Environmenta Actions

Port of Vigo: Green Port

BEST PRACTICES IN THE SUSTAINABLE DEVELOPMENT OF THE PORTS
The Port Authority of Vigo has implemented and certified the following systems of management support, keeping in this way a solid commitment to the sustainability.

Environmental Statement and Sustainability Report

The Port Authority of Vigo has registered in the WPCI “World Ports Climate Initiative” the most representative association of Ports worldwide regarding the climate change and the reduction of the release of green house effect gases.
Clean Traffic

The importance of the Port of Vigo lies, more than in the gross amount of cargo transported, in its quality and economic value, most of which corresponds to general goods (90%), but also bulk (8% solid and 2% liquid), which shows the commitment of the Port Authority to promote the “clean traffic” (vehicles, granite, containers) that have a lesser impact to the environment compared to bulk cargo.

The port has developed the strategy of promoting the sea transport of short distance or “Short Sea Shipping”.

Peso relativo de los distintos traficos del mercancías dentro del sistema portuario español durante 2010

- G.Liquidos
- G.Soldos
- Mercancía G.
- Pesca
- Avitualía.
What is a Green Port?

Green Port: is that which develops its activity considering not only to the economical scope but also the environmental and social scopes, or in other words, in a sustainable way:

Developes its activity causing the minimum possible impact, contributing with improving measures and control measures for the quality of the air, water, noise and waste.

At the same time, a Green Port is that which is able to provide power supply to the ships onshore (OPS), is provided with facilities for renewable energies and measures for the efficiency of the use of energy.
Improvements in the quality of the air

Project TEFLES
Goal: to develop technologies and models to reduce de emissions caused by ships in three scenarios: sea, Port approach point and maneuvering and Port stay.
Improvements in the quality of the air

Project TEFLES

As part of the study, the ships are visited and the enquiries are filled in, as they will be used to the model designing.
Manoeuvring model and technologies

Structure of the Manoeuvring model

- Engine model
  - WAVE
- Ship resistance and propulsion
  - CFD viscous code (HSVA)
- Aerodynamic resistance
  - CFD viscous code/Blendermann catalogue (HSVA)
Technologies

AFTER TREATMENT AND THERMAL. All techs related to main engine, main consumers and exhaust gases techs

After treatment. Dry scrubbing+ Compact SCR
Heat recovery
Engine tuning
Combinator mode
Speed reduction
Refrigeration system
Other consumers
Technologies studied
Results

all data „per year“

- P1: Speed reduction, Engine injection tuning, Trim optimization, Combinator mode
- P2: Wake adapted rudder, Bulbous bow, Paints
- P3: After treatment, cold ironing
- P4: After treatment, cold ironing, Combinator mode, Batteries for hybrid propulsion, Refrigeration
- P5: LNG fuel switch
Technologies studied

Cold ironing

![Graph showing CO₂ emissions vs. relative cost for different technologies.

Legend:
- LNG pu cost = 1/3 frequency converter pu cost
- LNG pu cost = 2/3 frequency converter pu cost
- LNG pu cost – frequency converter pu cost
- LNG pu cost > frequency converter pu cost]
**Improvements in the quality of the air**

**Project GPEC**

**Goal:** to develop a solution able to simultaneously achieves an important improvement regarding the efficiency of the energy and effectively reduces the emissions (NOx, SOx, CO2, PM y VOC) of the ships in the port, in such way that its implementation is both possible and viable, and most of all, in medium sized Ports and also medium-large. Three types of solutions are a priori considered:

1) **Use of GNL Engines. Retrofitting.**
   It consist in modifications and adaptations made to the ships so that they are able to replace the motorization to use less polluting fuels such as Natural Gas.

2) **On Shore Power Supply (OPS).**
   Power supply system for the ships in a set of points Located in the edge of the quay.

3) **Off-Grid Shore Power (OGSP).**
   Independent energy generation system that allows to supply energy in the location where there is demand of it, in other words, In the specific area of the Port where the ship is to dock.
Future Plans

- To develop strategies that assist in the implementation of the usage of the Natural Liquid Gas in the Port.
- To expand the supply system to small and medium ships, the supply systems to cargo ships and maritime terminals.
- Complement the renewable energies in the Port with new systems: wind power, tidal power, etc.
- SMART-PORT
Thank you for your attention

Atlantic Stakeholders Platform Conference

Porto, 20th January, 2015

http://tefles.eu/

Carlos botana Lagarón
Head of Environmental and development Policies
Port of Vigo
carlosbotana@apvigo.es