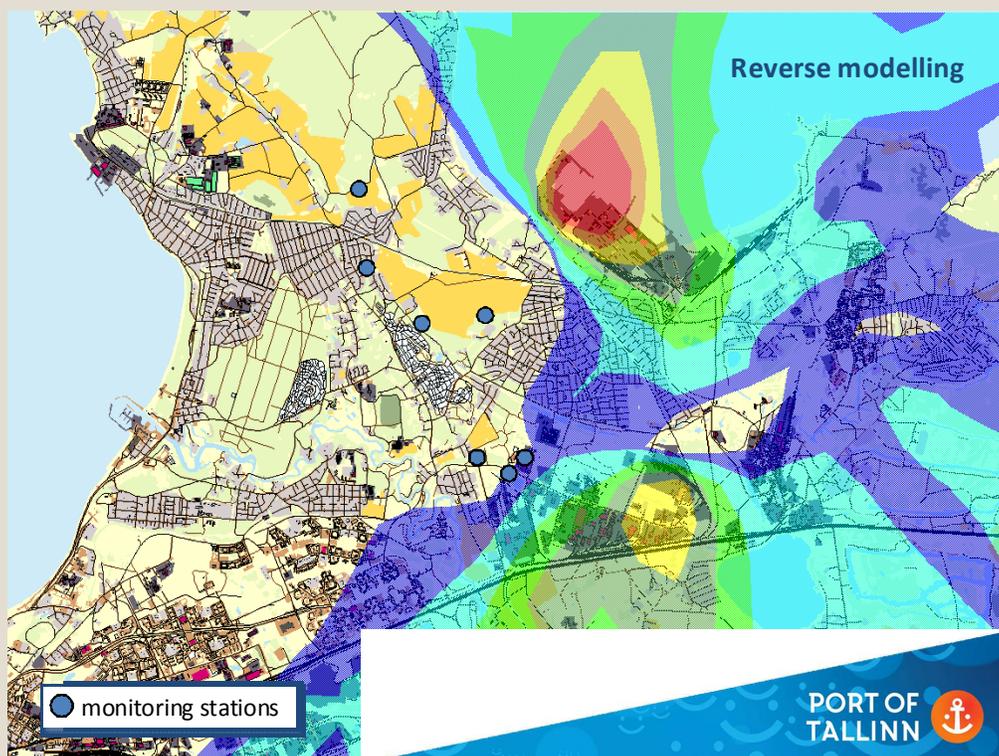
Links:

<http://mail.klab.ee/seire/airviro/muuga1.html>

<http://mail.klab.ee/seire/airviro/muuga2.html>

<http://mail.klab.ee/seire/airviro/dispmuuga.html>

Illustrations:





Port of A Coruña, Spain
Contact Person: Andrés Guerra Position: Sustainability Manager Email: aguerra@puertocoruna.com
Environmental issue : Air quality / Water quality
Response: Exemplify / Engage
<p>Environmental Control Panel at the port of A Coruña</p> <p>The air and water quality control have been, since 1996 (First ESPO Port Environmental Review), environmental management priorities of the European Ports. The Port of A Coruña, a solid and liquid bulk handling port situated in Galicia, in the northwest of Spain, has designed a tool which comprises a system of indicators to provide public information on the environmental, meteorological and oceanographic situation of the port. Its aim is the control of the environmental effects of the operations and services which are performed in the port, the automatic recommendation of operative procedures taking into account the weather forecast and the real time access to monitored variables by our stakeholders and competent organisations. This environmental "dashboard" inherits the results of the HADA project (Life02 ENV/E/000274), initiative sponsored by the European Commission through its LIFE Programme.</p> <p>The meteorological data comes from three automatic weather stations deployed in the breakwater and in two docks (San Diego and Centenario) dedicated to solid bulk handling. The environmental data comes from an air quality control station set up in San Diego Dock and equipped with analysers of sulphur dioxide, nitrogen oxide, carbon monoxide and a particle trap PM10, and from an multi-parameter water quality meter set up close to the breakwater mouth which register pH, Temperature, Dissolved Oxygen, Turbidity, Conductivity, Total Dissolved Solids, and chlorophyll-a. The oceanographic data comes from a couple of tides gauges and buoys close to the A Coruña port and punta Langosteira Harbor. The system receives weather, wave and currents forecast from the Spanish met office, the Spanish holding Puertos del Estado and the Galician met office. Moreover, at present time, are being developed two "Apps" to Android (Ondas e Vento A. P. A Coruña) and Iphone systems to receive the environmental data in mobile phones, iPads and Tablets.</p>
<p>Links:</p> <p>http://cma.puertocoruna.com (Android Market: Ondas e Vento A. P. A Coruña)</p>



Illustration:

Cuadro de Mando Ambiental - Puerto A Coruña - Windows Internet Explorer

Ubicación: Dique de abrigo
 Estado: Última Lectura: 31/07 08:00 GMT

Velocidad Viento: 2,7 Km/h Dir. Procedencia: E (87,8°)
 Última media horaria:
 PM10 (Med. Horaria): 5,8 ug/m3 NOX (Med. Horaria): 68,9 ug/m3 NO2 (Med. Horaria): 45,6 ug/m3
 CO (Med. Horaria): 0,5 mg/m3 SO2 (Med. Horaria): 4,7 ug/m3 Acceso Estación Control

Rosa viento y PM10 (Últimas 24 y 48 horas previas a 31/07 08:00 GMT Más información)

Vel. Viento (Kmh)
 + 70 Km/h 40 a <70
 20 a <40 6 a <20 - 6 Km/h
 Últimas 24 horas Últimas 48 horas

PM 10 (ug/m3)
 + 60 ug/m3 40 a <60
 20 a <40 10 a <20 - 10 ug/m3
 Últimas 24 horas Últimas 48 horas

Previsión Riesgos AEMET
 Elaborado: lunes, 21 abril 2012
 Validez: martes, 22 abril 2012 a las 00:00

Riesgos importantes y extremos:
 Nivel de riesgo importante
 Fenómeno Oceanográfico
 Procedencia Noroeste, Oeste

NOTA: Los datos mostrados corresponden a los últimos recibidos directamente por los equipos de medida. Aunque la Autoridad Portuaria emplea sus mayores esfuerzos en mantener los equipos funcionando correctamente, pueden darse datos erróneos por fallos en los dispositivos de medida. El contenido es meramente informativo y carece de efectos jurídicos vinculantes para la Autoridad Portuaria.

Mapa: Radar A Coruña - Reflectividad - Pluviometría
 PPI 2012-07-31 07:35 UTC



Port of Turku, Finland
Contact Person: Markku Alahäme Position: Quality Manager Email: markku.alahame@port.turku.fi
Environmental issue: Air quality
Response: Exemplify
<p>Air quality monitoring</p> <p>According to the Environmental Protection Act, it is the responsibility of a municipality to enhance air protection within its region. The municipality must therefore organise the necessary air quality monitoring system. An actor whose activities may cause air pollution must also be aware of the impact of such activities on the environment.</p> <p>In 1988, the Turku Region Air Protection Co-operative Group was established. Today the Turku Region Air Protection Co-operative Group consists of the municipalities around Turku area together with actors like the power plant and local energy producers, oil refinery and other industries, and also Port of Turku.</p> <p>Practical issues concerning air quality monitoring, e.g. reporting, are handled by the City of Turku's Environmental Protection Office. Actors taking part to air quality monitoring system share the costs mainly based on their calculated air emissions and the information gathered is available to all participants.</p> <p>The components monitored today in eight monitoring stations are nitrogen oxides (NO_x), particles (PM₁₀, PM_{2.5}), sulphur dioxide (SO₂), carbon monoxide (CO) and ozone (O₃) in Turku region.</p>
<p>Links:</p> <p>http://www.ilmanlaatu.fi/ilmanynt/nyt/ilmanynt.php http://www.ilmanlaatu.fi/ilmanynt/nyt/ilmanynt.php?as=Suomi&rs=430&ss=186&p=stationindex&ls=englanti http://www.ilmanlaatu.fi/ilmanynt/nyt/ilmanynt.php?as=Suomi&rs=430&ss=Valitse+mittauspaikka&p=stationindex&pv=04.09.2012&h=12&et=graph&ls=englanti</p>



Port of Helsinki, Finland

Contact Person: Aino Rantanen

Position: Quality and Environment Manager

Email: aino.rantanen@hel.fi

Environmental issue: **Air quality**

Response: **Exemplify** / **Enable** / **Engage**

On-line air quality monitoring in cooperation with authorities

Together with Helsinki Region Environmental Services Authority as part of the overall Helsinki Region air quality monitoring. Measured components include: nitrogen monoxide NO, nitrogen dioxide NO₂, sulphur dioxide SO₂, and fine particles PM_{2,5}.

There are stationary and mobile stations. The location of the mobile measuring stations varies every year, in 2012 the West Harbour, Hernesaari (cruise harbour) has a mobile station.

The results describe the impact of the harbour on general air quality in the area. Real time, online results in the webportal.

Links:

<http://www.hsy.fi/en/regionalinfo/airquality/measuringstations/harbour/Pages/default.aspx>



Port of Piraeus, Greece
Contact person: Chryssanthi Kontogiorgi Position: Head of Environmental Protection Department Email: kontogiorgich@olp.gr
Environmental issue: Air quality
Response: Exemplify / Engage
<p>Port Air Quality Monitoring Programme</p> <p>Air quality is an issue of major concern for the city of Piraeus, due to the high density of population and the large number of commercial activities concentrated at the coastal zone. As the port of Piraeus is located in direct proximity to the residential areas, according to the environmental terms issued by the competent national authorities for port's operation, PPA SA should identify the level of the air emissions generated by its operations and assess its effects to the wider air quality.</p> <p>The main port activities involved in air emissions are:</p> <ul style="list-style-type: none"> • Shipping, especially at the passenger port (operation at berth, movement during arrival-departure) • Cars and trucks embarkation and disembarkation to/from ships • Cars of port personnel and users • Trucks carrying goods <p>A station for monitoring the air quality has been installed on the west area of the central port of Piraeus, suitably equipped with specialized instruments and calibrated to measure/record the concentration of specific air pollutants during all day. The monitoring program is implemented in cooperation with the National Technical University of Athens. The station was launched on 20.11.2009 and is capable to monitor the following parameters: Nitrogen oxides (NOX), Sulfur dioxide (SO2), Carbon monoxide (CO), Ozone (O3), Particulate matter PM10, Benzene (C6H6), Toluene (C7H8), Ethylbenzol and Xylenes. The measured concentrations are recorded and kept on appropriate files in order to provide reference and data for analysis and assessment. As the passenger port is the most loaded in terms of ships' calling (cruise ships, coastal navigation), the station has been installed within this area</p> <p>The installation and operation of the Monitoring Station has helped PPA SA to identify the main sources of air pollution within the port area, to record all significant air pollutants and assess the extent of the contribution of port operations to the air quality of the wider municipal-residential area.</p>
<p>Links:</p> <p>http://www.olp.gr/en/nature-protection/nature-quality</p>

Illustrations:



Port of Rauma - Port operating company Rauma Stevedoring (Euroports group), Finland

Contact Person: Juha Arvo

Position: Safety Manager

Email: juha.arvo@euroports.fi

Environmental issue: **Air quality**

Response: **Exemplify**

Improving air quality and bulk material handling performance

Neighbours close to Port of Rauma had complained about air quality during bulk (kaolin for paper industry) unloading operations. Measuring showed that values of PM₁₀ size particles were too high in the neighbourhood during windy weather.

In 2009 the port operating company Rauma Stevedoring invested over 4 million euros in a new unloading funnel and changing and encasing the conveyor belt system leading to the storage. After installation of the new facilities PM₁₀ levels have always stayed well below the highest permitted levels in all conditions.

Bulk handling performance doubled from 500 to 1000 tons per hour - the investment has been successful also from the financial point of view.



Enabling; providing conditions that facilitate users and enhance improved performance

Port of Dover, United Kingdom
Contact Person: Vicki Case Position: Environmental Manager Email: vicki.case@doverport.co.uk
Environmental issue: Air quality
Response: Enable
<p>Redesigning the ferry terminal</p> <p>Air Quality is an important local issue in Dover as the port and its main approach road, the A20, is immediately adjacent to the town centre. Over 4,000 freight vehicles per day travel along the A20 to the ro-ro ferry berths resulting in high levels of nitrous oxides. The A20 has been designated an Air Quality Management Area by the local authority, with which the port works closely to deliver air quality improvements. Traffic congestion significantly exacerbates the emissions and therefore the main mitigation is to maintain traffic flow.</p> <p>The ferry terminal (representing Europe’s busiest international ferry port) is an intensely used and space constrained (surrounded by the famous White Cliffs and harbour) 24/7 facility that has developed over many years. The Port has created a major new and innovative scheme that completely redesigns the entrance to the terminal, forming a buffer zone that provides assembly space removed from the port’s internal road network and approach roads for 220 freight vehicles.</p> <p>Without the buffer zone, when traffic volumes exceed the uptake capacity of an individual ferry operator, the traffic queues out of the port and along the A20. Once the queue passes the port entrance there is no way to accept traffic from any operator. Therefore all ro-ro traffic is delayed on the approach road to the port whilst at the berth the vessels of those operators who have not exceeded their uptake capacity have to sail below capacity. The proposals will accommodate the traffic of the affected operator whilst allowing the traffic of other operators to travel through the port unhindered. Due for completion in 2013, the project is expected to significantly improve traffic flow and reduce congestion and associated air quality issues along</p>

the A20 as well as creating a more efficient operating environment for our customers.

Links:

Further information about this project can be found on the Port of Dover website at the following link:

<http://www.doverport.co.uk/?page=PorDevelopmentTerminal1>

Illustrations:



Port of Gothenburg, Sweden



Contact Person: Susann Dutt (general questions), Lars-Göran Nilsson (technical questions)

Position: Manager Sustainability, Maintenance manager electrical

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Environmental issues: **Air quality / Energy conservation and climate change / Noise management**

Response: **Enable / Engage**

Onshore Power Supply for seagoing vessels

Onshore power supply (OPS) for seagoing vessels is a measure to improve air quality in ports and port cities. By replacing onboard-generated power from diesel auxiliary engines with electricity generated onshore, a substantial reduction of air pollutants and noise is achieved as well as the reduction of carbon dioxide emissions (depending on the energy source).

In 2000, the Port of Gothenburg was the first in the world to offer OPS with high-voltage. That was the year that Stora Enso connected its vessels to OPS. In 2011, a further step was taken towards cleaner shipping when Stena Line began operating a new OPS facility for the company's new ferries used on the route to Germany. What is unique about this facility is that it transforms the standard frequency of 50 hertz for alternating current in Europe to 60 hertz, which the majority of vessels use as a system frequency.

At present, the passenger and freight ferries (ro-ro vessels) that are used in scheduled traffic within Europe use this technology. Today 10 vessels are equipped for the technology and 5 quays are offering Onshore Power Supply in the Port of Gothenburg. In total, one in every three vessels that calls at the port can now turn off its diesel engines at the quayside and use onshore power supply. The power is supplied by environmentally labeled electricity like wind power. The shipping lines using the technology are Stena Line, Cobelfret and Transatlantic.

The aim in the short term is that all ro-ro vessels and passenger ferries will be connected to shoreside power. In the longer term, the aim is that by 2015, 40 per cent of all vessels that put into the Port will use OPS.

Links:

<http://www.portofgothenburg.com/About-the-port/Sustainable-port/>
www.onshorepowersupply.org

Illustration:



Ports of Stockholm, Sweden



Contact Person: Gun Rudeberg

Position: Company Lawyer and Head of Environmental Affairs

Email: gun.rudeberg@stoports.com

Environmental issue: **Air quality / Energy conservation and climate change / Waste**

Response: **Enable / Encourage**

Differentiated port fees

In 1998, Ports of Stockholm implemented a system with environmentally differentiated port fees as an incentive for shipping companies to reduce their environmental impacts. Even before that, in 1991, a voluntary agreement was reached applying to the regular services between Sweden and Finland to use fuel with a sulphur content of 1 percent, which implied a reduced fee. Also, in 1993 discounts were introduced for double hull tankers. With the system, shipping companies using our ports pay a discounted fee when they call in to our ports if they meet certain environmental standards. Discounts are given to vessels that use low sulphur fuels (< 0,5 percent) and to vessels that have implemented measures to reduce nitric oxide emissions such as catalytic converters fitted to all engines.

To encourage cruise liners to sort and recycle their waste Ports of Stockholm also give a discounted fee for waste disposal. A fee is imposed regardless of whether or not the vessels leave waste; the no-special-fee system is applied, but vessels receive a discount of about one-third of the fee for each passenger if the waste is sorted. Furthermore, Ports of Stockholm provides onshore power supply which is subject to a tax reduction in Sweden and therefore it can be seen as another economic incentive, similar to the differentiated port fees.

Since implementing the differentiated port fees Ports of Stockholm have noticed a significant increase in the measures taken by the shipping companies in order to reduce their environmental impact. The large amounts of discounts that have been given have thus paid off in terms of improved environment, despite an increase in traffic.

Links: Prices for services 2012

<http://www.stockholmshamn.se/Documents/EN/SH%20Pricelist%202012%20version%20120201.pdf>

Illustrations:





Port of Antwerp, Belgium

Contact Person: Kris De Craene

Position: Manager of the Environmental Department

Email: kris.dekraene@haven.antwerpen.be

Environmental issue: **Air quality**

Response: **Enable**

Shore-side electricity services for barges

An initiative reducing the environmental impact of port operations carried out along the shore-side interface relates to barges at berth. On the one hand, the Antwerp Port Authority is developing a renewal programme of shore-side power infrastructure for barges within the port area; the existing infrastructure dates back to the 1980's and does not meet modern service standards. On the other hand, an integrated system is being developed for the electronic payment of different services provided by the port authority, including, besides the availability of shore-side power, the delivery of drinking water and the collection of waste. Once this integrated system is in place, barge operators will be able to make use of one single digital window. Such an integrated, user-friendly service will enable barge operators to fully focus on their core business in the port of Antwerp. A pilot project on a specific location in the port for a limited period of time is set to provide more detailed insights into the operational, practical and financial preconditions, restrictions and opportunities. During the first pilot phase, the Antwerp Port Authority pays for the shore-side electricity under the condition that the barge operator makes no use of generators while at berth.

A communication strategy has been put in place, focusing on adequately informing and thereby stimulating barge operators to make use of the facilities. In a way, this can be considered as the "twin initiative" of the mandatory use of BTS. BTS aims at increasing the efficiency regarding the container barge handling in the port of Antwerp, while the renewed shore-side electricity programme seeks at minimizing the emissions of barges during the – reduced – time at berth. The common element of these complementary tools lies in the ambition to trigger and facilitate (container) barge terminals and barge terminal operators to decrease their environmental footprint by optimizing their operational efficiency.



Port of Ystad, Sweden

Contact Person: Björn Boström

Position: Managing Director

Email: bjorn.bostrom@ystad.se

Environmental issue: **Air quality / Energy conservation and climate change / Noise management**

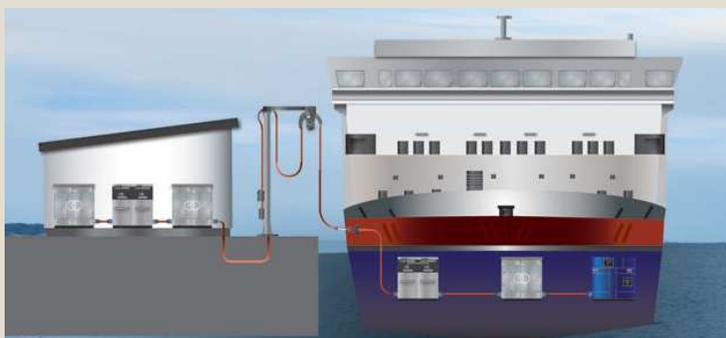
Response: **Exemplify / Enable / Engage**

Onshore Power Supply and clean own vessels

The port of Ystad has installed Onshore Power Supply (OPS) at all ferry berths. The facility, which currently is the world’s largest, enables the vessels to turn off all main and auxiliary engines powered by fossil fuels during laytime in the Port. At the end of the year, after a testing period, the system will be up and running in full scale with onshore connected vessels on a daily basis. Various measurements will then be performed making it possible to calculate the achieved effect, both in terms of emissions of carbon dioxide, sulfur dioxide, nitrogen dioxide and noise emissions.

In addition, the whole fleet of tug masters has been replaced with new environmentally friendly ones equipped with the lasts available technology. The port of Ystad is situated close to the city center and effects the immediate urban environment. The investment is expected to get the effect that residents consider the port of Ystad as a company at the forefront. A concrete and clear impact on the population is expected to reduce the disruptive diesel smell. The smell and the low frequency noise are perceived by the publics as the direct tangible evidence of noxious and noise in the neighborhood.

Illustration:





Port of Trelleborg, Sweden

Contact Person: Ulf Sonesson

Position: Manager Infrastructure Development

Email: ulf.sonesson@port.trelleborg.se

Environmental issue: **Air quality / Energy conservation and climate change / Noise management**

Response: **Enable / Engage**

Onshore Power Supply

Today OPS facilities are available in two ferry berths, however the first ship has not yet connected – i.e. per Aug 2012. OPS for remaining ferry berths is under construction and will be available for ferry liners within the near future.

The port is supplying 4 transformers, 7 connection stations with control panels - 10 kV, 50 Hz. 4 MW are available in the first step, but 7 MW are required (considering the ferries berth time and aggregate effect). Thus the city's power supply capacity has to be expanded. All ferry berths will be equipped with OPS facilities in 2012.



Encouraging; providing incentives to greener port users

Port of Le Havre Authority, France

Contact Person: Jean-Paul Raffini

Position: Deputy Head, Department of Environment

Email: jean-paul.raffini@havre-port.fr

Environmental issue: **Air quality / Energy conservation and climate change**

Response: **Encourage / Engage**

Environmental Ship Index in the Port of Le Havre and prospects on the Seine river (HAROPA)

From 2009, port of Le Havre – in close partnership with the ports of Amsterdam, Antwerp, Bremen, Hamburg and Rotterdam – has jointly started to establish and implement an “Environmental Ship Index” (ESI). Carrying on its involvement in this port collective initiative started on the North-West European range, the port of Le Havre Authority adopted a new incentive policy in December 2011, aiming at encouraging shipping companies to go beyond the requirements of the regulations (ships fitted with higher-performance or less fuel consumption equipment, giving preference to low sulphur content or less polluting fuels, generating less emissions in SO₂, NO_x, CO₂ or particulate matters...).

From this year, the opportunity is thus offered to the 10 cleanest container or ro-ro shipping lines as regards their emissions into the air to be granted an « environmental reward »: the latter can reach up to the equivalent of 10 % of the port dues on ships. Practically, an agreement (Environmental Charter) is signed between the Port and each shipping company wishing to do so. This agreement mentions the joint commitments and the terms under which the ESI is applied in Le Havre and states all granting conditions (to have a minimum score of 25 points). With this aim in view, a funds dedicated to the « ESI » has been especially created within the Environment Department and will be used to finance the environmental rewards.

This initiative which applies the « World Port Climate Initiative » is echoed in a concrete way in the biggest world ports, private terminals, but also within the main shipping lines calling at the port of Le Havre, most of them subscribing to the ESI; in a near future, the ports of Rouen and Paris have decided to carry out



feasibility studies also aiming to extend and strengthen clean navigation along the Seine artery.

Links:

<http://esi.wpci.nl/Public/Home>

Illustrations:



**Environmental Charter of
Grand Port Maritime du Havre for the implementation of
the Environmental Ship Index (ESI)**

Whereas :

- on 11 July 2008 the Grand Port Maritime du Havre joined 55 other ports in signing the international declaration of the World Port Climate Initiative (WPCI) to fight climate change and actively contribute to the improvement of the air quality by encouraging ships to reduce their greenhouse gas emissions (GHG);
- the Grand Port Maritime du Havre has willingly contributed to the creation and development of the Environmental Ship Index (ESI) since its inception along with the five founding others ports in 2009;
- the purpose of the Environmental Ship Index (ESI) is to promote clean shipping to improve air quality and preserve the environment;
- France's Second Grenelle Act of 12 July 2010 aims to reduce GHG emissions;
- on 27 September 2011 the Grand Port Maritime du Havre signed the shared commitments of the Le Havre climate and energy plan to reduce GHG emissions throughout the community and lower its vulnerability to climate change;
- on 29 November 2011 the Management Board decided to deploy the Environmental Ship Index in the Port of Le Havre following the specifications of this charter:

In 2012, further to its other environmental protection initiatives, the Grand Port Maritime du Havre has decided to reward those shipping companies that operate the most environment-friendly ships in Le Havre.

Starting 1 January 2012, the ten sea-going container or ro-ro shipping lines (PCC, PCTC and CONRO) with the best performance in terms of reducing air emissions will receive an "environmental reward" consisting of a discount of up to 10% on port dues for ships (following the 2012 pricing conditions set up in the Port of Le Havre).



Ports of LE HAVRE, ROUEN and PARIS



Port of Rotterdam Authority, The Netherlands

Contact Person: Maurits Prinssen

Position: Project manager sustainable development (shipping)

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Environmental issue: **Air quality / Energy conservation and climate change**

Response: **Encourage**

Incentives for cleaner sea going and inland ships

Air quality and deposition of classical pollutants may block developments in port areas. Stricter standards for the emissions of NO_x, soot and CO₂ applicable to all or new built vessels is a good start for getting a cleaner fleet in our port.

Beside this the Port of Rotterdam Authority is of the opinion that ship operators that invest in clean technologies or running on cleaner fuels should be rewarded. From January 1, 2011, clean seagoing ships which score 31 points or more on the Environmental Ship Index (ESI) receive 10% discount on the GT section of their port dues in the port of Rotterdam. Ship owners can register their vessels for an ESI score on the website of the World Climate Initiative (under the auspices of the IAPH): www.wpci-esi.org. In order to be eligible for the ESI discount in Rotterdam, the agent or shipbroker must complete an application form after every visit by the vessel. Several ships can be registered on one form. Following verification, the discount is confirmed by letter and then we proceed to payment. The agent or broker is responsible for making the discount over to the ship's owner. 25 vessels received the reduced Port Dues in 2011 and in the first half year of 2012 already 61 vessels received their discount.

Also for inland navigation the Port of Rotterdam Authority introduced an environmental differentiation in the port dues:

Cat. 1 Ships with engines that do not meet the CCNR II emission requirements (+10%).

Cat. 2 Ships with engines that do meet the CCNR II emission requirements (0%).

Cat. 3 Ships with a valid Green Award Certificate (-15%).

Cat. 4 Ships with engines that are more than 60% cleaner than the CCNR II emission requirements (-30%).



Cat. 5 Ships without engines/barges (0%).

Links:

Incentive program seagoing vessels:

<http://www.portofrotterdam.com/en/Shipping/harbour-dues/Pages/Apply-ESI-discount.aspx>

IAPH website for Environmental Ship Index:

www.wpci-esi.org

incentive program inland navigation:

<http://www.portofrotterdam.com/en/Shipping/harbour-dues/Pages/harbour-dues-inland-shipping.aspx>



Ports of Bremen / Bremerhaven, Germany

Contact Person: Jochen Kreß

Position: Environmental Manager, Ministry of Economic Affairs and Ports, Bremen

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Environmental issue: **Air quality / Energy conservation and climate change**

Response: **Encourage**

Environmental Ship Index (ESI)

The Ports of Bremen/Bremerhaven together with other European ports want to take responsibility against climate change and for good Environmental performance above the legally required standards. Therefore they have implemented the Environmental Ship Index (ESI) in their ports charge system from January 2012 onwards. The ESI is one key project of World Port Climate Initiative where Bremen/Bremerhaven together with other 54 of the world's key ports have committed themselves reducing their greenhouse gas emissions (GHG). ESI was worked out by a group of north-west European ports including Bremen /Bremerhaven and evaluates the amount of nitrogen oxide (NO_x), sulphur oxide (SO_x) that is released by a ship and includes a reporting scheme on the greenhouse gas emission of the ship. The ESI is a good indication of the environmental performance of ocean going vessels and will assist in identifying cleaner ships in a general way. If a ship performs better than legally required participating ports give incentives in different ways. In Bremen ESI has been implemented as follows:

- Environment-friendly ships can be granted a discount on tonnage charges on submission of an ESI certificate issued by WPCI (World Ports Climate Initiative) by 31 March of each year.
- A total of 25 ships with the best ESI score ≥ 20 will receive the following discount:
 - a. ships with a score of between 20 and 30 ESI points will receive 5 % discount per port call;
 - b. ships with 31 ESI points or more will receive 10 % discount per port call.

The discount will be granted at the end of the year and the figures verified by bremenports.

For ship owners these rebates sum up with rebates they get in other ports in equivalent incentive schemes.

Links:

<http://www.bremenports.de/en/location/port-charges/environment-based-tonnage-charge>

<http://esi.wpci.nl/Public/Home>

<http://senatspressestelle.bremen.de/sixcms/detail.php?gsid=bremen146.c.36417.de>



Port of Hamburg, Germany
<p>Contact Person: Hendrik Hollstein</p> <p>Position: Deputy of Environmental Strategy</p> <p>Email: hendrik.hollstein@hpa.hamburg.de</p>
<p>Environmental issue: Air quality / Energy conservation and climate change</p>
<p>Response: Encourage</p>
<p>Environmental Ship Index (ESI)</p> <p>Stricter air quality standards and interest for nearby residents prompt port authorities to take stricter measures to improve air quality in their ports. The development of an Environmental Ship Index (ESI) is a project within WPCI. The ESI identifies seagoing ships that perform better in reducing air emissions than required by the current emission standards of the International Maritime Organization. The ESI evaluates the emissions of nitrogen oxides (NO_x) and sulphur oxides (SO_x) of a given ship while rewarding ships that report on their greenhouse gas emissions. The ESI is a good indication of the environmental performance of ocean going vessels and assists in generally identifying cleaner ships.</p> <p>The index is intended to be used by ports to reward ships when they participate in the ESI and will promote clean ships, but can also be used by shippers and ship owners as their own promotional instrument. ESI aims at achieving a genuine reduction in emissions of NO_x, SO_x and particulates, as well as CO₂ in the longer term, to be achieved by initiating changes in behaviour among ship owners/operators and ports. In Hamburg, vessels with an ESI score above 20 points are granted a discount on the harbour dues up to 10%</p>
<p>Links:</p> <p>http://www.wpci-esi.org/Public/Home</p>
<p>Illustration:</p> <div style="text-align: center;"> </div>



Port of Gothenburg, Sweden

Contact Person: Åsa Wilske

Position: Senior Manager Sustainability, Manager Sustainability

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Environmental issue: **Air quality / Energy conservation and climate change**

Response: **Enable / Encourage / Engage / Enforce**

Economic support for cleaner shipping

During 2011-2012, a campaign is taking place directed at the port's customers – the shipping companies. The campaign means that vessels that opt for cleaner fuel whilst operating in the port's fairways will be compensated financially. Vessels classified as green according to an international index will also be compensated. Shipping companies can also apply for financial support to convert their vessels to run on LNG (liquefied natural gas) or equivalent clean fuels.

Port of Gothenburg has the ambition to encourage cleaner shipping. For several years the Port of Gothenburg has applied an environmentally differentiated port charge. Shipping lines that use fuel with a sulphur content higher than 0.5 per cent pay a surcharge. It is the income from this sulphur surcharge that is now reinvested in shipping lines that are investing in the environment. The reimbursement has been arranged in consultation with the Gothenburg Shipbrokers' Association, environmental organisations and a number of the port's customers. The port's customers can choose to take part in one of the following programmes:

- Improved fuel quality: The Port of Gothenburg supports shipping lines and operators that opt for a fuel with a maximum sulphur content of 0.1%. The extra cost of using cleaner fuel within the Gothenburg traffic area will be compensated up to SEK 250,000 per year for each vessel.
- Green vessels according to the Clean Shipping Index: Support for vessels classified as green or offering "good environmental performance", according to the Clean Shipping Index. Read more about the Clean Shipping Index at www.cleanshippingproject.se. These vessels can apply for reimbursement of the port charge up to SEK 60,000.
- Conversion to cleaner fuel: The Port of Gothenburg provides support to shipping companies that invest in the conversion of their vessels to LNG or other alternative fuels, such as methanol.

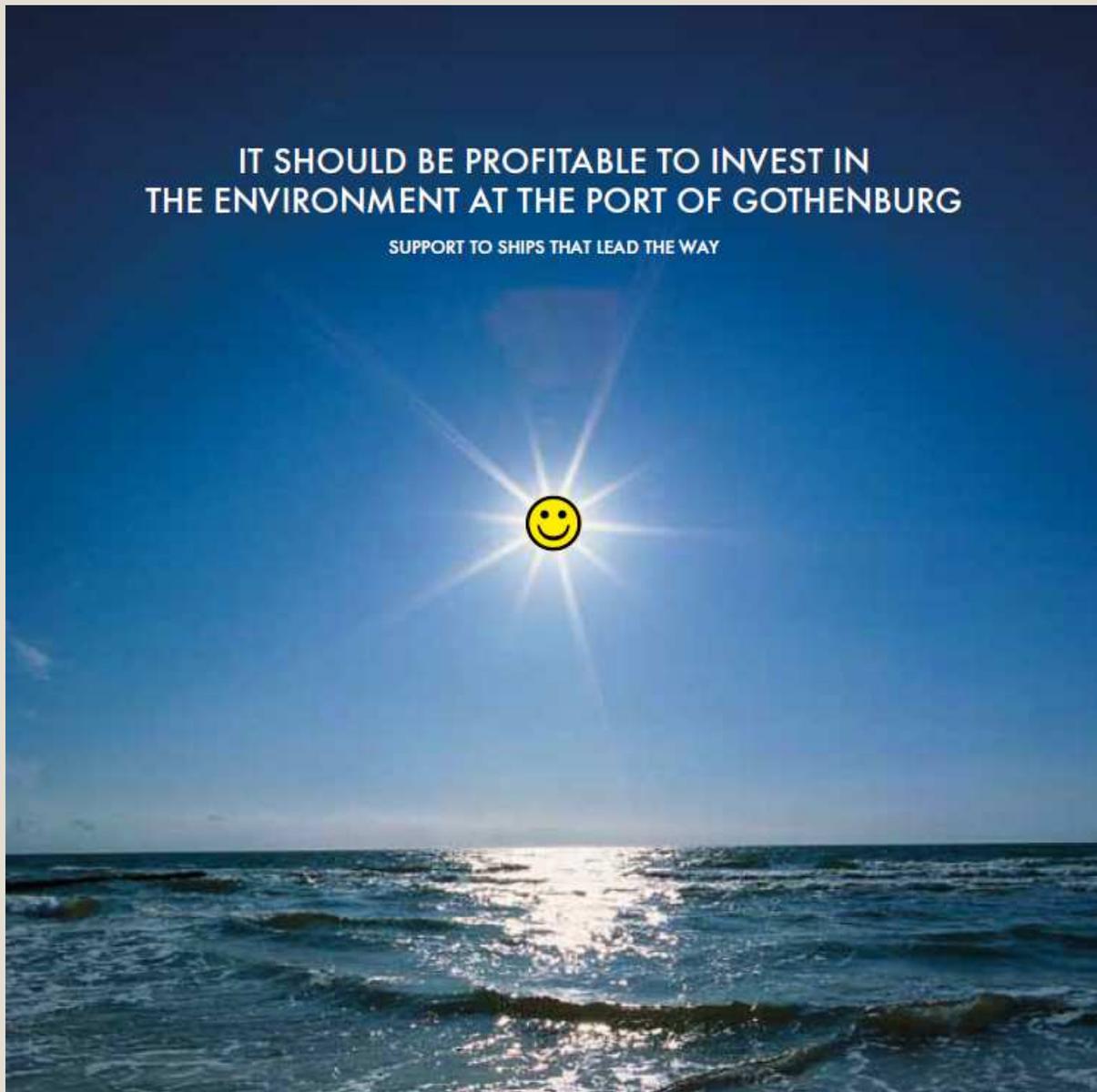


Links:

<http://www.portofgothenburg.com/About-the-port/Port-Tariff/>

<http://www.portofgothenburg.com/About-the-port/Sustainable-port/Support-for-shipping-companies-that-invest-in-the-environment-/>

Illustration:





Port of Antwerp, Belgium

Contact Person: Kris De Craene

Position: Manager of the Environmental Department

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Environmental issue: **Air quality**

Response: **Encourage**

Stimulating investments on state-of-the-art terminal equipment

Terminal operators acquiring more environmentally-friendly equipment of course contribute in a very direct way to environmental progress. This does not only go for the port and its wider surroundings, but also for their own employees working in cleaner and safer labour conditions. From this perspective, the Antwerp Port Authority has developed a sustainable policy initiative to stimulate investments in state-of-the-art terminal equipment. By means of a financial impulse scheme, the Antwerp Port Authority wants to stimulate and accelerate the transition towards green terminal equipment including, amongst others, forklifts, straddle carriers, mobile cranes, reach stackers and ro-ro-trackers. The envisaged investments vary from engine retrofits and engine replacements to fuel transitions or even complete equipment replacements. The impulse scheme is organised through an (annual) call system. The subsidy budget per call – 400.000 euro in the first phase – is spent on the basis of a ranking in accordance with detailed evaluation criteria. By allocating part of the budget to demonstration projects, the programme provides room for innovation. The financial incentives for speeding up emission reducing measures related to terminal equipment are based on the maxima allowed under the framework of the European de minimis rules for state aid.

Illustration:





Engaging; with users and/or authorities in sharing knowledge and skills

Port of Gothenburg, Sweden

Contact Person: Jill Söderwall

Position: Vice President Business Area Energy & Cruise

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Environmental issue: **Air quality / Energy conservation and climate change**

Best practice addressing: **Enable / Engage**

Liquefied Natural Gas (LNG)

During the next few years, shipping will be subject to much stricter environmental stipulations. Emissions must be reduced substantially and new, alternative fuels are required. One such fuel is liquefied natural gas (LNG). LNG is a natural gas that is cooled down to -163°C and temporarily transformed into liquid form. It then takes up 600 times less space than it does as gas. It comprises mostly methane gas. During combustion, it produces lower emissions of carbon dioxide and nitric oxide compared with using oil. Above all, it has considerably lower emissions of sulphur compounds and particles.

Port of Gothenburg is taking an active role in order to facilitate the use of LNG as ship fuel. We see it as an important part of sustainable development to be at the forefront in order to create necessary infrastructure and inspire other ports around the North and Baltic Seas. The aim by Port of Gothenburg is to have an LNG terminal in place by 2015. Freight vessels should not need to put into a special energy terminal. Instead bunkering should be handled by bunker vessels during loading and discharge, exactly as is the case today. In June 2012 Swedegas and Royal Vopak announced that they are looking at the feasibility of setting up a joint venture LNG terminal in Gothenburg. According to the companies, the terminal could be completed as early as 2015.

The Port of Gothenburg takes part in the international work related to LNG within World Ports Climate Initiative.

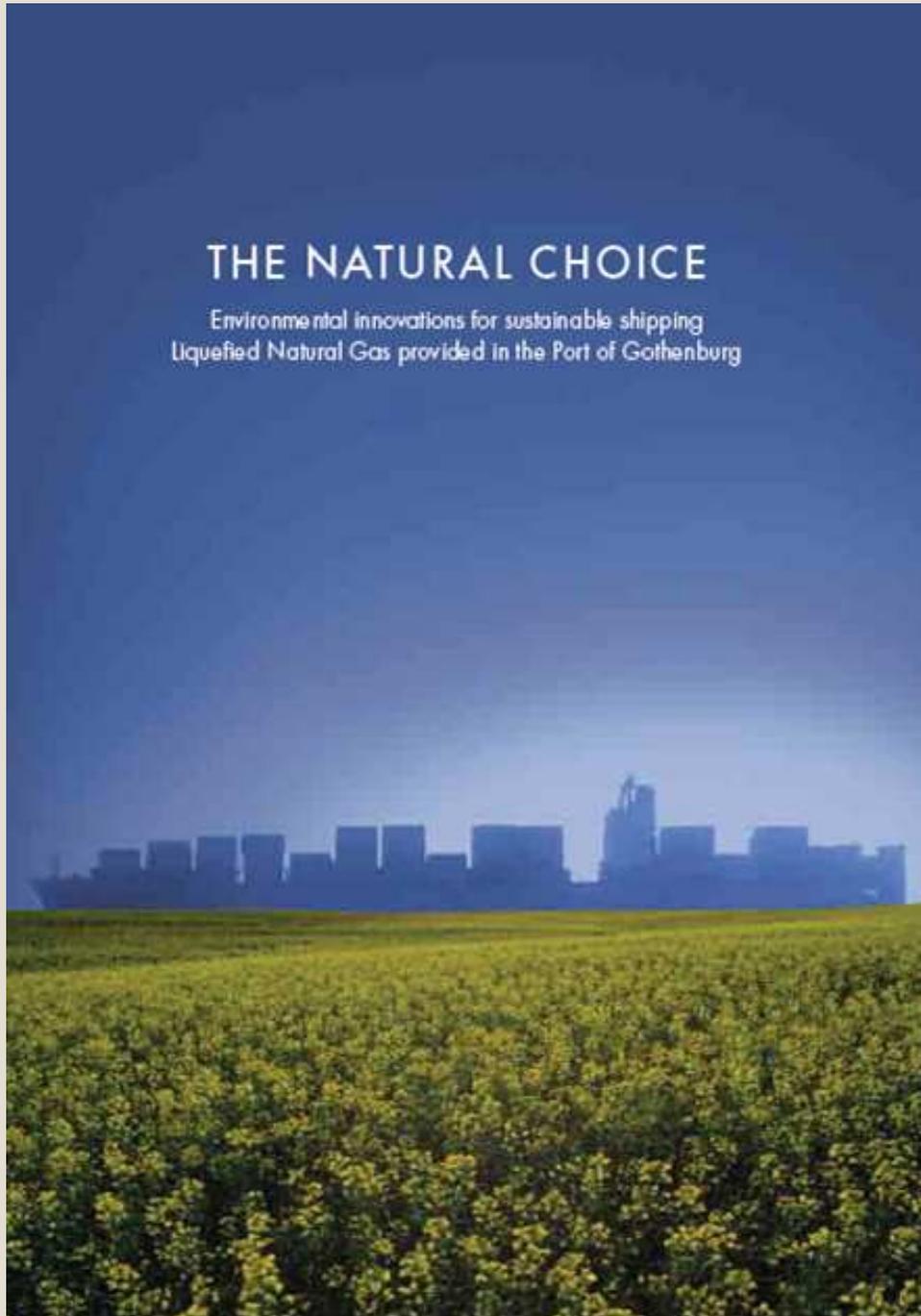
Links:

<http://www.portofgothenburg.com/About-the-port/Sustainable-port/Liquefied-natural-gas--LNG/>

<http://wpci.iaphworldports.org/project-in-progress/lng-fueled-vessels.html>



Illustration:





Port of Rotterdam Authority, The Netherlands

Contact Person: Maurits Prinssen

Position: Project manager sustainable development (shipping)

Email: mmwj.prinssen@portofrotterdam.com

Environmental issue: **Air quality / Energy conservation and climate change / Waste management / Water quality**

Best practice addressing: **Enable / Engage / Enforce**

Liquefied Natural Gas

Stricter standards for seagoing vessels (ECA area for Sulphur) but also CCR IV for new inland barges opens the horizon for clean technologies and fuels. Ship owners may choose for abatement technologies, but we see more and more interest for the cleaner fuel LNG (Liquefied Natural Gas). The fuel reduces the emissions from the exhaust dramatic and may also result in less CO2 emissions. In contrast to diesel fuel the LNG will not produce any waste (ANNEX I: oil sludge/slob) and can't pollute the harbour water.

To facilitate LNG fuelled vessels the Port of Rotterdam Authority has already an incentive scheme in place and will adapt their Port Bye Laws. To start with inland navigation before the end of this year and next year(s) for bunker activities for seagoing vessels. Beside this we participate in several expert groups (e.g. IAPH/WPCI/LNG) and involve other authorities for this new fuel in the discussions about the environmental benefits and safety issues. Together with the ports of Amsterdam, Zeeland, Antwerp and the Dutch Ministry of Infrastructure and Environment we asked DNV to study the safety issues on the water for LNG-vessels. This study is available for other authorities and relevant stakeholders.

In Rotterdam the first LNG driven inland barge bunkers every 2 weeks. More bunker facilities will be developed in the near future.



Port of Bremen/Bremerhaven: Germany

Contact Person: Bjela Koenig

Position: Master mariner & expert for maritime sustainability (Bremenports GmbH & Co. KG)

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Environmental issue: **Air quality / Energy conservation and climate change**

Best practice addressing: **Exemplify / Enable / Engage**

Liquefied Natural Gas

In July 2008 the Ports of Bremen and Bremerhaven signed the World Ports Climate Declaration and started to work actively on the reduction of greenhouse gases in the whole transport chain. To reduce ship based emissions in the ports of Bremen and Bremerhaven the management company Bremenports decided to actively support the future use of liquefied natural gas (LNG) as ship fuel. In maritime circles of experts LNG represents a bridging technology in the short- and mid-term on the way to emission-free fuels. Since November 2011 bremenports works on the realisation of a depot for LNG in the port of Bremerhaven. To ensure immediate absorption of LNG after having completed the planning and build-up of the LNG depot, bremenports decided to become a consumer itself. Therefore the consideration concerning LNG driven service ships owned by bremenports started in January 2012, shortly after the first planning for the port's LNG depot. By working on own ships with LNG drive, bremenports encourages other companies located in the port to weigh the advantages of LNG as a fuel. If requested exchange of know-how and technical discussions are offered to local companies that are managing tug boats, bunker vessels, supply and service ships, small ferries or even trucks and buses. If these companies have reassurance that LNG will be available in the port in appropriate time, it is more likely that they will invest in the use of LNG.

This holistic approach of bremenports, both as promoter of LNG supply and future LNG consumer, facilitates the development of a prospering LNG infrastructure in the ports of Bremen and Bremerhaven. LNG will be available in Bremerhaven before the new sulphur limits of 0.1% in ship fuels will become effective in the SECAs (sulphur emission control areas). At the same time the first LNG driven ships are planned to be in service in both ports. To share our own knowledge by means of good practice examples, bremenports is active in international (e.g. WPCI WG LNG), national, regional and local initiatives.



Ports of Stockholm, Sweden

Contact Person: Gun Rudeberg

Position: Company Lawyer and Head of Environmental Affairs

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Environmental issue: **Air quality / Energy conservation and climate change / Water management**

Response: **Engage**

Collaboration agreements with other ports

With its brackish water, the Baltic Sea is an especially vulnerable environment. A number of studies have been performed over the years and talks have been held at different levels concerning what actions to take and how to improve the situation in the Baltic Sea.

Within the EU, a strategy for the Baltic Sea region was adopted in 2009, based on four pillars; improving the environment, increasing prosperity, making the region more accessible and attractive as well as safety and security. The strategy's implementation is dependent on cooperation.

One example of how to improve the environment by cooperation is that Ports of Stockholm have reached agreements with two ports, Ports of Helsinki (2009) and Ports of Turku (2011), in order to develop, collaborate and work jointly to continue with concrete efforts for an improved environment. Discussions are also held with other ports in the Baltic Sea to reach similar agreements.

Areas for collaboration is widening the use of shore power, receiving black- and greywater and enabling bunkering of LNG. With the agreement, the ports also commit to further developing cooperation with other ports in the Baltic Sea in order to stimulate the work being done to reduce the environmental impact, from shipping in general and ports in particular.



Port of Rotterdam Authority, The Netherlands

Contact Person: Maurits Prinssen

Position: Project manager sustainable development (shipping)

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Environmental issue: **Air quality**

Response: **Engage**

Cooperation for less ships' emissions

The mission of the Platform Ships' Emissions is to reduce ships' emissions in a way that enhances the competitiveness of the maritime sector in the Netherlands. This is done by promoting cooperation and the sharing of knowledge on emission reduction methods. The platform is an initiative from within the maritime sector to unite business and environmental interests. The partners in the platform are Holland Marine Equipment Association, MARIN, North Sea Foundation, Port of Rotterdam Authority, Royal Association of Netherlands' Ship-owners and TNO.

The platform takes a broad approach towards the emission' problems and solutions, thus contributing to an overview for all the stakeholders in industry, government and others. As the focus of the platform is on the Dutch maritime sector and environment, part of the information is in Dutch. However, as many sources are in English, you will also find many English documents on the website and some workshops are. In the almost 5 years of existing the platform organized 21 workshops, 2 expert meetings and published the results and presentations on the website. Beside this, also relevant documents may be published on the website.

Links:

Website: www.scheepsemisies.nl

LINKEDIN: https://www.linkedin.com/groups?home=&gid=3902022&trk=anet_ug_hm



Enforcing; setting rules and ensuring compliance

There were no pure enforcing examples provided in this first version of the Good Practices Annex. Enforcing elements are present on a couple of the provided examples but those were considered to address better other Es and therefore were classified under the above sections. As also mentioned within the ESPO Green Guide, it should be noticed that the enforcing element is seen by port authorities as a last resort instrument in line with their belief that a lot can be achieved through cooperation and common understanding in line with the principle of self-regulation.

Energy conservation and climate change

Summary of port contributions



The table below summarises the port contributions in the field of energy conservation and climate change in order of appearance.

	Port	Exemplify	Enable	Encourage	Engage	Enforce
1	Rotterdam	+				
2	Ghent	+				
3	Dover	+	+	+	+	
4	Bremen	+	+		+	
5	Valencia	+			+	
6	Setubal	+				
7	Aalborg	+				
8	Aalborg	+			+	
9	Hamina Kotka	+	+		+	
10	Gothenburg		+		+	
11	Antwerp			+	+	
12	Amsterdam			+	+	
13	Gothenburg	+	+		+	
14	Hamina Kotka	+	+		+	
15	Antwerp		+		+	+



Exemplifying; setting the good example when managing own operations

<p>Port of Rotterdam Authority, The Netherlands</p>
<p>Contact Person: Maurits Prinssen</p> <p>Position: Project manager sustainable development (shipping)</p> <p>Email: mmwj.prinssen@portofrotterdam.com</p>
<p>Environmental issue: Energy conservation and climate change</p>
<p>Response: Exemplify</p>
<p>Calculation of the port authority carbon footprint, reporting and setting reduction targets</p> <p>Since 2007, the Port of Rotterdam Authority publishes a yearly footprint report regarding CO2 emissions from its own operational activities. For the CO2-reporting methodology the Green House Gas - protocol (GHG) is used. The Port of Rotterdam Authority owns a fleet of approximately 25 vessels for various port control services, leases some 170 cars and 50 operational vehicles. The Port of Rotterdam Authority owns, operates and leases various buildings to accommodate approximately 1200 employees and operational activities. Furthermore, the Port of Rotterdam Authority is responsible for the maintenance of waterways, dredging and constructing activities. This footprint addresses CO2-emissions of energy use of buildings and transportation needed for daily activities and operations.</p> <p>For the following operational activities the GHG-boundaries are:</p> <ul style="list-style-type: none"> • Scope 1: direct CO2-emissions of vehicles and vessels, gas use of building; • Scope 2: CO2-emissions related to the electricity usage of owned or leased buildings; • Scope 3: indirect CO2-emissions of business flights and commuting employees. <p>In 2010 the Port of Rotterdam Authority published a Business Plan for the period 2011-2015 with the following objectives regarding the carbon footprint:</p> <ul style="list-style-type: none"> • a CO2-emission reduction of 10% within the Business Plan period 2011-2015; • reported 2010-emissions of 9,8 kTon as new baseline for our Business Plan reduction ambitions; • operational activities are to be CO2-neutral as of 2011



- CO₂-reductions in respect investment projects such as maintenance dredging, construction quay walls and other port development projects will be subject to sustainable procurement criteria.

The 2011 report includes the CO₂-footprint of 2011 figures. This year we are able to compare the emissions with a new base year 2010. This report will reflect on our reduction goals and objectives and draw conclusions regarding the results so far. To offset the CO₂-emissions, emission credits were bought on the voluntary credit trading market.

Illustration:

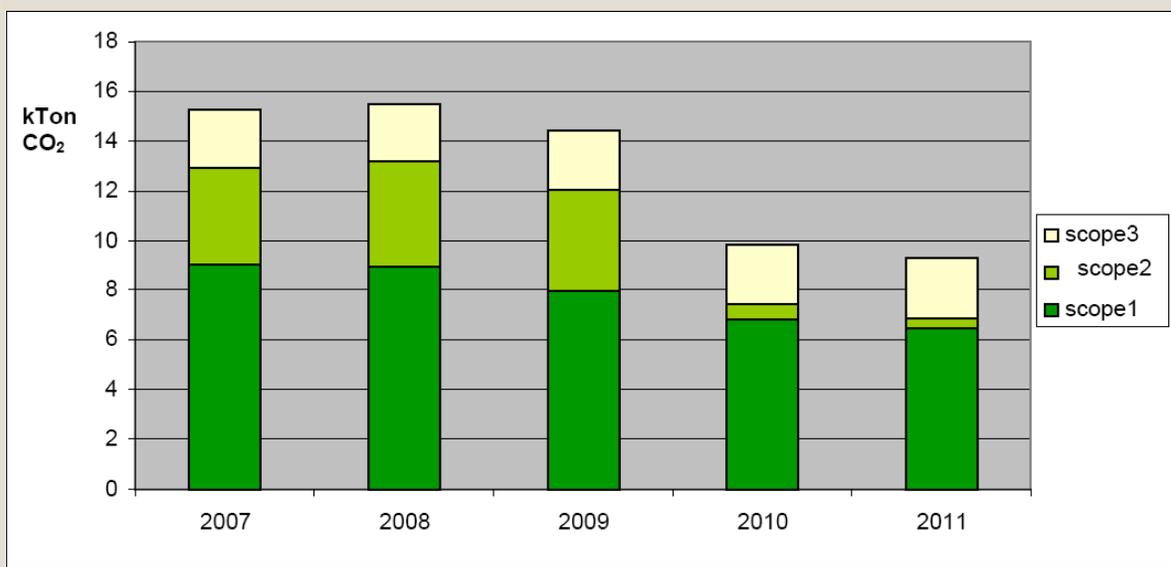


Figure 1: Total CO₂-emissions of scope 1, 2 and (limited) 3 activities over the period 2007- 2011



Port of Ghent, Belgium

Contact Person: Filip Remmerie

Position: Facility Manager

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Environmental issue: **Energy conservation and climate change**

Response: **Exemplify**

Ghent Port Company head office building

Ghent Port Company's offices are partly housed in a new office that was taken into use in 2005. The new building project consisted of a wing that was built on the original building of the port's head office. As Ghent Port Company wanted to see its attention for sustainable development reflected in its own offices it resolutely opted for a construction in which sustainable techniques and materials are at the centre. For instance, the reuse of original cobblestones of the quay flooring at the Grootdok symbolizes the sustainability aspect; also the environment-friendliness of the furniture was crucial.

Ghent Port Company's main building was the first office building in Belgium that was entirely constructed according to the "passive house" concept. This means that by making use of thorough insulation and sophisticated heat recuperation techniques the energy consumption of the building could be reduced to an absolute minimum. This concept also implies that thanks to this advanced insulation, airtightness, sunblinds and well-considered ventilation there is no need for air-conditioning installations nor for a classic heating installation (although a small natural gas system –comparable to one installed in an average family home- is installed for additional heating during severe winters).

Thanks to this new building, Ghent Port Company received the prize for the most energy-friendly enterprise on September 26, 2006 in the category "companies having a yearly natural gas and electricity consumption between 70 and 700 MWh". This prize is an initiative by the "Open Companies Day" and is supported by Electrabel and the Flemish government. In 2007 the building was again among the winners. In March 30, Ghent Port Company received the "Passive House Quality Certificate". This certificate is issued by the non profit organization Passive House Platform and guarantees that the design fulfils the criteria for passive houses, among other things a net energy requirement smaller than or equal to 15 kWh/m²/year.

Links:

www.portofgent.com

Illustration:





Port of Dover, United Kingdom

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Position: Environmental Manager

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Environmental issue: **Energy conservation and climate change**

Response: **Exemplify** / **Enable** / **Encourage** / **Engage**

Energy management

Energy Management has been a high profile environmental programme at the Port of Dover since it began in 2006. Actual reductions have been achieved year on year in electricity; the most significant carbon emissions source (approx. 75% of the total carbon footprint). Total savings since the baseline year equate to almost 10,000 tonnes of carbon dioxide emissions or £1.5 million; significantly improving the efficiency and cost effectiveness of the port operations as well as the sustainability. Monitoring data is collected by meters and a building energy management system (BEMS) and displayed on an online graphics package. This allows our technical team to analyse the energy use at the port and more tightly control the heating ventilation and air conditioning (HVAC) system to meet operational demand. Areas of high consumption and waste are more readily identified allowing reduction programmes and engineering solutions to be more focussed. Staff and significant port tenants are encouraged to participate in the scheme and are given feedback on performance against targets through an energy monitors scheme, regular meetings and newsletters.

Successful projects that have been implemented include a complete refit of high mast lighting which delivered increased light output with much fewer lamps by focussing the light where it is needed and reducing light loss. Port land has been made available to a third party which operates a combined heat and power (CHP) plant powered by used cooking oil which provides the port with renewable electricity and free heating. A working partnership has been developed with a tenant whose operation within the port is very energy intensive. The energy graphics package is used to measure the energy efficiency of the operation by comparing throughput with energy consumption. This data is analysed in conjunction with the tenant to determine where savings can be made.



Links:

Performance against energy targets and further details of the measures implemented can be found in our annual environmental bulletin available on the Port of Dover website at the following link: <http://www.doverport.co.uk/?page=AnnualReports>

Illustration:



Port of Bremen/Bremerhaven, Germany

Contact Person: Uwe von Bargaen

Position: Environmental Director (bremenports GmbH & Co. KG)

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Environmental issue: **Energy conservation and climate change**

Response: **Exemplify** / **Enable** / **Engage**

Energy management

In July 2008 the Ports of Bremen and Bremerhaven signed the World Ports Climate Declaration and started to work actively on the reduction of greenhouse gases and the enhancement of the use of renewable



energy. As management company for the port infrastructure bremenports GmbH & Co. KG investigated its energy consumption. The improvement of energy efficiency and the promotion of renewable energy became important objectives in the ports own sustainability-initiative “greenports”. In 2010 the Management decided to use eco-power from renewable sources wherever possible. Solar power plants have been installed on two new buildings and allow bremenports to feed around 40,000 kilowatt-hours into the grid every year. The port infrastructure in Bremen and Bremerhaven (without the energy for street-lighting in Bremen) still needed 5,8 million kilowatt-hours of electrical energy in 2011, but now nearly 100 % of the used energy came from renewable sources. Further studies to investigate the possibilities for the local production of renewable energy in the port or surrounding area are planned.

Port users shall be stimulated by the greenports-initiative to reduce their energy consumption, to produce and use renewable energy and to take part on regional projects like Nordwest 2050, Klimastadt Bremerhaven or Klimabörse Bremerhaven. These projects focus on climate protection and as well on climate adaptation strategies. In a working group of Via Bremen different stakeholder work together to share their knowledge and to extend sustainability of the maritime business and to investigate carbon-footprinting.

Links:

<http://wpci.iaphworldports.org/about-us/members.html>

<http://www.bremenports.de/en/greenports/daring-to-go-green>

<http://www.bremenports.de/en/greenports/port-environment-protection/every-small-step-takes-you-forward>

<http://www.nordwest2050.de/>

<http://www.klimastadt-bremerhaven.info>

<http://www.kooperation-anpassung.de/kooperationsboersen/bremerhaven.html>

<http://www.via-bremen.com/Ueber-VIA-BREMEN/Innovationskreise/Nachhaltigkeit--CO2/Innovationskreis-Nachhaltigkeit--CO2>



Port of Valencia, Spain

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Position: General Sub-director

Email: ftorres@valenciaport.com

Environmental issue: **Energy conservation and climate change**

Response: **Exemplify / Engage**

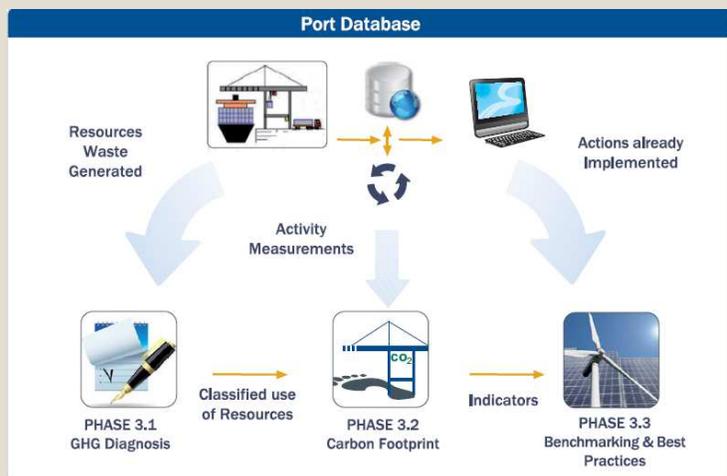
CO₂ footprint calculator

The Port Authority of Valencia, together with five other European seaports, partners within the Climeport project, has developed a methodology to obtain an accurate estimate of the carbon footprint taking as starting point a comprehensive inventory of GHG emissions. The method distinguishes between 4 levels, (1) the port as a whole, (2) port activities, (3) services and processes and (4) port equipment and machinery. The distinction allows the calculation of the carbon footprint of port activities both in total and for each one separately. In such way it allows taking targeted measures for reducing GHG emissions. An online tool (ECOABACUS) has been designed to facilitate the calculation of the carbon footprint of ports.

Links:

<http://www.valenciaport.com>, <http://www.climeport.com>

Illustration:





Port of Setúbal and Sesimbra (APSS), Portugal

Contact Person: Paulo Aldeia

Position: Chief Division of Electrical Infrastructure

Email: paldeia@portodesetubal.pt

Environmental issue: **Energy conservation and climate change**

Response: **Exemplify**

Step reduction of the public lighting electricity consumption

Compliance with the guidelines emerging from the report of the Energy Certification and Indoor Air Quality of the headquarters of the APSS, SA and other administrative buildings. Operationalized through the A 120/2011 CA, 24/03/2011, AP Eco Project include:

- All electrical equipment acquisitions must be of the minimum energy class A.
- Replacing lamps with high consumption;
- Improved efficiency of HVAC;
- Installation of photovoltaic panels (support facilities) and solar water heaters;
- Use of centralized equipment's rather than individual;
- Sensibilization to workers to the importance of individual contributions in achieving the objectives of the APSS.

Installation of systems that reduce the consumption of public lighting in the period of reduced need strict control of operating hours of public lighting network;

Links:

<http://www.portodesetubal.pt/>

Illustration:



Port of Aalborg, Denmark

Contact Person: Brian Dalby Rasmussen

Position: Environmental Coordinator

Email: bdr@aalborghavn.dk

Environmental issue: **Energy conservation and climate change**

Response: **Exemplify**

Rebuilding office building to meet the passive house standard

A 200 square meter office building from the 70ties at the Port of Aalborg was to be rebuilt and modernised. It was decided to gain experience with the passive house standard. Through effective insulation, energy recovery from ventilation and state of the art windows, the use of energy for heating is reduced with 94%. On top of that, the employees will experience a much better climate and comfort inside the building. The technical experiences from the project will be used in the building projects to come.

Illustration:





Port of Aalborg, Denmark

Contact Person: Brian Dalby Rasmussen

Position: Environmental coordinator

Email: bdr@aalborghavn.dk

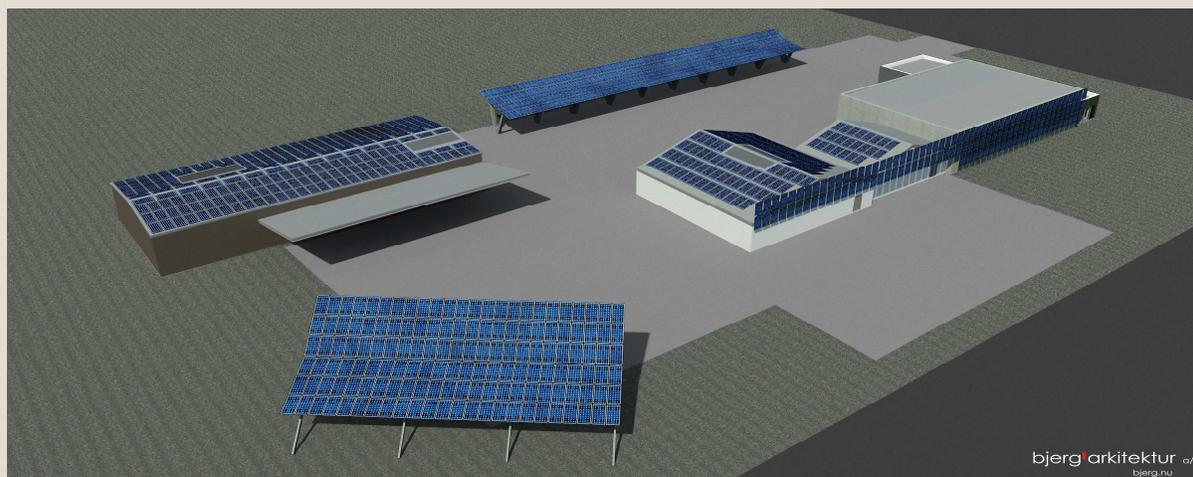
Environmental issue: **Energy conservation and climate change**

Response: **Exemplify / Engage**

PV panels for local carbon free electricity production and corporation with the University

The Port of Aalborg is implementing 95 kWp of PV panels, supplying the head office with carbon free electricity. The power plant consists of five sections placed on four existing buildings. Each section is placed in different orientations and angles towards the sun, allowing measuring the difference in efficiency, self-cleaning etc. The plant has been designed in collaboration with Department for Energy Technology at Aalborg University. In the coming five years period the university will use the plant for research, and student projects.

Illustration:



Port of HaminaKotka Ltd, Finland

Contact Person: Riitta Kajatkari

Position: Development Manager

Email: Riitta.Kajatkari@haminakotka.fi

Environmental issue: **Air quality / Energy conservation and climate change**

Response: **Exemplify / Enable / Engage**

Keeping quayside clear from ice for berthing

During winter berthing may take hours for the ship before it has managed to clear all ice between quay and hull, ropes are fastened and unloading/loading can start. This creates disruption of stevedoring timetables, quay availability and produces unnecessary energy consumption and ship emissions to the air. Additional ship propeller forces also wear quay structures by producing strong erosion when ships push ice away with water stream produced by propellers between ship and quay. Therefore additional erosion protection at the bottom in front of the quay must be designed. Air produced by compressor is used at the port to make the ship maneuvering quicker. Air comes from pipes installed at the harbor bottom in front of quay line. This also helps to minimize the emissions of the ship.

Illustration:





Enabling; providing conditions that facilitate users and enhance improved performance

Port of Gothenburg, Sweden

Contact Person: Stig-Göran Thorén
 Position: Senior Manager Business Development
 Email: stig-goran.thoren@portgot.se

Environmental issue: **Air quality / Energy conservation and climate change / Noise management**

Response: **Enable / Engage**

Rail shuttles

RAILPORT Scandinavia is the name given to the rail shuttles operating to and from the Port of Gothenburg. It is an extensive system involving a large number of freight terminals in Sweden and Norway. These rail shuttles allow large volumes of goods to reach the port's customers quickly and efficiently. At present, there are 26 daily rail shuttles between the Port of Gothenburg and 24 towns and cities throughout Sweden and Norway. The development of the rail shuttles is a very focused initiative taken by the Port of Gothenburg and got underway properly in 2002. Since then, the volume of goods has almost trebled and the number of containers is now heading towards the 400,000 mark. This is around half of all the containers that are transported to and from the port each year. At present, it is mainly containers that are carried on the trains, although work is in progress to increase the number of trailers moved by rail.

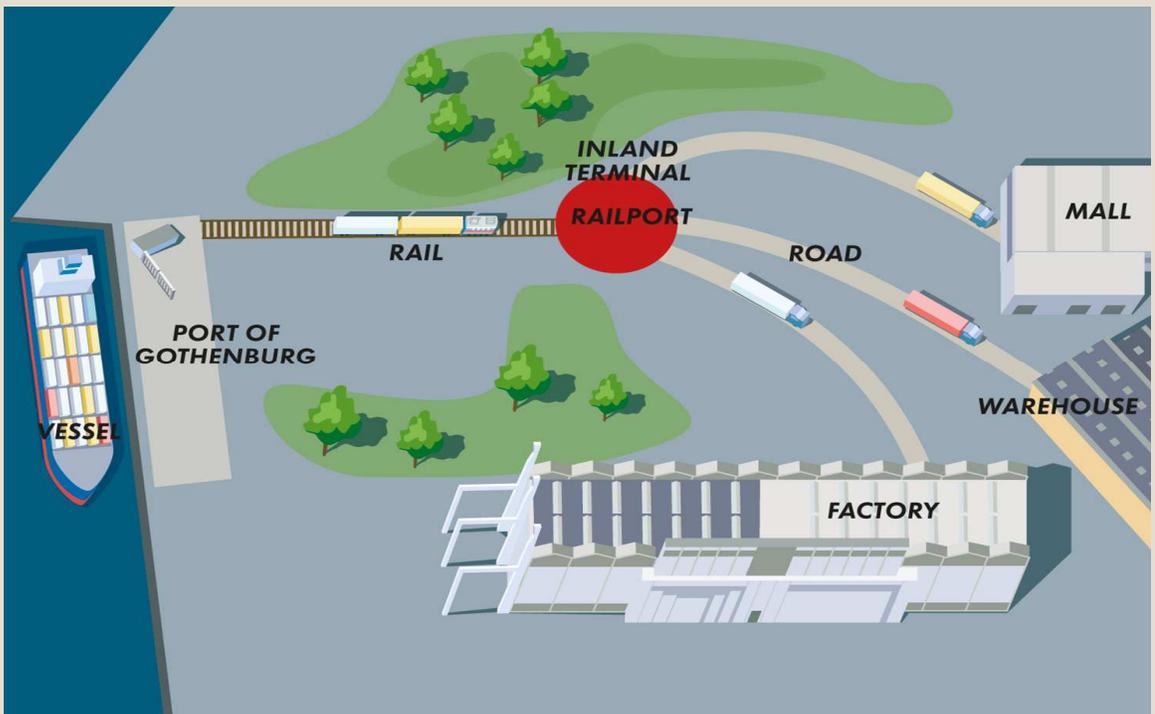
Did you know that the rail tracks at the Port of Gothenburg are the most heavily used tracks in Sweden and that the port is one of the largest railway stations in the country? Each day, more than 70 trains arrive and depart. The trains can travel right up to the quayside, which allows rapid, efficient reloading to and from the vessels.

Railport Scandinavia reduces transport energy use by 70 per cent and saves air emissions. Road congestion is also reduced with a subsequent fall in the number of accidents on the roads. In one year, rail shuttles save around 50,000 tonnes of carbon emissions, equivalent to emissions from 17,000 cars for a whole year. Each day, the rail shuttles replace more than 700 trucks.

Links:

<http://www.portofgothenburg.com/Line-selection/RAILPORT-Scandinavia/>

Illustrations:





Encouraging; providing incentives to greener port users

Port of Antwerp, Belgium

Contact Person: Kris De Craene

Position: Manager of the Environmental Department

Email: kris.dekraene@haven.antwerpen.be

Environmental issue: **Energy conservation and climate change**

Response: **Encourage** / **Engage**

Energy efficiency audits

The energy efficiency audit programme refers to a port-wide initiative of the Antwerp Port Authority to promote the conduct of voluntary audits regarding the energy efficiency of port operators. An energy efficiency expert assists the Antwerp Port Authority in the implementation of the initiative. The port users pay a very modest sum for the energy efficiency audit (125 euro when <20 employees on site, 250 euro when >20 employees on site). The detailed audits result in tailor-made proposals for concrete measures and estimations of the economic feasibility and/or the period of cost recovery. The engagement of the Antwerp Port Authority also includes cooperation and assistance regarding the follow-up of the audit results. At the same time, the Antwerp Port Authority is available to share its knowledge regarding the subsidy landscape for rational energy use, and even to provide assistance with regard to the application for possible subsidies. By developing this initiative, the Antwerp Port Authority intends to engage and encourage private companies to invest in (or : to take profit from) energy efficiency measures. In some cases, energy efficiency measures appear to qualify as low-cost or even no-cost. To the latest category belong recommendations which are situated on the “behavioural” level.

Under the first energy efficiency audit scheme, launched in 2010 with a budget of 100.000 euro, nine companies participated and benefited from the offer. Since the audit reports tend to show clear potential for energy savings, other companies show serious interest and might follow the path. It must be noted that the Directive of the European Parliament and of the Council on energy efficiency (2011/0172 (COD)) contains similar triggers to boost the conduction of energy audits. Among other provisions, it stipulates that Member States shall develop programmes to encourage small and medium sized enterprises to undergo energy audits, and the subsequent implementation of the recommendations from these audits.



Port of Amsterdam, The Netherlands
Contact person: Jan Egbertsen Position: Manager Strategy Email: jan.egbertsen@portofamsterdam
Environmental issues: Air quality / Energy conservation and climate change / Waste management
Response: Encourage / Engage
<p>Sustainability and Innovation Fund Port of Amsterdam</p> <p>The Port of Amsterdam started on 30 September 2009 with the “Sustainability and Innovation Fund Port of Amsterdam”. A sustainable development of the port region is of strategic importance for the Amsterdam Port Authority. This can only be achieved in close cooperation with local and regional companies. The fund gives a grant for feasibility studies and for pilot projects. From the start in 2009 until 2012 a total of € 4 million has been granted to companies in the port region for development of innovative sustainable projects. These projects mainly focussed on development of sustainable energy sources, energy reduction and reduction of CO₂ – emissions in the port area. November 2012 an evaluation has been made of this fund and the results over the last years (2009 – 2012). Based on this evaluation it has been decided to continue the fund.</p> <p>Some examples of feasibility projects are:</p> <ul style="list-style-type: none"> • Use of compromised bio gas as fuel for trucks used for city distribution of cargo. • Research for bio mass incineration plant for steam delivery to a ethanol factory. • Effective use of residual heath by the production of asphalt. • Realisation of a tank station for bio gas for trucks for collection of household waste. <p>Some examples of pilot projects are:</p> <ul style="list-style-type: none"> • Production of fertilizer by using residual products to close the phosphate production circle. • Development of a crane system for use of regenerative energy during braking of the crane lifting system. • Innovative system for reduction of evaporation during loading and unloading of oil products. • Demonstration installation for energy production of waste products in agri bulk. • Development project for use of recycled consumer oils and fats in production of bio fuels.



- Use of chute for development of heat and steam.
- Use of LED lighting on terminal.
- Development of a crowd funding program for use of solar energy cells on roofs of warehouses in the port area.

Links:

<http://www.portofamsterdam.nl/Eng/A-smart-port---Specials/Innovation.html?highlight=diha>

<http://www.portofamsterdam.nl/diha?highlight=diha>



Engaging; with users and/or authorities in sharing knowledge and skills

Port of Gothenburg, Sweden
Contact Person: Susann Dutt
Position: Manager Sustainability
Email: susann.dutt@portgot.se
Environmental issue: Air quality / Energy conservation and climate change
Response: Exemplify / Enable / Engage
<p>Adoption of the World Ports Climate Declaration from 2008</p> <p>The port is committed to contribute to the following actions:</p> <ul style="list-style-type: none"> • Reduction of greenhouse gas emissions from ocean-going shipping • Reduction of greenhouse gas emissions from port operations and development • Reduction of greenhouse gas emissions from hinterland transport • Enhancement of the use of renewable energy • Development & availability of CO₂ inventories <p>A stated objective is to be a renowned innovator of climate-smart transport concepts by 2015. Port of Gothenburg has also decided to be totally climate neutral for operational activities under its own control and influence by 2015 (scope 1 & 2+ business travel). A third goal is to reduce the indirect emissions of greenhouse gases by 10% in 2015 compared to the baseline year 2010.</p> <p>The port of Gothenburg is calculating its carbon footprint since 2010. The development of the Carbon Footprint is based on ISO 14064-1:2006 & the Greenhouse Gas Protocol. Inspiration and experience has also been gathered from World Ports Climate Initiative, Climeport, Business Leaders Initiative on Climate Change and the Carbon Footprint reports by Port of Oslo and Port of Rotterdam Authority.</p> <p>To minimise the carbon footprint from our business Gothenburg Port Authority (GPA) believes that collaboration is one key word to success. We therefore actively participate and/or support different initiatives like; World Ports Climate Initiative, Climate strategy for West Sweden, The Climate Initiative by</p>

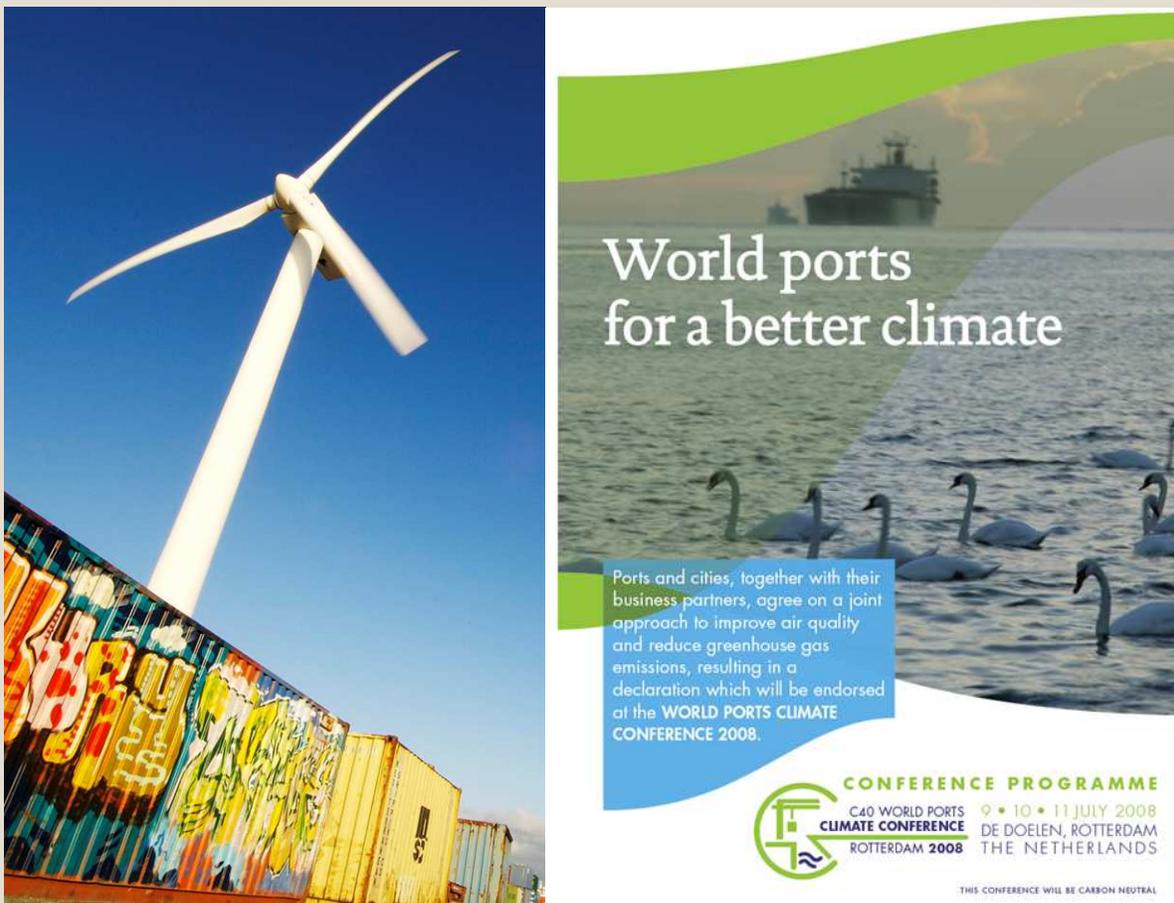
CSR West Sweden and the Climate Programme with three terminal operators (container, ro/ro and car).

Links:

<http://www.portofgothenburg.com/About-the-port/Sustainable-port/Sustainability/>

<http://wpci.iaphworldports.org/>

Illustration:





Port of HaminaKotka Ltd, Finland

Contact Person: Riitta Kajatkari

Position: Development Manager

Email: Riitta.Kajatkari@haminakotka.fi

Environmental issue: **Energy conservation and climate change**

Response: **Exemplify** / **Enable** / **Engage**

Area lighting for port operating yards

Lighting of yards is one of the biggest electricity consumption items at the port. That is why an effective lightning system was needed. In Port of HaminaKotka only one third of all lightning comes automatically on by nightfall. This ensures a basic lighting needed for safety and security. Full lighting must be ordered from the port authority for the sector where operations are going on. It is on for a predetermined time after which lighting goes automatically down again, unless a new cycle is ordered. Next step is to arrange mobile control for the sector lighting.

In the future new measuring systems will be practical in order to optimize the energy use. Energy use and economics go here hand by hand. Apart from energy savings diminished lighting cuts down light pollution from the port. Design of lights also maximize the effectiveness of lighting and minimizes dispersion.



Enforcing; setting rules and ensuring compliance

Port of Antwerp, Belgium

Contact Person: Pascale Pasmans

Position: Senior Consultant

Email: pascale.pasmans@haven.antwerpen.be

Environmental issue: **Air quality / Energy conservation and climate change / Noise management**

Response: **Enable / Engage / Enforce**

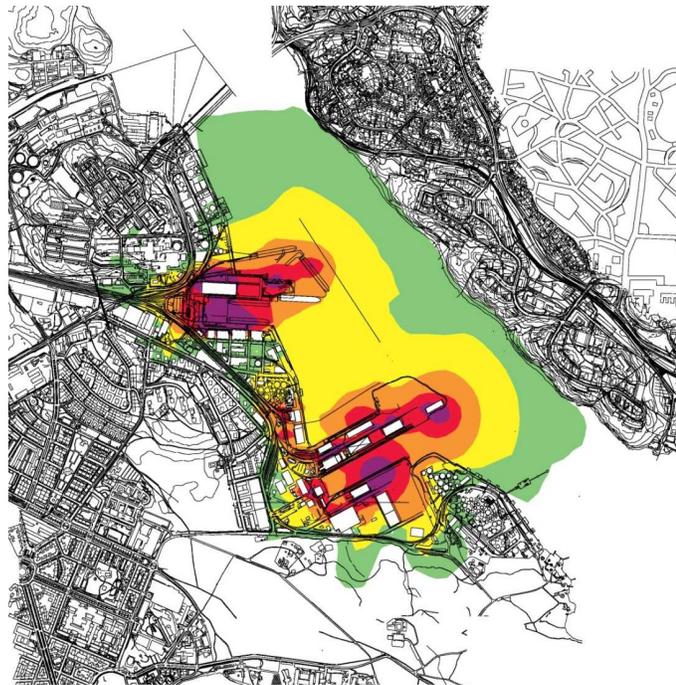
Barge Traffic System

The Barge Traffic System (BTS) is an operational planning instrument for container barge and terminal operators resulting in more time-efficient cargo handling on the terminal side and less delays for barges waiting at berth. The fully integrated software tool optimises at the same time the benefits of the Automatic Information System (AIS), an automatic tracking system used on ships and by vessel traffic services (VTS) in order to identify and locate vessels through the electronic exchange of data with other nearby ships and AIS Base stations. It is offered to port users as a free web application. The BTS system offers advantages to each actor using it. The container barge operator can use one central platform for slot requests for all terminals in the port, thus avoiding a lot of telephone calls. The terminal operator has one connection with all barge operators instead of many bilateral contacts. All operators have real time information with regard to the lock planning, barge positions, etc. By making the use of BTS mandatory, the port of Antwerp acquires a full overview of all container flows by inland navigation in the port and can evaluate the efficiency of the container barge handling in the port.

The actual phase of enforcement, aiming at a full and uniform use of the BTS within the Antwerp port area, was preceded by a long period of intense consultation with the port stakeholders. The Antwerp Port Authority tends to believe that the port operators are now fully convinced of the operational benefits of the system. It has the ambition to extend the system to the non-container barges. The operational benefits for individual terminal and (container) barge operators should result in safety and environmental benefits for the wider port community. Under these assumptions, BTS can become an example of a technology triggering both operational efficiency and environmental progress.

Noise management

Summary of port contributions



The table below summarises the port contributions in the field of noise management in order of appearance.

	Port	Exemplify	Enable	Encourage	Engage	Enforce
1	Tallinn	+				
2	Bremen	+	+			
3	Trelleborg	+			+	
4	Stockholm	+	+		+	
5	Hamburg			+		+
6	Ghent				+	+
7	Groningen				+	
8	Ghent					+



Exemplifying; setting the good example when managing own operations

Port of Tallinn, Estonia
Contact Person: Ellen Kaasik
Position: Head of Quality and Environmental Management Department
Email: e.kaasik@ts.ee
Environmental issue: Noise management
Response: Exemplify
<p>Preventing noise propagation</p> <p>Setting a good example by applying techniques (noise barrier) to prevent noise propagation from industrial operations and port/railway traffic. An initial survey and assessment study of the noise created in Muuga railway station in Muuga Harbour was carried out. The study consisted of measurements of the noise emissions and noise levels, mapping of the existing situation and modelling the future, based on available data. The Muuga railway station is located on the eastern part of Muuga Harbour and the closest residential house is 50 m away from the border of the station.</p> <p>The main results of the survey and assessment demonstrated that:</p> <ul style="list-style-type: none"> • The braking and collisions of wagons and locomotive engines create the most prominent noise events; • The crashes are impulsive and the braking sounds are highly tonal; • The results of both the measurements and the noise mapping showed that the equivalent sound levels (LAeq) at and near the closest houses exceed 50 dB even without any adjustments day and night; • The effectiveness of the planned barrier was checked using the calculation model. <p>It was decided to erect 4.8 m high barrier with possibility to extend it to 6 m in the future. Based on the noise modelling results, the erected 4.8 m high and ~400 m long noise barrier is able to lower the noise, at most by approximately 5-6 dB at the distance of the closest residential houses.</p>

Illustration:





Ports of Bremen / Bremerhaven, Germany

Contact Person: Jochen Kreß

Position: Environmental Manager, Ministry of Economic affairs and ports, Bremen

Email: Jochen.Kress@wuh.bremen.de

Environmental issue: **Noise management**

Response: **Exemplify, Enable**

Noise management in Bremerhaven

The aim of the noise protection efforts is to maximize the noise reduction for the people who live near the port. By using an innovative state of the art technical measurement device, installing a continuous dialogue with the local people and implementing efficient passive noise protection this aim could be fulfilled beyond the legally required standards as regards the development of container terminal 4 (CT4) in Bremerhaven. This means a noise level of 30 db(a) will not be exceeded in sleeping and living rooms of nearby houses by using passive noise protection.

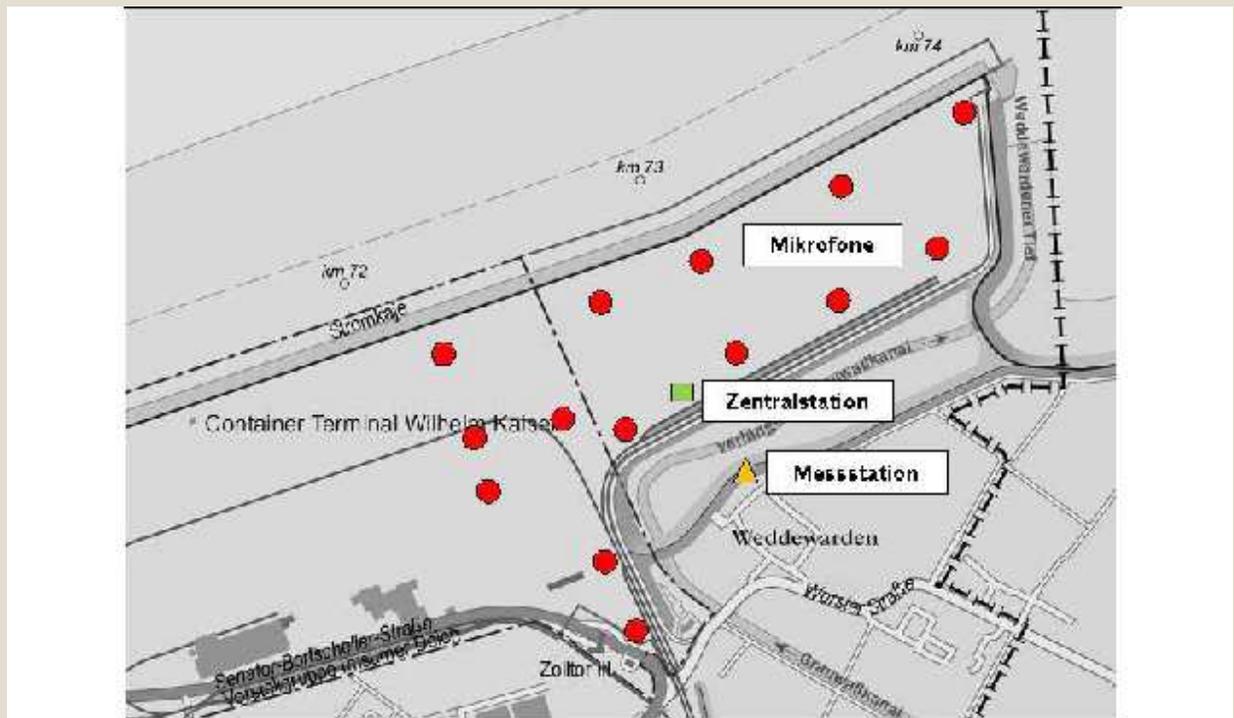
To reduce noise actively a “noise measuring chain” was installed for the first time in Germany. Apart from the immission station in the nearby village of Weddewarden, 15 more emission stations were deployed on the terminal to measure port and traffic noise at source. All stations are interconnected by radio and monitored by a central evaluation unit. The system is able to differentiate between different noise sources, e.g. traffic, railway, planes, background noise and special impulse or tonal conspicuous noise like dog barking, bird singing or whistling.

The device monitors the noise continuously at all stations during night time. If defined noise levels are exceeded at the measuring stations or peak levels are reached due to container handling the system reacts in two ways: First the audio sequence around the signal is recorded. Second warning faxes are sent to the terminal operators 30 seconds at the latest after the signal. The faxes contain the location of the assumed source amongst other information. The operational headquarters react on the faxes instantly in order to prevent the noise as quickly as possible.

Moreover, the nearby population has the possibility to stimulate the record of the data by telephone calls if

a loud and annoying noise has happened. In this case 30 minutes prior and after the phone call are recorded. All other incoming phone calls in this time frame are documented and registered.

Illustration:





Port of Trelleborg, Sweden

Contact Person: Göran Hall

Position: Manager Vehicles & Vehicle Maintenance

Email: goran.hall@port.trelleborg.se

Environmental issue: **Noise management**

Response: **Exemplify** / **Engage**

Noise reduction on terminal fleet

Noise reduction on reachstackers and terminal tractors through close cooperation with our suppliers (starting 2006):

- Reachstackers (from 105 dBA to 100 dBA in operation, idling 95 dBA) - examples:
Noise trap for cooling fan, noise absorbing aluminium sheet (oil resistant) under frame (engine, gearbox), engine speed regulation (night time)
- Terminal tractors (reduction by approx 5 dBA, best vehicle 102 dBA):
Noise absorbing lead rubber carpets (2007), special steel sheets between engine and landing (2010), sealing between driver's cab and frame, further improvement as sheets were replaced by galvanized sheets over gearbox and landing to driver's cab (2011), engine speed regulation (1700 rpm). Latest improvement is Ad Blue catalyst mounted on our newest terminal tractors. This addresses reduction of noise as well as air emissions (2012).



Enabling; providing conditions that facilitate users and enhance improved performance

Ports of Stockholm, Sweden

Contact Person: Gun Rudeberg

Position: Company Lawyer and Head of Environmental Affairs

Email: gun.rudeberg@stoports.com

Environmental issue: **Noise management**

Response: **Exemplify** / **Enable** / **Engage**

Noise reduction in Port of Kapellskär

The Ports of Stockholm comprise of three ports, one of them is Port of Kapellskär which mainly has roro-traffic between Sweden and Finland. In the late 1990s, after a period with limited operations in the port, several new ferry lines resulted in increased traffic. Consequently, the port received complaints about noise from residents living within close proximity to the port. In 1998 the port initiated cooperation with representatives from the residents, the municipality and ship owners in order to discuss the problem and what measures that could be taken. An investigation was carried out, monitoring, measuring and analyzing the noise, both from the port activity itself but also from the ferries operating the port. A distinction must be made between these types of noise because the Port Authority can only *encourage* shipping companies to take action to reduce noise, whereas the Port Authority can actually *perform* noise mitigation measures in the harbor.

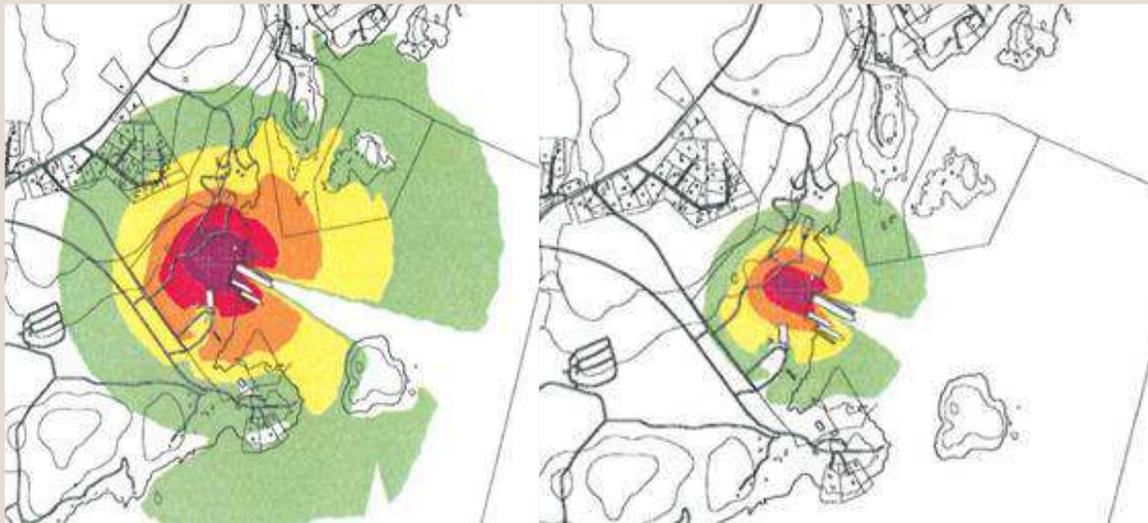
One measure was to cover vessel flaps and trailer ramp with insulation to reduce noise generated when metal strikes metal or concrete. Another measure was to divert traffic after leaving the trailer ramp which forced speed to be reduced and thus reducing impact sound and noise from the vehicles. The result was reduced impact sounds with 10-15 dBA at a cost of two million SEK.

Regarding the noise from vessels, the Port of Kapellskär has also prepared for the possibility to provide onshore power supply should the shipping companies choose to further engage in noise reducing measures. Noise differentiated fees is another measure but this is yet to be investigated by the port. The port is also

sharing information and cooperating with ship owners to make them aware of the noise problem and to encourage them to take action onboard the vessels.

Illustration:

Noise modelling - before and after insulating the trailer ramp (6-10dBA lower)





Encouraging; providing incentives to greener port users

Port of Hamburg, Germany

Contact Person: Hendrik Hollstein

Position: Deputy of Environmental Strategy

Email: hendrik.hollstein@hpa.hamburg.de

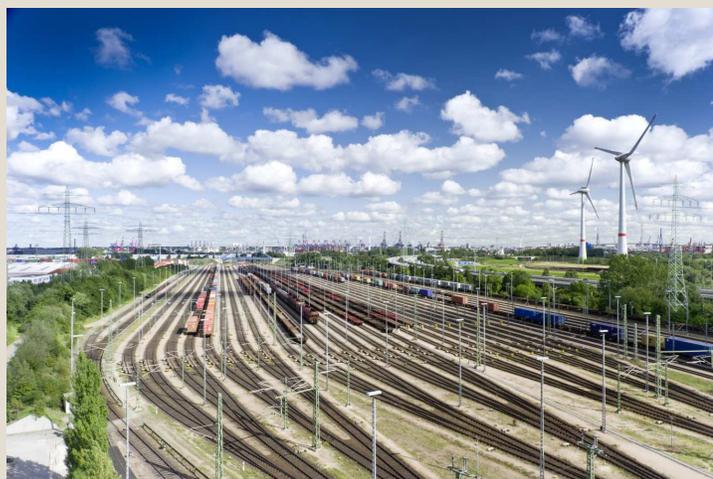
Environmental issue: **Air quality / Noise management**

Response: **Encourage / Enforce**

Green charges for port railway

The HPA is investing large amounts to expand and improve environment-friendly rail and water transport. As regards the port railway, activities include environmental components in railway charges and an eco-tariff for low-noise wagons used by companies operating on the port railway network, which is Europe’s biggest. This component consists of financial incentives that are meant to encourage companies to use noise-damping brakes on their rolling stock and diesel particulate filters on their locomotives. The resulting reduction of noise and particulate emissions in the port makes the railway system more environment-friendly. By integrating green components into port fees and charges for the port railway, HPA is encouraging green behaviour by port customers, thus taking a leading role worldwide.

Illustration:





Engaging; with users and/or authorities in sharing knowledge and skills

Port of Ghent, Belgium

Contact Person: Elisa Taeman

Position: Environmental Policy Adviser

Email: elisa.taelman@havengent.be

Environmental issue: **Air quality / Noise management**

Response: **Engage / Enforce**

Environmental complaints desk for the Ghent Canal Zone

The close intertwinement of the living function and the industrial and port activities in the Ghent Canal Zone regularly leads to complaints concerning smell, dust and noise nuisance. A number of residents did not always know which authority to contact for these complaints; it became clear that this was specifically a problem outside office hours. This finding led to the establishment of an environmental complaints desk for the Ghent Canal Zone. The objectives of this structure are:

- to function as one single contact point for nuisance complaints by residents of the Ghent Canal Zone;
- to obtain a clear view concerning the local nuisance perception, especially in the evening and at night when the regular authorities cannot be reached and to determine the policy priorities based on this;
- an efficient complaints registration and follow-up: standardized registration of the complaint, if possible immediate contact is made with the assumed perpetrator and the registered complaint is forwarded immediately to the competent authority for the further settling of the complaint;
- a better communication with the residents.

The final aim is a reduction of the local nuisance problems. In practice, the residents of the Ghent Canal Zone can permanently (24 hours a day and 7 days a week) notify their nuisance complaints on the port and industrial activities in the Ghent Canal Zone at a free telephone number. The complainant can make a selection between contacting the environmental department of the city of Ghent, the municipality of Evergem, the municipality of Zelzate or the Environmental Inspection Department of the Flemish authorities. After office hours, during weekends and on holidays, the system automatically connects through to Ghent Port Company ampco that then registers the complaint and possibly makes on-the-spot findings.



Groningen Seaports, The Netherlands

Contact Person: Bart van der Kolk

Position: Staff

Email: info@groningen-seaports.com

Environmental issue: **Noise management**

Response: **Engage**

Noise management in the port of Delfzijl

The Port of Delfzijl is situated adjacent to the city of Delfzijl and the Waddensea that is a birds and habitats protected area. Noise management is therefore an important issue. In 2010 main agreements were made with local governments, tenants, and Groningen Seaports on:

- Noise management;
- on insulation projects;
- the (future) operators in the port are able to use all the available noise;
- on monitoring the effect of the environmental noise on the Waddensee,
- the local governments, the business association of the tenants in the port of Delfzijl and Groningen Seaports are officially advisors of the authority during the process of authorization by changes in operations or new investments.

By monitoring the effects of environmental noise, taking care of the available noise in the future, Groningen Seaports and partners find a way to facilitate the future operations in their port.

Links: www.groningen-seaports.com, www.gemeentedelfzijl.nl, www.provinciegroningen.nl

Illustration:





Enforcing; setting rules and ensuring compliance

Port of Ghent, Belgium

Contact Person: Alain Moerman (Province of East Flanders)

Position: Project employee - Project Ghent Canal Zone

Email: alain.moerman@oost-vlaanderen.be

Environmental issue: **Noise management**

Response: **Enforce**

Enforcing truck traffic to follow specific route

As the villages surrounding the port are daily traversed by heavy truck traffic that causes a lot of inconvenience, a traffic study was carried out. The aim was to thoroughly investigate the traffic situation in these residential centres so as to subsequently come to proposals for keeping truck traffic out of these village centres without obstructing the accessibility and approachability of the neighbouring port area. An additional limiting condition was that the village centres obviously had to remain accessible for heavy and large vehicles having a local destination such as fire engines and removal firms.

This led to a project that enforces the truck traffic to follow a specific route. Among the measures to enforce this route are: the installation of traffic signs, adapting the signposts to the companies, fixing agreements with GPS operators and directional police controls. The substantial element in this approach is however the installation of two-pole digital truck gates on the entrance roads to the village centres. These gates register each vehicle that is higher than 3 metres and the passage time between entering the village centre and leaving it. This enables to decide whether or not the truck had a local destination; through traffic will be booked.

About 2 years ago a first set of these gates was installed in one village. After evaluation the system seems to work well and other gates will be introduced in other villages around the port. The realisation of this project went along with a lot of communication: not only towards residents, companies and professional federations, but also specific truck plans are available in several languages at places that are visited by truck drivers (filling stations, rest and parking spaces etc.).



Illustration:



Waste management

Summary of port contributions



The table below summarises the port contributions in the field of noise management in order of appearance.

	Port	Exemplify	Enable	Encourage	Engage	Enforce
1	Dover	+	+	+	+	
2	Tallinn	+				
3	Tallinn	+				
4	Dunkirk	+				
5	Aalborg	+				
6	Piraeus	+			+	
7	Setubal		+			
8	Stockholm	+	+	+		
9	Kalundborg		+	+		
10	Valencia		+			
11	Trelleborg		+			
12	Groningen		+	+		
13	Stockholm		+	+		
14	Antwerp		+	+		
15	Rotterdam				+	
16	Dunkirk				+	



Exemplifying; setting the good example when managing own operations

Port of Dover, United Kingdom
Contact Person: Vicki Case
Position: Environmental Manager
Email: vicki.case@doverport.co.uk
Environmental issue: Waste management
Response: Exemplify / Enable / Encourage / Engage
<p>Waste management in the Port of Dover</p> <p>Waste initiatives have been put in place at the Port of Dover in order to recognise the value of the waste products generated and increase the sustainability of not only the operations of the harbour authority but those operating within the port estate.</p> <p>Separate Waste Management Plans are in place for ships waste and port-generated waste. Annual targets are set to reduce waste to landfill and increase recycling for the general waste produced across the port estate. By working with our waste contractors to increase recycling and energy from waste we are on target to achieve a significant 90% landfill avoidance for this general waste stream. Information about changes to the waste service and performance against targets is provided to the main operators within the port community through quarterly meetings and newsletters.</p> <p>Waste charges have been revised to reflect the value of recyclable waste products and encourage our customers to segregate and recycle and larger receptacles have been designed to reduce transport costs and emissions.</p> <p>Particular success has also been achieved through the development of a paving framework agreement to cover the paving requirements for all landside infrastructure within the port. Instead of pricing and tendering each paving job separately, the framework takes a long term view of all the paving maintenance requirements within the port. This enables strategic decision making, which improves the efficiency and</p>



economies of scale associated with the works. Recycling capabilities and environmental performance were key criteria in selecting the principal contractor. In 2011, 82% of all wastes produced by the framework were recycled into clean aggregate, concrete and road sub base.

Links:

Performance against waste targets and further details of the measures implemented can be found in our annual environmental bulletin available on the Port of Dover website at the following link: <http://www.doverport.co.uk/?page=AnnualReports>

The Ships waste Management Plan is also available at:

<http://www.doverport.co.uk/assets/client/images/collateral/Ships%20WMP%20ammended.pdf>

Illustration:





Port of Tallinn, Estonia
Contact Person: Ellen Kaasik
Position: Head of Quality and Environmental Management Department
Email: e.kaasik@ts.ee
Environmental issue: Waste management
Response: Exemplify
<p>Mobile Technological Handling Station (MTK)</p> <p>Mobile Technological Handling Station (MTK) of liquid oil-containing waste is based on new innovative technological set and energy saving solutions for optimum handling of oil-containing waste (incl. bilge, slops, sludge etc) and is built in 10 standard 20-foot sea containers installed in two levels.</p> <ul style="list-style-type: none"> • Extremely flexible handling system enables to handle waste of different ratio without the necessity for manual readjustment of technology and equipment; • Electronic monitoring and control system is additionally equipped with a stability system enabling constant output and ensuring continuous and constant even quality of the oil component; • VFD self-regulating decanter is developed as a completely new system; • Integrated recycling system of residual heat for pre-heating handled waste; • Mixture of hydrocarbons separated from oil-containing waste, is taken for storage into a container through the oil separation system without the necessity for additional technological processes; • Control over the process is executed from one location (also possible via the Internet); • Production process is controlled by one operator who can simultaneously execute other work - the luminous and sound signals are located outside of the control centre; • Equipment comply with the highest technical compatibility and safety requirements of EU; • Electrical installation complies with zone 2 strict explosion safety requirements of EU. <p>Technical specifications:</p> <ul style="list-style-type: none"> • Maximum capacity/output: 15.000l/t or 120.000m³/year; • Feed input: 10–90% oil /water mixture, up to 15% v/v sediments; • Viscosity of input waste: <25 cSt on separation temperature; • Density: light fraction differs only by 5% from the heavy fraction;

- Water content in oil component output: <math><0.1\%</math> (actual production indicators, Tallinn);
- Sediments in oil component output: <math><0.1\% \text{ w/w}</math> (actual production indicators, Tallinn);
- Heating source: hot water, steam or thermal oil (according to the parameters of the boiler system);
- Automation: fully automated;
- Material: for parts in contact with waste as well as for assemblies, high-quality materials are used, incl. chrome metals, stainless steel, Viton and Teflon.

Illustrations:





Port of Tallinn, Estonia

Contact Person: Ellen Kaasik

Position: Head of Quality and Environmental Management Department

Email: e.kaasik@ts.ee

Environmental issue: **Waste management**

Response: **Exemplify**

Setting a good example by demonstrating excellent waste recycling rate.

The aim is to increase the ship-generated waste recycling rate with the purpose of reducing the overall amount of waste landfilled. Today (in 2012), we reuse or recycle 74% of ship-generated waste received from cruise ships. Whether the waste is recycled or disposed of at landfill depends on the type of waste. We make all attempts to ensure that recyclable waste is recycled or reused and is diverted away from landfill. Non recyclables, like mixed domestic wastes are disposed of at landfill. All sorted and recyclable wastes will be transported to the special sorting facility, where they are further sorted based on the type and quality of the material. Then the waste will be packed and forwarded to the specified organizations to be reused, recovered or recycled.

Illustration:





Port of Dunkirk, France
Contact person: Pascal Gregoire Position: Environnemental Manager Email: pgregoire@portdedunkerque.fr
Environmental issue: Waste management
Response: Exemplify
<p>Strategy for sustainable development and management of dredged sediments in the Port of Dunkirk</p> <p>Since 2006, the port of Dunkirk has implemented innovative ways of managing its dredging sediment in agreement with its Dredging Master Plan (SDD), strategic tool laying down the objectives and actions to be taken, and its Operational Dredging Management Plan (PGOD), operational tool outlining methods and procedures for smooth running of dredging operations and the implementation of appropriate and operational solutions for managing dredged products. This means that only uncontaminated sludge is dumped at sea, while the sand is re-used to reconstitute the coastline. The non-submersible sludge is managed on land where it is recycled.</p> <p>Several innovative methods for the recycling of non-submersible sludge have been studied by the port of Dunkirk as part of the national approach Sédimatériaux: landscape re-modelling, use in road-building as well as manufacturing of concrete containing a proportion of sludge. To date, 150.000 cubic metres have been re-used in the port's territory in the form of landscape re-modelling (see illustration). This landscape re-modelling is designed to promote the development of biodiversity in an area of low species richness.</p> <p>In May 2012, the first port road using materials made of this sediment was rebuilt. By the end of 2013, concrete blocks including this sediment will be made and used in the port's territory to strengthen defences against the sea. Currently, the port is studying the feasibility to use sediment to produce aggregates that it will use to strengthen its coastline subject to erosion. In this way, the port hopes to finalise the recycling of non-submersible materials before the end of 2016.</p>



Illustration:



Port of Aalborg, Denmark

Contact Person: Brian Dalby Rasmussen

Position: Environmental coordinator

Email: bdr@aalborghavn.dk

Environmental issue: **Waste management**

Response: **Exemplify**

Production of biogas from waste

Loading and unloading organic materials in bulk such as corn, soya, pulp, sphagnum etc. create spills. In the Port of Aalborg we get around 300 tons of organic waste material every year. Instead of disposing it, we now formed an agreement with the local biogas plant, using it for the production of methane gas.



Port of Piraeus, Greece
Contact person: Chryssanthi Kontogiorgi Position: Head of Environmental Protection Department Email: kontogiorgich@olp.gr
Environmental issue: Waste management
Response: Exemplify / Engage
<p>Waste alternative Management System</p> <p>PPA SA has done a thorough audit within all port area in order to identify the possible sources of recyclable waste. After the identification of the waste streams, a Handbook on alternative waste management was elaborated and an appropriate management system was put in place. The Handbook includes all the procedures and steps that port employees should follow for appropriate waste management and it has been circulated to all the relevant personnel of PPA SA.</p> <p>Overall, the following procedure has been implemented:</p> <ul style="list-style-type: none"> • PPA SA cooperates with the respective recycling companies which have been authorized by the Hellenic Ministry. • In every field of activity the appropriate number and type of bins and containers for the waste collection have been assigned. • In each activity sector (e.g. workshop, offices) there has been designated personnel in charge of supervising the waste collection and the implementation of the waste delivery process. • The recyclable waste is collected and the relevant delivery documents are issued. <p>The implementation of this system was started in 2005 in a pilot framework, incorporating gradually all possible recyclable waste streams. The system has been further and fully developed in 2009. It is worth noting that certain practices, such as the management of waste toners and cartridges, are not regulated obligations but voluntary initiatives that support the PPA's environmental policy.</p> <p>The implementation of this waste management system and the relevant record keeping on quantities and types of waste delivered, led to achievements such as the avoidance of bins overflowing and the maintenance of a cleaner port. After the entry into force of the system and its gradual development, the abovementioned waste are managed separately by the biodegradable and common domestic waste, reducing the waste disposed in landfills, saving energy and natural resources, while ensuring environmental protection and public health. This practice has also enhanced the active participation of port employees to PPA SA waste alternative management and thus their environmental awareness as well.</p> <p>The system is based on the principle of waste transport routes optimization avoiding unnecessary internal routes for the transport of small quantities to a central collection point, as waste delivery is done at the</p>



production sites. Moreover, due to the reuse, recovery and recycling of the specific waste (reduced amounts of waste disposed in landfills), the contribution of port activities in air emissions associated with global warming have been decreased. Furthermore, the implementation of the system allows the assessment of the contribution of each activity in waste production and the identification of corrective actions, where appropriate.

Links:

<http://www.olp.gr/en/nature-protection/nature-quality>



Enabling; providing conditions that facilitate users and enhance improved performance

Port of Setubal and Sesimbra (APSS), Portugal

Contact Person: Graça Viegas

Position: head of division of the environment

Email: gveigas@portodesetubal.pt

Environmental issue: **Waste management**

Response: **Enable**

Collection and temporary storage of waste generated by small boats

APSS enables and provides means of collection and temporary storage of waste generated by small boats using the best techniques available. Containers for waste contaminated with hydrocarbons, equipped with sump, and wherein the cover container for used oil and has double wall flag strokes. The volume of containers also allows a high turnover and ease of use, allowing high safety standards.

In addition, the users of recreational docks are encouraged to adopt good environmental practices, particularly regarding the management of waste generated by they own. The provision of suitable equipment for waste collection, creates conditions to make the source separation improves the efficiency of waste management, increasing the amount that you can enter in recovery circuits

Illustration:





Ports of Stockholm, Sweden

Contact Person: Gun Rudeberg

Position: Company Lawyer and Head of Environmental Affairs

Email: gun.rudeberg@stoports.com

Environmental issue: **Waste management / Water management**

Response: **Exemplify / Enable / Encourage**

Reception of black and grey water

Facilities for offloading black and grey water in Ports of Stockholm were first built in 1985 and 1987 by the terminals of Silja Line and Viking Line respectively. Today 14 stationary facilities are used in the daily operations of all of the shipping companies operating regular scheduled services. It is also possible to offload black and grey water at each of the quays used by cruise ships, free of charge. In 2011, Ports of Stockholm received almost 630 000 m³ black and grey water.

A potential problem is that there is no standardized coupling when connecting vessels to the sewer system. Ports of Stockholm have therefore equipped a car with different “adaptors” that can easily reach different parts of the port with the right gear, in order to enable the reception. The Port is obliged to receive black and grey water should the shipping company choose to do that. A special fee may not be imposed, instead the service is included in the port fee, a so called “no special fee”. It is thus a general fee, based on the number of passengers, regardless of if the vessel offload black- and grey water or not.

Work is also going in the other two ports that comprise Ports of Stockholm, Port of Kapellskär and in Port of Nynäshamn. In Kapellskär a treatment plant has been constructed and sold to the municipality. Under 2012/2013 construction of PRF on the quays will start. In Nynäshamn investigations are performed of how to handle black and grey water.

Illustrations:



Port of Kalundborg, Denmark

Contact Person: Liselotte Rorup

Position: Marketing Manager

Email: lr@portofkalundborg.dk

Environmental issue: **Waste management**

Response: **Enable / Encourage**

Reception of waste water from ships

Pipeline for waste water built in the quay. The waste water from ships goes directly into the municipality sewage system 50 m3 per hour. Permanent solution, easy and convenient handling of waste water. Odour free, large capacity.

Illustration:





Port of Valencia, Spain

Contact Person: Federico Torres

Position: General Sub-director

Email: ftorres@valenciaport.com

Environmental issue: **Waste management**

Response: **Enable**

Waste management in the port of Valencia

The port of Valencia is pioneer on waste management in port areas. This statement is due to the existence of specific facilities for MARPOL waste reception Annexes I and IV and the existence of a Waste Transfer Center (CTR), where waste generated in the port is managed and segregated before delivery to an authorized treatment facility. The port of Valencia has also implemented an updated Waste Management Plan in order to be up-to-date with the new legal requirements arising from International Conventions, EU Directives or other local legislation. The aim of these actions is to efficiently manage waste and facilitate its delivery and management by vessels calling at the port of Valencia. A future challenge is the creation of similar facilities for waste management in the other ports under the management of the Port Authority of Valencia.

Links:

<http://www.valenciaport.com>

Illustration:





Port of Trelleborg, Sweden

Contact Person: Ulf Sonesson

Position: Manager Infrastructure Development

Email: ulf.sonesson@port.trelleborg.se

Environmental issue: **Waste management / Water management**

Response: **Enable**

Reception of waste water from ships

Black and grey water has been received from ferries in the two newest berths 8 and 9 and pumped via pipes to the city's sewage treatment plant since 2009. Construction of waste water reception facilities for ferry berths 2-5 will be ready autumn 2012 and this additional black and grey water will be handled the same way as described above.



Encouraging; providing incentives to greener port users

Groningen Seaports, The Netherlands

Contact Person: Bart van der Kolk / GJ Reinders

Position: Staff

Email: info@ groningen-seaports.com

Environmental issue: **Waste management**

Response: **Enable / Encourage**

Encouraging marine litter collection

Groningen Seaports donate and facilitate the foundation KIMO to collect waste that fisherman catch at sea as a by-catch. Despite many initiatives to reduce marine litter it remains one of the most significant environmental problems affecting the marine environment. 20,000 tonnes of litter is dumped into the North Sea alone every year. KIMO's Fishing for Litter is an imaginative yet simple initiative that aims to reduce marine litter by involving one of the key stakeholders, the fishing industry. KIMO directly provides fishing boats with large bags to deposit marine sourced litter. When full, these bags are deposited safely on the quayside to then be collected for disposal. The initiative not only involves the direct removal of litter from the sea, but also raises awareness of the significance of the problem amongst each community. Groningen Seaports stimulate the fishermen to improve his effort in this project by a yearly event and a present for the crew.

Links:

<http://www.fishingforlitter.org/FishingforLitter.aspx>, www.groningen-seaports.com

Illustration:





Ports of Stockholm, Sweden

Contact Person: Gun Rudeberg

Position: Company Lawyer and Head of Environmental Affairs

Email: gun.rudeberg@stoports.com

Environmental issue: **Waste management**

Response: **Enable** / **Encourage**

Waste management for cruise liners

Every year the Ports of Stockholm host a large number of cruise ships which are carrying large amounts of both solid and liquid waste. To enable reuse and recycling of solid waste in the most efficient and environmental way, the Ports of Stockholm have tried different ways to enable reception of waste which is sorted and encourage the cruise ships to deliver the waste. This applies to cruise ships only because the regular ferry services manage their own waste. The work began in 2000 and has continued and been developed since then. To encourage cruise ships to sort their waste Ports of Stockholm introduced a differentiated waste fee. A fee for waste disposal is imposed regardless of whether or not the vessels leave waste; the “no special fee” system is applied, but vessels receive a discount of about one-third of the fee for each passenger if the waste is sorted.

The Ports also decided to introduce an annual award, The Environmental Boy Diploma, to the vessel that performed best in waste handling and sorting. Initially Ports of Stockholm also required that the contractor of waste reception would have a person available on the quay to inform the crew about the sorting of waste. Special containers for sorting / receiving solid waste were constructed and information and labels for the sorting of fractions were developed in several languages and distributed through agents to the owners and the crew.

The result of the work is that almost every cruise ship arriving in Stockholm delivers their waste in sorted fractions. The need of the Environmental Boy Diploma no longer exists, but the work each year to send out information to the cruise liners about the sorting and the opportunity for a discount from the waste tax continues.

Links:

Waste instructions for cruise vessels

<http://www.stockholmshamn.se/en/Services--prices/Waste-instructions-for-cruise-vessels/>

Pricelist of Cruise Liners 2013 (pdf)

<http://www.stockholmshamn.se/Documents/SH%20Pricelist%20Cruise%202013.pdf>

Illustrations:





Port of Antwerp, Belgium

Contact Person: Peter Van Den Dries

Position: Technical Environmental Manager

Email: Peter.Vandendries@haven.Antwerpen.be

Environmental issue: **Waste management**

Response: **Enable** / **Encourage**

Incentive-based fee system for waste delivery by ships and state-of-the-art monitoring system

Responding to the requirements of Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues, many EU ports have installed reception facilities, implemented waste management plans and developed fee systems. As the Directive provided a policy framework leaving room for interpretation, this lead towards a huge variety of systems currently being applied in EU ports. Although in general most of these different practices provide good results, some systems seem to be more effective than others. For several years now the port of Antwerp applies a strong incentive-based fee system, leaving room for an open market for PRF (free choice for ship-owner/agent), combined with a state-of-the-art monitoring and information system. The volumes of ship-generated waste that are being delivered in Antwerp are not only significantly high, but are increasing every year.

The system is being monitored through a state-of-the-art information system on ship-generated waste (WASCOL), reducing bureaucracy for the users and increasing transparency. As EMSA considers the WASCOL-system as one of the best practices in EU ports, Antwerp has been invited to present the monitoring and information tool to other EU Member States (SafeSeaNet expert group). The fee system includes a strong incentive towards maximum delivery of ship-generated waste, without limits in terms of maximum volumes. Practices related to ship-generated waste were installed after extensive consultation with all the relevant parties (representatives of PRF, ship agents, Port State Control, environmental administration, etc.) and a forum has been established, where all issues relating to ship-generated waste are being discussed (every 3-4 months). As Port State Control has direct access to the information and monitoring system, the data on ship-generated waste are being used when targeting vessels for inspection.



Engaging; with users and/or authorities in sharing knowledge and skills

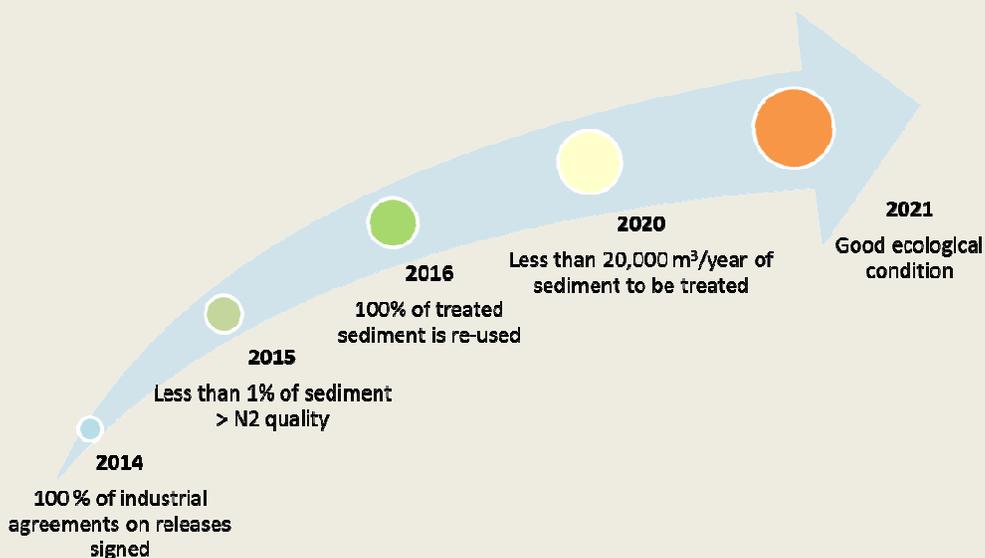
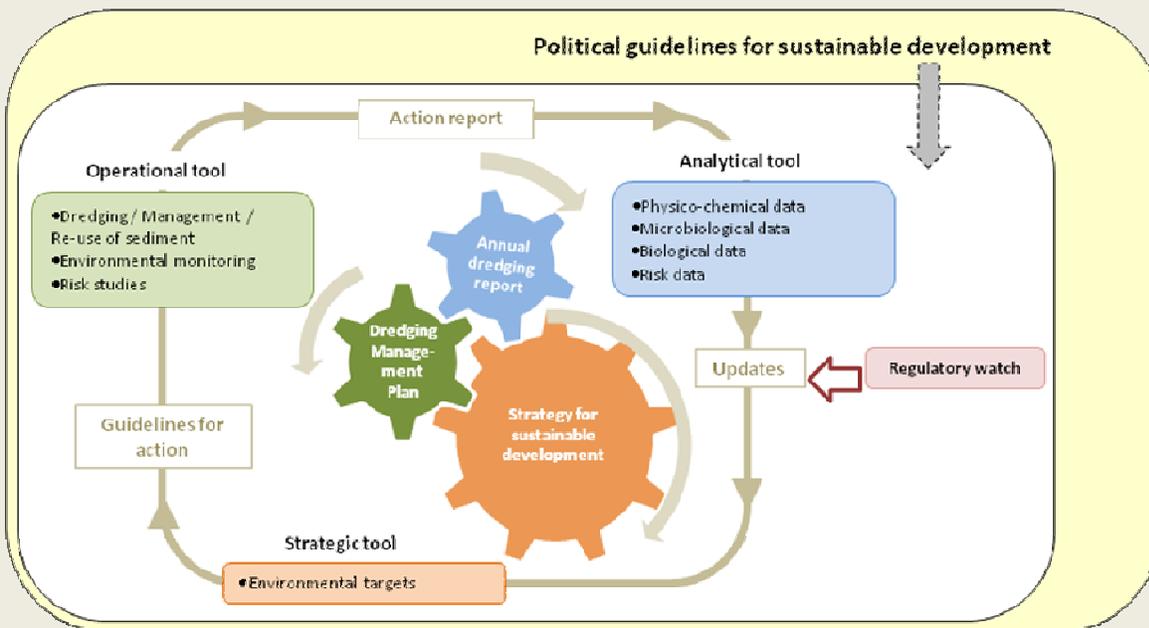
<p>Port of Rotterdam Authority, The Netherlands</p>
<p>Contact Person: Maurits Prinssen</p> <p>Position: Project manager sustainable development (shipping)</p> <p>Email: mmwj.prinssen@portofrotterdam.com</p>
<p>Environmental issue: Waste management</p>
<p>Response: Engage</p>
<p>Engaging with stakeholders regarding waste reception facilities</p> <p>Port Authorities facilitate adequate Port Waste Reception Facilities. Also the crew members should be informed about the possibilities in a port for waste disposal. In every port another system of collectors, fees, disposal rights and notification is in place. So for ship operators a challenging tasks to know what to do with the waste when calling a port. This is the reason why the Port of Rotterdam Authority is communicating on a regular basis with the relevant stakeholders (e.g. ships’ agents and waste collectors). The information is also published on the website in English.</p> <p>Beside the task of a port operator, we often contribute to the Sustainable Awareness Course from the Prosea foundation for training centres and ship owners. After this course (intending) seafarers are aware of all environmental impacts caused by shipping industry. For a better understanding of the need to separate waste on board, waste disposal in ports and treatment of waste on shore the Port of Rotterdam Authority decided to produce the free available movie ANY WASTE, ANY TIME. All relevant issues were addressed in this movie. Beside the Dutch and English language, also subtitles in all official IMO languages are available on the DVD. The movie is available on internet via youtube, our own website and vimeo.</p>
<p>Links:</p> <p>General information for waste disposal: http://www.portofrotterdam.com/en/Shipping/sea-shipping/Pages/waste-disposal.aspx</p> <p>Movie ANY WASTE, ANY TIME: http://vimeo.com/16423448</p>



Port of Dunkirk, France
Contact person: Pascal Gregoire
Position: Environnemental Manager
Email: pgregoire@portdedunkerque.fr
Environmental issue: Waste management
Response: Engage
<p>Strategy for sustainable development and management of dredged sediments in the Port of Dunkirk</p> <p>The Port of Dunkirk, located on the North Sea, is a multi-purpose industrial port which has to maintain required draught in the channels and in allow its quays, to guarantee safe ship sailing conditions. Given the volumes involved (4 million cubic metres per year), the dredging and management of dredged sediments, at sea and on land, are a major issue for the port of Dunkirk. This is particularly true since the port has declared its intention to pursue an exemplary environmental policy in its activities, and specifically in those related to dredging and sediment management.</p> <p>The port has set itself a number of objectives regarding its dredging operations, such as achieving and preserving a good ecological condition of water, maintaining and developing biodiversity, and limit the risks to health and to the environment. Thus, a Dredging Master Plan (SDD), which is a strategic tool designed to set environmental targets and to define and schedule the action plan to be followed to reach them, is being developed in compliance with the French environmental policies, the Grenelle Environment Law and the Grenelle Sea Law. An operational tool dedicated to the problem of dredging was implemented in parallel: the Operational Dredging Management Plan (PGOD). This plan marks a change in port's practices because it guarantee to port's partners disposal of the sediment in the long term and its nil impact on the aquatic and coastal environments. It is structured around a number of fundamental actions, including:</p> <ul style="list-style-type: none"> • a long-term official authorisation covering both dredging operations and submersion which includes all aspects related to sediment; • a complete recycling of uncontaminated sand and non-submersible materials; • feedback of experience on dredging operations and regular updating of the PGOD after each Annual Dredging Report. <p>These actions will be carried out in order to meet the 2021 target for good ecological condition of water.</p>



Illustrations:





Enforcing; setting rules and ensuring compliance

There were no “enforcing” type of practices submitted for this first version of the Good Practices Annex. As also mentioned within the ESPO Green Guide, it should be noticed that the enforcing element is seen by port authorities as a last resort instrument in line with their belief that a lot can be achieved through cooperation and common understanding in line with the principle of self-regulation.

Water (consumption and quality) management

Summary of port contributions



The table below summarises the port contributions in the field of water management in order of appearance.

	Port	Exemplify	Enable	Encourage	Engage	Enforce
1	Valencia	+				
2	Valencia	+				
3	Setubal	+				
4	Le Havre		+			
5	Groningen		+			
6	Trelleborg	+	+			
7	Dover	+	+	+	+	
8	Dunkirk				+	
9	Nantes		+		+	+



Exemplifying; setting the good example when managing own operations

Port of Valencia, Spain

Contact Person: Federico Torres

Position: General Sub-director

Email: ftorres@valenciaport.com

Environmental issue: **Waste management / Water management**

Response: **Exemplify**

Collection of floating waste from the sheltered waters of the port and surveillance to detect any accidental spills and leaks

In 2003, the public agency “Maritime Safety and Rescue” owned by the General Management of the Merchant Navy transferred ownership of the vessel named LIMPIAMAR III to the Valencia Port Authority. As a consequence, the VPA drafted a tender for “cleaning the sheltered waters of the service area of the Port of Valencia” so that the function would be performed by a private company. This solution consists of collecting all floating waste from the water surface. The barge (8 hours daily) that is equipped with a “special” basket is going around the port and collecting all floating waste (plastics, wood... etc.). Then, a private company is in charge to collect the waste from the barge and separate it. In addition to the waste collection, the barge is also surveying for any potential spill from vessels and port users and informs the Port Authority (Environmental department and Emergency Control Center) in order to take immediate actions.

Links: <http://www.valenciaport.com>

Illustration:





Port of Valencia, Spain

Contact Person: Federico Torres

Position: General Sub-director

Email: ftorres@valenciaport.com

Environmental issue: **Air quality / Noise management / Water management**

Response: **Exemplify**

Environmental monitoring

The Port Authority of Valencia has a network of instruments for the characterization of environmental issues. Through a real time monitoring system, it is able to evaluate the impact on port activities of issues such as noise, air quality or water quality. This network includes sound level meters, particle sensors, ozone meters, weather stations and also an instrumental buoy for the characterization of water quality at the port. These measuring instruments are monitored through a SCADA system that allows knowing in real time the evolution of the different environmental aspects considered.

The system allows to monitor the following environmental issues:

- Air quality
- Surface Water and Sediment
- Dredging
- Noise

This system has proved to be helpful on the control of noise levels produced by the port activities. If permissible levels have been exceeded, it could be used for the control of the efficiency of corrective measures implemented. In addition, knowing the data provided by weather stations it has been possible to reduce emissions, for example, on the handling of bulk cargoes.

Future challenges are to integrate all this information into a program that simulates the spread of both particles in the air and water discharges in order to combat its effects more efficiently.

Links:

<http://www.valenciaport.com>

Illustration:





Port of Setúbal and Sesimbra (APSS), Portugal

Contact Person: Artur Pires

Position: Chief of Infrastructure Division, Inspection and Maintenance

Email: apires@portodesetubal.pt

Environmental issue: **Water management**

Response: **Exemplify**

Precise control and reduction in the irrigation water consumption

- Improving the efficiency of irrigation from green spaces, providing them with automated systems, adjusting the time and duration of irrigation throughout the season according to the humidity and the temperature of the day;
- Using of movable counters to monitor consumption in irrigation and washing of public spaces;
- Progressive replacement of exotic species by native species;
- Opening two independent extensions to irrigation water;
- Set of monthly readings and analysis;
- Developing education programs for the gardening team.

Links:

<http://www.portodesetubal.pt/>

Illustration:





Enabling; providing conditions that facilitate users and enhance improved performance

Port of Le Havre Authority, France

Contact Person: Jean-Paul Raffini

Position: Deputy Head, Department of Environment

Email: jean-paul.raffini@havre-port.fr

Environmental issue: **Energy conservation and climate change / Water management**

Response: **Enable**

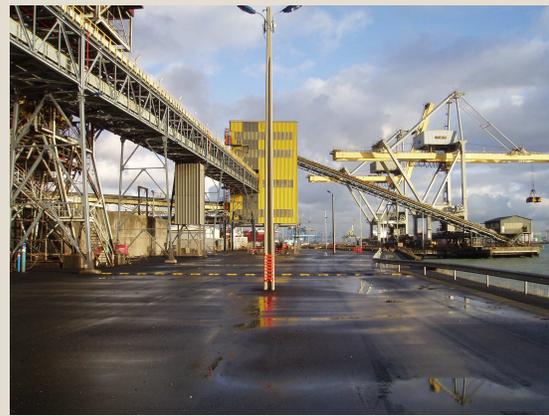
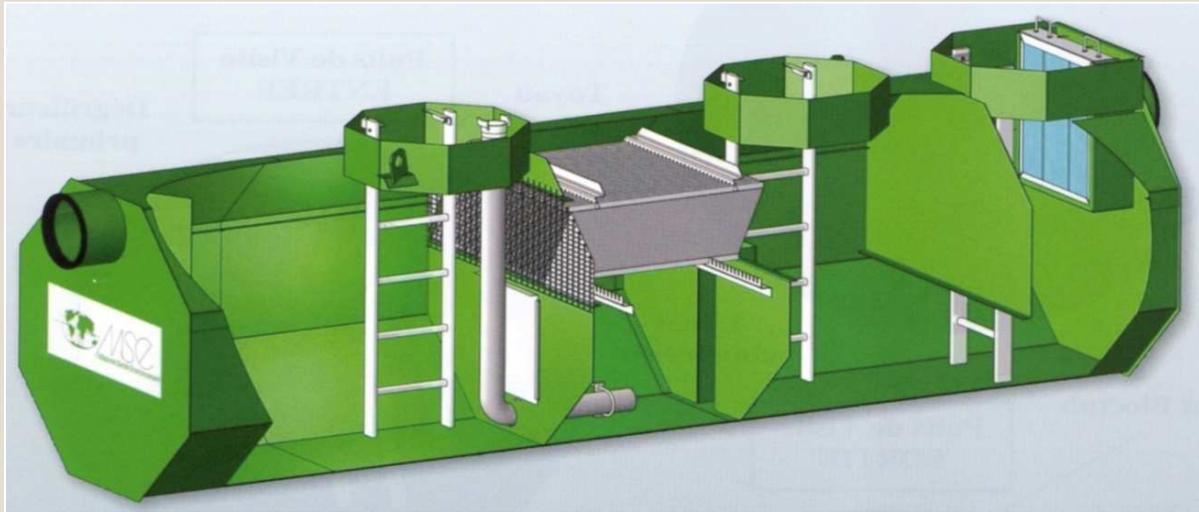
Collection and processing of rainwater from the Le Havre ore terminal

The work carried out in 2008 by the Grand Port Maritime du Havre in order to reduce the environmental impact of the ore terminal (coal) on the quality of dock water, now makes it possible to collect and process the rainwater coming from around the East and West coal storage yards (see pictures before and after the work down below). The work amounting to more than € 2 million was carried out on a surface of 4 hectares and over two years or so, without hindering terminal business. The main task performed on the worksite was the creation of collection ditches and structures for the storage and processing of the rainwater (see filtration diagram with a lamellar clarifier). Water coming from the network of ditches surrounding the yards is now processed and controlled before being discharged into the Théophile Ducrocq dock. As for the water now stored in a buffer dock of 400 m3 before disposal, it is re-used for internal processes (cleaning operations, dust control) in order to limit the present use of drinking water.

Lastly, organising the excavation work necessary to collect rainwater made it possible to process more than 90 % of the materials collected. Among the materials, almost 6,200 tonnes of coal were reclaimed after scraping of the top layers of the terminal on which the coal had deposited and settled for numerous years. After the screening* operation, 5,500 tonnes were estimated to be fully recycled and they were directly carried to a thermal production centre.

* Screening is an operation which makes it possible to separate a population of pieces of matter according to their size into one (or several parts)

Illustrations:





Groningen Seaports, The Netherlands
Contact Person: Bart van der Kolk
Position: Staff
Email: info@groningen-seaports.com
Environmental issue: Water management
Response: Enable
<p>Sustainable processing of wastewater: Saline Wastewater Treatment Plant (SWWTP)</p> <p>The direct discharge of unpurified (saline) wastewater into fresh surface water is no longer acceptable. Transporting this wastewater to a sewage water treatment plant (RWZI) is not always the optimum solution. Building and managing your own plant is too expensive and too complex. What other options are available? This question was concerning a number of companies located at the Oosterhorn industrial park - the harbour district close to Delfzijl in the Netherlands.</p> <p>In this case North Water supplied the answer by constructing a saline wastewater treatment plant using the Design, Build, Finance & Operate (DBFO) concept. This activated sludge plant has a capacity of 35,000 PU (Pollution Units) and if required this capacity can be increased. Because North Water takes care of the treatment of the wastewater the companies producing the waste discharges are relieved of all cares.</p> <p>The harbour industrial park developer "Groningen Seaports" has developed several industrial parks - Oosterhorn is one of them. Several companies at this industrial park discharged mainly saline wastewater into the surface water of the Zeehavenkanaal – ultimately, this was an environmentally undesirable situation. Therefore the treatment of most of these wastewater flows was necessary. Experience showed that, due to the high salt concentrations, it was best to treat this wastewater separately in a saline wastewater treatment plant.</p>
<p>Links:</p> <p>http://www.northwater.nl/en/Projects/Paginas/ZAWZI.aspx</p> <p>http://www.youtube.com/watch?v=vxxu6iYCyVg</p> <p>www.groningen-seaports.com</p>



Illustration:



Port of Trelleborg, Sweden

Contact Person: Ulf Sonesson

Position: Manager Infrastructure Development

Email: ulf.sonesson@port.trelleborg.se

Environmental issue: **Water management**

Response: **Exemplify** / **Enable**

Filter equipment in surface water drains

Construction of filter equipment in surface water drains in the port's terminal and traffic areas aiming at reduction of harmful substances. The construction work will be finished early autumn 2012. A program for water sampling and evaluation will then be carried out.



Encouraging; providing incentives to greener port users

There was no clear “encouraging” type of practice submitted for this first version of the Good Practices Annex.



Engaging; with users and/or authorities in sharing knowledge and skills

Port of Dover, United Kingdom
Contact Person: Vicki Case
Position: Environmental Manager
Email: vicki.case@doverport.co.uk
Environmental issue: Water management
Response: Exemplify / Enable / Encourage / Engage
<p>Water quality management in Dover</p> <p>Dover Harbour is not only home to Europe’s busiest ferry port. It is also a busy and valued recreational area for water sports activities and the local community. Water Quality is therefore an important consideration for the Port of Dover and this is reflected in its environmental policy and through its environmental objectives and targets.</p> <p>The Port’s commitment to preventing pollution incidents has ensured improvements in surface water drainage across the Port. Penstock valves and interceptors have been fitted across the Port estate, thereby reducing the potential for a landside spill to impact upon the marine environment. A port-wide Oil Spill Contingency plan, as well as staff awareness and oil spill training, ensures that the Port of Dover is prepared for any such incident. The boatyard includes a cutting edge closed loop washdown area, where over 95% of the water utilised is recycled and reused within the state-of-the-art system as well as reducing pollution by preventing debris from draining back into the harbour.</p> <p>In addition to preventative methods, the harbour is continually monitored for its water quality. The Port contracts the Environment Agency (a UK government agency) to monitor the water quality on a weekly basis throughout the bathing water season. The results are published weekly on public notice boards along the sea front. Bi-annual surveys are also conducted across the harbour and the River Dour (a local river which flows directly into the harbour). These measure a variety of water quality indicators. The Port is proactive in improving the water environment. 2011 saw the Port collaborate with the Environment Agency in order to carry out a River Dour litter collection. Annually, the Port also provides direct practical support and funding to</p>



the White Cliffs Countryside Partnership (WCCP) beach clean event. This is held on Shakespeare Beach (a beach adjacent to the Port's Western Docks) as part of the Marine Conservation Society's annual Beach Clean Weekend.

The work of the Port has resulted in Dover Harbour being listed in the Marine Conservation Society's Good Beach Guide for a number of years, enabling a busy international port to operate successfully alongside the community.

Links:

Pollution prevention and water quality details can be seen in the most up to date Environmental Bulletin, found at: <http://www.doverport.co.uk/?page=AnnualReports>

The Oil Spill Contingency Plan can be found on the Port of Dover website:

<http://www.doverport.co.uk/assets/client/images/collateral/Oil%20Spill%20Contingency%20Plan%20-%20Oct%2010%20-%20current%20version.pdf>

Details of how the water quality testing by DHB is carried out can be found on the Port of Dover website:

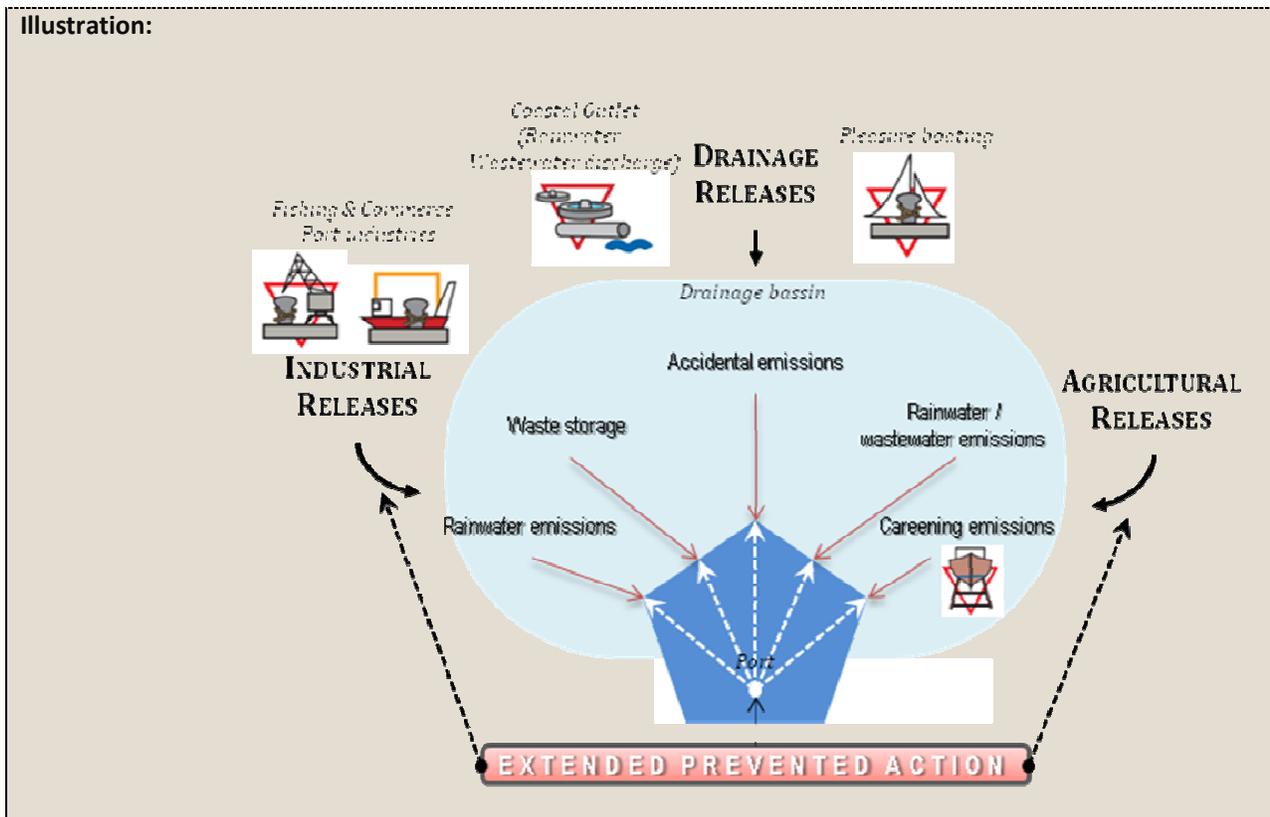
<http://www.doverport.co.uk/assets/client/images/collateral/Env%20Monitoring%20Water.pdf>

Illustration:





Port of Dunkirk, France
Contact person: Pascal Gregoire
Position: environmental management
Email: pgregoire@portdedunkerque.fr
Environmental issue: Water management
Response: Engage
<p>Strategy to improve water quality</p> <p>Like any port, the port of Dunkirk is the recipient of many contaminants (trace metals, PAH, PCB, microorganisms, nitrogenous matter, phosphorus,...) from various sources : waters from drainage basin, wastewater, rainwater and releases from activities located on its territory. Thus, the quality of port waters is not merely a port issue, but a whole area one, where all inside and outside activities whose releases end up sooner or later in port docks have an influence. A port is also an interface between the terrestrial and the aquatic world and a place where various activities take place (swimming, water sports, fishing, etc.). Therefore, all land sources releasing contaminants to the sea are of significance.</p> <p>The port is fully aware of this situation, and many years ago it set up operations for monitoring and supervising its territory, the near shore and coastal waters various aspects (biology, eco-toxicology, microbiology, physical chemistry of the sediment, etc), specifically for water. The port therefore takes regularly water samples from all the port docks, as well as from the outer channel and the near shore waters, in order to assess the water quality in terms of chemical and microbiological contamination. The results show that the quality of the transitional water is chemically good. The quality of the water upstream of the port docks is poor.</p> <p>In order to achieve the targets of the Water Framework Directive as well of the Grenelle Environment Law, the port is working to reduce the pollution diffused on its territory. To this end, in 2006 the port put in place a series of agreements with industries located on its territory to identify their wastewater disposal, most of which are listed as environmentally regulated installations. The same type of agreements is implemented with the control department toward better management of the wastewater disposal.</p>





Enforcing; setting rules and ensuring compliance

Port of Nantes – Saint-Nazaire: France

Contact Person: Mathias GUERIN

Position: Environmental projet manager

Email: m.guerin@nantes.port.fr

Environmental issue: **Water management**

Response: **Enable** / **Engage** / **Enforce**

Water treatment in Nantes- Saint Nazaire

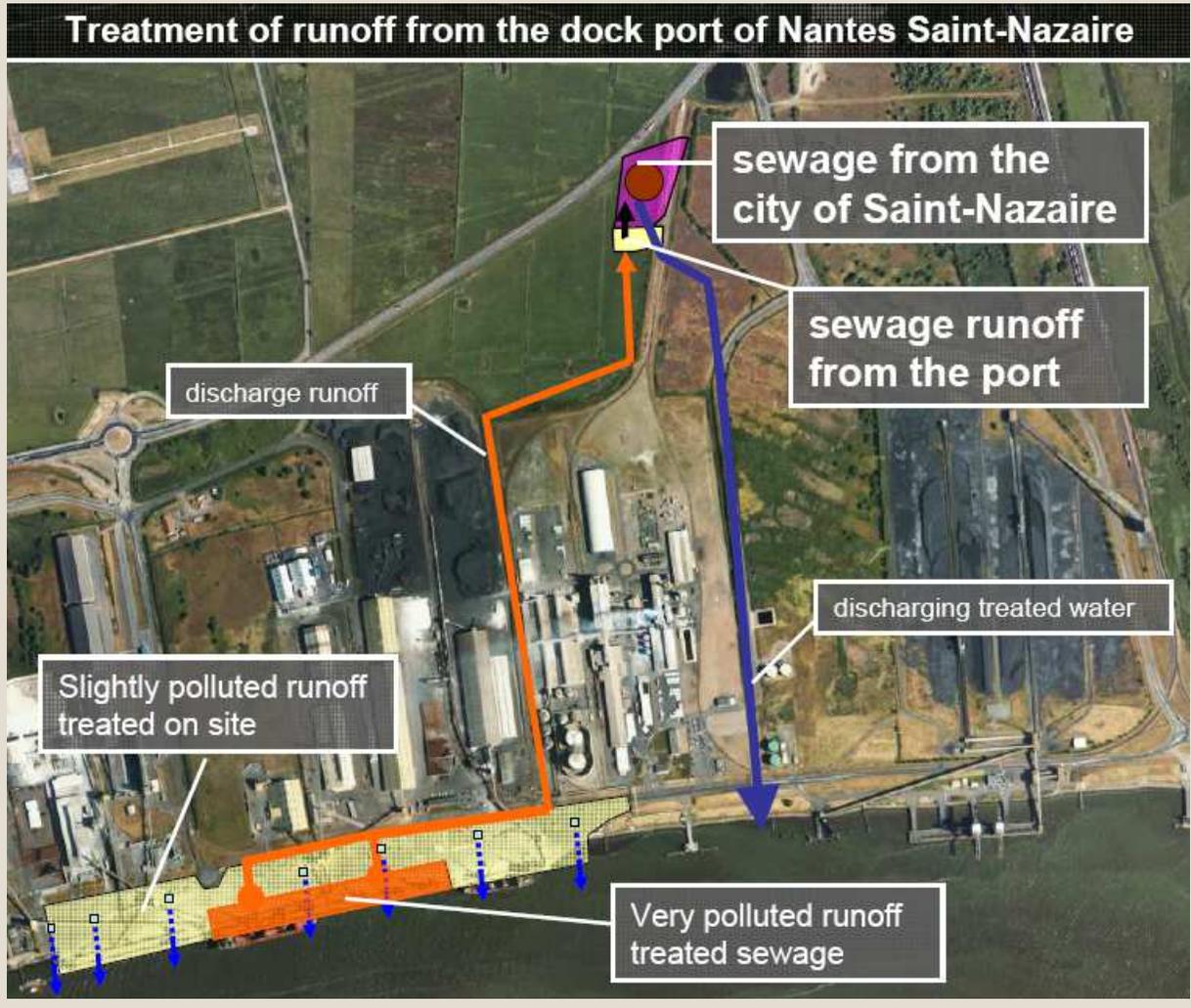
Handling of dry bulk generates dust deposits on the ground and requires regular cleaning docks. Runoff was directly discharged without treatment in the Loire. To reduce the environmental impact the Port has built a water treatment plant capable of treating a flow of 200 m³ / h. After sieving, the effluent treatment is carried out by lamellar settling associated with the injection of chemical reagents. This installation can significantly reduce organic pollution and treat phosphorus pollution. An agreement was reached with the terminal operators to limit the input of pollution to the water treatment facility. Financial penalties are imposed for non compliance with the agreement. The complete installation of a € 3 million, is subsidized at 30% by the Water Agency Loire - Britain and will enter service in October 2012.

A partnership was formed with the City of Saint-Nazaire, which envisaged the construction of a wastewater treatment plant for urban water near the port area. After studying the complementarities between future sanitation facilities, the city and the Port have agreed to work together towards a common equipment which has allowed economies of scale and a significant reduction of environmental impact:

- reducing the number of buildings and equipment;
- pooling of resources for treatment and sludge storage;
- reuse of treated water produced by the station of the city for the operation of the preprocessing unit of the Port.

This project is part of the Port's environmental policy, which aims in particular to achieve better water quality by 2015.

Illustration:





Other examples

For few of the submitted examples, it has been challenging to classify them under a specific environmental issue. Those refer mainly to management elements such as environmental reporting and management systems that address all five selected environmental issues. Those examples are presented in this separate section.

Port of Dover, United Kingdom
Contact Person: Vicki Case Position: Environmental Manager Email: vicki.case@doverport.co.uk
Environmental issue: Air quality / Energy conservation and climate change / Noise management / Waste management / Water management
Response: Exemplify / Encourage / Engage
<p>Reporting environmental information and consulting with stakeholders</p> <p>The Port of Dover recognises the importance of its environmental responsibilities and experience has shown that there is much value in publishing and sharing information on environmental matters. The Port of Dover website has a dedicated environmental section which provides an array of general information as well as specific environmental reports and policies. This information is easily accessible, and updated on a regular basis.</p> <p>An annual Environmental Bulletin is produced and is published on the website as well as hard copies being made available to tenants and local groups. The Bulletin highlights progress against annual environmental objectives and targets, detailing the Port’s work and its achievements on waste, energy, water as well as environmental occurrences and environmental quality. Details of Port projects, developments and significant features from the year are also discussed.</p> <p>Environmental issues are aired (and have been since 2002) at quarterly meetings of the Port Consultative</p>



Committee (PCC). This is the main stakeholder engagement forum in which over 60 organisations participate, ranging from local residents groups through to government agencies. The PCC provides stakeholders with the opportunity to raise their own port-related issues, including environmental matters. The PCC was particularly valuable during the development of the Terminal 2 project, which enabled wide ranging discussions over a number of years on the Port's plans for a second major ferry terminal and the environmental issues that this involved.

Health, Safety and Environment Liaison Group meetings are held quarterly with major tenants, during which environmental issues within the Port can be raised and discussed. Tenants play an important part in the Port's energy consumption as well as regarding environmental occurrences, so it is important that they are fully involved with the Port on environmental matters.

Links:

Link to the Environmental Page on the Port of Dover website:

<http://www.doverport.co.uk/?page=PortEnvironment>

Annual Environmental Bulletins:

<http://www.doverport.co.uk/?page=AnnualReports>

Illustration:





Port of Valencia, Spain

Contact Person: Federico Torres

Position: General Sub-director

Email: ftorres@valenciaport.com

Environmental issue: **Air quality / Energy conservation and climate change / Noise management / Waste management / Water management**

Response: **Exemplify / Enable / Encourage / Engage**

Environmental management of the whole port area

ECOPORT addresses the implementation of environmental management system standards in port facilities for ports' stakeholders following the ISO 14001 standards and adapted to the ports' facilities. The aim is to improve the environmental management of companies within the port community. These improvements are based on Environmental Management Systems that facilitate the implementation of ISO 14001 within a period of 5 years.

In this sense, the PAV provides support to companies with the elaboration of several guides:

- "ECOPORT Guide for the implantation of environmental management systems by levels in port facilities", in which it proposes and describes in five successive levels, the steps necessary to be performed by the port companies to implement an EMS according to the norm ISO 14001 and EMAS regulation.
- Guide E4Port, on energy management by levels according to ISO 50001

Additional services include:

- Environmental consulting service to the port companies involved.
- An environmental advisory service on environmental port legislation through the application "ECOPORT-LEX" (<http://www.ecoportlex.es/>).
- Developing of training actions on environmental issues aimed at the port companies.

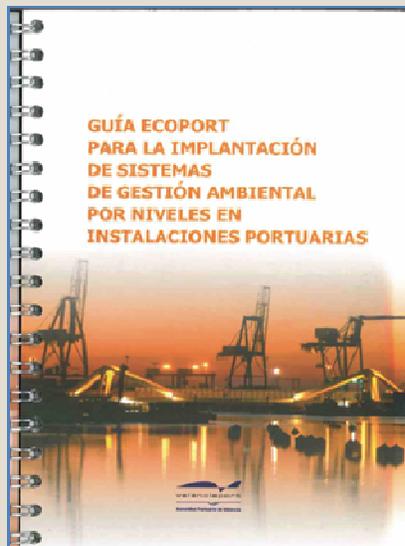


Currently, 24 companies of the port community have been certified to ISO 14001 or EMAS, and 16 companies are in implementation processes of EMS. This represents an important step forward in the field of environmental management of the port community.

Links:

<http://ecoport.infoportvalencia.es>

Illustrations:





Port of Aalborg, Denmark

Contact Person: Brian Dalby Rasmussen

Position: Environmental coordinator

Email: bdr@aalborghavn.dk

Environmental issue: **Air quality / Energy conservation and climate change / Noise management / Waste management**

Response: **Exemplify / Enable / Encourage / Engage**

Network for sustainable development

Together with a few neighbour companies The Port of Aalborg have initiated a network for companies and institutions situated in the south-eastern part of Aalborg – “postal code 9220”. During the first year more than 50 companies joint the network and it is still growing. The network will contribute to the development of infrastructure, services, employment and social life within the area. Ten companies have joint forces in a focus group for environment and energy, aiming to create environmental improvement through collaboration, sharing of knowledge and industrial symbiosis.



Colophon

The European Sea Ports Organisation (ESPO) represents the seaports of the Member States of the European Union and has observer members in several other European countries.

For further information, please contact:

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