

Driving Change in the Danube Region: Successes 2014-2020

Programme co-funded by European Union funds (ERDF, IPA, ENI)

A stream of cooperation

Five years after its adoption in 2015, the Danube Transnational Programme has already yielded a broad variety of positive results for the Danube Region. Through a far-reaching range of projects, partners, and experts, the programme's multifaceted strategies towards a sustainable, interconnected, socially responsible, and well-governed region have paved the way forward for future generations of Danubians. The challenges faced by the programme were unique, aiming to facilitate new shared goals, unified standards and measurements, and a sustainable approach to a common riverine region comprising both EU and non-EU countries.

Balancing a variety of priorities, the DTP nonetheless exploited the cross-sectorial possibilities of its broad remit. This meant conjoining a future bio-economy with a tighter transport network, or building opportunities for new job-creating forms of green tourism while simultaneously tackling brain drain and improving professional mobility within the region.

Above all, the key to the Danube Transnational Programme's successes lies in its integrated approach. The region's many untapped potentials, from the Danube waterways network, to its dormant Jewish cultural heritage, to its potential as a leader in developing green technological innovation, the DTP's various projects interlock towards similar long-term goals. During its lifetime, the DTP facilitated great strides in the social, economic and territorial cohesion of the 14 Danube countries, building policies that drive positive change.

This brochure examines **five key areas of success**, demonstrating just some of the ways in which the Danube Transnational Programme has already contributed to a better Danube Region. By developing policy frameworks, tools, services and concrete pilot investments within the fields of social innovation, environment, governance, culture, and more, the Danube Transnational Programme can be viewed as the first of many major steps forward for the most international river basin in the world.

More information about the DTP projects and their results:
www.interreg-danube.eu/approved-projects

Bio-Economy

Pioneering methods and solutions for tomorrow's Green Economy.

Operating at the nexus of innovation and the environment, **Bio-Economy** represents one of the most important areas for the long-term development of the Danube Region. Despite varying capacities for research and technological innovation, the Danube Region has the diversity of knowledge and skills in place to potentially pioneer all kinds of sustainable and groundbreaking solutions for newer, greener economic models.

As made clear by the goals of the EUSDR though, this doesn't only mean encouraging R&D into green solutions. It means investing in new Bio-Economy businesses, and the building of new networks between businesses and innovators. Recognized as some of the key cradles of innovative approaches, SMEs were of particular importance to the Danube Transnational Programme's Bio-Economy-focused actions.

Thus, several projects focusing on new ecosystems for SMEs, e.g. **Made Danube**, **DanuBioValNet** and **MOVECO**, contributed to the targets set by EUSDR Priority Area 8 (research, tech development, SME competitiveness). Generating new products, services and business processes remained a priority, yet the DTP's recognition of strengthening ties between researchers and business – not to mention intra-regional disparities – is the only way forward into a new Bio-Economy ready to meet future needs and competition as foreseen by the EU's Europe 2020 strategy.

Several projects funded by the Danube Transnational Programme focused on implanting knowledge and building networks to help further Green Innovation strategies for a future-facing Bio-Economy. Knowledge sharing and network building have taken several forms, from the summer schools and forums held by EcolnnDanube, to purpose-built online platforms such as MOVECO's virtual marketplace or Made in Danube's DTIC e-tool.

Achievements

- 🌀 Encourage entrepreneurship
- 🌀 Ensure knowledge transfer
- 🌀 Improve access to research infrastructure and protection of intellectual property
- 🌀 Foster regional innovation
- 🌀 Transform revolutionary ideas into successful ventures

Target Areas

- 🌀 Eco-innovation
- 🌀 Biofuels
- 🌀 Eco-construction
- 🌀 Eco-packaging
- 🌀 Industrial hemp usage
- 🌀 Urban recycling



DanuBioValNet

The bio-economic potential of the Danube Region's biomass resources remains under-exploited, so new 'clusters' of actors (SMEs, farmers, universities, research institutions) were devised. By clustering actors, new ties that facilitate the eco-innovations and activities necessary for the Danube Region to create products in three hitherto underdeveloped areas were forged: phytopharma (herbal medicines), eco construction (e.g. sustainable buildings) and bio-plastic packaging.

A collaborative Action Plan identified new innovative tools and methods developed for transnational cross-clustering, paving the way forward for a future of green innovation throughout the Danube Region, enabling relevant actors to collaborate to fully exploit its untapped potential.

#sustainability #groundbreaking #bioeconomy



MOVECO

Under the motto "Your trash is my treasure", stakeholders joined forces to accelerate transition to a **Circular Economy**, built upon easily recycled products and generative renewable energy to minimise waste to the benefit of both economy and environment. Particular attention was paid to educating SMEs on measures such as dematerialisation, digitisation, improved product design, and plastics with higher recyclability.

A dedicated online platform, including a marketplace, toolbox, and step-by-step guide for enterprises interested in Circular Economy has been developed and it is accessible to all interested stakeholders.

#circulareconomy #SMEs

"Your trash is my treasure"



EcoInnDanube

Focusing on development and application of eco-technologies, eco-innovation actors gathered together and strengthened existing networks. They created Green Summer Schools and Innovation Forums in Germany, the Czech Republic, Hungary, Serbia, Slovakia and Austria, offering a chance for hands-on training, transfer of knowledge, and investor-innovator meetups, forging long-lasting ties between innovators and businesses.

A flagship product is a Virtual Lab – **ecoinnovative.eu** – providing an online platform to connect actors seeking eco-solutions with innovators offering new solutions.

#ecoinnovation #ecotech



Made in Danube

With demand for renewable biological resources on the rise, the development of both renewables and smart & green growth in the Danube Region was encouraged. Synergies in these fields have been improved by developing innovation tools to match company needs with research expertise. Three existing regional initiatives have been integrated: Smart and innovative precision farming (Nitra, Slovakia), Competence Center in Wood Sector (Vukovar, Croatia) and Biofuel (Novi Sad, Serbia)

The online platform to help Danube Region actors operating in Bio-Economy to better cooperate, and to assist in converting research into marketable solutions is a core usable product that practitioners are encouraged to use.

#greengrowth #innovation #disruption

Transboundary water and flood management

Working across borders to achieve shared goals

As the most international river basin in the world, the Danube River Basin is naturally diverse in terms of both culture and environment. Even so, recent decades have seen a variety of problems take hold throughout the region, stemming from varied overexploitation, overuse and degradation. Tackling transnational problems like these that go beyond borders poses an additional set of challenges, which is where the Danube Transnational Programme stepped in to uphold and support joint cooperation between Danube countries to achieve shared goals to improve **transboundary water and flood management**.

In keeping with EU goals, and together with key steps taken towards water management, considerations have to be made simultaneously to preserve precious landscapes, biodiversity and ecological corridors throughout the region. This means also fostering connectivity between protected areas and habitats, encouraging the repopulation of migratory fish species whose historical migration routes have been cut off by hydromorphological changes or man-made infrastructure.

Most essential to the creation of a methodologically homogenous and more effective network for basin-wide water and flood management are the unification of data collection practices and the establishment of centralised monitoring systems. Projects such as **JOINTISZA**, **DAREFFORT** and **Danube Floodplain** assessed and made recommendations for regional abilities to forecast and prepare for flooding, while **SIMONA** and **DanubeSediment** created a basin-wide framework for assessing quality and quantity of shifts in Danube sediment, respectively.

Achievements

- ④ Update to the Integrated Tisza River Basin Management Plan
- ④ Findings key to future Danube-wide management plans
- ④ Establishment of a holistic overview of capacities and monitoring practices for flooding, drought, and sediment
- ④ Unique new way to observe Danube droughts via DroughtWatch.eu
- ④ Various strategies and best practice guides for authorities and stakeholders

Target Areas

- ④ Floodplain restoration
- ④ Harmonising forecasting systems for flooding and ice
- ④ Creating integrated water and flood risk management plans
- ④ Improving and harmonising drought monitoring and management

JOINTISZA

#watermanagement #Tisza

The **Tisza River Basin** (TRB) is the largest sub-basin of the Danube River Basin, sharing a drainage area of 156,869 km² between Ukraine, Romania, Slovakia, Hungary and Serbia. Our stakeholders embedded flood risk management planning more deeply into an updated Integrated Tisza River Basin Management Plan (ITRBMP) and developed improved methods for urban hydrology management procedures.

Key outputs:

Updated version of the ITRBMP

Developed improved methods for urban hydrology management procedures through pilot actions on selected cities

Investigated possible climate change impacts on drought and water scarcity

Danube Floodplain

Following recent years of catastrophic flooding throughout the Danube River Basin (DRB), transnational water management and flood risk prevention have been improved throughout the Danube while maximising benefits for biodiversity conservation. This was done through an integrated approach that first updated the floodplain areas, inventory and their ranking using the Floodplain Evaluation Matrix-FEM, then assessed the efficiency of floodplain projects in the Danube District, and finally developed tools for increasing the knowledge and cooperation of experts, practitioners, decision makers and stakeholders on floodplain restoration.

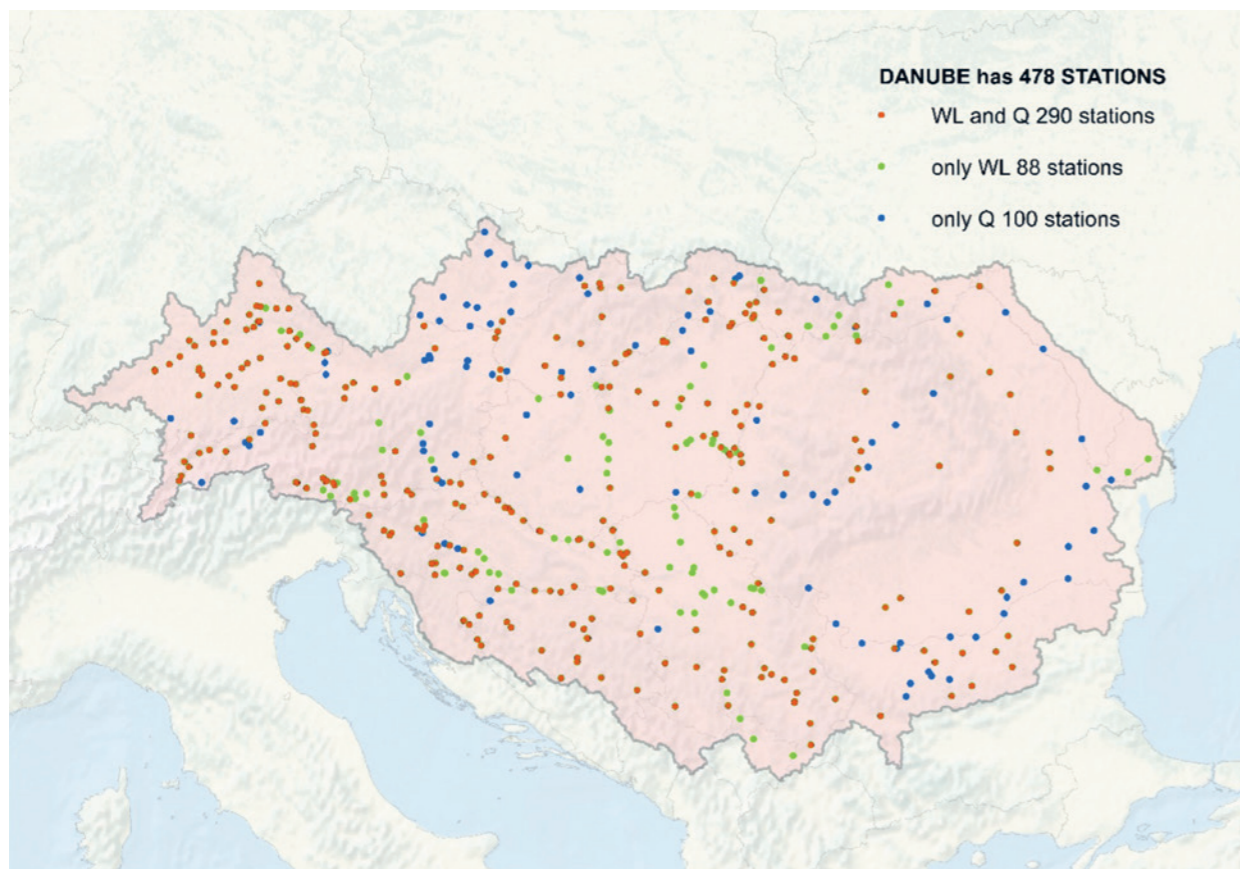
#floodplains #biodiversity



DAREFFORT

#forecasting #floodrisk

In order to secure sound flood forecasting, transnational hydrologic data was gathered from across the region. This included an overarching assessment of the consistency, reliability, and delivery systems used by the project's network of participants to send and receive hydrological data. Standardised hydrologic and ice data services and harmonised distribution for all Danube catchment countries were provided through interface software. Thanks to this tireless work, **estimates of minimum warning lead time** required, plus **suggestions for E-learning tools** to create a more equitable flood risk forecasting knowledge across the Basin were also made.



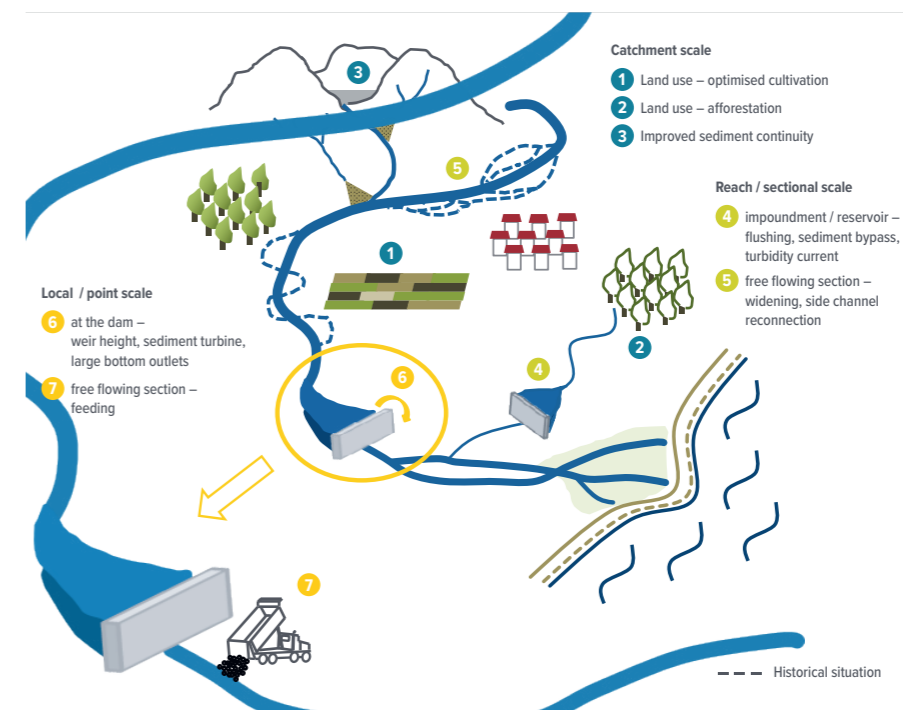
DanubeSediment

#hydropmorphology #sediment

Closing the knowledge gaps on a changed regime of sediment flowing from Black Forest to Black Sea in the Danube River, and strengthening Danube Region governance pertaining to sediment have been core objectives for the past years that were finally achieved.

The **Danube Sediment Management Guidance (DSMG)** and **Sediment Manual for Stakeholders** were produced to strategise and recommend steps to target sectors (hydropower, navigation, flood risk management, river basin management), including:

- ④ Measures to preserve and improve river morphology
- ④ The establishment of a harmonised sediment monitoring network
- ④ Beginning assessment of sediment quality (not just quantity)
- ④ A transnational and cross-sectorial roadmap for the Danube sediment





SIMONA

After Joint Danube Surveys concluded that the DRB lacked necessary infrastructure to adequately monitor contaminated sediment, a response came through structured measures.

Among the needed measures, a harmonised and coordinated method for monitoring hazardous substances in water and sediment of the Danube was created, supported by a newly-developed tool for **sediment quality monitoring**. Longer-term though, cooperation in transnational water management was encouraged and improved.

#hazardoussubstances #sediment



DriDanube

Established to increase the Danube Region's capacity to cope with drought, homogenisation of previously heterogeneous methodologies of assessing and forecasting drought impacts within the Danube River Basin was reached through the Drought User Service – branded and released to the public as **DroughtWatch.eu** – and a powerful new framework: the **Danube Drought Strategy**. By identifying common steps to be taken and strengthening forecasting abilities in the Danube River Basin, vast headway in a Basin-wide switch from a reactive to a proactive drought management approach was made.

#proactivemanagement #drought



Danube Region heritage

A leverage for prosperity

The mixture of intangible and tangible heritage makes preserving the Danube River Basin's unique shared heritage one of the broadest tasks of the Danube Transnational Programme. "**Danube Heritage**" comprises a variety of traditions, buildings, stories, cuisines, and natural areas in need of protection and valorisation. In addition to providing an opportunity to retain and invigorate disappearing heritage, history and practices in the region, the Danube Transnational Programme represented an opportunity to forge new networks and create new leverage for economic prosperity in the region.

The **REDISCOVER** and **Amazon of Europe Bike Trail** projects reconnected disparate sections of the Danube Region in radically different ways, the former strengthening fading remnants of tangible and intangible Jewish heritage in a variety of Danube Region cities, the latter more literally combining hundreds of kilometres of bike trail into a new international flagship river trail for global tourists.

The likes of the **ECO KARST** and **LENA** projects sought rather to trailblaze new paths for the region's natural heritage valorisation towards green economy by channelling local know-how into focused projects to create new "green" jobs or to level-up the resilience of karst regions to man-made effects.

Cultural Heritage

- ☉ Formed a strategy to re-illuminate a faded Jewish Cultural Heritage shared throughout the region
- ☉ Exploited new methods to map out and explore the Danube's Iron Age heritage
- ☉ Built a network of key stakeholders sharing an interest boosting DRB tourism

Natural Heritage

- ☉ Completed vital groundwork for the Amazon of Europe Bike Trail feeding sustainable tourism
- ☉ Shared vital knowledge between experts to the benefit of seven valuable karst regions
- ☉ Elaborated upon a future-facing plan to create new "green jobs"





DANUrB

Small communities along the Danube have been connected through a spatio-cultural network – a “**Danube Cultural Promenade**” – and unified their long-shared heritage and space into one single tourism destination brand - DANUrB. Thematic routes have been created thus paving the way for attracting of more tourists to the breathtaking and beautiful Danube Region.

The region’s cultural heritage has been branded under the DANUrB name, under the auspices of which a Good Practices, a Valorisation Toolkit, an entire book on unexplored Danube Cultural Heritage, plus an online platform at www.danurb.eu networking Danube Cultural Heritage Sites and Stakeholders have been created.

#culturalheritage #UNESCO

Iron-Age-Danube

Modern technology has evolved archaeology beyond the confines of old methods, enabling us to see our archaeological heritage in more complex ways, and over larger areas. The need to think outside the usual “archaeological” box forged new strategies to **monumentalise early Iron Age landscapes** in the Danube River Basin. This has been achieved through strategic planning for the future of archaeological heritage sites, new field research in selected micro-regions, the development of a tourism-oriented phone app and the creation of new tourist routes with boards.

#IronAge #CulturalHeritage



ECO KARST

#karst #sustainability

The **natural heritage of seven protected areas as an economic development factor**, was a starting point for supporting developments in sustainable management as well as raising awareness to the vulnerability of karst ecosystems. The **Common Strategy for Protection and Sustainable Use of Ecosystem Services in Karst Eco-Regions** was created, providing guidance for the protection and upgrading of **ecosystem services** (ES) in karst regions inside and outside of protected areas, for starting new local pro-biodiversity business (PBB) models, and fostering new networks between key actors.



LENA

A carefully selected 11 protected areas covering more than 375,000 ha, each chosen for outstanding nature values and untapped potential for sustainable economic use, have been the testing area for boosting the local economy while protecting nature.

Four Guidance documents based on the experience gained in the project pilot sites were produced, focusing on: communicating the value of nature, sustainable resource use, planning/marketing ecosystem-based economic activities and securing funding for sustainable development of communities.

New opportunities for tourism and sustainable transportation were created: 97 people were trained & certified as Danube Guides, and E-mobility was promoted through creating e-bikes routes, and installing charging stations for e-bikes.

#LocalKnowledge #Sustainability
#ProtectedAreas



REDISCOVER

The Danube Region is abundant in the **hidden intellectual heritage of Jewish society in smaller settlements**, and based on such treasure, knowledge and heritage, **creative attractions** have been formulated. This included integrating intangible elements of Jewish heritage usually not recognised by the mainstream community and visitors, in less visible places outside of capital and larger cities. Some of the products such as a Joint Visibility Strategy and a **Handbook for Tourism and public relations** have been created. Operating under the slogan, “**one heritage in eight countries**”, these products have been designed to help replicate the initiative in further cities of the Danube Region.

#IntegratedTourism #JewishHeritage

Amazon of Europe Bike Trail

#SustainableTourism

A tireless and visionary work established an internationally recognised and sustainable **flagship Cycling Tourism route** within the future five country **UNESCO Biosphere Reserve Mura-Drava-Danube**. The key product is an integrated bike trail over 1,000 km in length, running along both sides of the rivers Mura, Drava and Danube.

Based on Nature-oriented Visitor Guidance, existing Cycling Routes are equipped with commonly-designed infrastructure (resting areas, info points), while a sustainable tourism product is created with a Unique Brand by establishing the related Organisational and Information System and a joint Bookable Product. A transnational solution is created by these outputs to promote Sustainable Cycling Tourism, while preserving the environment.



Inland Waterway Transport (IWT)

New actions supporting the European Green Deal

One key endorsement by the Danube Transnational Programme was for projects creating a safer and more sustainable transport in the Danube Region. Besides the environmentally friendly land-borne methods such as urban mobility plans, e-bike services, journey planning apps et al, DTP projects focused also on the **Inland Waterway Transport (IWT)** that continues to be an under-exploited form of transport in the region. By comparison, Danube cargo volumes are only 10-20% of those transported on the Rhine. Furthermore, emissions by inland vessels sometimes exceed those of land transport, thus sustainable development should look into green growth, efficiency, and innovation in the sector.

The modernisation of Danube ports and the inland fleet was a priority of projects such as **DAPHNE** and **GREDEL**, creating networks and strategies to improve the longevity and sustainability of ports and vessels. This upgrading and networking of actors and technology through the region will both mitigate pollution and facilitate green job creation along the Danube River.

Achieving its goal of shifting to a greener transport in the Danube Region also means forging essential transnational frameworks and methodologies. Both **GREEN DANUBE** and **Danube Stream** worked with a wide range of key actors in various countries to envisage this new future for Danube IWT.

Achievements



GREEN DANUBE

#ReducingEmissions #GreeningStrategies

One of the main challenges faced in developing a sustainable Danube-borne Inland Waterway Transport is not exceeding emissions limits. A contribution to this comes from the elaboration of a transnational policy agenda and strategy for greening Danube IWT through three-level approach:



1. Institutional capacity building along the Danube

- Initiating active involvement in pollutant emission reduction
- Measurements of Danube emissions** and air quality by scientific teams



2. Organisational capacity building and cooperation

- Investigation of existing green technologies & practices
- Analysis of engine types, vessel longevity, fuel consumption and gas emissions
- Provision of tailor-made innovative solutions and creation of a **vessel greening technologies** database



3. Individual capacity building

- Establishment and pilot testing of **Environment Information Centres**
- Increasing intensity of trans-Danubian cooperation
- Ensuring long-term transnational cooperation.



Danube STREAM

#InlandNavigation #WaterwayManagement

While developing effective waterway infrastructure management, an efficient and environmentally friendly Danube transportation network was established and maintained. This meant consolidating common standards and tools, creating user-oriented information services to enable rapid information transfer, plus cooperating with all stakeholders in ecology and navigation. The main tools that are available for waterway practitioners are the updated FIS – Portal for the Danube (danubeportal.com) and a practical manual on environmentally sound Danube waterway management, aiming to achieve Good navigation and ecological status, favourable conservation status, and maintenance of wetlands.

Update of FIS – Portal for the Danube (danubeportal.com)

Available in several Danube languages, this portal comprises:

- ⦿ Current info on water levels, ice situation, shallow sections
- ⦿ Danube traffic updates
- ⦿ Information on infrastructure and important contact data
- ⦿ Up-to-date inland navigational charts

Sustainable Waterway Management

Practical manual on environmentally sound Danube waterway management, aiming to achieve:

- ⦿ Good navigation status (GNS)
- ⦿ Good ecological status (GES)
- ⦿ Favourable conservation status (FCS)
- ⦿ Maintenance of wetlands

Update of D4D – Infrastructure and Inland Navigational Charts (d4d-portal.info)

Portal displaying Inland Electronic Navigational Charts of all countries along the Danube

The Common Danube Report

Information brochure for waterway administrations & the public, providing info on Danube navigation – three editions were published during Danube STREAM.

The Danube Glossary

Comprises terms related to Danube navigation, available in English and several Danube languages.



GRENDEL

#StateAid #IWT

While working to directly support Danube vessel fleet operators, the various aspects of fleet modernisation necessary to achieve various European IWT and environmental policy objectives were addressed, paving the way forward for improvements to be made to the environmental and economic performance of the Danube fleet via three key methods: Know-how transfer for Danube fleet operators, Elaboration of reference documents on inland vessels greening and Supporting development of favourable regulatory framework.

1. Know-how transfer for Danube fleet operators

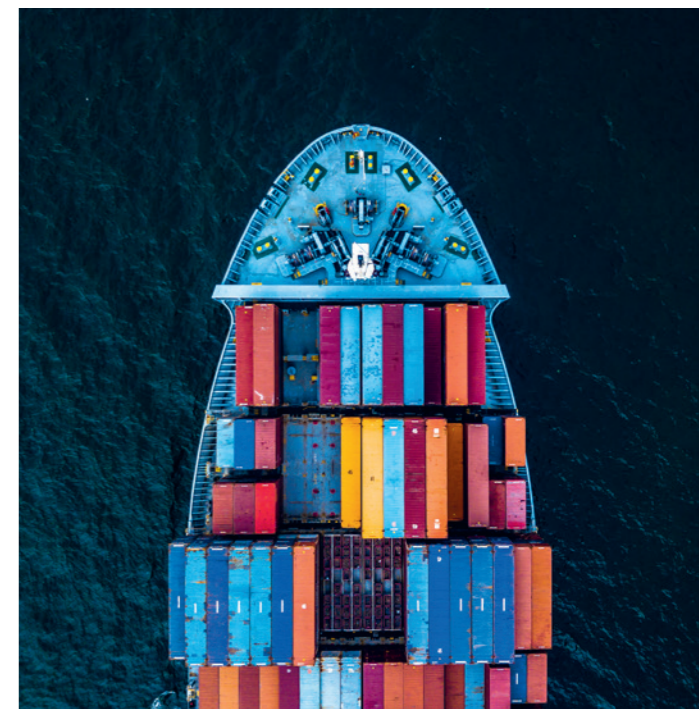
- ⦿ Exchange of information with regard to the latest greening technologies
- ⦿ Guidelines for transport and logistics management
- ⦿ Information on financing opportunities

2. Elaboration of reference documents on inland vessels greening

- ⦿ Technological factsheets to improve the environmental performance of inland vessels
- ⦿ Innovative and greening inland vessel concepts
- ⦿ IWT fleet modernisation recommendations

3. Supporting development of favourable regulatory framework

- ⦿ Model State Aid Scheme
- ⦿ IWT fleet modernisation strategy





DAPhNE

#GreeningPolicy #TransnationalPolicy

The balanced development of Danube Ports was facilitated by turning them into eco-friendly and multi-accessible hubs for a future, green economy. With a long-term view to making Danube ports catalysts for economic growth and job creation, permanent public-private sector cooperation was established. An overarching **green port policy** was created through:

The Danube Port Development Strategy & Network

- ⦿ Diagnosed “flaws and virtues” of the Danube port industry
- ⦿ Eight-year strategy (2020-2027) with objectives made at both local and basin-wide level
- ⦿ SWOT analysis of 21 Danube ports

Model architecture for Port Community System (PCS)

- ⦿ Manages, optimises and automates port processes
- ⦿ Connects transport and logistics chains
- ⦿ Prioritises security of data

Green Port Policy Guidelines

- ⦿ Elaborated via collaboration with Danube port authorities
- ⦿ Set goal to define standard measurements for environmental performance
- ⦿ Highlighted importance of funding, education, and training

Tackling Brain Drain in the Danube Region

Employing innovative multi-level governance for more labour-market oriented educational systems

The fragmented nature of the Danube Region, comprising a broad range of national capabilities and capacities between 14 states both within and outside the EU, has presented a barrier to addressing major social challenges. Social mobility, brain drain, unequal opportunity, and a lack of entrepreneurship in the cultures of the Danube pose key hurdles the Danube Transnational Programme helped to overcome. Addressing these governmental bottlenecks meant addressing demographic changes, lagging educational systems, and working towards the inclusion of marginalised groups. The DTP undertook several targeted projects to directly tackle and mitigate the negative effects of these processes in a more strategic way.

One of the key factors driving youth migration and stagnating the growth of an entrepreneurial culture is a gap in Danubian **Vocational Education and Training (VET)**. Such VET systems have a strongly positive impact on local economies and societies (e.g. easing transition from education to work, boosting youth employment, reducing labour market disparity), thus they formed the core of the **Learning by Doing** and **EDU-LAB** projects.

Such developments to help labour mobility and respond to rapid economic changes both during and after education are regarded as very useful to tooling up Danube Region youth and connecting them directly to workplaces via apprenticeships and other work-based learning schemes. Other projects, such as **InnoSchool**, sought to implement change earlier in the educational process, building new systems to educate with a focus on social innovation and instilling a culture of entrepreneurship at a younger age.





EDU-LAB

The **Danubian Charter for young talents** is a core result of joint efforts to provide young people with new chances in education and employment prospects. The charter committed participants to a new governance model, connecting education to employment while upholding sustainability goals. The **New Danubian Governance Model** outlined propositions to confront the pull factors that see so many young people opt to leave the Danube Region for Western Europe, focusing largely on ensuring regional educational gaps in knowledge and competencies get addressed.

Much of the emphasis was placed on involving the private sector more strongly into a **triple-helix cooperation** with higher education and policymakers, to create a practice-based learning environment conducive to creating not only well-educated young people but in creating economic opportunities for them within the region.

#Education #ChangingBrainDrain

Learning by Doing

The transnational tools forging vital connections to improve **Vocational Education and Training (VET)** have been jointly developed. Establishing new opportunities for Work-based Learning (WBL) is seen as a key way to prepare today's young people for the modern workplace. A variety of learning interactions for exchanging experiences have been realised as well as best practices, while establishing its Danube Work Based Learning Observatory Network and publishing A Guidebook for More Efficient WorkBased Learning in the Danube Region, paving the way forward for WBL in the Danube Region.

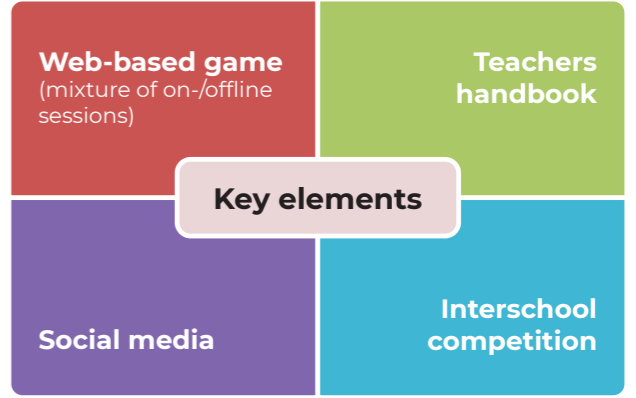
#Education #WorkBasedLearning

InnoSchool

#EducationInnovation #Entrepreneurship

In order to strengthen social innovation and the entrepreneurial spirit of secondary school students in the Danube Region, a highly innovative Learning System has been developed. The **InnoSchool Learning System (ILS)** was developed with the input of policy bodies, secondary schools, social service organisations and regional businesses alike, and it was piloted in 90 schools across nine Danube countries.

The core of ILS lies in two main innovations: such as the introduction of **Serious Game** for online simulations, a platform used in conjunction with teacher sessions and experiential learning, and **Social media and interschool competition** to boost its appeal to students.





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