

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)



[[]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 zeroemission 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				ſ	Vessel & Fleet Operators		Ports & Terminal Operators		Danube IWT Users & Logistics Operators	
	Reduction Administrative Barriers	Infrastru Mainte	cture & nance	State Aid Fleet & Terminal Modernisation		Fleet modernisation Programmes and Projects	P	Development Strategy & Action lan and Implementation projects (Danube Port Network)	м	oU - Innovative Danube Logistics / Pilot & Deployment Projects	
	Existing EU Progran mes • National Programmes • Lea Projects • Financing Schemes										
		EUSDR PA1A • Dan abe Corridor Plan • Danube Innova ion Centre (INDanube - EIBIP)									
	Danube Transnational Programme			L	Danube Transnational Programme GRENDEL		Danube Transnational Programme DAPhNE		Various ongoing projects in DTP, H2020, CEF; some projects in preparation for forthcoming call		
	01/2017-06/20)19				06/2018-11/2020		01/2017-06/2019			
			Danube Transnational Programme GREEN DANUBE					DYONYSUS			
	01/2017-06/2019 Proposal							Proposal 3 rd call			



DANUBE IWT MODERNISATION

REDUCTION

REDUCTION

Electric propulsion

USE OF ALTERNATIVE FUELS LNG/CNG • Bio-fuels • Methanol • Ethanol • Hydrogen • GTL **AIR POLLUTANT EMISSIONS** Alternative technologies • After-**'CO2** treatment • New engine concepts and optimisation ENERGY CONSUMPTION Energy-efficient navigation • Energy efficient ship design • Hybrid/diesel-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)



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



ASSOCIATED STRATEGIC PARTNERS

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





NON-FUNDED STAKEHOLDERS

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



GRENDEL Work approach

Green and Efficient Danube Fleet

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"GRENDEL 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
- ⑦ Technical concept
- 8 Economics: investment & operational costs
- Period Environmental sustainability
- Benefits
- Consideration for deployment
- Peployment examples





01 APR 20 BUDAPEST

Join us on 01 **April 2020.** Budapest



GRENDEL Vessel concepts - FLUVIUS



Suggestions for environ-

mental measures

Elaboration of detailed

concept - starts soon

- ✓ 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





 \checkmark



2019

Measurements & detailed

concept - Jan 2020



is on-going with equipment

Elaboration of conceptual

design - starts soon

installed



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





Type 3 pusher





Type 1 pusher: 2 x 1194 kW/1800 rpm



Type 2 pusher: 2 x 895 kW/1800rpm



Type 3 pusher: 2 x 1185 kW/1000rpm



Type 4 pusher: 2 x 925 kW/750rpm



GRENDEL State Aid scheme model

Priorities





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Photo: © NAVROM

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