GRENDEL „Green and Efficient Danube Fleet“
Towards modernisation and greening of Danube inland waterborne sector and strengthening its competitiveness

2nd Public Consultation
Charlotte SIOT

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

22nd January 2020 – Budapest – Hungary
**DANUBE CARGO VESSELS**

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

- **ROMANIA**
  - 1,596 vessels
  - 49.66%

- **BULGARIA**
  - 266 vessels
  - 8.28%

- **HUNGARY**
  - 378 vessels
  - 11.73%

- **SLOVAKIA**
  - 144 vessels
  - 4.48%

- **SERBIA**
  - 257 vessels
  - 8.28%

- **AUSTRIA**
  - 173 vessels
  - 5.38%

- **UKRAINE**
  - 350 vessels
  - 10.89%

- **CROATIA**
  - 260 vessels
  - 8.28%

- **MOLDOVA**
  - 50 vessels
  - 1.56%

**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

GREEN DEAL FOR DANUBE RIVER TRANSPORT

National Governments of Danube States
- Reduction Administrative Barriers
- Infrastructure & Maintenance
- State Aid Fleet & Terminal Modernisation

Vessel & Fleet Operators
- Fleet modernisation Programmes and Projects

Ports & Terminal Operators
- Development Strategy & Action Plan and Implementation projects (Danube Port Network)

Danube IWT Users & Logistics Operators
- MoU - Innovative Danube Logistics / Pilot & Deployment Projects

Existing EU Programmes • National Programmes • Lead Projects • Financing Schemes
- EUSDR PA1A • Danube Corridor Plan • Danube Innovation Centre (INDanube - EIBIP)

Interreg Danube Transnational Programme DANTE
01/2017-06/2019

Interreg Danube Transnational Programme GRENDEL
06/2018-11/2020

Interreg Danube Transnational Programme GREEN DANUBE
01/2017-06/2019

DYONYSUS
Proposal 3rd call

Various ongoing projects in DTP, H2020, CEF, some projects in preparation for forthcoming call.
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
- Synchronomodality
- 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

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GRENDEL PROJECT KEY FACTS

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

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

TIME
- 6.2018 - 11.2020
  - 30 months of working & cooperation together

ASSOCIATED STRATEGIC PARTNERS
- Ministries & their implementing bodies
- Other fleet owners & operators

NON-FUNDED STAKEHOLDERS
- Fleet owners & operators
- Logistics service providers
- Technology providers
- Cargo owners
"GRENDLE addresses various fleet modernisation aspects: [i] use of low carbon & alternative fuels, [ii] reduction of air pollutant emissions (CO2, NOx, 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

Battery electric
Drop-in (bio)fueels
EURO VI Truck engines
Energy efficient navigation

COMING SOON

Battery electric
Drop-in (bio)fueels
EURO VI Truck engines
Energy efficient navigation

GRENDEL State Aid Scheme workshop. Budapest. March 2019

Fleet modernisation workshop.
Vienna. March 2019

01 APR 20
BUDAPEST

SAVE THE DATE
Join us on 01 April 2020.
Budapest
# GRENDEL Vessel concepts - FLUVIUS

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- Electrical system assessed and performance measurements done → solar panels feasible
- Technical solutions with low enviro impact (LED, heating, cooling, water supply - examined)
- Elaboration of detailed concept - starts soon

- Emission measurements
- Suggestions for environmental measures
- Elaboration of detailed concept - starts soon

- Vessel in shipyard – Sep 2019
- Measurements & detailed concept - Jan 2020
- Measuring operational profile is on-going with equipment installed
- Elaboration of conceptual design - starts soon
GRENDEL  Vessel concepts - NAVROM

Structural modification
- New main engine foundation
- New exhaust system supports
- Top of funnel modifications, extension of funnel to aft (air draft unchanged)
- New stainless steel urea tank

Piping system modifications
- New exhaust system for ME’s and modified for DG’s
- New box coolers for the ME’s system
- Minor modifications for the fuel oil and lube oil systems
- Modified ventilation system arrangement
- New urea and compressed air systems

Other modifications
- Control panels and alarm panels, cable trays
GRENDEL  State Aid scheme model

Priorities

1. 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.

2. 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.

3. 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.

4. Renewal of actors in the sector
   Encourage the acquisition of the first boat for new river transport companies and new entrants.

5. 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
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www.interreg-danube.eu/grendel

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