



"GRENDEL - GRGreen and EfficieNt DanubE fLeet": Towards green, efficient and competitive river Danube transport

Project proposal in the 2nd Call of the Danube Transnational Programme (DTP)

Vienna, June 2017



Danube Transnational Programme (1): Intro

- Financing instrument of the European Territorial Cooperation (ETC) → Interreg
- Provides a framework for the implementation of joint actions and policy exchanges between national, regional and local actors from different Member States
- Finances projects for the development and practical implementation of policy frameworks, tools and services and concrete small-scale pilot investments. Strong complementarities with the broader EU Strategy for the Danube Region (EUSDR) are sought.
- EU support comes from three different funds: ERDF: 202 095 405,00 €, Instrument for Pre-Accession Assistance II (IPA II): 19 829 192,00 €, European Neighbourhood Instrument (ENI): 5 000 000,00 €
- Is the instrument for implementation of the EU Strategy for the Danube Region (EUSDR)



ELIGIBLE COUNTRIES

EU Member States

Austria (AT), Bulgaria (BG), (Czech Republic (CZ), Germany (DE), Croatia (HR), Hungary (HU), Romania (RO), Slovenia (SI), Slovakia (SK)

IPA Countries

Serbia (RS), Bosnia and Herzegovina (BA), Montenegro (ME)

ENI Countries

Moldova (MD), Ukraine (UA)

Danube Transnational Programme (2): Structure

Innovative and socially responsible Danube Region



- 1.1: Improve framework conditions for innovation
- 1.2: Increase competences for business and social innovation

ERDF: 56,58 MM €
IPA: 5,46 MM €

Environment and culture responsible Danube Region



- 2.1: Strengthen transnational water management and flood risk prevention
- 2.2: Foster sustainable use of natural and cultural heritage and resources
- 2.3: Foster the restoration and management of ecological corridors
- 2.4: Improve preparedness for environmental risk management

ERDF: 64,67 MM €
IPA: 6,23 MM €

Better connected and energy responsible Danube Region



3.1: Support environmentally-friendly and safe transport systems and balanced accessibility of urban and rural areas

3.2: Improve energy security and energy efficiency

ERDF: 42,44 MM €
IPA: 4,09 MM €

Well governed Danube Region



- 4.1: Improve institutional capacities to tackle major societal challenges
- 4.2: Support the governance and implementation of the EUSDR

ERDF: 26,27 MM €
IPA: 2,53 MM €

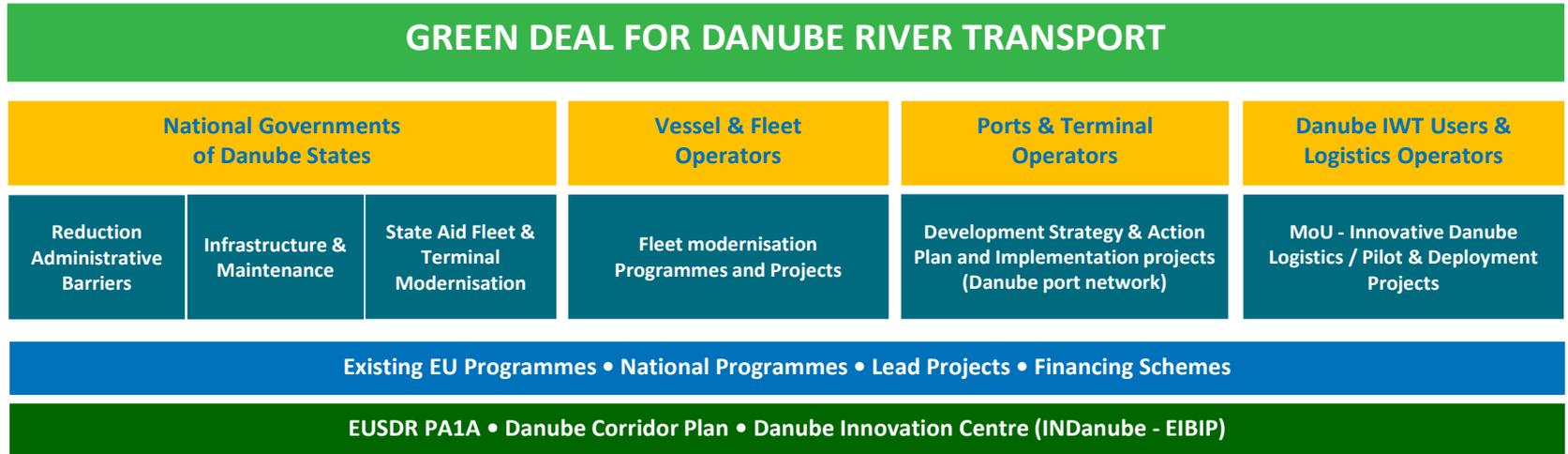


Specific objective (SO) 3.1: Improve planning, coordination and practical solutions for an environ-mentally-friendly, low-carbon and safer transport network and services in the programme area contributing to a balanced accessibility of urban and rural areas

- **2nd Call:** *Restricted to multi/ inter-modality (especially inclusive but not limited to rail and air transport), transport safety (inclusive of ITS, if applicable), IWT fleet modernisation, connectivity of rural areas and improvement of public transport*



Motivation



“**GRENDEL - GR**een and **EfficieNt DanubE fLeet**” is the 3rd project that addresses the objectives defined in the “**Green Deal for Danube River Transport**”, the policy & business framework to improve efficiency & environmental performance of Danube waterway transport system elaborated by Pro Danube. The other two projects funded by the Danube Transnational Programme are:

- **DANTE - Improving administrative procedures and processes for Danube IWT**: aims at identifying and eliminating administrative barriers for inland waterway transport
- **DAPhNE - Danube Ports Network**: aims to facilitate a balanced development of Danube Ports as eco-friendly, well accessible multimodal hubs for the transport system of the region and to turn them into buzzing economic centres functioning as catalysts for economic growth and creation of high value jobs.

Introduction & Rationale

- Due to a variety of reasons, **market take-up of innovations in IWT proceeds only slowly**. Long economic lifetime of fleet investments, low innovation rates, high investment costs combined with **low re-investment capacity** and a **lack of general awareness on available innovations** hamper improvements.
- Inland waterborne transport is the **most environmentally friendly mode of transport in terms of greenhouse gas (GHG) emissions per tonne-kilometre**. Shipping more goods on water reduces GHG and traffic congestion. Inland vessels offer an enormous carrying capacity per transport unit and inland waterways still offer a high infrastructure capacity. However, there is still a **significant potential in reduction of energy use (up to 10 -20%) and pollutant emissions (up to 80%)**, in particular with regard to existing vessels, and a large modal shift potential towards a sustainable and high performing transport mode.
- **Inland waterborne transport offers a variety of freight forwarding solutions**, however, it is **not always sufficiently considered** as part of the logistic chain solution. **New logistic and vessel concepts** shall enable better use of existing and free capacities and lead to a revitalised image of IWT among transport users and logistics service providers.

Project objectives

- Prepare / support vessel operators for modernisation / greening of Danube fleet based on know-how transfer and results of European and regional innovation projects & real-life demos following the European transport and environmental policy priorities
- Elaboration of fleet investment plans defining investment volumes and greening technologies
- Provide support to the vessel operators regarding financing opportunities for fleet greening
- Facilitate state aid for fleet modernisation (funding volumes, funding objectives and activities)
- Further development of regulatory framework for implementation of greening technologies
- Identify required new / future skills of workforce & prepare for training
- Build up a vessel operators' platform to facilitate knowledge transfer on greening technologies (technical feasibility and financial viability) as part of the stakeholders' management
- Elaborate Danube wide fleet modernisation strategy and related recommendations
- Implement tools, learning interactions and pilot actions which are part of fleet modernisation strategy
- Integrate IWT into logistics systems in cooperation with logistics providers

Policy background I

- GRENDEL corresponds to the European Commission's 2011 [Transport White Paper on a Roadmap to a Single European Transport Area](#), the recent [European Strategy for Low-Emission Mobility](#) as well as directives and regulations adopted on the EU level, among others [Alternative Fuels Directive](#), [Non-Road Mobile Machine Regulation \("NRMM"\)](#) as well as [Renewable Energy Directive \("RED"\)](#). It prepares the Danube IWT fleet operators for a step change to increase the environmental (in terms of energy efficiency and emissions reductions) and economic performance (in terms of improvement of processes and digitalisation) of the Danube navigation.
- GRENDEL addresses [key intervention areas of NAIADES II](#) "Towards quality inland waterway transport" (which are reflected in EUSDR actions as well): (i) [quality through innovation](#) via know-how transfer events & targeted activities; (ii) [environmental quality](#) through preparatory actions for deployment of technologies aiming at reducing air pollution & energy consumption complying with new emission limits for IWT; (iii) [integration of IWT into the multimodal logistic chains](#) through improved transport & logistics management processes & integration of services and information streams, incl. RIS; (iv) [smooth functioning of the market](#) through consultations & actions fostering favourable legislative framework and public support measures; and (v) [skilled workforce and quality jobs](#) through consolidated information on skills and trainings needed for the personnel working in the (future) modern IWT sector.

Policy background II

- Regional Policy/EUSDR PA1A: **availability of the modern Danube fleet** (improved environmental and economic performance) is one of the pillars aiming to increase cargo transport on the river by 20% by 2020 compared to 2010 (**target I**). The **synergies with RIS (target IV)** and DINA will be investigated to improve the transport and logistics management processes. Social dimensions, such as the **skilled workforce and quality jobs (target V)** are addressed by GREDEL project as well.
- Europe 2020 Strategy: (i) **targets combining public & private investment** to reach 3% of EU's GDP. Model Scheme for State Aid and other innovative financial instruments provides Danube states with policy instrument to foster the modernisation of IWT sector. (ii) **Supporting the sustainable growth** by raising awareness of public and private stakeholders on new legislation concerning emission limits for inland shipping, technical requirements for inland vessels, use of alternative fuels and the consequences for the sector.
- Various **transport and IWT development strategies in the Danube riparian countries**

Project key facts



FUNDED PARTNERS

- Fleet owners & operators
- Innovation & technology organisations
- IWT development organisations (industry representatives)
- 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%



1.2018 - 6.2020

- 30 MONTHS



ASSOCIATED STRATEGIC PARTNERS

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



NON-FUNDED STAKEHOLDERS

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

Project partners

FUNDED PARTNERS

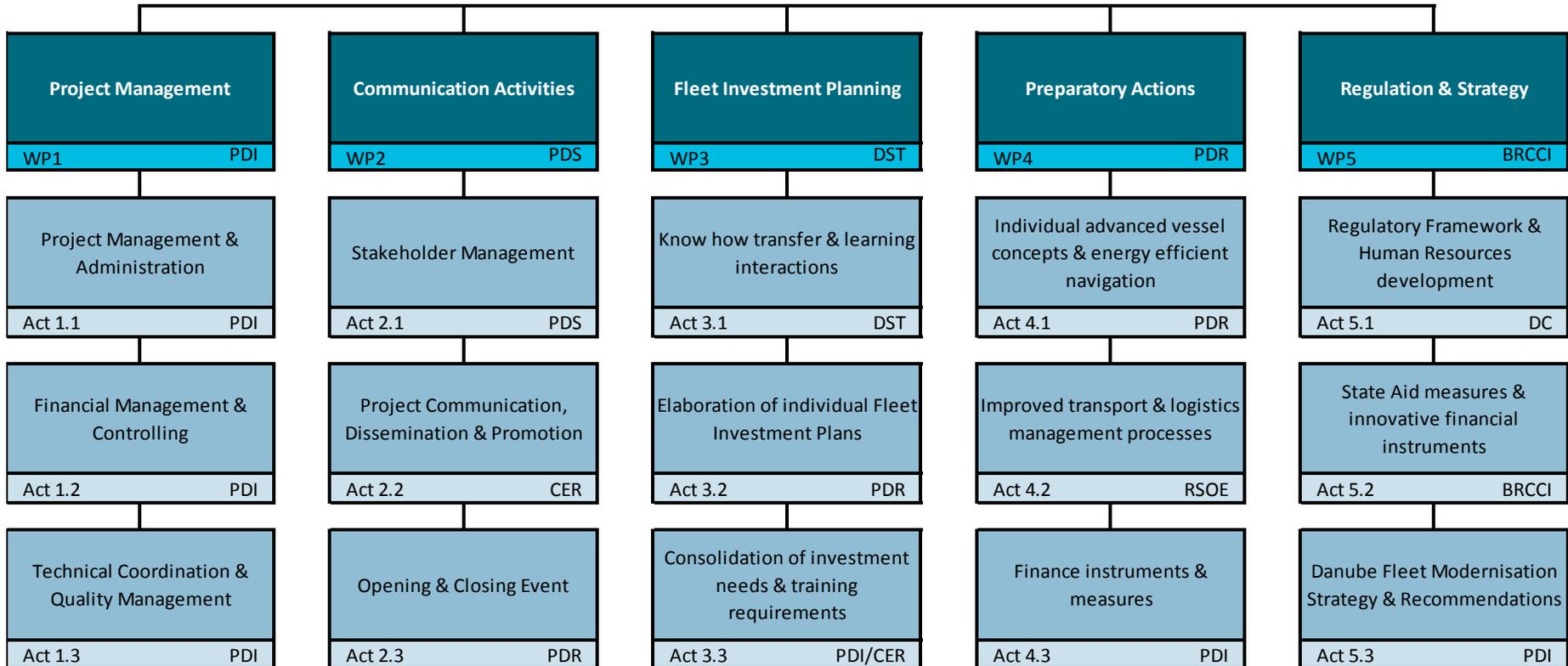
- **Pro Danube International (LP)**
- DST – Development Centre for Ship Technology and Transport Systems (DE)
- National Association of Radio Distress-Signalling and Infocommunications (HU)
- Danube Commission (International Org.)
- Bulgarian-Romanian Chamber of Commerce and Industry (BG)
- Pro Danube Romania (RO)
- Romanian Maritime Training Centre – CERONAV (RO)
- SDG – Ship Design Group S.R.L. Galati (RO)
- Romanian Naval Authority (RO)
- River Navigation Company NAVROM SA (RO)
- Fluvius Shipping and Transport. Company (HU)
- Danubia Kreuzfahrten GmbH (AT)
- Pro-Danube Serbia (RS)

ASSOCIATED STRATEGIC PARTNER

- Federal Ministry for Transport, Innovation and Technology (AT)
- Ministry of National Development (HU)
- Executive Agency Maritime Administration (BG)
- CFND (RS)
- Donau Tankschiffarts-Gesellschaft m.b.H (AT)
- Bulgarian River Shipping (BG)
- Bulgarian River Cluster „Danube” (BG)
- Romanian River Ship Owners and Port Operators Association (RO)
- BAVARIA Schifffahrts- und Speditions-AG (DE)
- Ministry of Maritime Affairs, Transport and Infrastructure (HR)
- Ministry of Transport (RO)

Work breakdown structure

"GRENDEL - GRen and EfficieNt DanubE fLeet"
Towards green, efficient and competitive river Danube transport



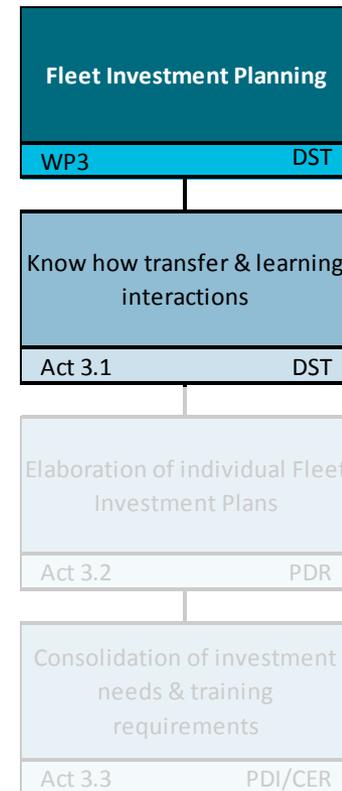
Act 3.1 “Know-how transfer & learning interactions”

Objective

- Ensure that Danube fleet operators and other relevant IWT stakeholders gain comprehensive **up-to-date knowledge** on **greening technologies** and **on viable solutions for efficient fleet management** including their **financial impact, operational & environmental impact when being deployed** – prerequisite for to support decision process of fleet operators with regards to future investments plans.

Activities

- Elaboration of inventory & assessment of greening technologies and solutions, update considering Danube specifics (incl. technical feasibility, economic viability) based on outcomes of previous projects
- Dissemination of decision support tools (i.e. Econaut, IWT Greening Tool, Funding Database, TCO models, Efficient Navigation tools, Innovation Radar) & their application by Danube stakeholders
- Prepare & execute of knowledge transfer workshops, one in the upper/middle/lower Danube each
- Application of new innovative decision support tools (*such as Econaut, IWT Greening Tool, Funding Database, TCO models, Efficient Navigation tools, etc.*)
- Awareness raising for impact of new regulations (NRMM, ES-TRIN) & greening challenges



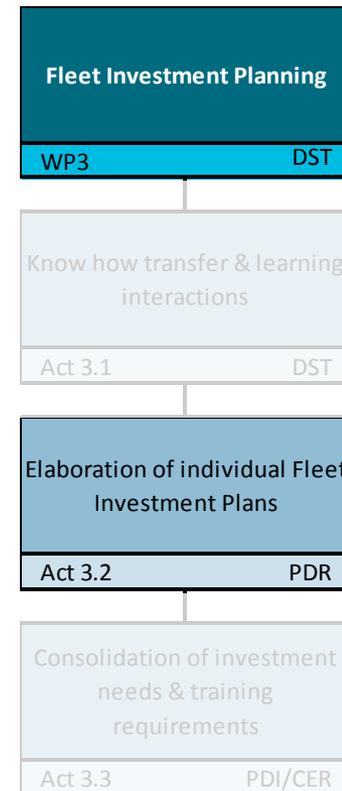
Act 3.2 “Elaboration of individual fleet investment plans”

Objective

- To elaborate **detailed company individual** and **aggregated national fleet investment plans** in order to lay out the investments planned by the Danube IWT sector in the upcoming 10 years period. The 2018-2023/2027 timeframe addresses also the next budgetary period of the European Union. The investment plans of fleet operators which expressed concrete interest to invest in the next 2-5 years (becoming ERDF PPs) will target in their plans the **most urgent fleet modernisation requirements (refurbishment/renewal)** addressing environmental and economic performance (air pollutants, energy reduction, improvement of fleet & logistics management activities). Further to this, assigned regional/national coordinating partners will **map main technological priorities, investment volumes and timeline** of required investment on **national levels** by interacting with ASP fleet operators and other major fleet operators. All investment plans will **create a basis for the volume and type of interventions** and will feed into the shaping of the **State Aid Measures** (allocated amounts, addressed priorities & timeline).

Activities

- Definition of methodology & structure of fleet investment plans (“template”) to align contributions and to receive a comparable input for consolidating the plans into an information representative for the entire Danube region
- Elaboration of individual fleet investment plans of funded fleet operators (ERDF PPs)
- Elaboration of aggregated fleet investment plans of ASP & other fleet operators on national levels



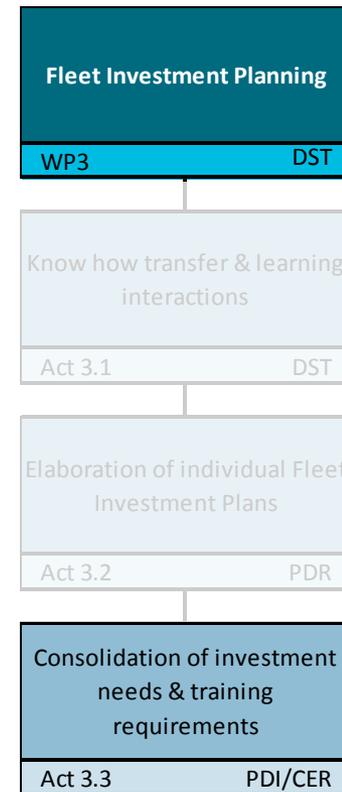
Act 3.3 “Consolidation of investment needs & training requirements”

Objective

- To prepare consolidated input for elaboration of public support measures and other innovative financial instruments (Act 5.2) summarising the investment (technological) priorities, necessary financial volumes and timelines of required investments. The chosen approach will also identify a “pipeline of projects” for fleet modernisation in the Danube region.

Activities

- Agree on structure, topics to be covered in the consolidation of the fleet investment plans while balancing the requirements addressing (i) confidentiality of business related data and (ii) conciseness of necessary investments' volumes and priorities. Non-disclosure agreements will be signed individually between fleet operators and organisation(s) processing data into for the consolidated report
- Consolidate individual & national fleet investment plans into an overview plan covering the whole Danube region based on the defined set of required information
- Consolidate human resources and E&T requirements providing an overview of new skills and additional workforce on-board of vessels as well as of other personnel
- Define curricula for the additional E&T needs required for implementation of greening technologies in order to ensure efficient investment in E&T systems at all levels
- Evaluate the investment plan against the requirements necessary for the elaboration of the public support measures and other innovative financial instruments (Act 5.2 & 5.3)
- Validate the consolidated investment plan for the Danube region with dedicated experts from public and private sector.



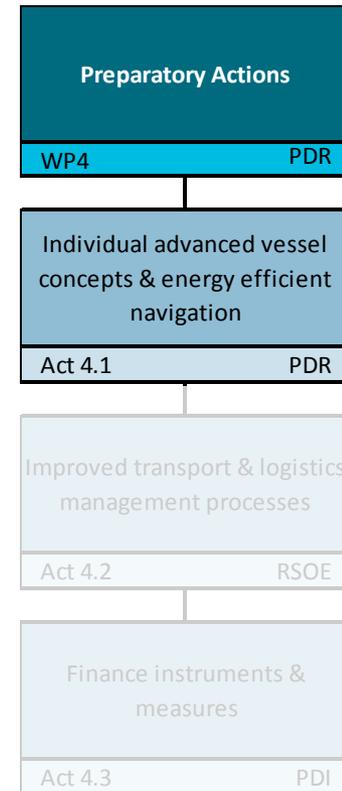
Act 4.1 “Individual advanced vessel & operational concepts”

Objective

- To prepare selected fleet operators for fleet modernisation activities by elaboration of (i) advanced “green” vessel designs considering most promising greening technologies and (ii) solutions leading to increased efficiency in terms ship efficiency and navigation performance (energy efficient navigation). The involved fleet operators elaborate advanced “green” vessel concepts that will be used during or immediately after the project as basis for the technical documentation necessary for permits and for starting construction/retrofitting of vessels.
 - NAVROM/SDG will look into retrofitting & new vessels for own fleet (pushers & self-propelled vessels)
 - FLUVIUS will consider various technological improvements for own fleet, i.e. electricity produced from renewables (solar panels, wind or water), exhaust gases after-treatment, reduction of fuel consumption, enhanced propellers and gearboxes to improve engine efficiency & improved hull hydrodynamics.
 - Passenger vessels operator DANUBIA will look into hydrodynamics & greening technologies. Further to this, DANUBIA will investigate IT solutions & tools for energy efficient navigation to improve fuel consumption & decrease emissions.

Activities

- Requirements analysis: (i) relevant legal framework: incl. where applicable specific requirements, documentation and approval process; (ii) technical / operational solutions; (iii) in case of vessels – design principles: operational profile, possible propulsion configuration, CAPEX & OPEX, design parameters
- Elaboration of green IWT vessel concepts for various vessel types like pusher(s), self-propelled vessel(s), river cruise vessel(s), both for new vessels and vessel retrofitting
- Consolidation of results into a publishable report from elaborated conceptual designs with main facts & lessons learned



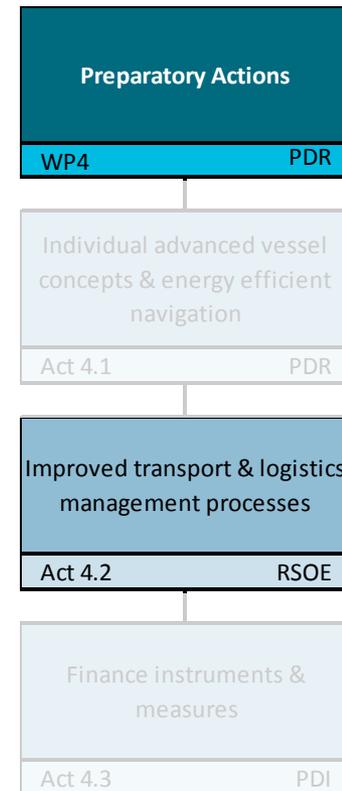
Act 4.2 “Innovative solutions to integrate IWT in logistics concepts”

Objective

- To improve transport & logistics management processes of fleet operators making use of digitalisation and considering available tools and services, incl. RIS, as well as future requirements derived from modern global logistics (e.g. Logistics 4.0). Improved transport & logistics processes in IWT shall enable better integration of IWT into the multimodal logistics systems, better use of existing and free capacities of fleet operators and lead to a revitalised image of IWT among stakeholders by demonstrating reliability and predictability – next to the well-emphasised cost-effectiveness and environmental friendliness.

Activities

- Analyse existing logistics & transport management processes and requirements of a representative sample of Danube fleet operators & best practices from Western Europe;
- Analyse tools (on-board and on-shore), digital data (from private or public sources), services, incl. RIS, software solutions available on the market
- Elaborate a model concept for improved (digital & advanced) transport & logistics management processes of IWT fleet operators with recommendations on use & integration of tools, digital data, and services
- Elaborate and provide feedback & recommendations of the IWT industry / sector to national RIS authorities concerning the future enhancement of RIS (synergies with CEF project “RIS COMEX” (www.riscomex.eu) & Horizon 2020 project AEOLIX (www.aeolix.eu))
- Prepare & carry out know-how transfer events



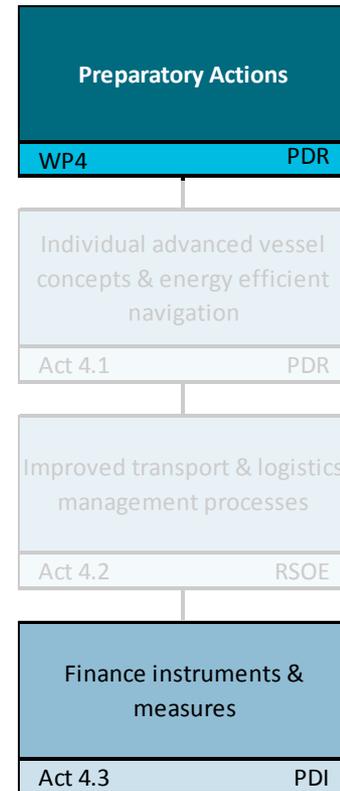
Act 4.3 “Finance instruments & measures”

Objective

- To give assistance to the Danube fleet operators (with special focus on those that intend to invest in coming 3-5 years) as regards financing opportunities for fleet modernisation: The advice will cover (i) available financing options like bank loans & equity instruments and (ii) existing public funding opportunities (EU, national, regional). The gaps between existing finance instruments and needs of the sector will be assessed. These gaps will be addressed further in Act 5.2 & 5.3 dealing with framework (regulatory, financial, strategy) for the Danube IWT fleet modernisation.

Activities

- Consolidate surveys, studies and reports concerning the financing instruments for modernisation of IWT fleet (on European level) - if needed amend the Danube input - and derive conclusions concerning the needs of the sector and comparing to the existing and/or discuss possible future options as regards the financing instruments & measures: see *PLATINA II. Market survey as a joint initiative of EC, EBU & ESO to identify the specific needs of the IWT operators with regard to the use of the proposed financial instruments for IWT modernisation investments*
- Continuous research of available national / regional financing and funding opportunities and provision of information about these opportunities to the sector through project website and through the “Funding Database” (elaborated in PLATINA and currently operated by EIBIP) to ensure synergies with similar initiatives
- Prepare & carry out workshop(s) concerning the financing instruments and measures
- Provide support to fleet owners & operators regarding financing opportunities for greening their fleets (through cooperating financing institutes like EBRD)



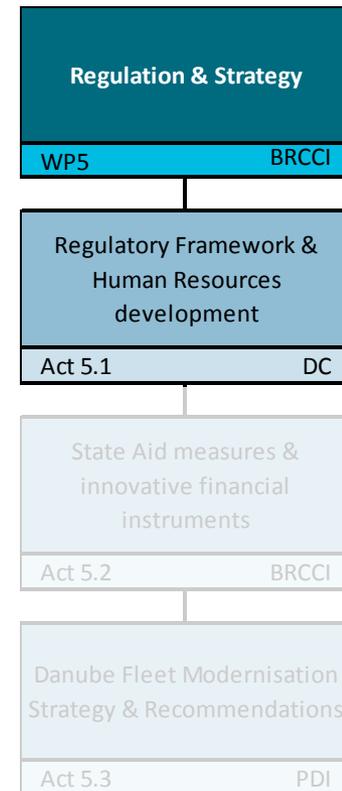
Act 5.1 “Regulatory Framework & Human Resources development”

Objective

- To facilitate a favourable regulatory framework for (identified) future technological developments & innovations through interaction with the Danube Commission (DC) and its Member States and to translate sector requirements into the regulatory framework shaped on the national as well as European level (through CESNI “European committee for drawing up common standards in the field of inland navigation” & its national representatives). The platform created in GREDEL and consisting of Danube fleet operators, IWT experts & users shall support DC & its Member States by providing expert advice and practical experience. The consultations will be carried out in the form of 3 workshops organised by DC around the most relevant topics addressed in the CESNI work-program as well as for topics identified by the DC as part of its work program covering:
 - *Regulatory framework to prepare conditions for Danube fleet modernisation addressing greening technologies, efficient navigation and integration of IWT into logistics systems*
 - *Identification of required skills of workforce & necessary education & trainings for personnel working in Danube navigation*

Activities

- Consolidation of know-how regarding regulatory framework related to the greening technologies & solutions, training & education & related gaps
- Prepare & execute 3 public consultations between DC, its Members States and Danube IWT sector as part of a structured and comprehensive regular information exchange with IWT industry leading to the future institutionalisation of this consultation mechanism in the working procedures of the DC



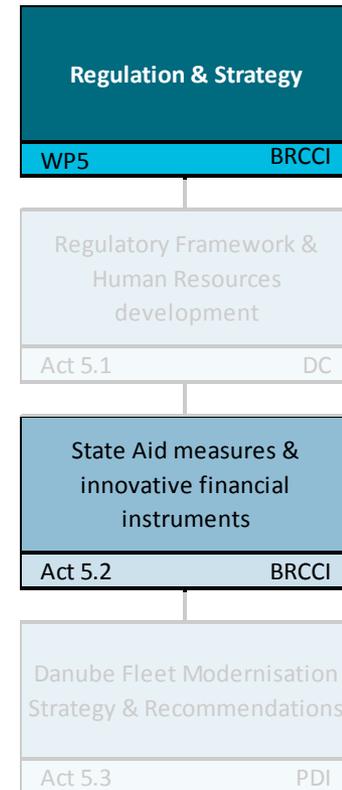
Act 5.2 “State Aid measures & innovative financial instruments”

Objective

- To create an encouraging framework of a variety of public support measures going beyond national borders and to help national governments to prepare well-designed and targeted public support measures (financial incentives for modernising fleet & fostering personal resources) that will stimulate innovation uptake and greening of fleet. For this reason, the financial instruments will be explored considering options of being created (i) from primarily public sources or (ii) public-private sources in sort of private-public partnership. GRENDEL will address both options.

Activities

- Prepare a Model State Aid Scheme that can be used by ministries to draft dedicated national state aid schemes. Know-how & experience from existing state aid schemes will be consolidated and conclusions drawn; best practice examples from other countries (F, NL, DE, CZ) will be analysed and considered as basis for the widely harmonized model. The impact and the compatibility of proposed State Aid measures with State Aid rules will be considered in the draft model. It is expected that the model scheme will be used to draft a fully- fledged state aid scheme which will be launched in at least one participating countries.
- Other innovative financial instruments will be exploited in cooperation with Western Europe stakeholders, incl. “IWT Innovation Fund” (or "Sustainability Fund for Inland Shipping"). GRENDEL will support these “European-wide” activities further through involvement and provision of input related to the Danube IWT sector investment priorities



Act 5.3 “Danube Fleet Strategy & Recommendations”

Objective

- To define **set of actions and measures addressing the fleet modernisation issues** (both related to "vehicles" themselves, as well as operational aspects & logistics). The “Danube IWT Modernisation Strategy & Recommendations” shall contain steps to be taken to reach the EU transport and environmental policy objectives in the Danube region while also complying with the national development needs & priorities of the Danube riparian countries. The Strategy will address the key intervention areas of NAIADES II and as well of the EUSDR targets aiming at “provision” of the modern Danube fleet with improved environmental and economic performance. The Strategy shall serve as guidelines in the sense of "a handbook" (a living working document) that can be used for **policy actions at the European, national and transnational levels as well as for the industry stakeholders’ decisions**. Good practices will be used as showcases in the Strategy providing tangible examples how to overcome the lack of innovation in IWT fleets which is hampered by manifold shortcomings in the market as well as regulatory framework.

Activities

- Definition of the content and structure of the Danube IWT Fleet Modernisation Fleet Strategy
- Elaboration of the Danube IWT Fleet Modernisation Strategy & consolidate recommendations
- Validate the Danube IWT Fleet Modernisation Strategy & Recommendations through dedicated workshop(s)



The “*GRENDel - GReen and EfficieNt DanubE fLeet*” project proposal is part of the “Green Deal for the Danube River Transport”, an initiative of the INDanube Innovation Transfer Centre.

INDanube is run by  **pro DANUBE**
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INDanube - Centre for Innovation Transfer in the Danube Region

Welcome to INDanube, the facilitator and promoter of innovation in inland waterways transport on the Danube and its navigable tributaries.

[More information](#)



Co-financed by the European Union