



**VIENNA** 2018



**A digital era for transport**

solutions for society, economy and environment

# PROMINENT

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Hosted and organised by:

*Austrian Ministry  
for Transport,  
Innovation and Technology*



**austriatech**

Co-organised by:



Together with:



# General Information



- 17 partners:
  - industry and fleet operators;
  - equipment and engine developers and manufacturers
  - certification institutes;
  - promotion, innovation and development agencies;
  - inland navigation education and training institutes;
  - consultants and knowledge institutes;
  - waterway operators and administrations
- 1<sup>st</sup> of May 2015 – 30<sup>th</sup> of April 2018
- € 6.500.000 (of which € 6.249.997,75 EU contribution)

# Starting Point



- Pave the way for wide-spread innovations to prepare IWT for the future (technological, logistical, social and environmental) until 2020;
- Developing cost-effective solutions and standardised applications (reducing required investment costs) → 70% of fleet, 30% cost reduction;
- Existing fleet, new fleet, human element;
- Decrease of energy consumption and carbon footprint.

# Six dedicated topics

- State-of-Play regarding greening technologies and concepts in relation to IWT;
- Advanced concepts for mass introduction (emission after-treatment, energy-efficient navigation, LNG, hybrid and right-sizing);
- Certification, monitoring and enforcement;
- Digital (education) tools;
- Real-life pilot deployment;
- Roll-out.

# Advanced Concepts for Mass Introduction



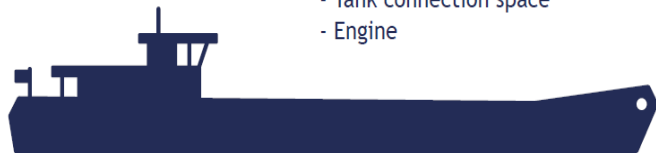
- Standardization efforts regarding:
  - LNG;
  - Diesel after-treatment;
  - Energy-efficient navigation.
- Monitoring, certification and enforcement
- Digital Education Tools

# LNG: Cost-benefit analysis

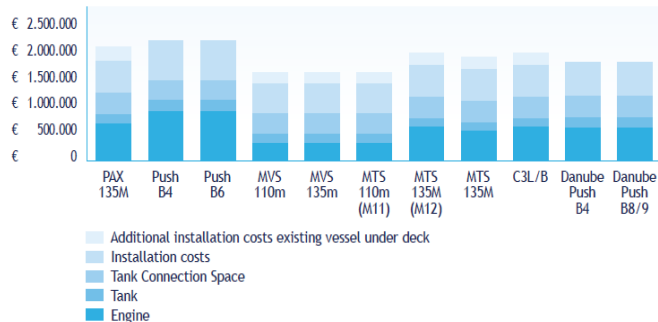


## COSTS

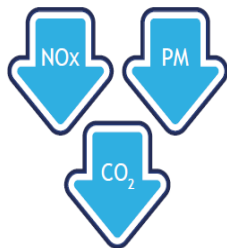
- Installation
- Tank
- Tank connection space
- Engine



## INVESTMENT COSTS



## ENVIRONMENTAL BENEFITS

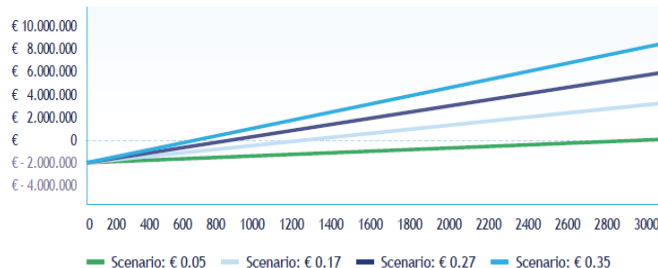


## FINANCIAL BENEFITS

Price advantage LNG - gasoil  
(based on 1 litre gasoil) scenarios:

Low oil price	€ 0.05
450 scenario	€ 0.17
New policies	€ 0.27
Current policies	€ 0.35

## BETTER NPV FOR VESSELS WITH A HIGHER FUEL CONSUMPTION



# Standardised emission after-treatment

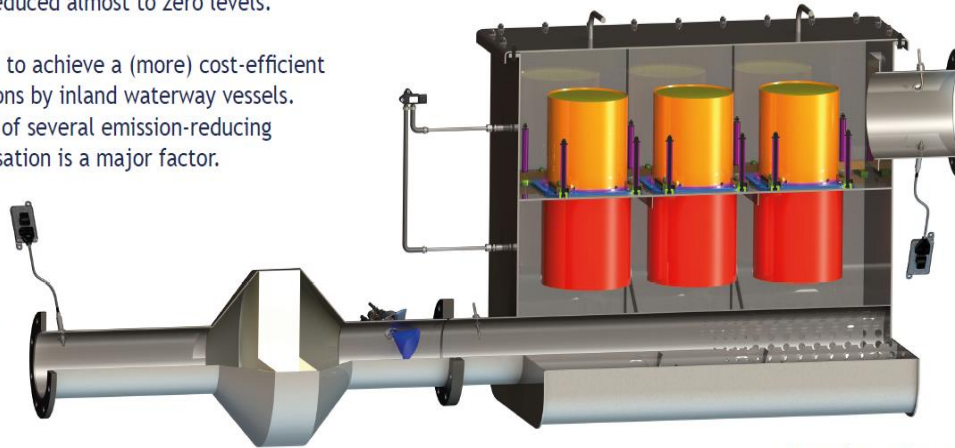
Worldwide emission standards have become increasingly stringent in order to protect the environment, to minimise greenhouse gases and to prevent the negative impact of combustion engine emissions on health. Toxic pollutants such as NO<sub>x</sub>, PM, HC, CO, methane & ammonia are to be reduced almost to zero levels.

One of the aims of PROMINENT is to achieve a (more) cost-efficient reduction of air pollutant emissions by inland waterway vessels. This is done by the development of several emission-reducing technologies, in which standardisation is a major factor.

For the existing Inland Waterway Transport fleet after-treatment systems are an relatively cost-efficient and easy way to monitor emissions.

SECTION OF A 2X3 SYSTEM

The red part is the DPF filter for particulate matter and the orange part is the SCR catalyst that converts NO<sub>x</sub>.



Source: Multronic Emission Systems

# Energy-efficient navigation

The evaluation of fuel-consumption savings achieved by an optimised sailing policy is extremely challenging in inland navigation as it depends on continuously changing conditions like

- hydrological parameters (water depth, flow velocity, etc.)
- the surrounding traffic
- the sailing schedule
- ship's load-case

## SIMULATIONS ON THE RHINE

**10% speed reduction  
saves up to 30%  
of the fuel**

## SIMULATIONS ON THE DANUBE

**1% increase in sailing  
time leads to a  
reduction in fuel  
consumption by 4%**



## TOOL FOR ENERGY-EFFICIENT NAVIGATION

The model is available online via a user friendly interface. This interface helps to estimate fuel use and NOx emissions for an upcoming trip, including alternative arrival times for corresponding fuel savings.

Visit the website:  
[www.iwtnavigator.eu](http://www.iwtnavigator.eu)



# Monitoring, certification and enforcement



## LEGISLATION & CERTIFICATION

PROMINENT helps to develop legislation and certification for inland ships and their emissions. With a proper and cost-effective type approval procedure, low emissions in practice can be secured for Retrofit Emission Control devices (REC).

## 80%-95% REDUCTION

of harmful NO<sub>x</sub> and PM emissions: Stage V limit values and diagnostics are recommended for Retrofit Emission Control devices (REC). So the same level for OEM Stage V and Retrofit Stage V.

Prominent developed a type approval procedure for REC and procedures for continuous on-board monitoring. Monitoring was demonstrated on vessels with different operating profiles such as Rhine and Danube vessels.

## ON-BOARD EMISSIONS MONITORING



- Real Sailing Emissions (RSE) for improving Legislation, Monitoring and Enforcement of Stage V emission levels.
- Environmental Performance Monitoring (EPM) monitors performance of entire vessel including CO<sub>2</sub> and logistic efficiency.

# Digital education Tools



## TEACHING MATERIALS FOR FUTURE LOGISTIC MANAGERS

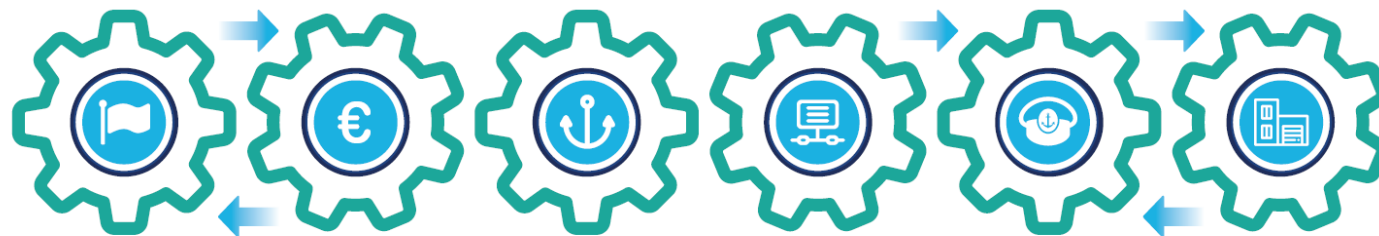


PROMINENT developed teaching materials for the community of practice (logistic managers). When they have to choose a transport modality they will sooner think of Inland Waterway Transport as a logical option: lower costs, less pollution, less traffic jams.

# Stakeholder action required for roll-out



## INNOVATIONS AND GREENING IN INLAND WATERWAY TRANSPORT



### PUBLIC BODIES TO PROVIDE

Enabling regulations and certification (EU & CESNI)

Grants and loans  
(coordinated between EU, EIB, MS, regional bodies)

### BANKS

Providing attractive loans, e.g. based on EIB backing, promoting green/sustainable investments

### PORT AUTHORITIES

Providing incentives for green/clean vessel, e.g. reduction and differentiation in port dues

### TECHNOLOGY PROVIDERS

Offering certified and affordable innovation to fleet owners

### FLEET / SHIP OWNERS

Willing to innovate, business case development for innovations (together with clients), focus on long term

Monitoring fuel consumption and exhaust gas emissions

### SHIPPERS

Making long term contracts with fleet owners to mitigate packback time risks of innovations

Promoting green transport in transporting contracts

Request footprint data from contractors as regards CO<sub>2</sub> and air pollutants



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