

## PROMINENT - full speed ahead

On May 1st 2015, the project **PROMINENT** started. For this multiannual research and implementation program for inland shipping, seventeen parties from five European countries collaborate to green the inland shipping industry. Initial results have already been achieved within the different fields of work (WP's). In this newsletter we proudly inform you on the progress made in various WP's.

**PROMINENT** - Promoting innovation in the Inland Waterway Transport Sector - aims to further decrease the energy consumption and carbon footprint of IWT. The activities within **PROMINENT** focus on three areas:

- > Massive transition towards energy efficient and clean vessels;
- > Certification and monitoring of emission performance and development of innovative regimes;
- > Harmonization and modernization of professional qualifications and the stimulation of the further integration of IWT into sustainable transport chains.

Besides the 'traditional' research activities, **PROMINENT** will focus on the key items to support uptake of the developed technologies and concepts by the industry. During the first nine months of **PROMINENT**, the consortium has been active to prepare the roadmap for future activities concerning advanced concepts for mass introduction, certification, monitoring and enforcement and digital education tools, to support the design of the pilots to test and validate the concepts developed within the framework of **PROMINENT**.

Since the involvement of end users is key to support the market uptake, the first Advisory Board of **PROMINENT** was conducted on the 19th of January 2016 in Brussels. The Advisory Board consists of



representatives from Member States Administrations, Professional Organizations and Unions, River Commissions as well as other key stakeholders in the areas where **PROMINENT** is active. The outcomes of the discussions will feed into the current activities, and will prepare dedicated stakeholder events where the end users will be invited for an active dialogue on how the industry should be supported to be able to make use of the technologies developed.

This newsletter will provide inside information in the developments in the first nine months, and is an open invitation for the start of a dialogue with, and the active participation of future end users. For example, in the area of pilot deployments we are searching for vessel owners willing to cooperate with **PROMINENT** to pilot technologies developed.

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## WP 1 State of play

*This work package was successfully concluded in November 2015. It provides the knowledge base and direction for the further work in this project. Promising greening technologies and concepts have been analysed and matched with the characteristics of the European inland fleet in order to identify those concepts with the largest potential greening impact.*

Groups of comparable vessels (fleet families) and their operational profiles were identified and their cost structure analysed. As a next step, the best greening technologies and concepts to raise energy efficiency and lower emissions were assessed regarding their effect, range of impact and their avail-

ability for the most relevant European fleet families. This assessment allowed conclusions on the best available technologies in the short term and their selection for further elaboration within the project. Although a lot of the identified technologies are expected to have strong advantageous greening

Type of measure	Area	Measure	NOx	PM	CO2 only	GHG (CO2&CH4)	Applicability on the fleet	Economic feasibility (ship owner)	Technical maturity	Non-tech. maturity (barriers)
			%	%	%	%	% of fuel consumption in Europe	+++/-	TRL level	+++/-
Ship-related technical measures	Fuels, standardised solutions	Use LNG (Liquefied Natural Gas) - single fuel/spark ignition	70-80	up to 95	20-25	0-10	10-50%	++	6	---
		Apply dual fuel (LNG and diesel)	50+65	50-90	20-25	0-10	10-50%	++	6	--
		Apply GTL fuel	10	20	0	0	>50%	-	9	0
	Propulsion system, standardised solutions	Apply SCR	70-90	0-20	≈0	≈0	10-50%	--	8	-
		Wall flow DPF	0	90	≈0	≈0	10-50%	---	7	-
		Combine SCR and DPF	80-90	90	≈0	≈0	10-50%	---	7	-
		Exchange of main diesel engine (CCR I by CCR II engine)	15-35	40-60%	0	0	>50%	0/-	9	0
		Exchange of main diesel engine (by Stage V engine)	65	80-90	0	0	>50%	-	5	--
		Right sizing	0-10	0-10	0-10	0-10	100%	++	9	0
Ship-operational measures	Sailing behaviour	Speed adaption	0-10	0-10	0-10	0-10	10-50%	+	9	0
		Optimised track choice	0-10	0-10	0-10	0-10	10-50%	+	9	0
Infrastructure	Waterway Information	Real time info on fairw. data	14 (3-25)				>50%	+	5/7	-
Ship-operational measures	Sailing behaviour	Speed adaption	14 (3-25)				>50%	+	5	-
		Optimised track choice	14 (3-25)				>50%	+	5	-

effects, they are not automatically taken up by market players. Therefore, the activities in this WP were completed by

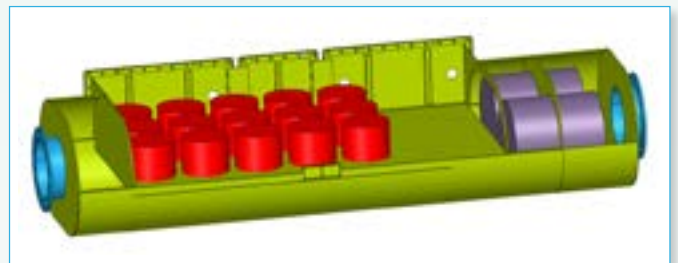
an investigation with the aim to identify the reasons for this fact as well as the measures to overcome them.

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## WP 2 Advanced concepts for mass introduction

*In order to achieve a reduction of air pollutant emissions, energy and fuel consumption by the inland fleet, a mass introduction of a range of alternative energy concepts and technologies will be supported. This should result in making these technologies and concepts available for 70% of the inland fleet and simultaneously reducing the costs of applying them with 30%. This could be achieved by the further development of standardisation and modularisation of the most promising greening technologies and concepts.*



The main focus of the work in this WP is to develop four of the most promising concepts and technologies, namely LNG, emission after-treatment of diesel engines, energy-efficient navigation and right-sizing and hybrid concepts. At the start of the project, two of those concepts were further elaborated: Emission after-treatment and Energy-efficient navigation. This resulted in the specifications of the demonstration projects for these concepts. Furthermore, the costs and benefits of these two concepts were analysed, these reports are available for download on the [PROMINENT](#) website.

### Emission after-treatment of diesel engines

After-treatment by the use of SCR catalysts and diesel particulate filters is one of the most effective ways of reducing air pollutant emissions, respectively NOx and PM, both potentially reducing with around 90%. The work focussed on the opportunities of further standardisation with the possibility of a cost reduction, which is needed for a mass implementation of after-treatment. This led to a specification for a pilot to be performed within [PROMINENT](#) with the application of after-treat-

ment. Also calculations were made for the costs of applying an SCR or the combination of an SCR and a DPF for several vessel types and a selection of common journeys. In these calculations also the impact of applying SCR and DPF is included.

### Energy-efficient navigation

Next to all the engine room solutions there is also a reduction of fuel consumption and emissions to achieve by navigating in a more energy-efficient way. With the development of an energy-efficient navigation system it is pursued to provide skippers with a helpful tool to sail more efficient. This concept will also be tested in a pilot and defining the settings of this will address issues, like e.g. the user requirements, necessary system parameters and available data for model calibration. Also the costs and benefits of this concept were analysed and this will give input for more detailed business models.

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## WP 3

# Certification and monitoring

*In WP 3 it all revolves around procedures for certification and monitoring of stringent emission limits. Not just for a range of different vessel types, but also for operating profiles and various situations (new engines, engine overhaul, retrofit).*

As a first step, an overview was made on which methods for certification, monitoring and enforcement are already available. Currently used engine type approval procedures seem to be relatively expensive and complex. Furthermore, the current certification and monitoring procedures do not guarantee low real sailing emissions. On the long term it is expected that most of the existing engines of IWT-vessels will

be equipped with emission control technologies such as after-treatment technology. In order to certify the emission performance of these vessels at a reasonable cost, dedicated simple on-board certification tests are a good option.

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## WP 4

# Digital education tools

*The project partners in this work package focus on the development of digital and electronic education tools, among which three E-learning modules and a European electronic service record and logbook.*

The E-learning module 'Vessel stability' will create awareness and sensitivity for vessel stability. A module 'Cost-efficient navigation' will give insight in the basics and advanced information on interactions between water depth, current and sailing speed on resulting fuel consumptions. The third module is about handing of (alternative) fuel and cargo, especially dangerous goods. All modules will be made available for all interested students and personnel in the IWT sector. The general structure, content and prerequisites of modules have been developed.



Later on in this work package, a prototype of a Electronic Service Record and Logbook will be developed and a web-based community of practice. In the next edition of this newsletter we will inform you on the progress made.

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The project **PROMINENT** aims at addressing the key needs for technological development, innovation and greening in the European inland navigation sector.

The project's three pillars will encourage a massive transition towards efficient and clean vessels; a reliable certification and monitoring of emission performance; and a harmonized and modern frame for professional qualifications.

The first pillar is essential to guarantee a technological and environmental progress of the IWT sector which has traditionally a very long assets life cycle.

In times of crisis it is more than ever the right moment to develop and deploy solutions that are cost effective and deliver value for money for both the ship operator, its client and the society. One such potential win win approach identified by the **PROMINENT** project is in the field of energy saving where several solutions will be tested and deployed at large scale.

Horizon 2020 is putting a renewed focus on innovation and on market uptake of solutions. Building on this, it is expected that the **PROMINENT**



project will provide the IWT sector with a strong push of realistic and valuable innovations. The presence of industrial players, clients and end users in the project is a good sign of the alignment of solutions developed with the needs of the sector. Hopefully, this will lead to success stories in the field of air pollution abatement and energy saving devices, where excellent solutions are designed for clients and implemented by them during the life time of the project.

Finally an interesting feature of the project is the broad spectrum of collaborations it is creating; both in research and innovation sector with technical solutions providers and end users; and in the broader sector of rulemaking and sector development. While the project is finishing its first year, all these points are progressing; it will be up to the project and to the sector's stakeholders to ensure that highest results are reached!

Gabriel Mialocq

Project Manager Transport Research at INEA

## WP 5

# Key results and outlook

*In this work package, the project partners will design and implement pilots to test, validate and demonstrate the key approaches and technologies for greening of the fleet.*

The task of setting up a consolidated database to collect data from the pilots 'Emission after-treatment' and 'Energy-efficient navigation' and to provide data on-board of vessels has started. The first test with wireless data transmission from ship on-board monitoring unit to a database have been done and the project partners have started with the installation of the on-board measurement system on the first few vessels. The selection of vessels to be involved in the monitoring pilot has stepped into a phase where consultations are going on with selected partners. The vessels will be selected by applying the results from WP 1, thus being representative by means of type and size.

### Furthermore:

- The selection procedure for two vessels to be used in the Energy efficient navigation pilot was closed with a successful agreement for two cargo vessels and one passenger vessel;



- The tendering process for the selection of a supplier for the equipment and services to be installed on ten selected pushers that will be involved in the pilot on the Danube has successfully been rolled out.

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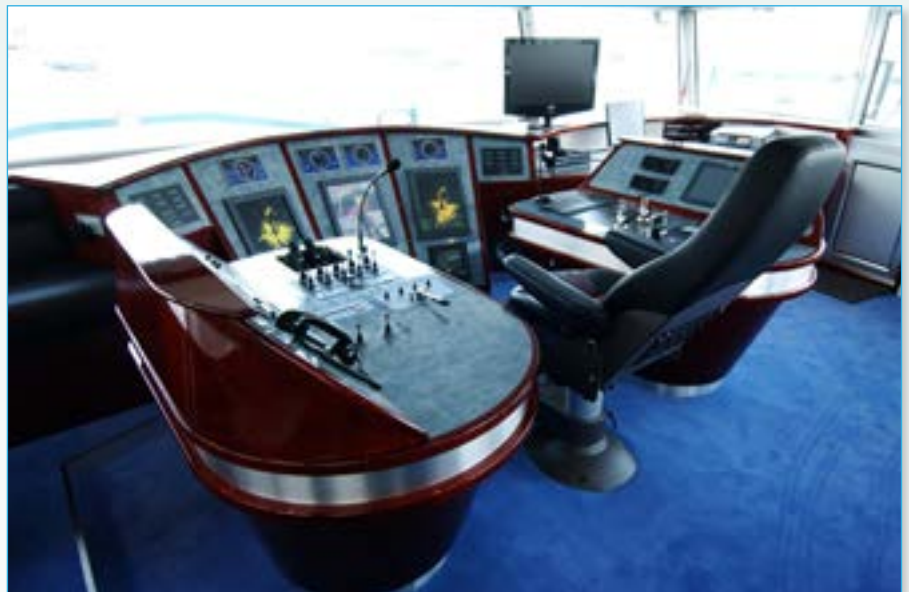
## WP 6

# Roll out

*WP 6 focusses on finding an answer on questions like: "What have we learned?", "Which barriers need to be resolved in order to be successful?" and "Which follow up actions do the IWT industry and public organisations need to take?"*

First step in this WP is the development of a complete analysis framework and template for sound evaluation of pilots. This framework will provide important input for further analysis on business cases and financing solutions. This will be done on two levels: an individual business level and an aggregated European level, in order to feed the discussion and process of decision making on financial instruments for innovation in the sector.

A key challenge in the success of the **PROMINENT** project is to reach small IWT-companies and to provide them with



'tailor-made' information. In order to realise this, an open, innovative and neutral app will be developed and introduced: the I-STEER Application. This app will make the findings of project **PROMINENT** available to the end-users and will also act as a platform for system suppliers. In other words: the app will

serve as a virtual market place where supply and demand of green technologies will be brought together.

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