Implementing the European Action Programme
for the promotion of inland waterway transport (NAIADES 2)

Reliable data essential to ensure correct external cost calculation

PLATINA 2 reviewed the quality of datasets used to calculate emissions and external costs for inland waterway transport at EU level.

The analysis looked at what data are needed and what data are available. This allowed the researchers to identify the knowledge gaps regarding the external costs of emissions to air. Based on these conclusions, recommendations were made on how to close the main data gaps.

What are the main gaps in current external cost data?

Methodologies for data collection for external cost calculation were not compared. The focus of the study was on the quality of the data used. Lack of reliability and uncertainties have been found in the following areas:

Logistics parameters

- There are no complete and reliable datasets available at European level regarding vessel kilometres and average load factor.
- Load (on loaded trips) often depends on the available water depth. Especially in free-flowing sections of waterways this fluctuates, just as well as their bandwidth.
- There is a huge information gap regarding the share of empty sailings. The only information available is the voluntary Eurostat data table.
- Eurostat statistics contain only two categories for vessels over 1,500 tonnes. More differentiation between vessel size classes (especially for large vessels and coupled units) is required.

Energy consumption

- The specific energy consumption differs from waterway to waterway and per vessel type. At present, models are used to estimate fuel consumption.
- However there is no representative dataset available on actual fuel consumption, measured in real life.
- There is limited information on the parameters that influence fuel consumption: there is for instance only limited data about the effect of sailing speed on the fuel consumption (and emissions).

Emission parameters

- Real world emission factors NOx and PM2.5 are unknown.
- Emission factors for LNG engines are hardly known yet.
- Information on auxiliary engines is largely missing, we have only limited information on the power they provide and the use made of them.
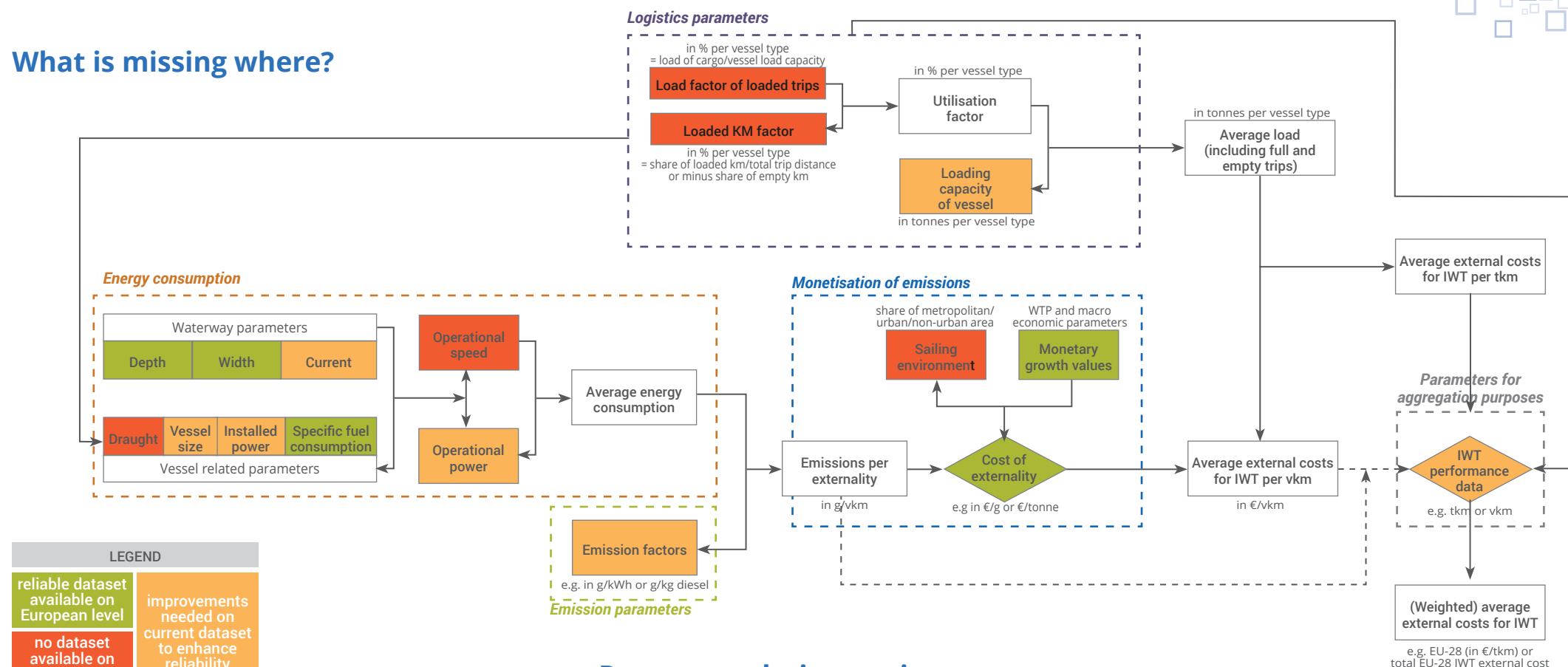
Monetisation

- There are big differences between countries and types of areas as regards the shadow prices for NOx and PM.
- More detailed information is required on the geographic breakdown of the traffic and transport performance: e.g. not only consider rural areas, vessels also pass urban areas.

Aggregation

- Significant information about inland waterway transport gets lost when translating information from a single dataset per trip (where possible) to the aggregated Eurostat statistics.

What is missing where?

Logistics parameters

in % per vessel type
= load of cargo/vessel load capacity

Load factor of loaded trips

Loaded KM factor

in % per vessel type
= share of loaded km/total trip distance
or minus share of empty km

in % per vessel type

Utilisation factor

Loading capacity of vessel

in tonnes per vessel type

in tonnes per vessel type

Average load (including full and empty trips)

Average external costs for IWT per tkm

Energy consumption

Waterway parameters

Depth | Width | Current

Draught | Vessel size | Installed power | Specific fuel consumption

Vessel related parameters

Operational speed

Operational power

Average energy consumption

Monetisation of emissions

share of metropolitan/urban/non-urban area

WTP and macro economic parameters

Sailing environment

Monetary growth values

Emissions per externality

in g/vkm

Cost of externality

e.g in €/g or €/tonne

Average external costs for IWT per vkm

in €/vkm

Parameters for aggregation purposes

IWT performance data

e.g. tkm or vkm

(Weighted) average external costs for IWT

e.g. EU-28 (in €/tkm) or total EU-28 IWT external cost

Emission factors

e.g. in g/kWh or g/kg diesel

Emission parameters

LEGEND

reliable dataset available on European level	improvements needed on current dataset to enhance reliability
no dataset available on European level	

Recommendations to improve data quality

- Data on fuel consumption must be collected and reliable models must be developed based on accurate speeds and waterway information. RIS sources can be used: AIS in combination with ECDIS, Notices to Skippers, etc.
- More reliable data are required on the average tonnage carried by inland vessels per travelled kilometre, properly taking into account the share of empty trips. It is recommended to explore options to use AIS to determine the total km sailed and the load per km, or ask Eurostat/National Statistics Institutes to provide more data.
- To address the lack of geographic detail to determine impact of NOx and PM2.5 emissions by inland waterway transport, we need to make use of GIS, Origing-Destination-flow data (e.g. ETIS+) and explore if it is possible to use AIS or TENtec.

" Data quality needs to be improved before comparing externalities for transport modes."

Talking to stakeholders

The study's findings were validated with the sector at the

- PLATINA 2 expert workshop in Brussels (Oct 2015)
- Working group meeting on Inland Waterway Statistics with National Statistics Offices in Luxembourg (Nov 2015)

Based on these exchanges, a paper was elaborated for the CESNI (European Committee for drawing up Standards in Inland Navigation) to explore how consumption and emission data could be added for a variety of engines.

Conclusions

- As current data are not reliable, there is no basis to start discussions about internalising external costs. Data quality needs to be improved first before aggregated external costs of different transport modes can be compared.
- As the legal framework regarding data collection on EU level cannot be changed on short term, we need to focus on voluntary actions by Eurostat, European Commission, national and regional authorities to close data gaps.
- The EU PROMINENT project is building on the findings of the study and is currently measuring real world fuel consumption and emissions.

PLATINA 2 is a multi-disciplinary project to implement the European Action Programme for the promotion of inland waterway transport (NAIADES 2). A consortium of 12 organisations from seven European countries including relevant stakeholder groups from the inland waterway transport sector, and in close cooperation with the European Commission, contributes to the promotion of inland waterway transport as a sustainable transport mode. It ran from autumn 2013 to spring 2016.
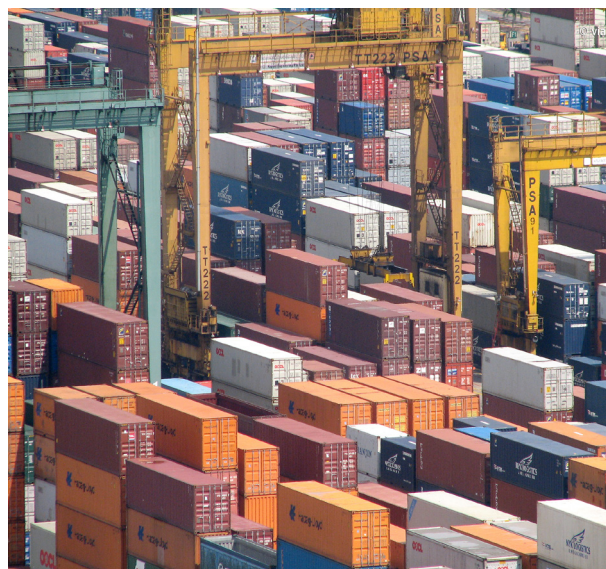
The project focused on 4 themes, for which the main conclusions were:

Markets & Awareness

□ Research on market transparency and synergistic actions allows better understanding of market structure, opportunities and bottlenecks for enhanced cooperation in inland waterway transport.

□ Promising high potential niche market segments in the Danube region revealed: high and heavy cargo, renewable energy resources & biomass and recycling material.

□ High potential for continental cargo transport over water identified in several European regions

Innovation & Fleet

□ Innovative technologies are available for greening of Inland waterways transport and is on display in the Greening Tool. Further work is needed on financing and emission rules.

□ Recommendations on how to bridge main knowledge gaps will allow better calculation of the external cost of emissions to air from Inland waterways transport

□ Most priority issues for research and innovation are tackled in EU and non-EU projects, some require further action, e.g. modernisation of small older ships.

Infrastructure

□ European inland navigation policy needs to consider differences of various waterway corridors.

□ Large datasets for monitoring waterway infrastructure development in EU are fragmented and confidential. New options to use data for policy analysis identified.

□ RIS already supports navigation and traffic management; needs to be developed for logistics operators.

□ Regular rehabilitation & maintenance are essential for competitive waterway infrastructure and benefit from exchange of experiences across waterway corridors.

Jobs & Skills

□ Technical standards for ship-handling simulators provided a basis to introduce simulators as a tool to modernise and harmonise professional qualifications in Inland waterways transport.

□ The concept for electronic service record books contributes to the creation of an equal level-playing field.

□ Learning materials for future logistics decision makers create awareness and knowledge of Inland waterways transport as a modality in the transport chain.

The partners in the project:

□ viadonau – Österreichische Wasserstraßen-Gesellschaft mbH (coordinator)
□ Voies Navigables de France
□ Bundesverband der Deutschen Binnenschiffahrt e.V.
□ Promotie Binnenvaart Vlaanderen VZW
□ Inland Navigation Europe
□ Dutch Ministry of Infrastructure and the Environment

□ PANTEIA BV
□ Entwicklungszentrum für Schiffstechnik und Transportsysteme e.V.
□ Centar za razvoj unutarnje plovidbe d.o.o.
□ STC - Group
□ Centrul Român pentru Pregătirea şi Perfecţionarea Personalului din Transporturi Navale
□ Stichting Dunamare Onderwijsgroep Haarlem

FOR MORE INFORMATION

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