TEFLES

Technologies and Scenarios For Low Emissions Shipping

**Funding:** European (7th RTD Framework Programme)

**Duration:** Feb 2011 - Jan 2014

**Status:** Complete with results

**Total project cost:** €3,038,611

**EU contribution:** €2,259,405

**Call for proposal:** FP7-SST-2010-RTD-1

**CORDIS RCN :** 97753

**Methodology:**

The methodology for a successful execution of this project is based on a structured combination of research and development activities in order to develop and combine after treatment, hydrodynamics...
and power generation technologies for emission reduction in ships, and structured activities in scenario building, in order to analyse the impact of combinations of the technologies into real-life ship operations (at sea, approach and manoeuvring, at port). The work plan has a clear result-oriented focus, dividing the activities into natural work packages with clear deliverables.

WP 2 has an approach on after treatment solutions with focus on reducing emissions and specially sulphur oxides, benchmarking and reducing the cost and payload of the available systems and optimizing the heat recovery to reduce fuel consumption.

WP 3 has an approach consisting in reducing the time and therefore the emissions on port entrance and manoeuvring until mooring, focusing on ship-tug interaction, propeller-rudder interaction at low speed, and manoeuvring on adverse meteorological conditions and shallow waters.

WP 4 has an approach of developing the knowledge needed to model and assess combinations of technologies resulting in simplified hybrid propulsion systems for ships, able to reduce exhaust gas emissions at low and fluctuating loads, like during harbour approach and docking manoeuvers, including interaction with service boats as tugs.

WP 5 handles the first scenario selected: the emissions reduction at sea on short distances to complete the port-to-port complete trip reduction. Port of Vigo (being TEFLES partner) and Port of St Nazaire are two nodes of the Atlantic Motorways of the Sea. The ship types selected for this model are MoS containerships and feeders or ferries.

WP 6 handles the second scenario: emission reductions during port approach and manoeuvring using the port of Vigo and port of St Nazaire logistics to be used for the MoS.

WP 7 deals with the third scenario: when ship docked, assessing the alternative Shore Power Port boosting by cold ironing, to assess and optimize the potential benefits that “cold ironing” can bring in terms of emissions reductions.

WP 8 will make an assessment of the cost-efficiency aspects of emissions reduction scenarios elaborated in WP5, WP6 and WP7.

WP 9 deals with the dissemination and will include presentations on relevant related events, a web page complemented with newsletter for dissemination and publishing.

Parent Programmes:
FP7-TRANSPORT – Transport (Including Aeronautics) - Horizontal activities for implementation of the transport programme (TPT)

Institute type: Public institution
Institute name: The European Commission
Funding type: Public (EU)

Lead Organisation:
Inova Consultores En Excelencia E Innovacion Estrategica, S.l.
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EU Contribution: €405,808

Partner Organisations:
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Address:
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Germany
Organisation Website: http://www.hsva.de
EU Contribution: €325,190
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<td>Avnida De Beiramar 2, 36208 Vigo, Spain</td>
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<td>Couple Systems Gmbh</td>
<td>Hamburger Landstrasse 49, 21357 Bardowick, Germany</td>
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<td>Istanbul Okan Universitesi</td>
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<td>Consultores Investigacion Tecnologica S.l.</td>
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<td>Heatmaster B.v.</td>
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**Technologies:**
- Alternative fuels
- Shore power for ships
- Ship design and manufacturing
- Combining controllable pitch propeller with variable rpm

**Development phase:** Research/Invention
Key Results:

Mitigating maritime transport emissions

Europe has set ambitious goals to cut 60% of carbon emissions in transport by 2050. An EU-funded project sought to make short sea shipping (SSS) more environmentally competitive as it is an important and high-efficiency means of transport.

The European Commission has placed limitations regarding the sulphur content for marine fuels used by inland waterway vessels and ships at berth in EU ports. As such, with effect from January 2010, Member States should ensure that marine gas oils are not placed on the market if sulphur exceeds 0.1% by mass.

Motivated by stringent regulations regarding sulphur emission-controlled areas, the EU-funded project ‘Technologies and scenarios for low emissions shipping’ (http://tefles.eu/ (TEFLES)) focused on reducing emissions in maritime (i.e. SSS) traffic.

The logic behind the TEFLES project was to design new approaches for setting up various scenarios at sea, in coastal areas and in ports. These were then analysed with advanced computer simulation tools to record the most promising and cost-effective technologies available. Without these methods in place, it was estimated that any technology approaches and developments would be less effective.

TEFLES developed and combined after-treatment, hydrodynamics and power-generation technologies for emission reduction in ships. In particular, scientists developed and validated an innovative exhaust gas cleaning system that integrates a dry scrubber and a compact selective catalytic reactor. Although a slight increase in fuel consumption was noticed, sulphur oxides were reduced by over 90% and heat recovery was increased by over 40%.

Design of advanced hydrodynamic models helped reduce fuel consumption at sea and in port scenarios. Scientists also focused on reducing the time and therefore the emissions on port entrance and manoeuvring until mooring, focusing on tug, propeller and rudder interactions.

Another task was to develop models for loads and power supply systems for various types of ships and different port power supply infrastructures. TEFLES assessed the potential benefits that cold ironing can bring in terms of emission reductions and improved energy efficiency.

Project findings were disseminated widely via the project website, seminars, conferences, workshops, newsletters and several published scientific papers.

Documents:
- D2.1.-State-of-the-art-and-efficiency-report (Other project deliverable)
- Final Report Summary - TEFLES (TEchnologies and scenarios For Low Emissions Shipping)

STRIA Roadmaps:
Transport electrification, Vehicle design and manufacturing, Low-emission alternative energy for transport
Transport mode: Water transport (sea & inland)
Transport sectors: Passenger transport, Freight transport
Transport policies: Environmental/Emissions aspects, Decarbonisation
Geo-spatial type: Other