Integrated transnational policies
and practical solutions for an environmentally-friendly
Inland Water Transport system in the Danube region

Output 4.1

IWT vessels regime and green technologies database

Version1.0 final

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Executive Summary

GREEN DANUBE consortium addresses the major challenge of strengthening environmentally friendly, safe and balanced inland water transport systems in Danube area. The project aims, among other, to promote Innovative Technologies and Operational Measures toward low carbon IWT shipping, that is the main focus of WP4 "Greening Technologies"

The current report presents main achievements on developing and establishing a database on IWT vessels regime and green technologies, integrating the inventories produced under activities 4.1, 4.2 and 4.3 of WP4. Description of its structure, contents, terms of use of the data base, as well as conclusions and recommendations are presented, for further improvement of the structure and contents of the database, as well as upload of essential information to be used during and after the project.

The database has been established with the aim to provide a knowledge base to Strategy development (within Activity 4.4 of WP4). This database is intended to serve as:

- a basic information tool for project partners, to consult, advise, and promote IWT greening technologies, operational measures, and best practices for air-emission reduction;
- an essential tool for national public authorities, international interest group organizations, and policy decision makers involved in Danube environment protection.

The database integrates sources of data and information that were used to carry out activities 4.1, 4.2 and 4.3. Main results achieved within these activities include:

- A Survey on characteristics and operating regimes of IWT vessels passing monitored critical areas was carried out within Activity 4.1, and a Technical report on inventory results including information on all vessel types was elaborated (presented in Green Danube report D.4.1.1)
- An Inventory and analysis of Existing Innovative Technologies and Best Practices aiming at emissions reduction of the inland waterways sector was carried out within Activity 4.2, and a Technical report was elaborated where:
  - A List of 22 innovative greening technologies and operational measure was suggested for sharing/transfer in Danube area (presented in Green Danube report D.4.2.1 section 3.2, and Annex 1)
  - A List of 10 Best Practices was suggested for sharing/transfer in Danube area (presented in Green Danube report D.4.2.1 section 5.3, and Annex 2).
- An inventory of the existing facilities (and future options) for supply of alternative fuels along the Danube including also information on other conditions affecting "greening of the fleets", was carried out within Activity 4.3, and a Technical report on Inventory of existing facilities and future option for supply of alternative fuels along the Danube was elaborated (presented in Green Danube report D.4.3.1)

The information and data that were used to complete activities 4.1, 4.2 and 4.3, and that were consequently incorporated in the database include:

- Documents and information (Reports, Photos, Videos, data files) that have been developed exclusively within Green Danube project
- Copies of, and/or links to, open public documents (such as EU Directives, EU Communications, International Conventions, Regulations, Standards, etc.), relevant to the Inland Water Transport, and Environmental protection.
- Copies of, and/or links to, open access reference documents (such as scientific publications, reports of EU funded projects, media articles, maps, photos, etc.)
- Statistical data published for open access by official sources (such as Danube Commission, EuroStat, International Commission of Protection of Danube river and other)
- Real-time data analysis for ship traffic and vessel regime, from River Information System (RIS), for Lower Danube, Bulgarian-Romanian part;
- Air-data measurements during field campaigns organized within GREEN DANUBE project;
- Other relevant information, including photos, video-files from field measurements, project meetings, etc.

Summarising the results of this development, it can be concluded that:

- The database on IWT vessels regime and green technologies, integrating the inventories produced under activities 4.1, 4.2 and 4.3 of WP4 has been successfully established and launched on 28 February 2018, with the aim to provide a knowledge base to Strategy development, within Activity 4.4;
- Contents of the database include information that will be used by project partners, as well as by stakeholders (including national public authorities, international interest group organizations, sectoral agencies, and policy decision makers involved in Danube environment protection) to consult, advise, and promote IWT greening technologies, operational measures, and best practices for air-emission reduction;
- Upload of information in the database, as well as improvement of the structure, contents, links within the database, will continue through the entire period of the project, and beyond, as the database will be maintained by the developer at least 2 years after the end date of the project.

1 Introduction

One of main objectives of GREEN DANUBE project is to promote innovative technologies and operational measures toward low carbon IWT shipping in Danube area.

The Application Form, and the Work Plan of the project, suggest that:

> *"A database on IWT vessels regime and green technologies database, integrating the inventories produced under activities 4.1, 4.2 and 4.3 will be established with aim to provide a knowledge base to Strategy development. This database will be an essential tool for national public authorities, international interest groups organizations and policy decision makers involved in Danube environment protection."*

In accordance to the work plan, various activities were carried out within period March 2017 – February 2018 in order to develop and establish this database. Leading role in this development was given to BDCA, assuming that they were responsible to install the appropriate hardware part, as well as to provide the development of the related database network software in order to secure the operation and use of the database. Other partners involved in activities 4.1, 4.2 and 4.3 (CERONAV, PDM, DST and REC) were also involved in the development of the WP 4 Database, providing advice, and information to be uploaded to the data storage.

Main steps in development of this database were as follows:

- Development of the concept and basic structure of the database (March - May 2017)
- Purchase of hardware (network disk storage NAS) to provide necessary storage capacity for storing of relevant information (June 2017)
- Contracting a software provider do develop all necessary software (June 2017)
- Discussion on structure, contents, terms of use of database (November 2017, during the 3rd Partner's meeting in Varna, Bulgaria).
- Completion of the software, instalment of the hardware and software in the premises of BDCA, activity 4.2 leader, and WP 4 leader (December 2017- January 2018)
- Upload of main information used/developed within activity 4.1, 4.2 and 4.3, and preparation for further upload of any data and information relevant to the subject (February 2018)

The Greeen Danube WP4 Database was launched on 28 February 2018, and is available by the following links:

1) http://gddb.bdcabg.org
2) ftp://62.176.95.130:16021

At the time of launching, the Database integrates sources of data and information that were used to carry out activities 4.1, 4.2 and 4.3, and this way it will provide a knowledge base to Strategy development planned within the Activity 4.4 of WP4.

2 STRUCTURE OF THE DATABASE

2.1. Type/Format of data stored in the base

The following typical type of data/information shall be uploaded in the database:

- Documents (formats: .DOC; .DOCX; .PDF; .TXT)
- Spreadsheets formats: (.XLS; .XLSX; .CSV)
- Field measurements Data, incl. from RIS-systems, GPS systems, Air-Emission Monitor stations and more, in various scatter data, formats: ASCII/TXT, NMEA, .GRD; .XYZ)
- Raster files (formats: .JPG; .PNG; .BMP; .GIF)
- Archived files (Formats: . RAR; .ZIP)

Upload of other formats is possible, as long as it can be accepted that they can be of use by both partners and external users.

2.2. Database Structure

Database has been developed to store data in 4 main sections – directories, as follows:

Directory 1: IWT – Vessel Data (Statistics on Inland Waterway Transport IWT on the Danube River, *Green Danube Activity 4.1*)

Sub-directories:

A. Green Danube Reports (Outputs and Deliverables, Activity 4.1)

B. Reference Data

- Official Documents
- Publications
- Technical Data (official sources of statistical data)
- Other info

Directory 2: Green Tech Data (Data on Innovative Technologies and Best Practices, *Green Danube Activity 4.2*)

Sub-directories:

A. Green Danube Reports (Outputs and Deliverables, Activity 4.2)

B. Reference Data

- Official Documents

- Publications
- Technical Data (from RIS - River Information System)
- Other info

Directory 3: Alternative Fuel Data(Data on Inventory of Existing and Designing Capacities for Alternative Fuel on the Danube River, *Green Danube Activity 4.3*)

Sub-directories:

A. Green Danube Reports (Outputs and Deliverables, Activity 4.3)

B. Reference Data

- Official Documents
- Publications
- Technical Data (forthcoming and existing LNG infrastructure)
- Other info

Directory 4: Air data measurements (Information from field measurements campaign, *Green Danube Activity 3.2*)

Sub-directories:

A. Green Danube Reports (Outputs and Deliverables, Activity 3.2)

B. Reference Data

- Official Documents
- Publications
- Technical Data (forthcoming and existing LNG infrastructure)
- Other info

An illustration of structure of the database is shown on Figure 2.1

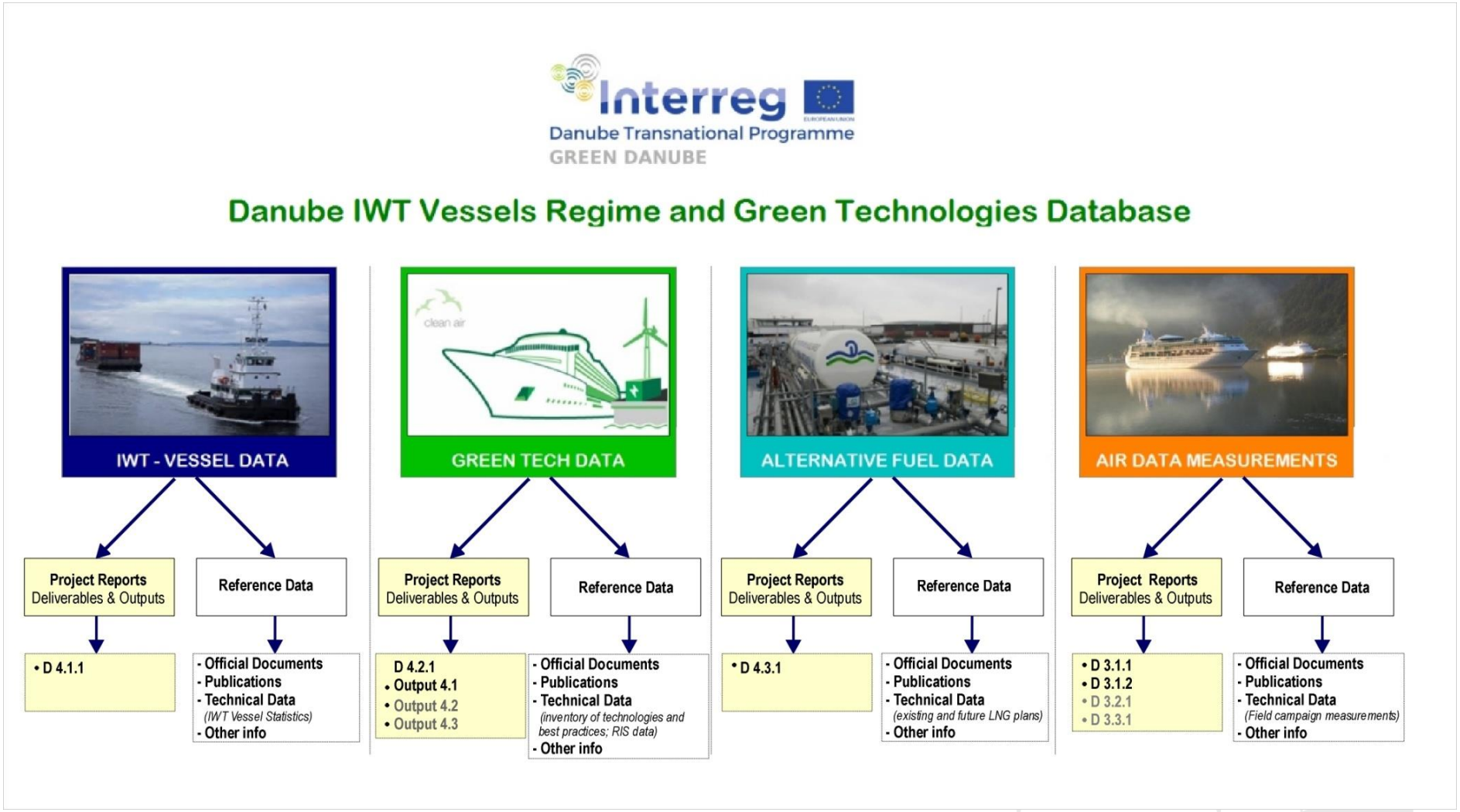

Figure 2.1: Structure of the Green Danube WP4 Database

2.3 Operational Requirements

Storage of data

Data storage is done in a NAS type network storage device (see Figure 3.1).

To prevent any data loss, the data are stored in two identical copies, on two independent media (network storage disks).

In addition, a mirror copy is stored on the web-server of BDCA, who provides hosting of the database.

Access to data

The following access options have been provided

(1) Remote FTP access to the NAS network storage locate at BDCA, through an access password at the following levels

(2) Direct access over an internal network (LAN), used by local Green Danube staff

(3) Internet access to a mirror copy of the database -only Level 1 (Open Public)

The following levels of control are available:

i. Full Rights (Administrator)

ii. Read, write, and delete files (Authorised partner's staff)

iii. Read & Download (Everyone, after registering)

Illustration of home screen with Sign-up / Log-in boxes is shown on Figure 2.2

Data protection

The operating software provides:

- Full compatibility with the host local network
- Reliable access protection for unauthorized users
- Full compatibility with the operation system (Windows 10) and relevant antivirus tools

Figure 2.2: Database home screen with Sign-up / Log-in info

3 Hardware and software

3.1 Hardware specifications

All data is stored on a network storage device of the type NAS - Network-Attached Storage. NAS is a file-level computer data storage server connected to a computer network providing data access to a heterogeneous group of clients. NAS is specialized for serving files either by its hardware, software, or configuration. It is often manufactured as a computer appliance – a purpose-built specialized computer.

NAS systems are networked appliances which contain one or more storage drives, often arranged into logical, redundant storage containers or RAID. In this case, the NAS contains 2 disks of 20000 GB each (all together 4000 GB).

Network-attached storage removes the responsibility of file serving from other servers on the network. They typically provide access to files using network file sharing protocols such as NFS, SMB/CIFS, or AFP.

Recently NAS devices began gaining popularity as a convenient method of sharing files among multiple computers. Potential benefits of dedicated network-attached storage, compared to general-purpose servers also serving files, include faster data access, easier administration, and simple configuration.

The NAS storage used to host Green Danube WP4 database on Greening Technologies is shown **here below on Figure 3.1**

Figure 3.1: NAS Network Storage (2 x 2000 GB)

3.2 Software environment

A specialised software system has been configurated to serve the specific purposes of Green Danube Innovative Technologies Database. The software system integrates basic (manufacturer's) software of NAS storage device + custom specialised software according to user's requirements + standard windows network applications.

Customised software has been developed and installed by an external service software provider, selected by activity leader BDCA, following a single tender procedure in accordance to the Bulgarian Low.

Operating system

Database software has been developed on WINDOWS operation system (compatible with WINDOWS environments, versions 7, 8.1, and 10).

Main features

- Provide secure storage of data
- Shape an appropriate log-on procedure for first time registration, to be followed by easy and reliable access to the information
- Provide easy access (read/download) data
- Provide first level options for edit/modify data (for authorized user only, from the project partner's staff)

Sign-up and Log-on menu is illustrated on Figure 2.2.

Some of the features of the developed software are illustrated here below on Figure 3.2 (management of the database), and Figure 3.3 (some additional features – data file converter).

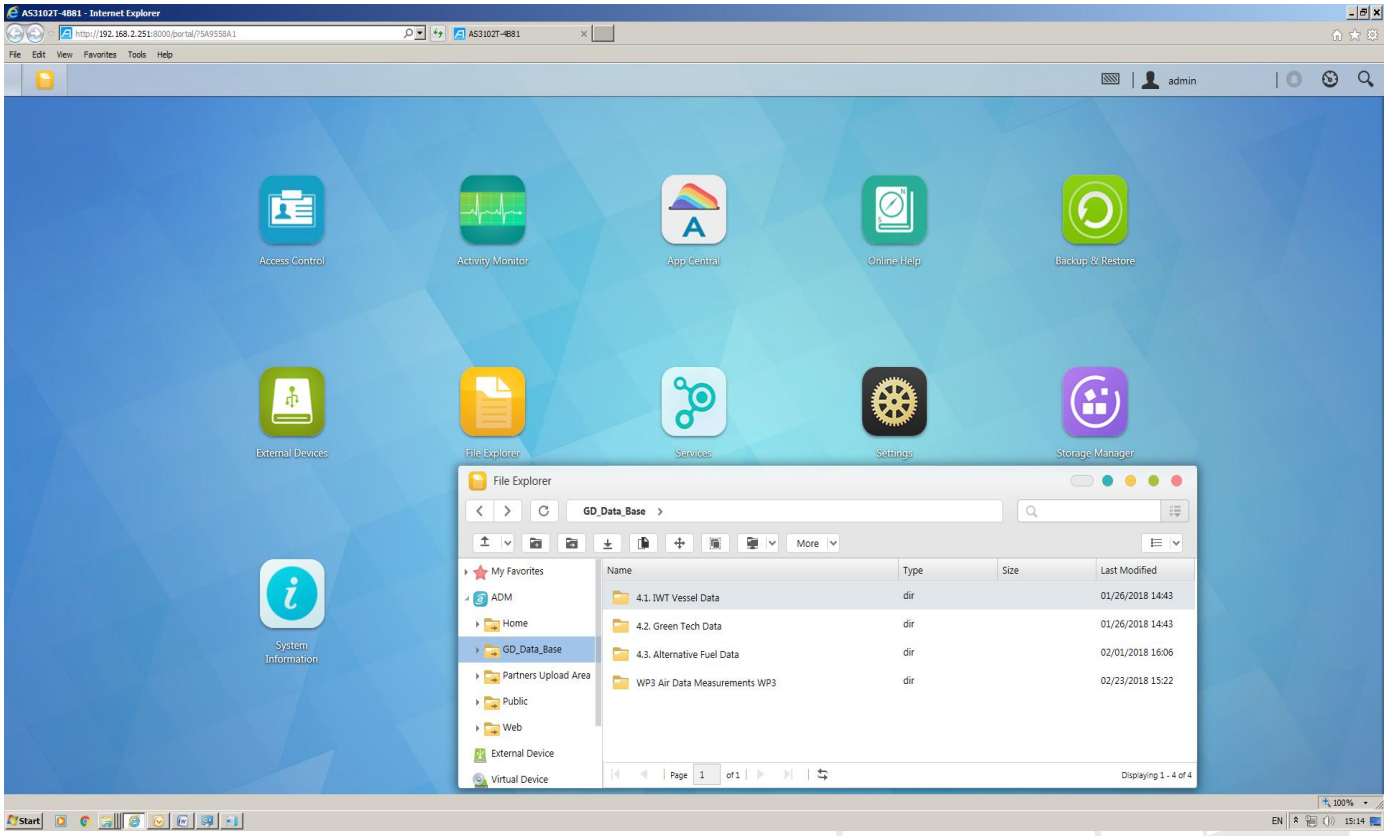

Figure 3.2: Management of the database by the Administrator

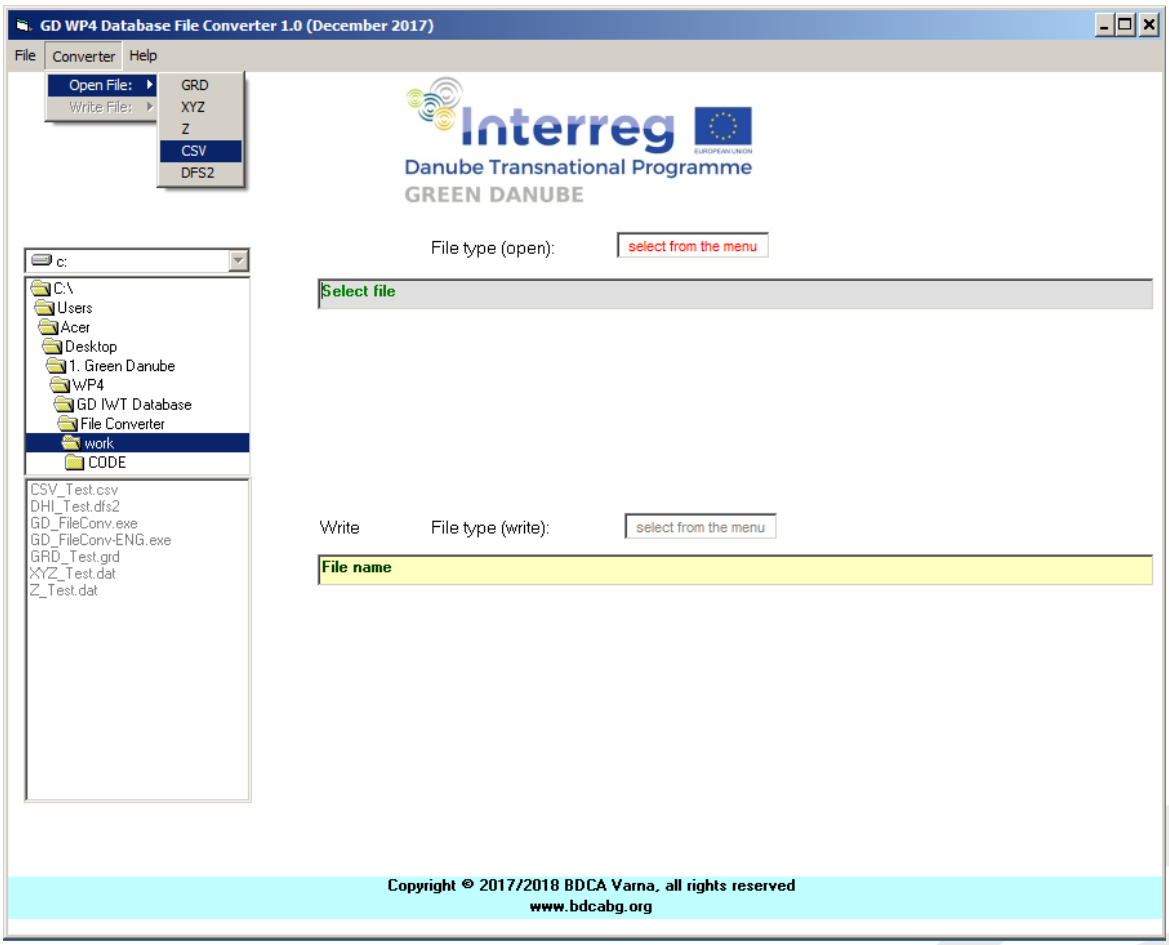

Figure 3.3: Data format file converter

Here below some example data stored in the database are illustrated as follows:

- Extract of Danube fleet statistics published by Danube Commission
- Real time data on ship traffic and vessel regime by River Information System (RIS)
- Processed data on ship traffic (Lower Danube)
- Example airdata measurements results of GD field campaign, October 2017

3. DATA ON DANUBE FLEET BY COUNTRIES AND BY YEARS OF CONSTRUCTION
(as of 31 December 2015)

Country	Fleet	Year of construction										Overall power of motorized vessels	TOTAL
		Before 1941	1941-1960	1961-1970	1971-1980	1981-1990	1991-2000	2001-2010	After 2010	Unknown	TOTAL*		
UA	Number of vessels (unit)	0	0	70	26	171	84	21	0	0	372		372
	Power (kW)	0	0	52 428	32 921	13 026	0	0	0	0	98 375	48 864	147 239
	Carrying capacity (t)	0	0	52 674	18 836	193 644	164 454	43 753	0	0	473 361		473 361
MD (2008)	Number of vessels (unit)	0	5	27	6	14	2	0	0	0	54		54
	Power (kW)	0	1 170	4 037	440	3 336	1 488				10 471	3 000	13 471
	Carrying capacity (t)	0	3 203	20 776	4 131	14 824	0	0	0	0	42 934		42 934
RO	Number of vessels (unit)	29	129	190	365	691	142	28	..	0	1 574		1 574
	Power (kW)	0	9 649	15 083	32 998	95 928	35 918	2 671	..	0	192 247	76 720	268 967
	Carrying capacity (t)	29 747	62 360	94 499	370 131	819 430	225 028	6 781	..	0	1 607 976		1 607 976
BG	Number of vessels (unit)	16	20	55	43	93	29	9	0	0	265		265
	Power (kW)	0	739	12 304	12 986	13 358	7 511	0	0	0	46 898	40 956	87 854
	Carrying capacity (t)	20 707	18 001	35 795	50 306	131 885	37 007	14 290	0	0	307 991		307 991
RS	Number of vessels (unit)	24	94	257	177	98	13	1	0	0	664		664
	Power (kW)	1 936	7 458	33 960	25 476	9 145	1 945	236			80 156	37 929	118 085
	Carrying capacity (t)	10 023	50 210	203 663	166 108	111 354	9 810	0	0	0	551 168		551 168
HR	Number of vessels (unit)	5	33	66	45	14	3	2	0	2	170		170
	Power (kW)	2 514	6 082	9 538	4 650	3 072	441		0	129	26 426		26 426
	Carrying capacity (t)	5 895	17 111	39 892	27 990	10 286	501	926	0	658	103 259		103 259

Figure 3.4 Example data available in the database: Extract of Danube fleet statistics published by Danube Commission

TABLE 1.1 Variation range of pollutants concentrations (min - max) in the **SULINA Channel Mm 8, Danube Delta, ROMANIA** (GPS_N 45 10 25.2/E 029 29 11.8)

Date: 12-13.10.2017

	NO (ppb)			NO_2 (ppb)			NO_x (ppb)			SO_2 (ppb)			CO (ppm)			PM 2.5 (µg/m^3)			PM 10 (µg/m^3)		
Time	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean
00^{00}-01^{00}	0.000	0.767	0.132	0.980	1.942	1.217	0.992	2.708	1.337	0.013	0.087	0.053	0.142	0.152	0.146	11.740	12.590	12.028	13.590	15.790	14.784
01^{00}-02^{00}	0.000	0.142	0.052	1.373	1.847	1.603	1.355	1.667	1.539	0.012	0.098	0.053	0.145	0.148	0.147	12.780	15.610	14.341	15.360	20.380	17.823
02^{00}-03^{00}	0.022	0.185	0.092	1.465	1.767	1.628	1.568	1.857	1.686	0.002	0.097	0.041	0.147	0.151	0.149	15.830	16.430	16.143	19.580	22.050	20.784
03^{00}-04^{00}	0.000	0.087	0.039	1.542	1.960	1.685	1.327	1.845	1.628	0.007	0.093	0.051	0.149	0.154	0.151	16.260	16.950	16.504	19.460	22.810	21.097
04^{00}-05^{00}	0.005	0.232	0.091	1.367	1.677	1.506	1.388	1.782	1.581	0.000	0.098	0.035	0.147	0.154	0.150	15.430	16.950	16.261	20.390	22.610	21.500
05^{00}-06^{00}	0.012	1.418	0.231	1.208	1.507	1.346	1.068	2.877	1.521	0.008	0.093	0.056	0.131	0.414	0.169	13.970	15.200	14.523	17.290	19.150	18.299
06^{00}-07^{00}	0.032	5.612	1.111	1.025	3.222	1.597	0.860	8.833	2.667	0.013	0.093	0.050	0.146	1.458	0.432	12.050	15.530	12.821	15.310	20.220	16.330
07^{00}-08^{00}	0.008	17.920	5.259	1.157	5.342	2.900	1.148	23.260	8.158	0.000	0.095	0.048	0.168	1.819	0.741	12.720	17.730	14.721	15.200	21.930	18.414
08^{00}-09^{00}	0.117	7.533	3.192	1.058	5.248	2.624	1.340	12.780	5.816	0.010	0.098	0.052	0.151	2.495	0.993	11.180	16.630	13.709	14.140	19.530	16.488
09^{00}-10^{00}	0.365	8.915	3.763	3.020	8.878	5.391	3.500	17.370	9.154	0.013	0.077	0.039	0.226	2.220	1.089	13.260	25.120	18.883	15.970	29.290	22.083
10^{00}-11^{00}	2.362	13.670	5.043	3.662	11.090	5.946	6.023	24.750	10.988	0.000	7.405	0.683	0.587	1.720	1.230	13.750	28.950	19.098	16.700	35.300	23.715
11^{00}-12^{00}	1.990	21.190	7.100	3.975	17.620	7.982	6.257	35.920	15.082	0.128	7.712	1.317	0.656	1.520	1.311	9.684	21.510	15.106	15.850	29.630	22.527
12^{00}-13^{00}	1.155	11.590	4.979	2.305	9.472	5.466	3.460	19.160	10.443	0.033	0.337	0.137	0.674	1.621	1.185	5.961	9.215	7.765	8.693	14.120	11.332
13^{00}-14^{00}	1.345	9.448	3.323	2.363	12.770	5.005	3.725	22.220	8.329	0.012	0.910	0.210	0.561	1.466	0.942	5.458	6.564	5.943	7.591	9.629	8.938
14^{00}-15^{00}	1.908	6.520	3.169	2.607	8.757	4.200	4.515	15.280	7.368	0.005	0.083	0.042	0.745	1.498	1.135	5.076	6.035	5.385	6.742	9.249	8.263
15^{00}-16^{00}	1.277	8.292	4.473	2.438	7.997	5.354	3.715	15.970	9.828	0.000	0.088	0.027	0.630	1.849	1.270	5.151	5.520	5.274	6.801	9.675	8.062
16^{00}-17^{00}	0.815	16.540	3.864	1.858	14.970	4.577	2.852	31.500	8.440	0.008	0.093	0.048	0.179	2.007	1.086	4.463	5.561	5.032	5.510	9.352	7.438
17^{00}-18^{00}	0.507	16.200	5.762	1.898	20.910	8.816	2.405	32.680	14.578	0.000	0.093	0.050	0.169	1.364	0.569	4.247	5.181	4.632	5.719	7.766	6.823
18^{00}-19^{00}	0.005	5.545	1.121	1.388	4.087	2.562	1.095	9.575	3.644	0.000	0.090	0.038	0.147	0.444	0.224	4.972	11.410	7.230	6.964	14.280	10.165
19^{00}-20^{00}	0.002	5.568	0.866	1.783	5.373	2.729	1.420	10.360	3.495	0.007	0.090	0.045	0.157	0.228	0.174	12.160	16.990	14.984	14.930	21.840	19.216
20^{00}-21^{00}	0.012	0.180	0.066	1.048	1.868	1.436	1.102	1.625	1.389	0.008	0.090	0.049	0.159	0.171	0.165	15.610	16.980	16.339	18.150	20.930	19.482
21^{00}-22^{00}	0.000	0.348	0.098	0.843	1.257	1.047	0.868	1.388	1.108	0.037	0.092	0.076	0.156	0.174	0.162	14.400	15.510	15.008	17.170	19.270	18.223
22^{00}-23^{00}	0.000	0.230	0.044	0.675	1.165	0.974	0.762	1.097	0.947	0.007	0.098	0.067	0.148	0.161	0.152	12.430	14.140	13.200	14.420	17.110	15.964
23^{00}-24^{00}	0.002	0.802	0.130	0.780	2.832	1.134	0.810	3.633	1.201	0.012	0.092	0.066	0.146	0.189	0.153	11.630	12.210	11.838	13.740	15.150	14.312

Figure 3.5 Example data available in the database: Airdata measurements results of GD field campaign, October 2017

24.1.2018 18:00

		Name	MMSI	км/ч	RKM	River
1		JOCHENSTEIN		12.78	783.58	Дунав
2		PASSAU		0	492	Дунав
3		GREIFENSTEIN		4.82	506.3	Дунав
4		VALMAR		6.0	477.49	Дунав
5		HEMUS		0	496.44	Дунав
6		DISCOVER+AST-1		0	830	Дунав
7		PLISKA+PLISKA1		0.19	742.74	Дунав
8		VYARA		0	497.48	Дунав
9		EVROPA		0	493.56	Дунав
10		BALKAN		6.57	489	Дунав
11		PEZHOTO		0.19	493.42	Дунав
12		RUSCHUK		0.19	494	Дунав
13		ARIES		0	494.44	Дунав
14		KORSIKA		0	490.51	Дунав
15		VICTOR		5.61	793.53	Дунав
16		SIMONE		0	493	Дунав
17		DEL-CASSIA		0	497.45	Дунав
18		ANNA+INTERNOS		7.12	793.55	Дунав
19		SVETI PAWEL		13.52	653.24	Дунав
100		SIALIRNO+SL708.		0	794.48	Дунав
101		ATLAS		18.89	385.42	Дунав
102		MAYON		0	428.57	Дунав
103		KATARA		0	794.59	Дунав
104		BG TR10 3BARGE		0	497.44	Дунав
105		DANUBE EXPLORER		0	485.7	Дунав
106		RUBIKON122+TTC14004		0	490.13	Дунав
107		RUBIKON 4		0.19	490	Дунав
108		IVANA		9.82	616.77	Дунав
109		ALEKSEY IVLEV		4.07	681.82	Дунав
110		ZLATOUST		5.56	524.57	Дунав
111		GRIGORIY MOROZOV		6.85	845	Дунав
112		BORIS MAKAROV		0	496.64	Дунав
113		GAVANA		11.67	746.53	Дунав
114		ORENBURG		0	376	Дунав
115		SVYATAYA ANNA		0.37	789.83	Дунав
116		MEDNOGORSK		18.89	657.88	Дунав
117		MON AMI		0.37	845	Дунав
118		PRAHOVO		2.04	845	Дунав
119		ROVINARI 8		0	493.55	Дунав
120		UNITANK		0	485.52	Дунав

Figure 3.6 Example data available in the database: Real time data on ship traffic (RIS), Internal use only

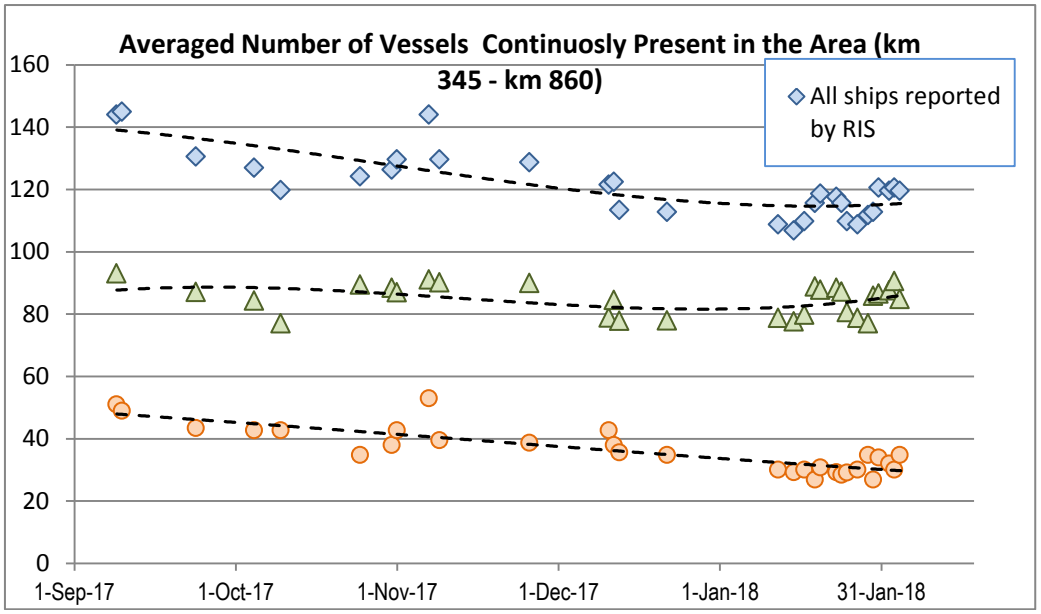

Figure 3.7 Example data available in the database:
Processed data on ship traffic (Lower Danube), September 2017 -February 2018

4 Terms of use

4.1 Access rules and conditions

This database is open to the public. To prevent malicious actions, incl. robot access to content, access to information is only available to registered users.

Green Danube shall reserve the right to suspend or terminate access to the database of any user if the user is in breach of the terms of use set herebelow, or if the user is using the database in a manner that would cause a real risk of harm or loss to database owners or other users.

4.2 GD DataBase Terms of Use

Th Green Danube WP4 Database is intended for specific information concerning innovative green technologies for reducing inland water transport air-emissions. These terms of use cover use and access to our project DataBase.

These terms outline the responsibilities of users when using our Data Base.

By using the information, they must agree to be bound by the terms set belo. If they are using information of our database for an organization, they must agree to these terms on behalf of that organization.

GD DATABASE ACCEPTABLE USE POLICY

User must agree not to misuse the GD DataBase or help anyone else to do so. User must agree not to do any of the following in connection with the DataBase :

- breach or otherwise circumvent any security or authentication measures;
- probe, scan, or test the vulnerability of any system or network;
- interfere with or disrupt any user, host, or network, for example by sending a virus, overloading, flooding, spamming, or mail-attacking any part of the DataBase ;
- access, tamper with, or use non-public areas or parts of the DataBase, or shared areas of the DataBase you haven't been given access to;
- access, search, or create accounts for the DataBase by any means other than our publicly supported interfaces (for example, "scraping" or creating accounts in bulk);
- publish, sell or share material belonging to the DataBase, unless specifically authorized to do so;

COPYRIGHT

This database is intended for specific information concerning innovative green technologies for reducing inland water transport air-emissions. The DataBase contains:

- Documents and information (Reports, Photos, Videos, data files) that have been developed exclusively within Green Danube project
- Copies of (and/or links to) open public documents (such as EU Directives, Communications, Regulations, Standards, International Conventions, etc.), relevant to the Inland Water Transport, and Environmental protection.
- Copies of (and/or links to) open access reference documents (such as scientific publications, reports of EU funded projects, media articles, maps, photos, etc.)

USER'S RESPONSIBILITIES

Users are responsible for their conduct. It must comply with our Acceptable Use Policy. Content in the DataBase may be protected by others' intellectual property rights! Please don't copy, upload, download or share content unless you have the right to do so.

Users may use the information in this DataBase only as permitted by applicable law, including export control laws and regulations.

TERMINATION

Green Danube reserve the right to suspend or terminate access to the database of any user with notice if:

- The user is in breach of these terms of use,
- The user is using the database in a manner that would cause a real risk of harm or loss to us or other users.

The above Terms of use were published at the log-on screen of the database in the internet, and are effective since the date of launching the database, February 28, 2018

5 CONCLUSIONS AND RECOMMENDATIONS

A specialise database on vessel statistics and green technologies has been developed and launched within WP 4 of the project GREEN DANUBE.

The database integrates sources of data and information that were used to carry out activities 4.1, 4.2 and 4.3.

Summarising the results of this development, it can be concluded that:

- The database on IWT vessels regime and green technologies, integrating the inventories produced under activities 4.1, 4.2 and 4.3 of WP4 has been successfully established and launched on 28 February 2018, with the aim to provide a knowledge base to Strategy development, within Activity 4.4;
- Contents of the database include information that will be used by project partners, as well as by stakeholders (including national public authorities, international interest group organizations, sectoral agencies, and policy decision makers involved in Danube environment protection) to consult, advise, and promote IWT greening technologies, operational measures, and best practices for air-emission reduction;
- Upload of information in the database, as well as improvement of the structure, contents, links within the database, will continue through the entire period of the project, and beyond, as the database will be maintained by the developer at least 2 years after the end date of the GREEN DANUBE project.