Interreg

EUROPEAN UNION

Danube Transnational Programme

GRENDEL

GRENDEL

Green and efficient Danube Fleet

Budget in EUR
Overall: 1.824,999.20
ERDF Contribution: 1,481,137.05
IPA Contribution: 70,112.25

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

Project co-funded by the European Union

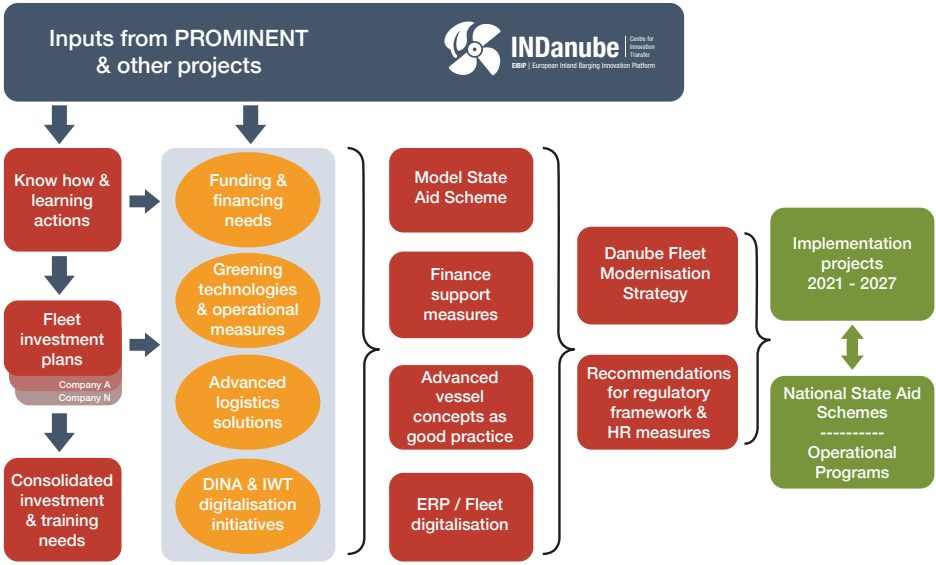
The GRENDEL project supports the Danube vessel fleet operators and their public counterparts in the challenging modernisation process of the sector. GRENDEL addresses various fleet modernisation aspects: [i] use of low carbon and alternative fuels, [ii] reduction of air pollutant emissions (CO2, NOx, PM) and [iii] overall energy consumption. Besides this, [iv] transport and logistics management processes are addressed to ensure better integration of the Danube IWT into logistics chains through new services (including River Information Services), digital data provision as well as dedicated tools to improve efficiency of fleet operations.

By establishing a solid partnership under the lead of Pro Danube International, with members ranging from international organisations, national authorities and decision makers to stakeholders operating on the Danube and its navigable tributaries, GRENDEL resulted in achievements that were welcomed by both public and private entities:

- Elaboration of technological factsheets
- Design of innovative and greening inland vessel concepts
- Organisation of Know-how transfer events & Public Consultations
- Provision of an IWT Innovative Technologies Database gathering technical information
- Development of a Model State Aid Scheme for the Danube region
- Establishment of a Danube IWT Fleet Modernisation Strategy & Recommendations

All the results of the project are available on the GRENDEL website.

GRENDEL was a vital step forward in providing a fruitful ground for the establishment of dedicated financial instruments that trigger investments in the fleet.

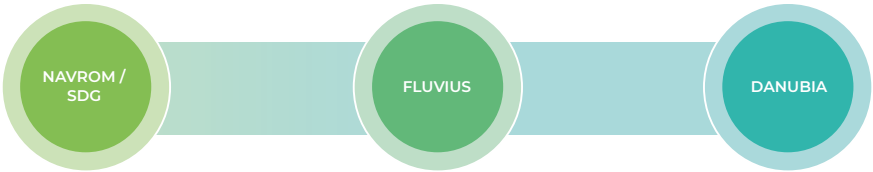


KNOW-HOW TRANSFER

GRENDEL developed a series of **technological factsheets** that propose concrete solutions to adapt the fleet to the strict environmental requirements set by the Legislator.

- Gas and gas-electric propulsion
- Diesel-electric propulsion
- After-treatment
- Fuel cell propulsion
- Battery electric propulsion
- Drop-in fuels
- EURO VI truck and NRE engines
- Energy efficient navigation

Moreover, the active involvement of various private vessel operators and businesses operating on the Danube gave the possibility to **shape the solutions** proposed in the framework of the project according to their needs and requirements.



- Conceptual design for 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 engines
- Elaboration of conceptual design for improving the hydrodynamics of the vessel hull design

- Concept for sewage plant upgrade
- Concept for improvement of noise and vibration characteristics

KNOW-HOW EVENTS

ERDF PARTNERS

Pro Danube International (AT) • DST - Development Centre for Ship Technology and Transport Systems (DE) • RSOE (HU) • Danube Commission (International Organisation) • 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 Forwarding Ltd. (HU) • Danubia Kreuzfahrten GmbH (AT)

IPA PARTNER

Innovation Centre of the Faculty of Mechanical Engineering in Belgrade (RS)

ASSOCIATED STRATEGIC PARTNERS

Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology (AT) • Ministry of National Development (HU) • Executive Agency Maritime Administration (BG) • CFND (RS) • DTSG (AT) • Romanian River Ship Owners and Port Operators Association (RO) • BAVARIA (DE) • Ministry of the Sea, Transport and Infrastructure (HR) • Ministry of Transport, Infrastructure and Communications (RO) • Ministry of Transport and Construction (SK) • Bulgarian Register of Shipping (BG)

IWT INNOVATIVE TECHNOLOGIES DATABASE

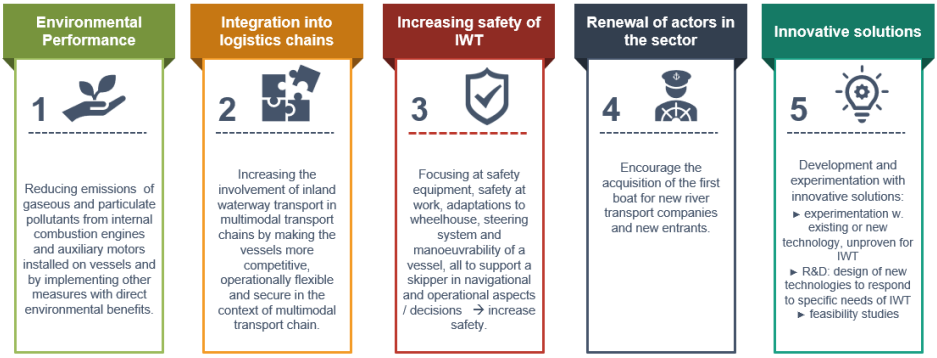
Provides a set of innovative technological solutions for fleet modernisation.

PUBLIC CONSULTATIONS

Several editions with public and private stakeholders and relevant EC services focussing on the drafting process of the Model State Aid Scheme and on the impact of the COVID-19 pandemic on Danube IWT, discussing possible recovery actions & plans.

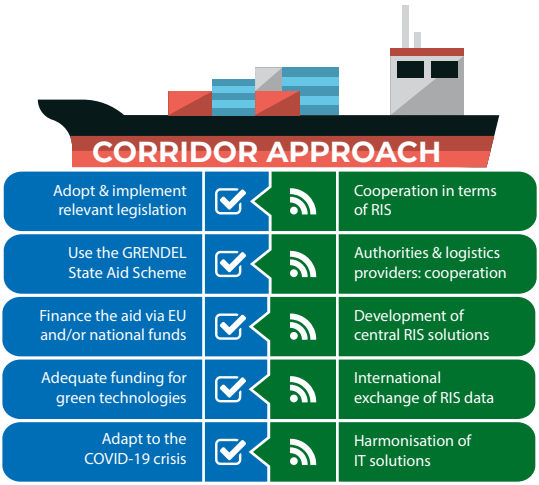
MODEL STATE AID SCHEME

Covering 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, requirements and administrative prerequisites.



DANUBE IWT FLEET MODERNISATION STRATEGY & RECOMMENDATIONS

Provides an **in-depth analysis of the specific challenges** Danube IWT is currently facing, proposing a set of **recommendations** to overcome them in a well-defined and coordinated manner.



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Website: www.interreg-danube.eu/grendel
Edition November 2020