

Green and efficient Danube fleet

*“Towards modernisation & greening of Danube inland waterborne sector and strengthening its competitiveness”*

## Regional know-how transfer

Output 4.3 – Transport management

Output 4.4 – Financing opportunities

Work Package 4 Preparatory actions

Version 1.0

Date: 30/11/2020

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## Document History

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1.0	30.11.2020	Pro Danube

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## 1 Scope of the document

The Green and efficient Danube Fleet project (GRENDEL) is co-funded by European Union Funds (ERDF, IPA) under the Danube Transnational Programme and it aims at supporting the Danube vessel fleet operators and their public counterparts in modernisation of the sector. The project's overall goal is the improvement of the environmental and economic performance of the Danube fleet.

Main goal of the know-how transfer events in the framework of the project was to ensure that Danube fleet operators and other IWT stakeholders gain comprehensive up-to-date knowledge on greening technologies and on viable solutions for efficient fleet management including their financial, operational and environmental impact when being deployed. The know-how transfer is important in order to facilitate investment decisions.

The 2<sup>nd</sup> know-how transfer event organised in the framework of the project took place on 29.09.2020 (online) and was organised by PDI, DST and DC as host. The event brought together representatives of the European Commission, international organisations, IWT stakeholders, as well as innovation experts and suppliers and gathered over 70 participants. It resulted in fruitful discussions and information exchanges between participants.

This know-how transfer event provided an overview on technologies and was extended to offer consolidated expertise on how to improve logistics and transport management processes of Danube fleet operators via a session dedicated to “Digitalisation of transport processes in inland waterway transport” (Output 4.3).

Besides, the elaborated GRENDEL model state aid scheme and identified innovative financial instruments were addressed in the session dedicated to “Funding and financing for modernisation of inland vessels” (Output 4.4).

The present document intends to give an overview on the know-how transfer event by providing the meeting minutes of this event, including the agenda and the list of participants. Besides, the GRENDEL website offers the possibility to consult the presentations held during the event<sup>1</sup>.

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<sup>1</sup> <http://www.interreg-danube.eu/news-and-events/project-news/5469>

# 2<sup>nd</sup> Know-How Transfer Event on Modernisation of Danube Vessels Fleet

## Meeting Minutes

- Date & Time:** 29 September 2020, 09:00 – 13:00 CEST
- Venue:** Online event (use of Webex)
- Meeting purpose:** Objective to bring together inland vessel operators from the Danube region with technology & innovation experts as well as technology suppliers to debate available technologies which could fit in the transition pathway towards (near) zero emission performance and future alternative solutions which still need further research. Besides technologies, insight into digitalisation aspects leading to paperless sailing and increasing efficiency of transport processes as well outlook to expected funding and financing and to the elaborated GRENDEL Model State Aid Scheme will be provided.
- Minutes by:** Pro Danube

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## Agenda

<b>09:00 – 09:20</b>	<b>Setting the scene</b>
	<p>Setting the scene - political and regulatory framework for modernisation of Danube inland waterway vessels</p> <ul style="list-style-type: none"> <li>• <i>Manfred Seitz (Danube Commission)</i></li> <li>• <i>Laure Roux (CCNR)</i></li> </ul>
<b>09:20 – 10:50</b>	<b>Low emission propulsion solutions</b>
	<ul style="list-style-type: none"> <li>• EU Stage V Update from the Manufacturer, Formerly known as the Dealer (<i>Peter Snijders, Koedood</i>)</li> <li>• Marinized Euro VI DAF Paccar engines for IWW Stage V (<i>Peter van der Heijden, NPS Diesel</i>)</li> <li>• Stage V Marine Developments (<i>Jan-Willem Vissers, Volvo Penta Europe</i>)</li> <li>• Scania propulsion and auxiliary solutions for inland waterway vessels: Marinisation of industrial engine range (NRE category engine) including EU Stage V approval according BAnz AT 20.12.2018Bz (IWA/IWP-solution) (<i>Detlef Plachta, ScanDiesel</i>)</li> <li>• Discussion</li> </ul>
<b>10:50 – 11:05</b>	<b>Pause</b>
<b>11:05 – 11:25</b>	<b>Powertrain technology outlook &amp; transition pathway towards (near)zero emissions</b>
	<ul style="list-style-type: none"> <li>• Future Powertrain Technology Options for Inland Waterway Transport (<i>Thomas Kammerdiener, AVL List GmbH</i>)</li> </ul>
<b>11:25 – 12:15</b>	<b>Clean carbon neutral (alternative) fuels</b>
	<ul style="list-style-type: none"> <li>• Overview of alternative energy carriers for inland navigation (<i>Friederike Dahlke-Wallat, DST</i>)</li> <li>• Alternative fuels – best practices and possible outlook (<i>Sebastian Dörr, Lubtrading</i>)</li> <li>• Discussion</li> </ul>
<b>12:15 – 12:35</b>	<b>Increasing resilience and energy efficiency</b>
	<ul style="list-style-type: none"> <li>• (Hydrodynamic) solutions to increase resilience &amp; energy efficiency (<i>Benjamin Friedhoff, DST</i>)</li> </ul>
<b>12:35 – 13:00</b>	<b>Discussion &amp; Closing of the day</b>
<p><b>The presentations of the following topics will be circulated to the participants on beforehand. Questions on these topics are welcome during the discussion session from 12:35-13:00.</b></p>	
	<b>Digitalisation of transport processes in inland waterway transport</b>
	<ul style="list-style-type: none"> <li>• Automation of Inland Navigation to Increase Safety and Energy Efficiency (<i>Alexander Lutz, Argonics GmbH</i>)</li> <li>• NOVIMAR – The vessel train concept (<i>Erwin van der Linden, EICB</i>)</li> <li>• River Information Services Corridor Approach – RIS COMEX and intended systems (<i>Mario Kaufmann, via donau</i>)</li> <li>• Introduction of new services for vessel management - VEMASYS (<i>Tony Ameryckx / Willem De Braal, Bluecentury</i>)</li> </ul>
	<b>Funding and financing for modernisation of inland vessels</b>
	<ul style="list-style-type: none"> <li>• Funding and financing of modernisation of inland vessels - outlook (<i>Markus Eppich, Pro Danube Management</i>)</li> <li>• State Aid model for Modernisation of Danube fleet (<i>Charlotte Siot, Pro Danube International</i>)</li> </ul>

## Meeting Minutes

### 1 Setting the scene

**Mr. Manfred Seitz (Danube Commission)** welcomed the participants to the 2<sup>nd</sup> Know-how transfer event (online format) organised in the framework of the GRENDEL project. This event was organised by GRENDEL in cooperation with the INDanube Innovation Transfer Centre, with the Danube Commission as host.

One of the main objectives of the GRENDEL project is to support the Danube fleet operators and their public counterparts in the challenging modernisation process of the fleet. In this regard, GRENDEL addresses various fleet modernisation aspects: use of low carbon and alternative fuels, reduction of air pollutant emissions, overall energy consumption and better integration of the Danube IWT into logistics chains through new services. Know-how transfer to Danube fleet operators, the elaboration of innovative technical vessel concepts and the development of a favourable regulatory framework in particular via the elaboration of a Model State Aid scheme are key activities of the project.

Mr. Seitz briefly presented the agenda and the main objective of the event to debate available technologies which could fit in the transition pathway towards (near) zero emission performance and future alternative solutions which still need further research. Besides technologies, insight into digitalisation aspects leading to paperless sailing and increasing efficiency of transport processes as well outlook to expected funding and financing are provided via two dedicated sessions on “digitalisation of transport processes” and on “funding and financing”.

Referring to the political and regulatory framework for modernisation of Danube inland waterway vessels, he introduced **Mrs. Laure Roux (Central Commission for the Navigation of the Rhine - CCNR)** who provided an overview of the CCNR activities related to the energy transition. After reminding some key elements about the CCNR and the Rhine fleet, the past and current emission regulations in inland navigation were mentioned. The emissions regulation have become stricter and stricter. The latest regulation is the Stage V EU emission regulation which is in particular stricter in terms of NO<sub>x</sub> and PM emission. Only air pollutants are currently regulated, not Greenhouse Gas emissions. This is in particular important when one considers that all the European and CCNR objectives towards 2050 both consider to reduce and to largely eliminate the emissions for air pollutants and Greenhouse gases.

The Mannheim Ministerial Declaration was adopted in 2018 and sets the objective of largely eliminating emissions in inland navigation by 2050. At this occasion, the CCNR was tasked to develop a roadmap in order to:

- reduce greenhouse gas emissions by 35% compared with 2015 by 2035,
- reduce pollutant emissions by 35% compared with 2015 by 2035,
- largely eliminate greenhouse gases and other pollutants by 2050.

This work is ongoing and consultation of CCNR observers and recognised Non-Governmental Organisation is foreseen at the end 2020 / 1<sup>st</sup> semester of 2021.

The Mannheim Declaration also pointed to the need for new financial instruments to achieve these environmental objectives and entrusted the CCNR with the task of leading this development. As such, ongoing studies are taking place in parallel on the topic of energy transition:

- a study on “The financing of the energy transition for a zero emission European inland navigation sector”

- a study about the evaluation of greening technologies towards a zero-emission IWT sector and identifying scenarios for transition options as well as their related costs
- a study on polluter pays systems and their application to the IWT sector.

First results will be available by the end of 2020.

More generally, Mrs. Roux reminded the importance to have in mind the panel of technologies available in inland navigation for the energy transition and to have a modular approach.

The work of CESNI was underlined in the context of the energy transition. ES-TRIN was developed in the context of CESNI and represents the core technical requirements for inland navigation vessels in Europe. It is revised every two years.

Mrs. Roux also informed about the existence of a leaflet (available under the [following link](#)) concerning pilot projects using a new technology which require a derogation from CESNI.

## 2 Low emission propulsion solutions

Mr. Seitz introduced the first session dedicated to low emission propulsion solutions and gave the floor to the company Koedood Marine Group. **Mr. Peter Snijders (Koedood)** went through his presentation. The ambition of Koedood is to have in 2021 an EU Stage V certified range from 500 to 1.700 kW of propulsion and auxiliary engines for the inland waterway auxiliary and propulsion systems. Koedood is right on track to achieve this ambition. Koedood used to be a dealer and is working on becoming a manufacturer, with the respective responsibilities. Further elements were presented:

- Engine-After-Treatment Family
- Development work
- Solution of Koedood
- Value of Koedood:
  - Optimized for total fluid consumption
  - Robust
  - Proven

**Mr. Jan-Willem Vissers (Volvo)** presented some updates on Volvo Penta solutions for Stage V marine which has an impact on the inland waterway business:

- Volvo Penta EU/IWW Stage V Offer Strategy
- Leverage IMO Tier III (<300kW): it will be a Stage V certified product.
- Growth through partnerships
  - Koedood D16 MG/MH (368 - 550kW)
  - Conversion of TAD1381-85 VE for IWW use
  - Conversion of TAD1385 VE for IWW use
  - Etc.
- Stage V Marine summary
- Volvo Penta Stage V marine

A newsletter will also be available after the meeting. *[The newsletter was published under the dedicated [News on the GRENDEL website](#)]*

**Mr. Peter van der Heijden (NPS Diesel)** gave an overview of the Marinized Euro VI DAF Paccar engines for IWW Stage V:

- Euro VI DAF – Paccar engines for IWW Stage V
- Stage V Emission Standards
- Use of EURO VI engines for IWT vessels
- NOx – PM | Euro VI – Stage V – CCR1 – CCR2
- Comparison Modalities - Emissions per container per km
- Why the Equivalence route Euro VI to IWW stage V?
- The road towards IWW Stage V
- Features IWW Stage V DAF Paccar engine platform

**Mr. Detlef Plachta (ScanDiesel)** provided an outlook on Scania propulsion and auxiliary solutions for inland waterway vessels:

- Facts on EU Stage V Regulation and on partners
- As solution partner for Scania Power Solutions, ScanDiesel got the permission to marinise EU Stage V NRE engines according to ES-TRIN and CESNI rules for the European market sale.
- Details:
  - Update of documentation by ScanDiesel
  - Type approval EU Stage V is valid.
- Equipment
- Application equipment
- EU Stage V inland waterway propulsion table
- EU Stage V inland waterway auxiliary table

## **Discussion**

Some of the topics / questions discussed between speakers and participants were:

- The usage of HVO, eventual related modifications of the tank and pipe systems and the cost of HVO per m<sup>3</sup> for NPS Diesel engines and Scan Diesel engines
- The fulfillment of the ES-TRIN requirement for dual skin fuel lines (art. 8.02) for distributors who make modification on the engine of engine manufacturer
- Question for engines above 1 000 kW and related solutions
- The zero emission challenge as a long way forward

## **3 Powertrain technology outlook & transition pathway towards (near) zero emissions**

The scope of the next presentation is to see the pathways of technological development for propulsion and power systems which would let arrive gradually to close to zero emission solutions.

**Mr. Thomas Kammerdiener (AVL List)** developed the future powertrain technology options for inland waterway transport:

- Motivation & Drivers:
  - Emission regulatory & GHG reduction targets
  - Zero impact emissions & IWW transport business models
  - Short term challenges
- Technology pathways for IWW propulsion:
  - Net and zero carbon fuels
  - Energy density of fuels and installation space on board
  - Engine technology options including exhaust gas aftertreatment requirements
  - Alternative propulsion and power generation on board
  - Fuel cell
- Summary and conclusions:
  - Fuels & Hydrogen
  - Transition draft for propulsion & power technology
  - AVL services

#### 4 Clean carbon neutral (alternative) fuels

**Mrs. Friederike Dahlke-Wallat (DST)** provided an overview of alternative energy carriers for inland navigation:

- Energy Carriers
- Diesel and diesel-electric propulsion
- Aftertreatment
- Euro VI and NRE engines
- Drop-In (Bio) Fuels
- Gas and gas-electric propulsion
- Fuel Cells
- Battery-Electric propulsion
- Conclusions:
  - Aims for 2035 and 2050 --> Price development of technologies
  - Preparations for energy turnaround on the Danube should start now
  - Creation of financial instruments
  - Selection of regionally appropriate measures

**Mr. Sebastian Dörr (Lubtrading)** presented the best practices and possible outlook for alternative fuels in the inland waterway sector:

- What can be used for marine
- What can be used for marine till 2030
- „The Carbon Journey“ – How to reduce GHG
- Biofuels from crops and waste are available
- Advanced refinery – reduced GHG

- Liquefied Natural Gas from biomass
- Renewable Hydrogen
- Any new fuel needs a defined standard, availability in large scale
- Introduction of new technology
- xTL EN 15940 - Standard from several processes
- PTL Demand over time and application
- Strategy for more xtl fuel
- Development car fleet till 2030
- Learning from road transportation
- Concept of Diesel R33
- What we can do now – Example Diesel R33
- New fuels will be blends – fuel roadmap

### **Discussion**

Several questions were discussed between speakers and participants on the following topics in particular:

- The hydrogen situation, perspective and existing timeline for making it available for inland vessels
- There is not only one right technology. Other criteria have to be considered as for example land use, possibility to produce according to the energy demand, etc.
- The fleet is diverse. There are niches for many alternatives.
- For inland waterways, it is also important to focus on the demand from the logistics and ports point of view.

Mr. Seitz underlined the need to work in different ways and to move forward with the technologies gradually.

## **5 Increasing resilience and energy efficiency**

**Mr. Benjamin Friedhoff (DST)** described the (hydrodynamic) solutions to increase resilience and energy efficiency:

- Motivation:
  - Many levers to improve economic and environmental performance of IWT
  - Fuel is usually even more money than time.
  - Energy costs will increase.
  - Less energy demand means less costs and less emissions.
- Energy efficient navigation:
  - Power demand rises disproportionate with speed.
  - Power demand is increased by shallow water effects.
  - Speed is reduced at small water depth.
  - Awareness
  - Optimized choice of speed and track

- Voyage planning with minimized waiting times (Slow Steaming)
- Increased utilization by better logistics
- Design for operation
- Hydrodynamic optimisation:
  - Widely used for newbuilds
  - What can be done for the existing fleet
- Coupled convoys
- Retrofit optimisation
- Resilience:
  - Efficiency calls for maximizing propeller diameter.
  - Ventilation needs to be prevented for low draughts.
  - Optimization allows draughts as low as 75% of prop. diameter.
  - Stopping may require a powerful thruster.
- Flextunnel
- NOVIMOVE:
  - Innovative Vessel Concepts
  - Increase the resilience of IWT
  - Focus on low water scenarios → add buoyancy
  - Concept → Techn. Verification → Operational Ver. → Economic Validation

Following this presentation, Mr. Seitz pointed out that when talking about greening the inland fleet, the hydrodynamics improvements and adaptations also have to be addressed together with the efficiency management of on-board systems and the entire integration of IWT into logistics chains.

## 6 Discussion & Closing of the day

The presentations of the session on “Digitalisation of transport processes in inland waterway transport” and on “Funding and financing for modernisation of inland vessels” had been made available on beforehand to all participants for questions during the current part of the event and allowed in particular to:

- offer consolidated expertise on how to improve logistics & transport management processes of Danube fleet operators
- offer advice in a comprehensive way regarding available financing options and existing funding opportunities and address the elaborated GRENDEL model state aid scheme.

The following topics were addressed by the session dedicated to “Digitalisation of transport processes in inland waterway transport”:

- Automation of Inland Navigation to Increase Safety and Energy Efficiency (**Mr. Alexander Lutz, Argonics GmbH**)
- NOVIMAR – The vessel train concept (**Mr. Erwin van der Linden, EICB**)
- River Information Services Corridor Approach – RIS COMEX and intended systems (**Mr. Mario Kaufmann, via donau**)
- Introduction of new services for vessel management - VEMASYS (**Mr. Tony Ameryckx / Mr. Willem De Braal, Bluecentury**)

The following topics were addressed by the session dedicated to “Funding and financing for modernisation of inland vessels”:

- Funding and financing of modernisation of inland vessels – outlook (**Mr. Markus Eppich, Pro Danube Management**)
- State Aid model for Modernisation of Danube fleet (**Mrs. Charlotte Siot, Pro Danube International**)

All the speakers, in particular those of the sessions “Digitalisation of transport processes in inland waterway transport” and “Funding and financing for modernisation of inland vessels” were present in this discussion part of the event.

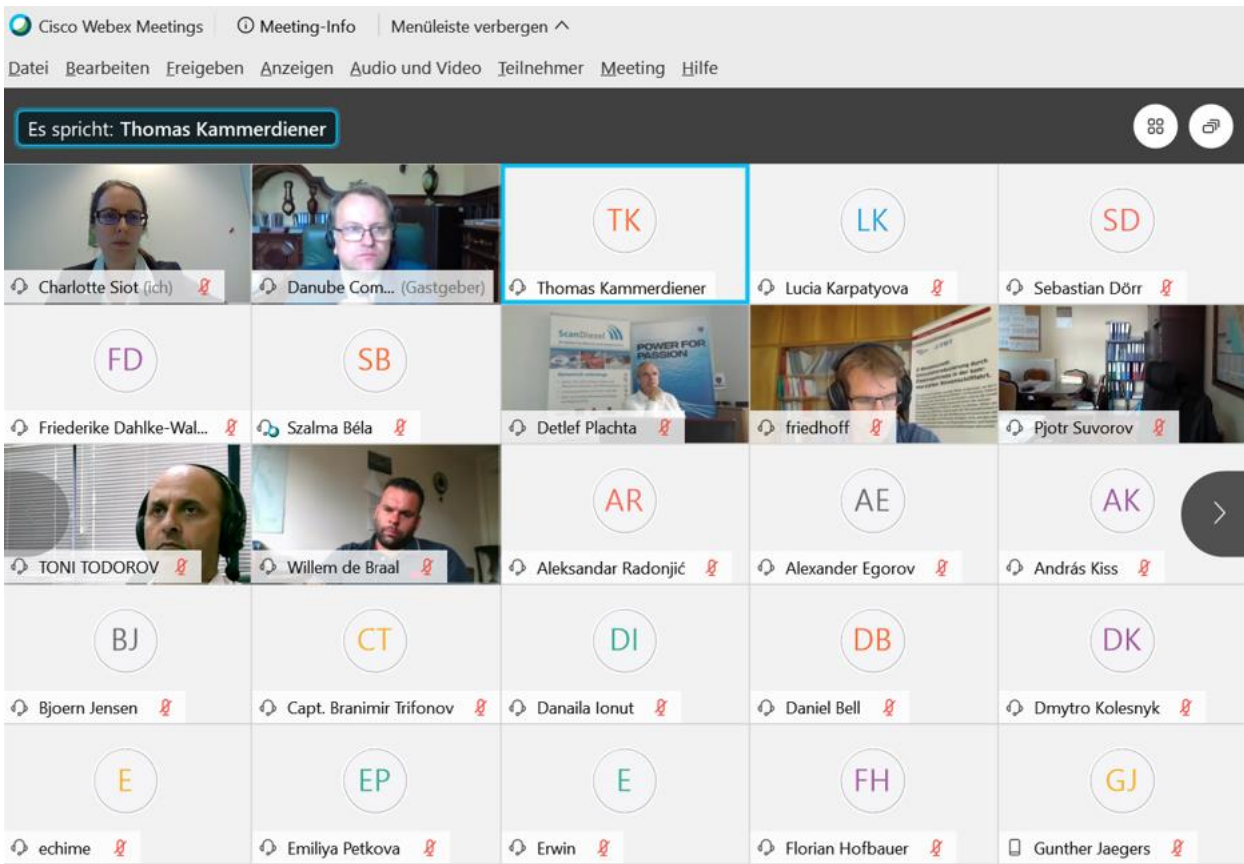
Some of the topics / questions discussed between speakers and participants were:

- On a labeling system of vessels.
- On the use of the Automatic Track-keeping system of Argonics GmbH in the Danube region. The use of this system in the Danube region means that it can be relevant to add it as eligible item in national state aid schemes by the Danube states.
- Information on the VEMASYS system which is an interesting system for barge operators with high return of investment
- The development of RIS information services is going on, significant progress has been made with the help of the RIS COMEX project – an update was provided by Mr. Kaufmann
- **Mr. Robert Rafael (Pro Danube International)** also mentioned as relevant topic to tackle the fact that there might be some potential for digital market places on the Danube. Its pre-conditions, barriers, etc. could be discussed. This is an important topic which might be connected to River Information Services and other follow-up measures or new ideas.
- Mrs. Siot added that in the framework of the GRENDEL project, PDI was currently working on the elaboration of the final version of the model state aid scheme for the Danube fleet which will be publicly available in November/December 2020 (publication on the GRENDEL website). This model covers the 5 most important aspects of fleet modernisation - (1) environmental performance, (2) integration into logistics chains, (3) increasing the safety of IWT, (4) renewal of actors in the sector and (5) innovative solutions. The model state aid scheme was developed to serve as a guideline for Danube riparian countries to develop national state aid schemes for fleet modernisation according to their individual needs.
- Mr. Rafael added that a Bulgarian partner of the project, BRCCI, was currently working on the elaboration of a draft state aid scheme based on this model (practical implementation of the model). Further information will be available during the Final event of the GRENDEL project taking place on 29 October 2020.

*For more details, the presentations are available for consultation under the dedicated [News on the GRENDEL website](#) and on the Danube Commission website ([following link](#)). The record of the event is also available on the website of the Danube Commission.*

**Meeting ended at: 13:15**





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Datei Bearbeiten Freigeben Anzeigen Audio und Video Teilnehmer Meeting Hilfe

Es spricht: Thomas Kammerdiener
