platform for the implementation of NAIADES II

Review of European data sets and gap identification for external costs calculations on emissions to air by inland navigation

PLATINA SWP 2.2 Knowledge basis for innovation take-up and internalization of external cost

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Workshop Knowledge Gaps in external cost calculations for IWT
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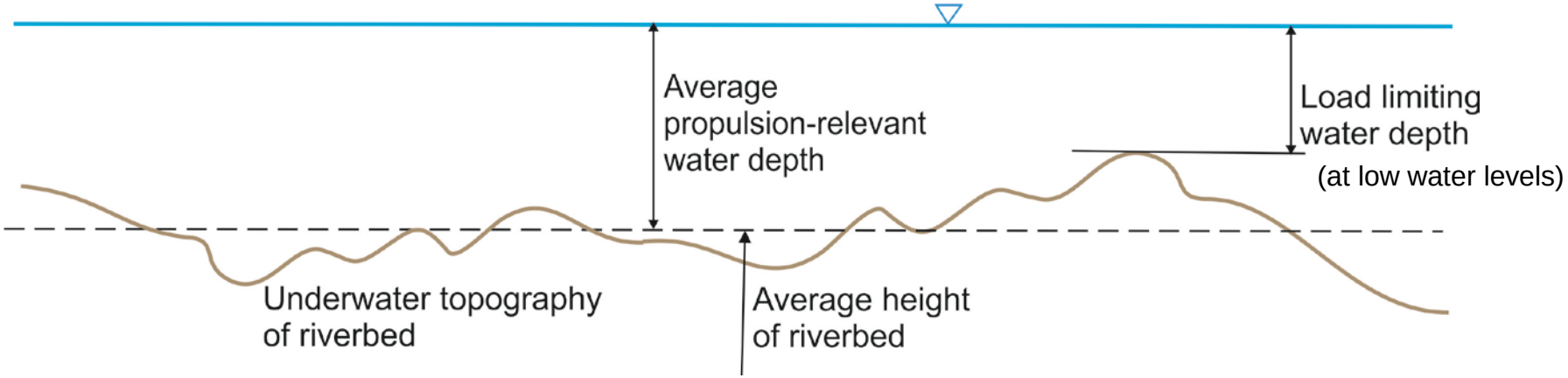
Relevant indicators

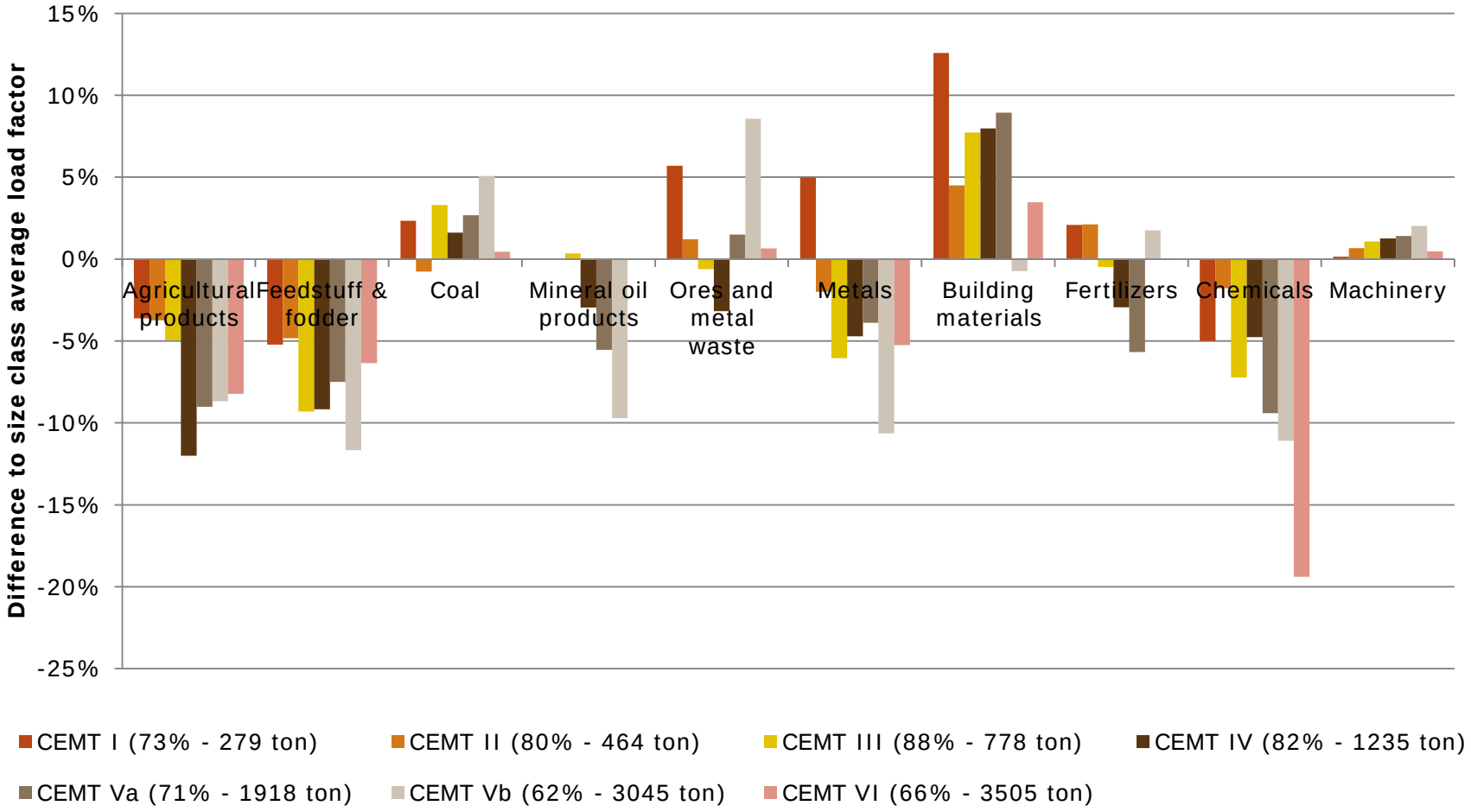
- Vessels
  - Dimensions in size classes upon dimensions (lenght, beam)
- Logistic aspects
  - Draught
  - Load factor
  - Information on empty trips

Vessel draught, influenced by … infrastructure

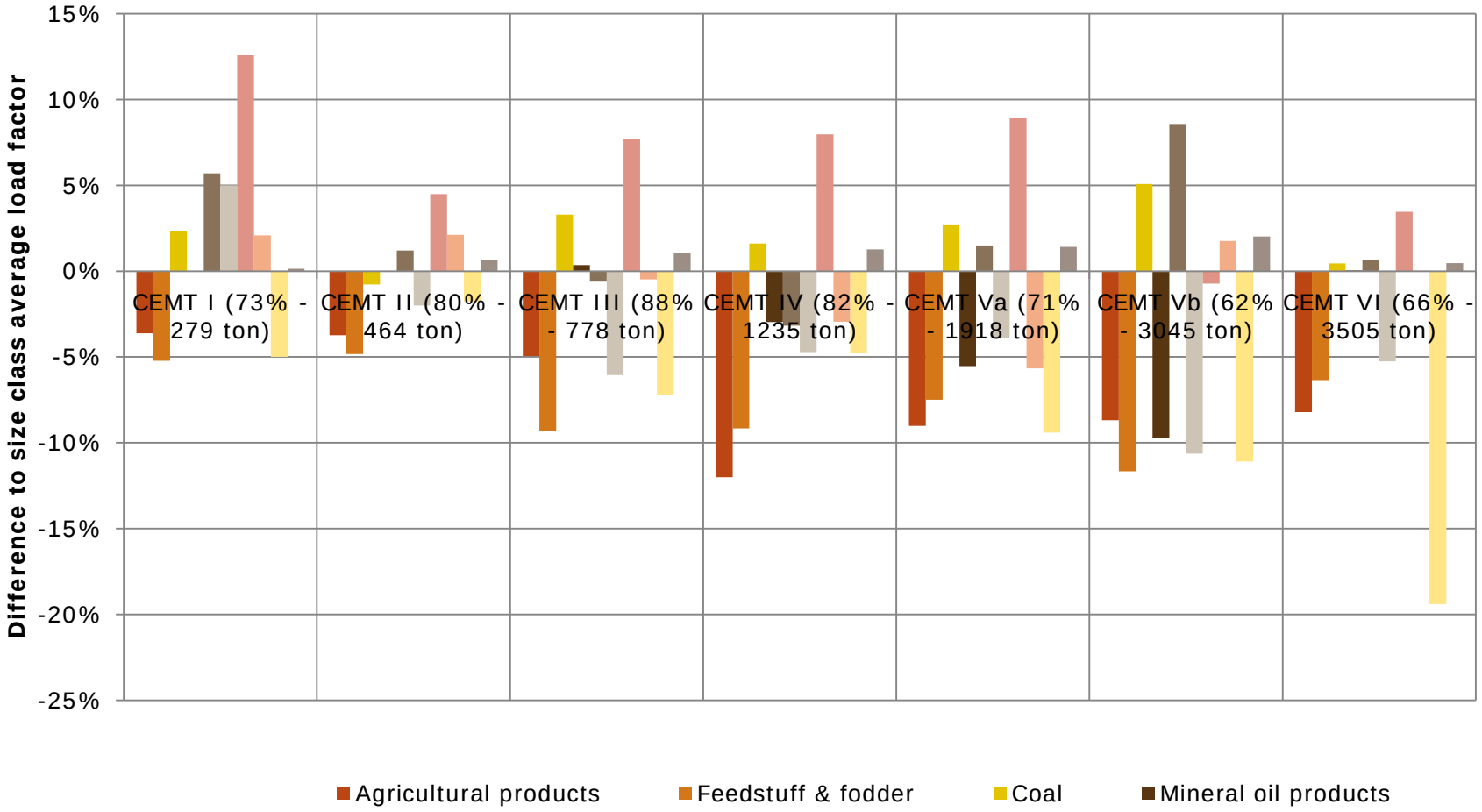


Longitudinal profile of a free flowing river (abstracted illustration)

… type of cargo



… type of cargo



Total kilometres

- Maximum draught of the vessel/convoy: deviation from the shortest route due to draught restrictions
- Dimensions of the vessel (length, width): choice of a route on which the vessel can sail given its dimensions
- Height of the vessel: choice of a route based on the bridge clearances allowed

Total kilometres

- Local Knowledge Requirements: detour to avoid additional labour costs due to Local Knowledge Requirements set by authorities
- Currents: detour to avoid currents and reduce fuel costs
- Costs: choice of route based on cost reduction

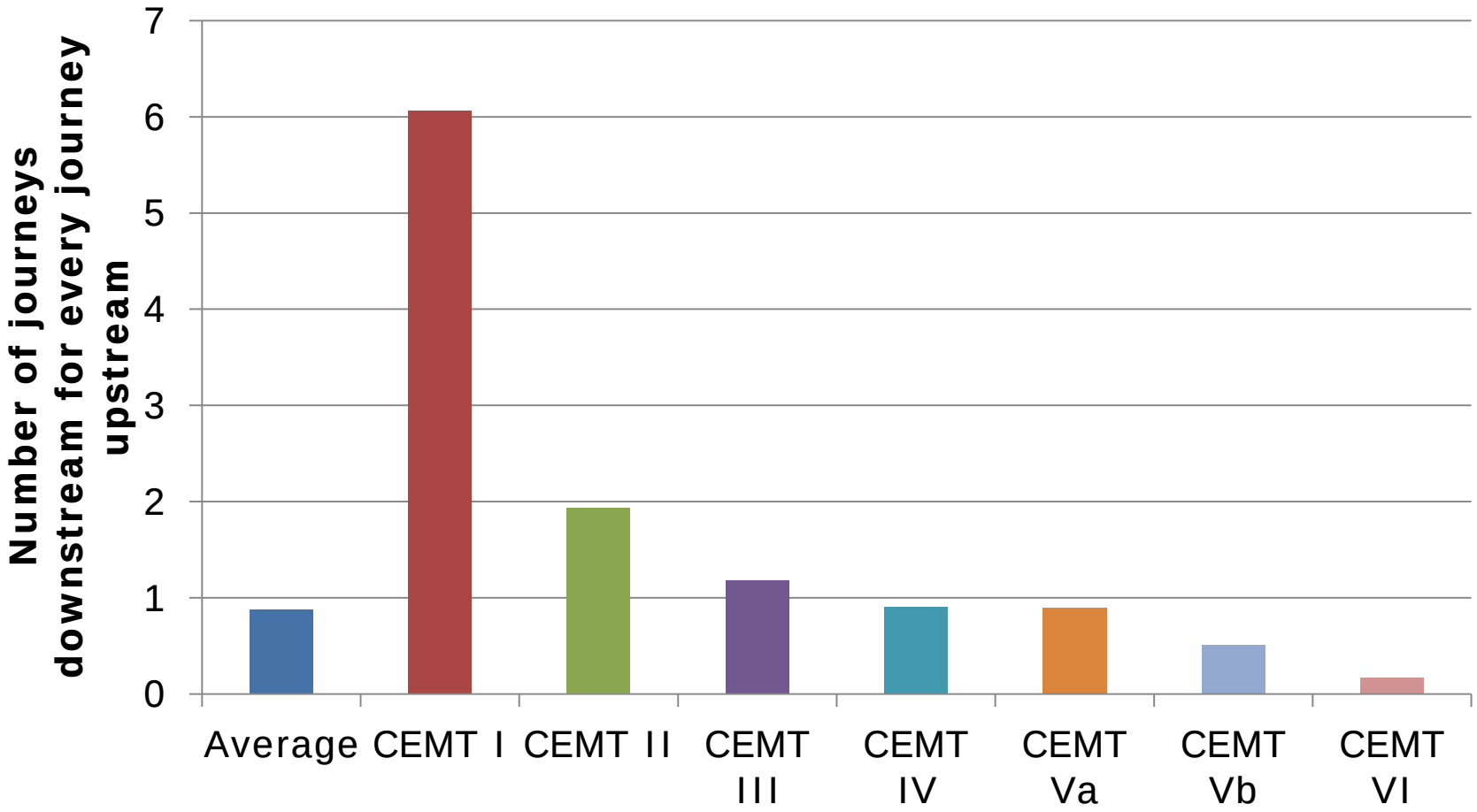
Total kilometres

- Urgency: if required by client
- Maximum speed of the vessel: to avoid delays
- (Un)availability of infrastructure / difficult nautical conditions

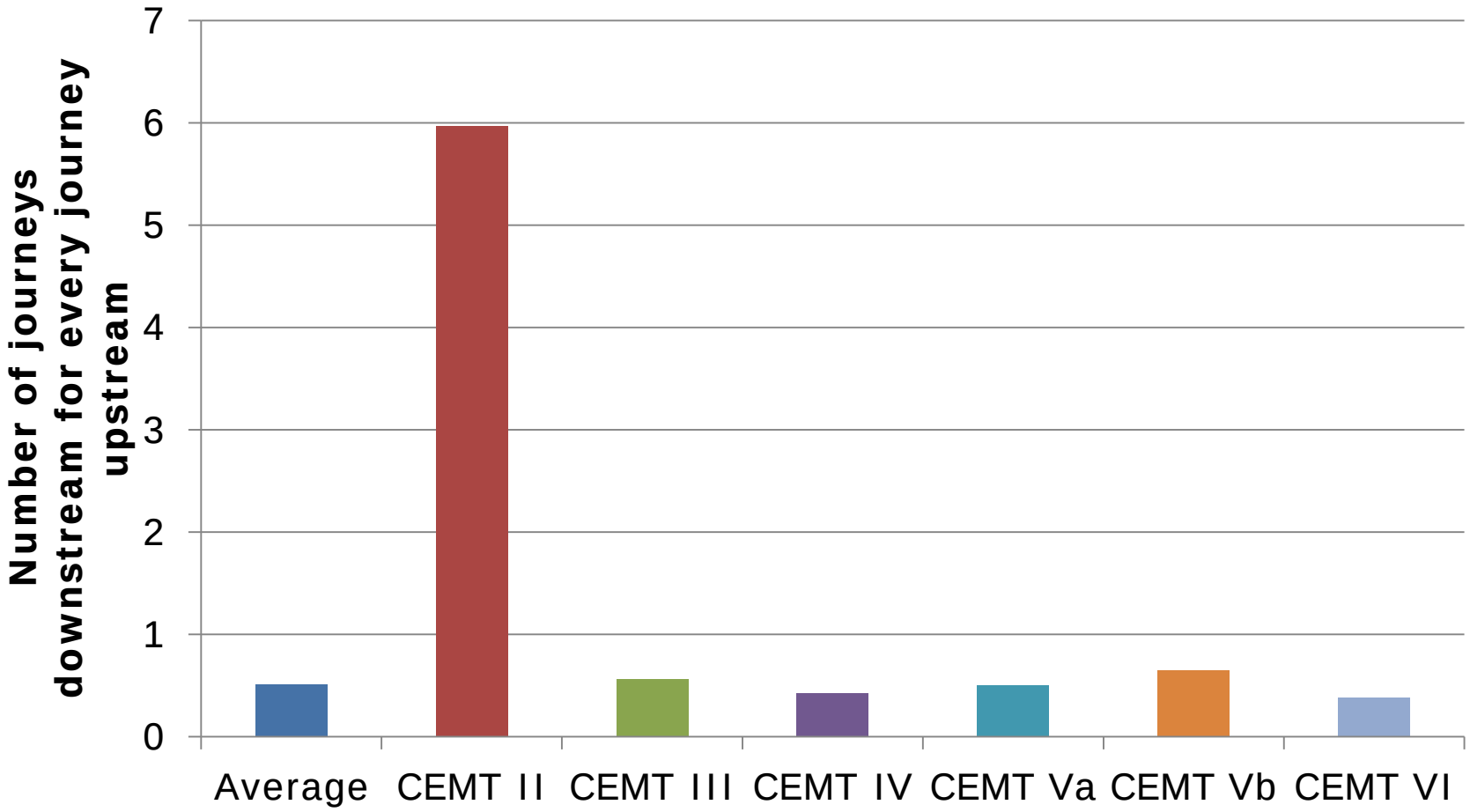
Empty kilometres

- Pricing and contracting options
- Differences between cargo segments (dry cargo / liquids / containers)
- Geographical and seasonal distribution of cargo flows

Number of downstream trips for every upstream trip (dry cargo)



Number of downstream trips for every upstream trip (liquid cargo)



Data requirements

- Geographical scope: per country
- Loading capacity (in tonnes or container units), load factors and share of loaded (or empty) kilometres in the total distance travelled, differentiated by:
  - Vessel types:
  - Vessel size classes
  - Cargo type: dry cargo, liquid cargo and container units
- Frequency of update: yearly, to monitor the development in time and the impacts of water levels

Available datasets /weaknesses

Vessel types, main dimensions

- European hull database:
  not public; coverage appr. 80% of fleet
- Eurostat (CEMT-classification)
  - by load capacity in 6 size categories
  - by date of construction for 5 periods
  - only for a limited number of countries
  - voluntary basis (no quality check by Eurostat)

Load capacity

- IVR Ships Information System (online database)
  - charge fee applied
  - limited reliability (missing info on active fleet)
  - no info on formations (pushed/coupled units)

Available datasets /weaknesses

Load factor information from models
(relevant for calculation of draught)

- TREMOD (by IFEU): average factors by vessel categories (dry / wet bulk, containers)
- Vaart!Vrachtindicator freight rates database (Panteia)
  - average load factors by vessel sizes
- BIVAS database: info on vessel movements on Dutch territory
  - info can be obtained about load factors per route segment or per vessel type

Available datasets /weaknesses

Load factor information from models
(relevant for calculation of draught)

- Austrian statistics
- DESTATIS statistics
  - Monthly statistics
  - Differentiated to vessel type (dry cargo, tanker, container ship)
  - No differentiations to vessel size classes
  - Only limited number of data collection points (cross border sections at Rhine, Moselle and Danube river).
  - Limited to domestic, international import and export and transit

Aggregation

- No complete and reliable datasets are available on a European level on vessel kilometres and average load factor
  - Apart from existing datasets in The Netherlands, Austria and Germany, Data collection methods should allow information on average load factors for Belgium, Bulgaria, the Czech Republic, France, Luxembourg, Hungary, Poland and Romania.
- Large gap: empty sailings, **voluntary** Eurostat datatable (B2).
- More differentiation needed between vessel size classes (especially for large vessels and coupled units)
- Significant information about IWT gets lost when translating information from a single dataset per trip (where possible) to the aggregated Eurostat statistics.

Data quality of existing datasets on tonnekilometres

- **The Netherlands** uses IVS'90 data. Here, vessel operators provide relevant information whenever they pass locks or moveable bridges.
- **Germany** relies on skippers and shipping agents that have to declare all loading and unloading operations in German ports.
- **France** relies on the loading declaration for the France internal network and from information provided by Rhine ports and the border lock of Iffezheim for Rhine related transports.
- **Belgium** relies on STA-messages and completed this with statistical information. The suppliers of the data are the local fairway authorities, as well as all major ports with the exception of the Port of Antwerp. Data is completed with data collected by the Netherlands.
- **Luxembourg** relies on toll declarations on the Moselle river
- **Austria** deducts their information on port authorities for national and international transport and gathers information at the lock operators of Ottenheim for transit transport.

Cross-country checks

- Differences exist between transport volumes in both directions reported by the Netherlands, Germany, Belgium, France, Austria and Luxembourg. Here, the volume reported by the Dutch authorities is lower in all cases.
- The same goes for Luxembourg, with the one and only exception that the Luxembourg reports are always higher than any other country.
- Volumes reported between France and Belgium (v.v.) are higher according to the Belgium authorities in both directions than according to the French authorities. There is a major difference in the reported transport flows from France to Belgium.
- Volumes reported between France and Germany (v.v.) are higher according to the French authorities than according to the German authorities. There is a major difference in the reported transport flows from France to Belgium.
- For both directions, the Belgian transport statistics show higher volumes transported between Belgium and Germany, than their German colleagues do.
- With regards to transport between the Danube and the Rhine, it should be noted that the Austrian authorities always indicate lower transport volumes than the authorities of other countries, with the only exception of the Netherlands.

Data quality of information on vessel kilometres

- Information about the amount of kilometres that vessels sail loaded and empty is not available at any statistical office.
- However, a Eurostat table (B2) is present that is filled by:
  - Belgium for 2009, 2011 and 2013
  - Czech Republic
  - Luxembourg (up to 2010)
  - Hungary
  - The Netherlands
  - Romania (starting from 2013).
- Data that has been provided by the Netherlands and Romania is however considered as “of insufficient quality” or “partial data”.
- Several countries have indicated that providing the information about empty trips is impossible using the current survey methods.

Concluding

- Weak basis for making reliable calculations
- Most important gaps:
  - lack of reliable data on the **average tonnage carried** by inland vessels per travelled kilometre, properly taking into account the share of empty trips

Recommendations

Collect and disseminate information on average loading factors and empty sailings of vessels

- Use existing datasets to make a first estimate for Europe by using information from the DESTATIS institute and Austrian statistics office

  Limiting aspects:

  1. *data is not differentiated to vessel size classes*
  2. *statistics do not present average load factor for North-South corridor, Lower Danube transports and the actual load factor for domestic transport in NL (possibility: BIVAS) and BE*

- Sailed (empty) kilometres: current EU databases are voluntary. Anonymised information from the Automatic Identification System (AIS) data in combination with information on the kilometres of loaded trips could be used.

Thank you for your attention!

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