



Danube Transnational Programme

**GRENDEL**

## **GRENDEL „Green and Efficient Danube Fleet“**

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

Final event

Charlotte SIOT

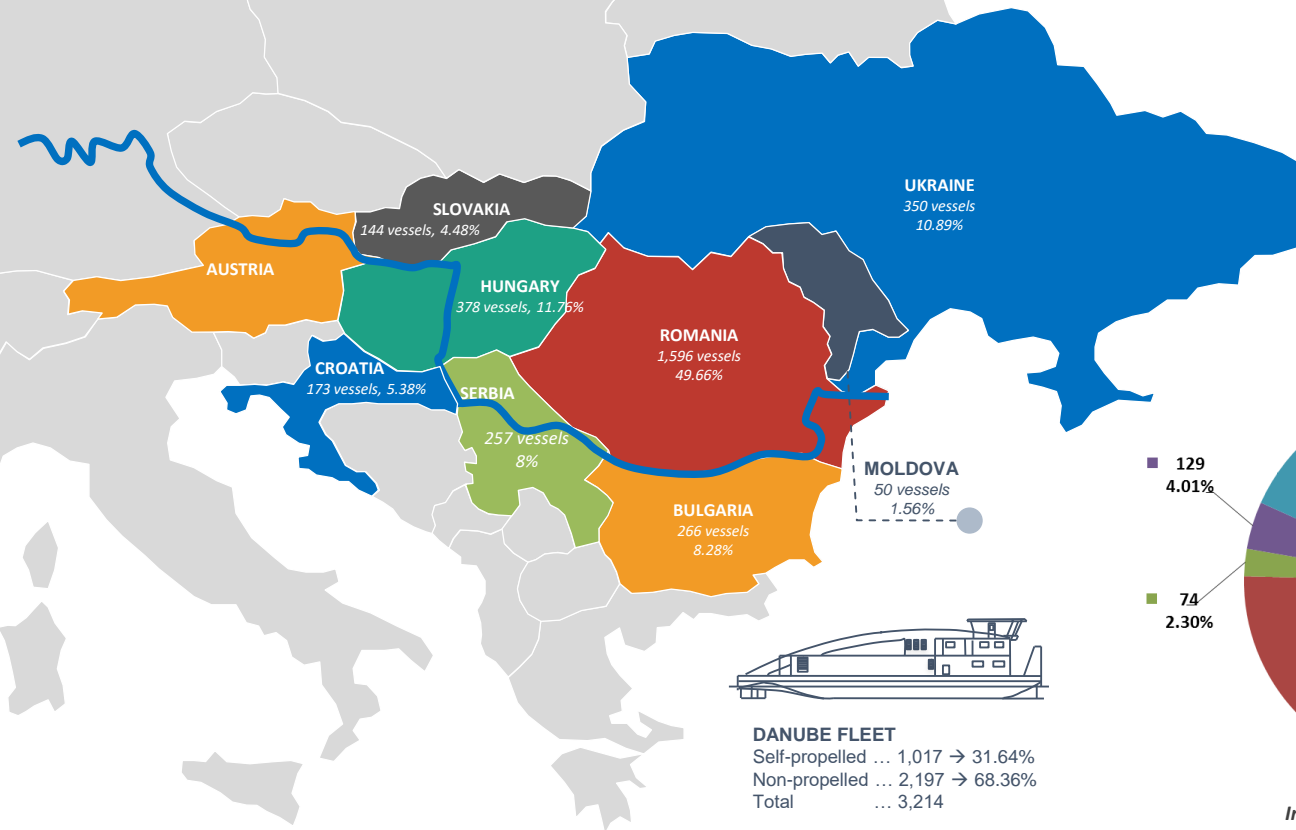
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Project co-funded by European Union Funds (ERDF, IPA)

29 October 2020 – Online / MS Teams

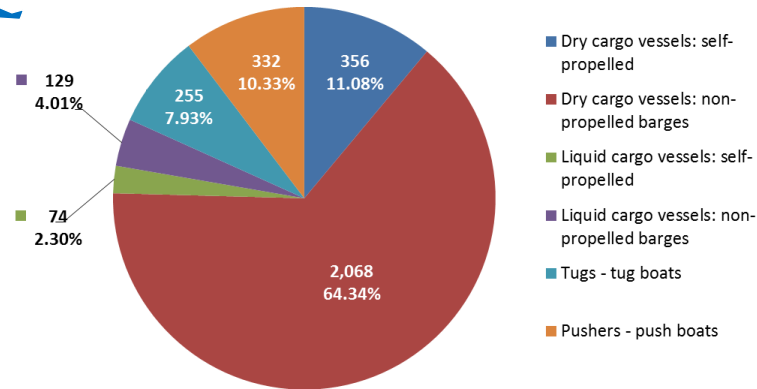
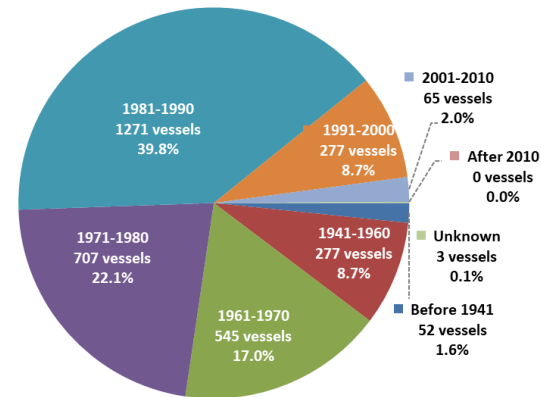


# DANUBE CARGO VESSELS



## DANUBE FLEET

Self-propelled ... 1,017 → 31.64%  
 Non-propelled ... 2,197 → 68.36%  
 Total ... 3,214



Inland vessels per country, per age and per type. Figures are for 2016.

[Source: Danube Commission. Charts: Pro Danube]

# CHALLENGES DANUBE CARGO VESSELS



## WATERWAY MAINTENANCE

Insufficient waterway maintenance led to little operating profits, thus to almost no fleet investment and rather to repair activities



## ADDRESSING ENERGY TRANSITION

- ❑ to be competitive (environmentally) to road & rail
- ❑ to be compliant with Stage V of NRMM
- ❑ to be politically supported and socially accepted



## ADAPTATIONS TO NEW MARKETS

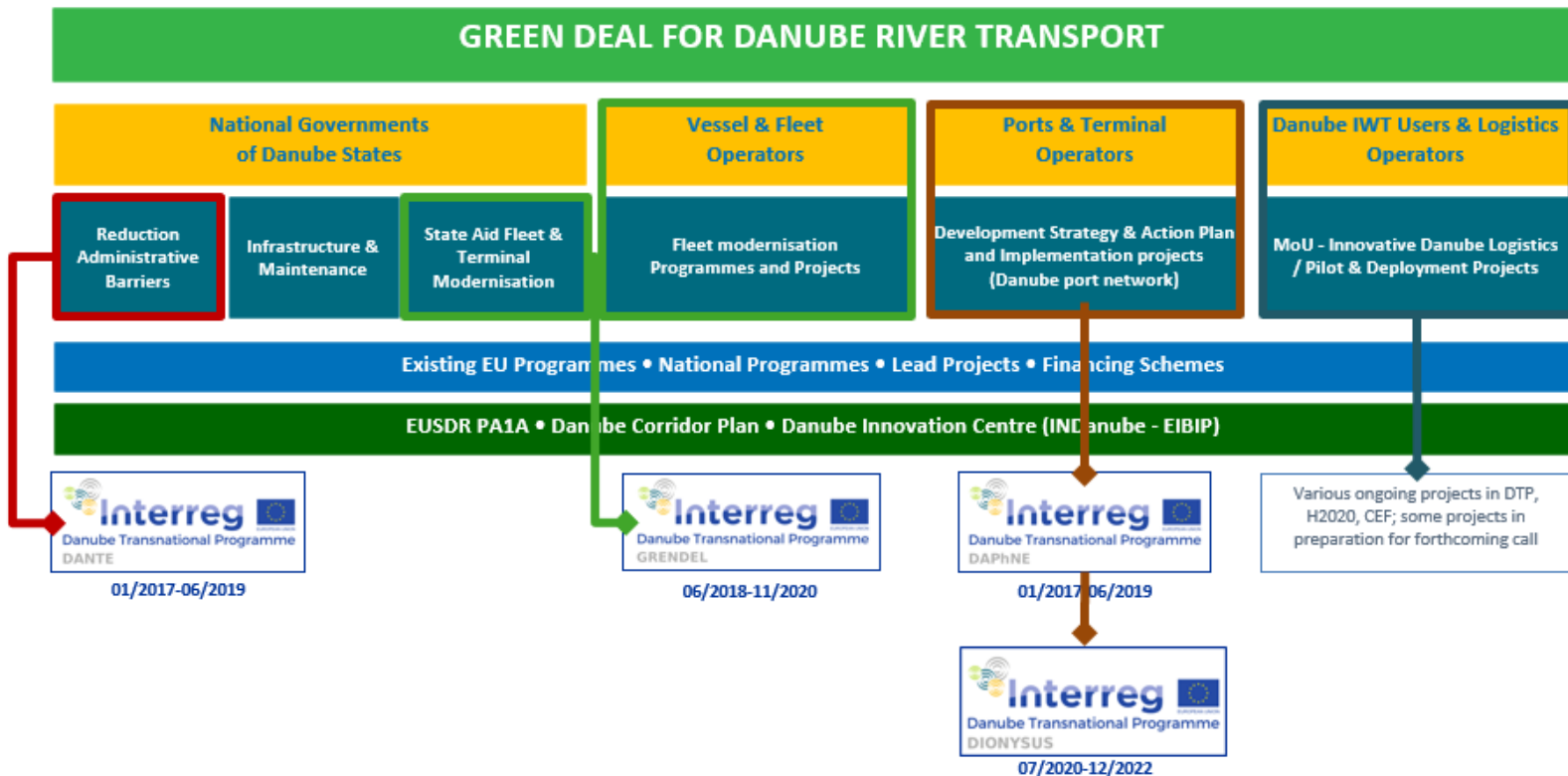
- ❑ RORO, container, biomass, biofuels, LNG & other gases, chemicals, fertilizers, high & heavy
- ❑ quality requirements beyond current equipment & service levels



## GREENING & MODERNISATION OF INLAND VESSELS

- ❑ Enables the **transition towards zero-emission** and **climate neutral** economy
- ❑ Contributes to **improvement of air quality** in urban areas along waterway and to **reduction of global warming**
- ❑ Strengthens sector **competitiveness**, the industry can be boosted, and both jobs in Europe and export opportunity for greening technologies worldwide can be created.

# POLICY INITIATIVE



# DANUBE IWT MODERNISATION

## USE OF ALTERNATIVE FUELS

LNG/CNG • Bio-fuels • Methanol  
• Ethanol • Hydrogen • GTL



## AIR POLLUTANT EMISSIONS REDUCTION

Alternative technologies • After-treatment • New engine concepts and optimisation



## ENERGY CONSUMPTION REDUCTION

Energy-efficient navigation •  
Energy efficient ship design •  
Hybrid/diesel-electric propulsion •  
Electric propulsion



## NEW LOGISTICS CONCEPTS

Synchromodality • DINA •  
Advanced RIS • Digital market  
places for cargo flows



## NEW CARGO FLOWS

Find your (water)way • New market  
segments: (containerised) LNG as  
cargo | steel & cars | continental  
cargo flows



## NEW VESSEL CONCEPTS

Optimal cargo load • Automation of  
navigation / vessel-trains



# GRENDel PROJECT KEY FACTS



## FUNDED PARTNERS

- Fleet owners & operators
- Innovation & technology organisations
- IWT development agencies
- Education institutes
- Ship design experts
- River commission (Danube Commission)



## ASSOCIATED STRATEGIC PARTNERS

- Ministries & their implementing bodies
- Other fleet owners & operators



## 1.8 MEUR

- ERDF contribution: 85%
- IPA contribution: 85%
- State contribution: up to 15%
- Own contribution: up to 15%



## 6.2018 - 11.2020

- 30 months of working & cooperation together



## NON-FUNDED STAKEHOLDERS

- Fleet owners & operators
- Logistics service providers
- Technology providers
- Cargo owners

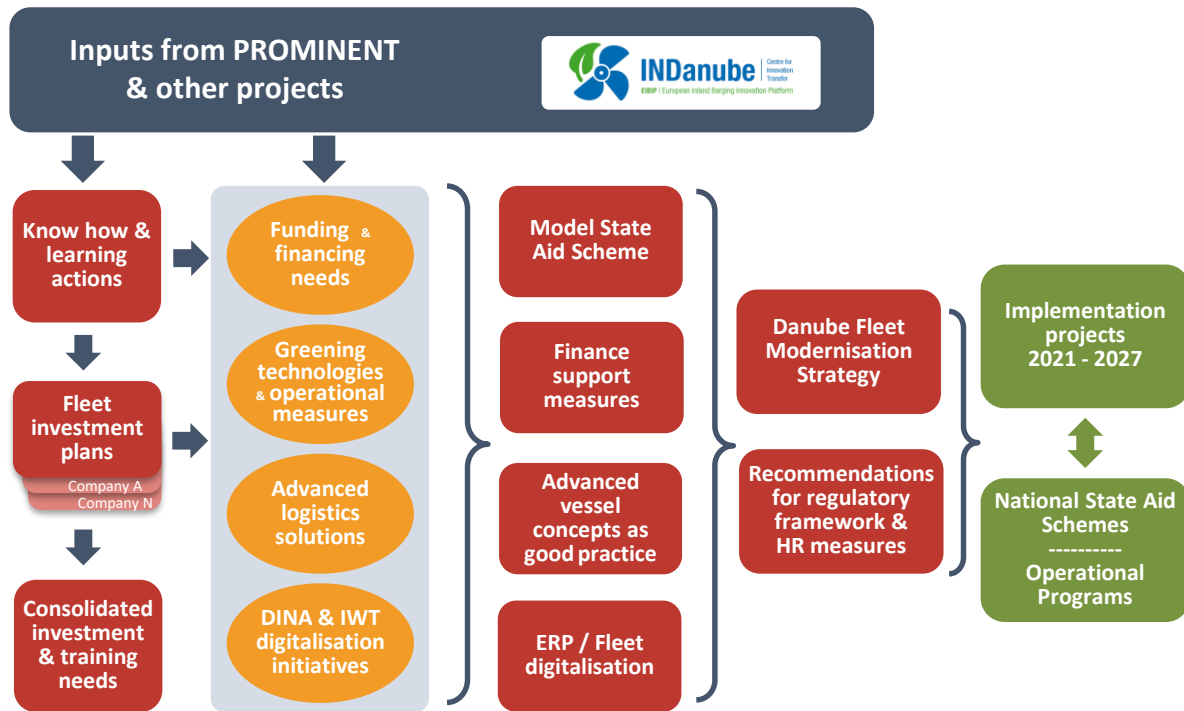
# GRENDEL *Work approach*

*Green and Efficient Danube Fleet*

“

*“GRENDEL addresses various fleet modernisation aspects: [i] use of low carbon & alternative fuels, [ii] reduction of air pollutant emissions (CO<sub>2</sub>, NO<sub>x</sub>, PM) and [iii] overall energy consumption. Besides this, [iv] transport & logistics management processes are addressed to ensure better integration of the Danube IWT into logistics chains...”*

*Jun 2018 – Nov 2020  
Funding: Interreg / DTP*



# GRENDEL *Know-how transfer to sector*

*Technological factsheets & know-how transfer events*



## CONTENT

- ? Regulations & solutions in development
- ? Technical concept
- ? Economics: investment & operational costs
- ? Environmental sustainability
- ? Benefits
- ? Consideration for deployment
- ? Deployment examples

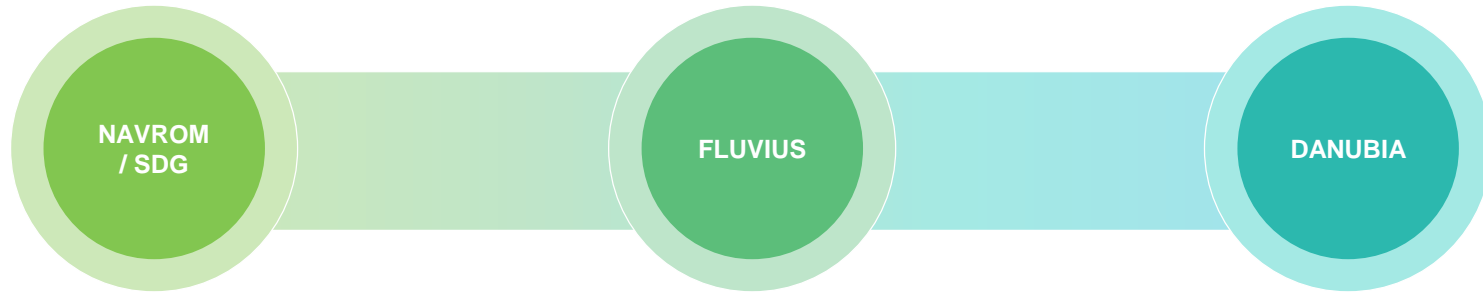


**Organisation of Know-how transfer events**

**Presentations available on the GRENDEL website**



# GREDEL *Vessel concepts*



- Conceptual design of retrofitting of 4 pusher types
- Conceptual design of a new LNG propelled pusher
- Concept for electricity produced from renewable sources
- Advanced concept of diesel-electric or hybrid propulsion
- Concept for changing main engine
- Elaboration of conceptual design for improving the hydrodynamics of the vessel hull design
- Concept for sewage plant upgrade
- Concept hydrodynamics and noise emissions

# GRENDL *Public Consultations*

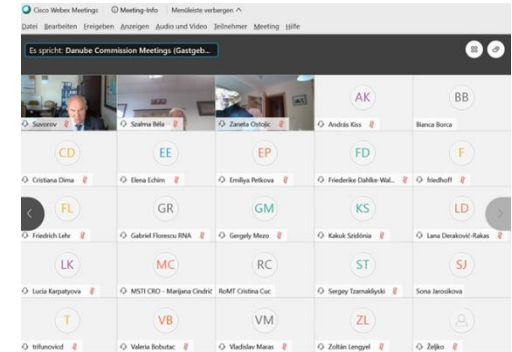
First edition, 26.03.2019



Second edition, 22.01.2020



Third edition, 30.09.2020



Reuniting Danube fleet operators with the relevant state authorities, ensuring that vital interests of Danube fleet operators are collected

Core objective to discuss and analyse the ongoing drafting process of the **Model State Aid Scheme**.

Core objective to discuss on the impact of the **COVID-19 pandemic** on Danube IWT with public and private stakeholders and relevant services of EC and to consider possible recovery actions

# GRENDEL *State Aid scheme model*

## Priorities

### Environmental Performance



Reducing emissions of gaseous and particulate pollutants from internal combustion engines and auxiliary motors installed on vessels and by implementing other measures with direct environmental benefits.

### Integration into logistics chains



Increasing the involvement of inland waterway transport in multimodal transport chains by making the vessels more competitive, operationally flexible and secure in the context of multimodal transport chain.

### Increasing safety of IWT



Focusing at safety equipment, safety at work, adaptations to wheelhouse, steering system and manoeuvrability of a vessel, all to support a skipper in navigational and operational aspects / decisions → increase safety.

### Renewal of actors in the sector



Encourage the acquisition of the first boat for new river transport companies and new entrants.

### Innovative solutions



Development and experimentation with innovative solutions:

- ▶ experimentation w. existing or new technology, unproven for IWT
- ▶ R&D: design of new technologies to respond to specific needs of IWT
- ▶ feasibility studies

# GRENDEL *Danube IWT fleet modernisation strategy*

## *Recommendations*

- Adapt financing opportunities to the strict requirements of the Legislator
- Secure a smooth integration of European legislative provisions at nat. level
- Adopt a widely harmonised State Aid Scheme for Fleet Modernisation using the GRENDEL proposal as a basis
- **etc.**



Environmental topics

Logistics aspects

- Continuous cooperation of the Danube riparian countries involved in RIS
- Continuous cooperation between relevant national authorities and logistics providers
- Promotion of national best practices promoted on the transnational level
- **etc.**

# **GRENDEL** *Dissemination of the project results*

*Reaching the stakeholders*





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Danube Transnational Programme  
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Photo: © NAVROM

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

[www.interreg-danube.eu/grendel](http://www.interreg-danube.eu/grendel)

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