# Project Data Sheet

<table>
<thead>
<tr>
<th>BASIC PROJECT DATA</th>
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<tbody>
<tr>
<td><strong>Full project title:</strong></td>
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<td><strong>Short project title:</strong> (acronym)</td>
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<td><strong>Project logo:</strong></td>
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<td><strong>Project website:</strong></td>
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<td><strong>Project ID:</strong></td>
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### Need and added value for Danube Region Strategy:
It is well known that the transport capacity of the Danube is poorly utilized. In addition, unlike the Rhine, the Danube is not a regulated waterway. Furthermore, it is a much longer and wider river with several shallow sectors. Consequently, transport infrastructure enhancement would require extensive waterway engineering. This could severely damage the eco-system of the river and adjacent areas and, in the long run, also harm the economy of the region. As a means to increase waterborne transport with simultaneous preservation of region’s natural resources, Green Chain introduces an innovative approach to ship design.

Four most important impacts of the Green Chain can be distinguished:

1. Introduction of innovative shallow-draught vessels for the Danube and the Black Sea;
2. Transfer of knowledge between the Danube and the Rhine waterway network;
3. Policy support for new type of ship safety regulations and GHG reduction measures;

### Objective(s) of project:
The Green Chain project aims to accomplish the following goals:

- To contribute to an increase of the modal share of waterborne transport, particularly in the Danube region and the Black Sea basin.
- To indicate ways to achieve efficient waterborne connections between inland and maritime ports (e.g. the Black Sea harbours and the Danube inland ports) as well as between main inland waterways and small, secondary waterways and canal systems (e.g. the Danube and its tributaries Sava, Tisa, the Danube-Tisa-Danube canal system, etc.).
- To introduce innovative ship design that would comply with present navigation conditions, in order to avoid excessive waterway engineering, simultaneously providing an efficient response to other environmental, technological and economical challenges in the area of waterborne transport.

### Planned project activities:
Green Chain is focused on innovative design of shallow-draught inland vessels and sea-river ships adjusted to the Danube waterway network and the Black Sea coastal zones. The project aims to provide customized ships, tailored in accordance to the present navigation conditions on particular waterways (river-adapted ships).

The project will also offer concepts for sustainable waterway development as well as for improvement of port infrastructure and enhanced port management and operation. A significant element of the project represents the evaluation of economic viability of developed designs and concepts (including costs of new-building of innovative ships) and quantitative and qualitative assessment of their...
influence on modal shift, emitted CO2, internal and external costs of transport, environment, etc. Based on the results of the evaluation, and taking also into account existing national and regional policies, a strategy for adequate policy framework that would enable introduction of the new designs will be developed.

The Green Chain goals should be attained through five thematic Research Activities: Waterways, Ports, Ships, Logistics chains, Transport policy. The Research Activities will provide applicable and feasible solutions for its main areas of research:

- Waterways will study feasible options for low environmental impact modernization of waterways;
- Ports will provide concepts for improvement of port management and operations;
- Ships will develop design of innovative vessels for inland and river-sea navigation;
- Logistics chains will perform demand and supply gap analysis;
- Transport policy will investigate policy shortcomings on both local and European level.

Transboundary impact:
The Green Chain team gathers respectable institutions in the fields of ship design and ship hydrodynamics, waterway engineering, port management and operation, transport economics and transport policy development from two of the most important European waterway networks: the Danube – Black Sea basin and the Rhine – North Sea coastal zone region.

Project beneficiaries / target groups:
- Shipyards
- Shipping companies
- Port managers and operators
- Research institutions
- Policy makers

**STATUS AND TIME FRAME**

**Current project phase:**
- Definition (e.g. project idea, abstract)
- Preparation (e.g. project proposal, feasibility study)
- Implementation
- Completion

**Start date:** t.b.d. **End date:** t.b.d.

**Notes:**

**PROJECT TEAM**

**Project leader:** PANTEIA BV, NEA Transport Research and Training / The Netherlands

**Project partner(s):**
- University of Belgrade – Faculty of Mechanical Engineering / Serbia
- Herry Consult GmbH / Austria
- STRATEC SA / Belgium
In addition, the project coordinator NEA will subcontract the MERCURIUS Shipyard, the Dutch shipping and shipbuilding company which also runs a shipyard in Serbia, specialized in new-building of inland vessels.

Contact person:
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- Website: www.nea.nl

FINANCING

Available: (please tick a box)
- Yes
- Partly
- No

Total budget: 2,900,000 EUR (indicative)

Source(s) and amount (potential sources for project ideas): (please tick a box and provide further info)
- National/regional funds: to be provided
- EU funds: Seventh Framework Programme
- IFI loans:
The Green Chain goals are consistent with the overall waterborne transport development strategy as defined by the NAIADES Action Programme and the WATERBORNE Technology Platform.

The NAIADES Action Programme sets inland fleet innovation as one of five main strategic areas, calls for improvement of logistics efficiency, safety and environmental performance of IWT and emphasizes the importance of vessels operating in low water levels, sea-river ships and vessel intended for small waterways. The consideration of possibilities for adapting the ship design to the present navigation conditions is also indicated as a research direction.

Throughout the execution, the Green Chain project will launch a number of actions envisaged by the WATERBORNE Technology Platform Strategic Research Agenda. For instance, WATERBORNE TP indicates risk-based analysis for cost-efficient safety, propulsion efficiency and low emission vessels, as some of the R&D and innovation priorities. The Green Chain project will utilize risk-based tools for the safety assessment of innovative ships and advocate for introduction of risk-based design, using practical examples. The project will incorporate the research on advanced greening technologies including emission reduction techniques. Furthermore, the project will contribute to development of energy-efficiency indicators of the inland vessel design, etc.

The Green Chain project addresses three (out of four) pillars of the EU Strategy for Danube Region: (1) Connecting the Danube Region (design of innovative shallow-draught vessels that should enable efficient connections between the Black Sea maritime harbours and inland ports on the Danube and on the secondary waterway network; concepts for improvement of port infrastructure, management and operation); (2) Protecting the Environment (concepts for sustainable waterway development and design of river-adapted ships) and (3) Building Prosperity (two-way knowledge transfer between the Rhine and the Danube basin; transferability of technology and policy).

In the first phase of the project, an overview of regulations relevant for each Research Activity will be made. Technical regulations are very important for the project execution, so in addition to current regulations, the ones that will come into force in the near future will be taken into account as well. Transport policy research group will also examine taxes and subsidies related to inland waterway transport and Black Sea coastal shipping of the Danube neighbouring countries, as well as legal restrictions for waterway and port infrastructure development.

The Green Chain team does not start from scratch, but relies heavily on experience gained through a number of European and national projects executed by partners so far. Also, collaboration within the project would enable the diffusion of results accomplished in the national (Serbian, Romanian, Belgian, etc.) and bilateral (Bulgarian-Belgian, Serbian-Dutch) projects to a broader, European-level community. Some examples of projects relevant for the proposed research are given below.

NEA was involved in developing the national transport master plans of Serbia, Bulgaria, and Romania. NEA has executed many inland waterway projects in the Danube region. Furthermore, the staff of NEA and BU has also previously
cooperated in EC-funded projects CREATING and IMPRINT-NET (both FP6).

The Department of Naval Architecture (University of Belgrade – Faculty of Mechanical Engineering) has a long history of continuous technical improvement of the Danube fleet. Introduction of push-boat technology on the Danube is one of the milestones of Department’s activities. Over the past 15 years, Department has continuously participated in Technology Development Programme of the Serbian Ministry of Science with research projects on development of new generation of inland Ro-Ro and container vessels. Furthermore, the members of BU have taken part in several international research projects. In CREATING (FP6 project), the only vessel intended for the Danube (out of four cases) was mostly developed by the BU team member, Prof. Dejan Radojičić. EUDET (FP4), COVEDA and MUTAND are some of the Danube ship technology related projects carried out by the members of the Department. Another important study on shallow-draught ship design “Environmentally friendly inland waterway ship design for the Danube River” commissioned by WWF was accomplished in 2009.

STRATEC has accomplished a number of studies in the field of waterborne freight transport, dealing with socio-economic evaluation and cost-effectiveness of infrastructure upgrade, such as:

- Study of the pricing of the Seine-Scheldt IWW project (including the SNE canal and a set of IWW improvements in North of France and Belgium, on the Scheldt and the Lys), on behalf of the Seine-Scheldt EEIG (2009-2011);
- Study on the pricing of the inland waterway network use, on behalf of VNF (2009-2011);
- Study of the internalisation of external costs of freight transport in the corridor Paris-Amsterdam, (simulation of various pricing scenarios, including road pricing, rail pricing and IWW pricing), on behalf of the European Commission (2009-2011);
- Socio-economic evaluation of the Seine-North Europe canal, in collaboration with the Setec consultancy, on behalf of VNF (2004-2008);
- Socio-economic evaluation on the implementation of a new large-size river lock between two terminals (Port 2000 container terminal and the «darse de l’Océan») in the Havre port (in collaboration with Setec), on behalf of the Port of Le Havre (2008-2010).

In recent years, through Romanian Development Programme for the Danube ports, Galati Free Zone has expanded its on-site port management know-how by completing several studies and projects related to improvement of port facilities, infrastructure and operational activities (design and construction of new terminals, construction of a ship dismantling workshop, development of pipelines fabrication line, vertical quay arrangement for inland and seagoing ships, etc.). Furthermore, Galati Free Zone has participated or assisted in EU-funded projects, such as WANDA and CAPRICO.

Further examples include: ongoing bilateral cooperation between Flanders Hydraulics and Bulgarian Ship Hydrodynamics Centre in the area of inland navigation (particularly in shallow waters), as well as transfer of knowledge on estuary navigation from Ghent University to the University of Belgrade, supported by Basileus programme in 2009, etc.

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<tr>
<th>Relation to other Priority Areas of the Danube Region Strategy: (please tick a box)</th>
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<tr>
<td>☐ PA1b: To improve mobility and multimodality – Road, rail and air links</td>
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<tr>
<td>☒ PA02: To encourage more sustainable energy</td>
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<tr>
<td>☐ PA03: To promote culture and tourism, people and people contacts</td>
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<td>☐ PA04: To restore and maintain the quality of waters</td>
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### Project Data Sheet

| PA05: To manage environmental risks |
| PA06: To preserve biodiversity, landscapes and the quality of air and soils |
| PA07: To develop the knowledge society through research, education and information technologies |
| PA08: To support the competitiveness of enterprises, including cluster development |
| PA09: To invest in people and skills |
| PA10: To step up institutional capacity and cooperation |
| PA11: To work together to promote security and tackle organised and serious crime |

#### EUSDR Compliance

**Compliance with targets of the Danube Region Strategy:**  
(please tick a box)

- [X] Increase the cargo transport on the river by 20% by 2020 compared to 2010.
- [ ] Solve obstacles to navigability, taking into account the specific characteristics of each section of the Danube and its navigable tributaries and establish effective waterway infrastructure management by 2015.
- [X] Develop efficient multimodal terminals at river ports along the Danube and its navigable tributaries to connect inland waterways with rail and road transport by 2020.
- [ ] Implement harmonised River Information Services (RIS) on the Danube and its navigable tributaries and ensure the international exchange of RIS data preferably by 2015.
- [ ] Solve the shortage of qualified personnel and harmonize education standards in inland navigation in the Danube region by 2020, taking duly into account the social dimension of the respective measures.

**Compliance with actions of the Danube Region Strategy:**  
(please tick a box)

- [X] To complete the implementation of TEN-T Priority Project 18 on time and in an environmentally sustainable way.
- [ ] To invest in waterway infrastructure of Danube and its tributaries and develop the interconnections.
- [X] To modernise the Danube fleet in order to improve environmental and economic performance.
- [ ] To coordinate national transport policies in the field of navigation in the Danube basin.
- [ ] To support Danube Commission in finalising the process of reviewing the Belgrade Convention.
- [X] To develop ports in the Danube river basin into multimodal logistics centres.
- [ ] To improve comprehensive waterway management of the Danube and its tributaries.
- [X] To promote sustainable freight transport in the Danube Region.
- [ ] To implement harmonised River Information Services (RIS).
- [ ] To invest in education and jobs in the Danube navigation sector.
| Affiliation to thematic working group of Priority Area 1a of the EUSDR: (please tick a box) |  
|---|---|
| ☒ Waterway infrastructure and management |  
| ☒ Ports and sustainable freight transport |  
| ☒ Danube fleet |  
| ☐ River Information Services |  
| ☐ Education and jobs |  