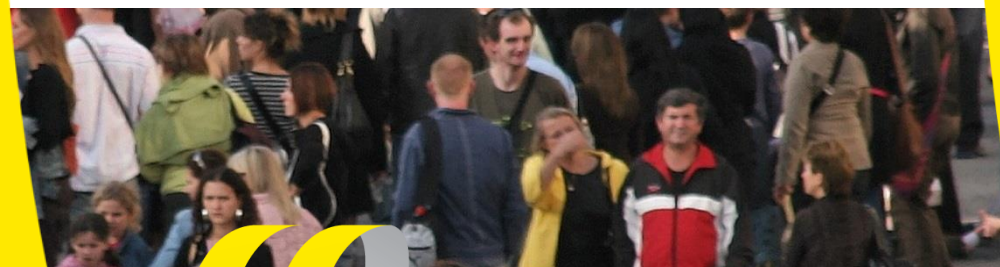




The Management of Ship-Generated Waste On-board Ships

Workshop on Port Reception Facilities

15-9-2016



CE Delft

- Independent, not for profit environmental policy analysis organisation
- Founded 1978, based in Delft (NL), 40 employees
- Main fields of work: transport, energy and resources
- Maritime shipping: more than 10 years of experience on air pollution and GHG policies
- Clients: IMO, European Commission and Parliament, national and regional governments, trade associations and environmental NGOs

All our publications are available on www.cedelft.eu



CHEW Consult

- Independent consultant for sustainability in Shipping
- Main field of work; Inland shipping, waste (and financial structures), biofuels, degassing, online monitoring of emissions
- Focus both on implementations of new strategies
- More than 10 years experience in Inland and maritime shipping
- Clients: Governmental organisations, such as Dutch environmental ministry, CCR, NGO's, pioneers in the field of biofuels for shipping and working closely with other consulting companies.

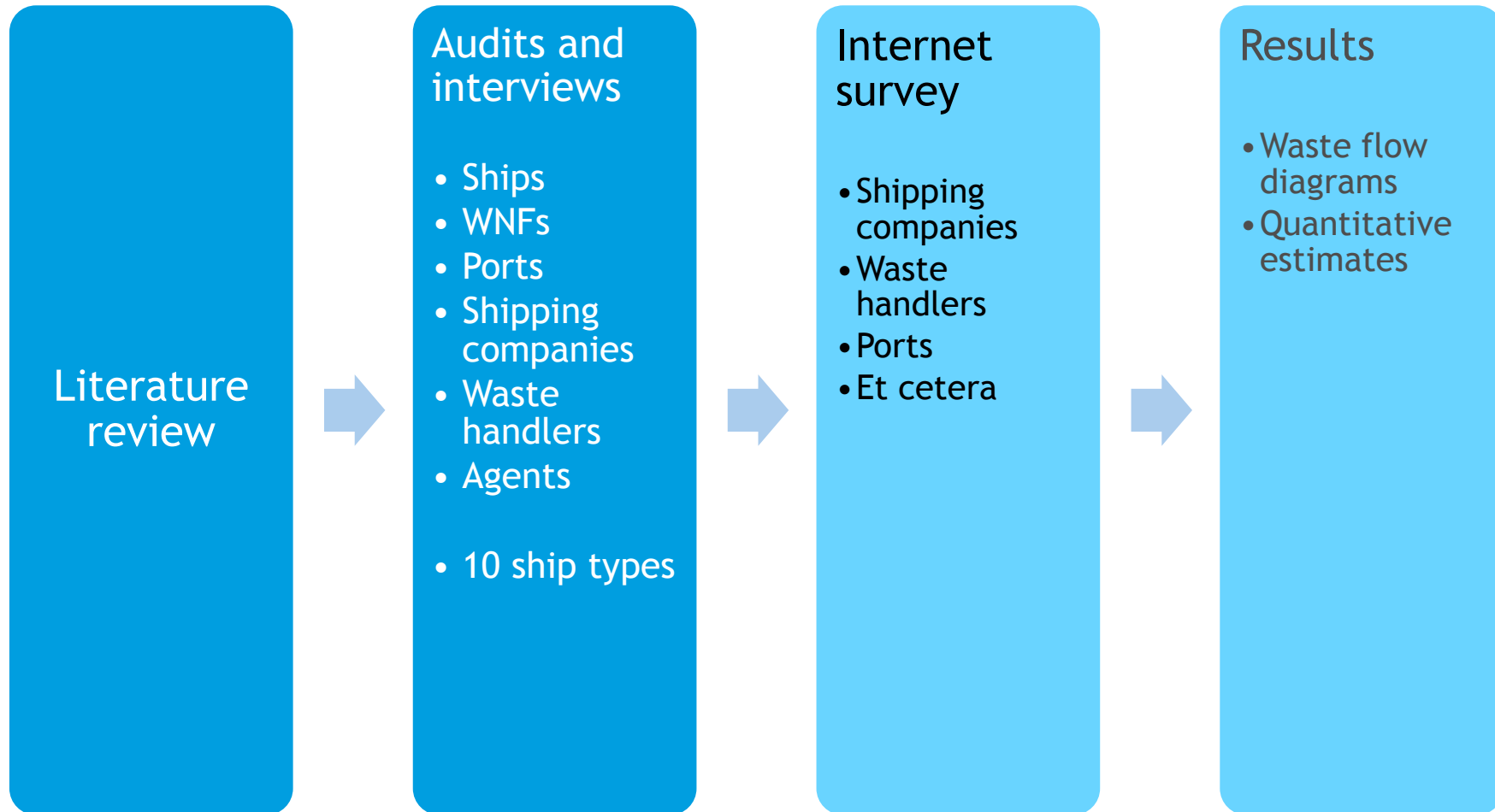
Outline of the presentation

- Aim of the study
- Methods
- First results
- Some observations from port inspections
- Next steps

Aim of the study

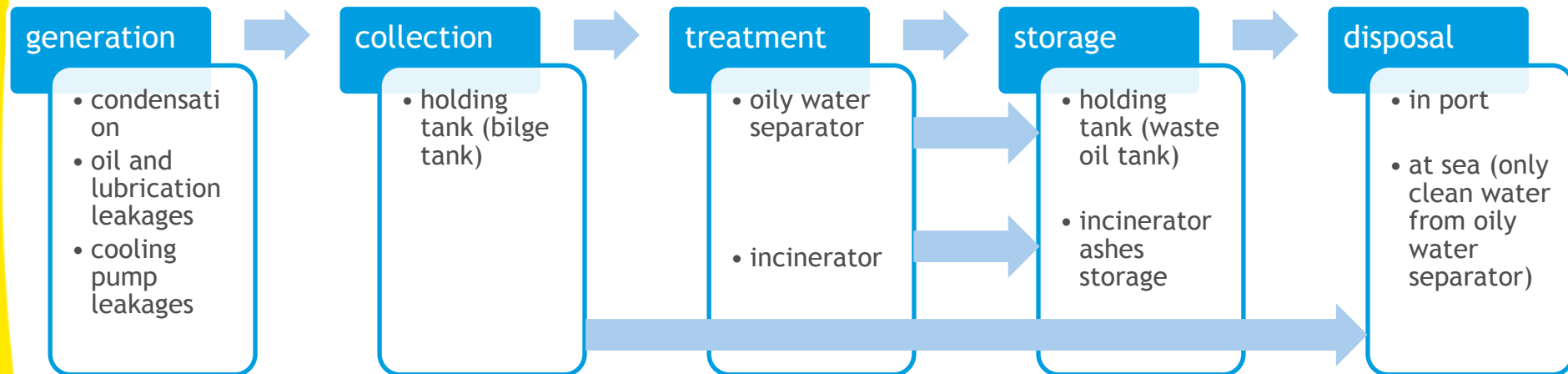
- Within the context of the review of the PRF directive
- Aim:
 - provide a detailed review of the waste practices and management;
 - provide average quantities of different types of waste;
 - provide an overview of technologies and methods to reduce waste.
- Empirical study: generate information

Method of the study



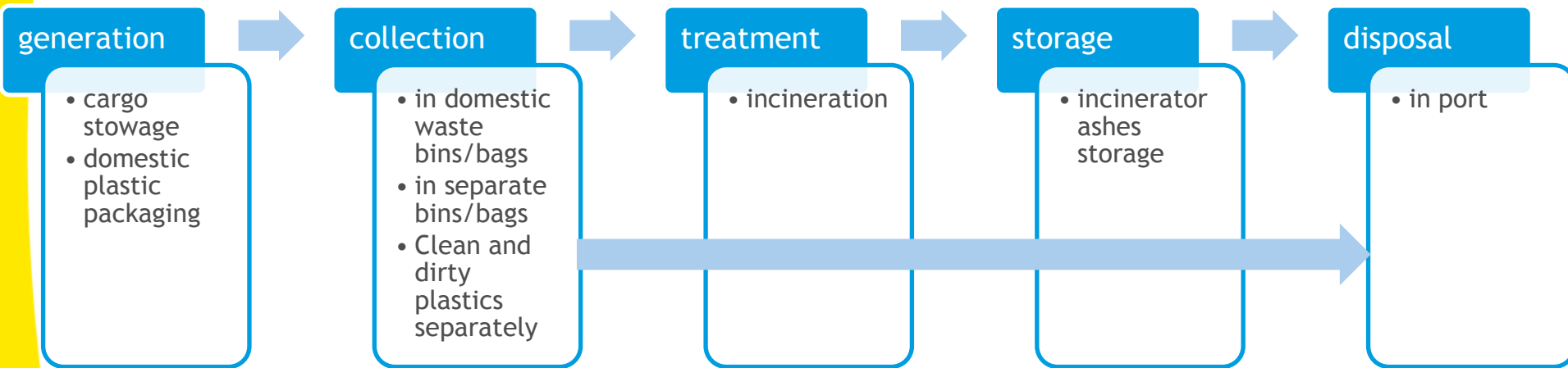
First results: waste flow diagrams

- Example: bilge water (MARPOL Annex I)



First results: waste flow diagrams

- Example: plastics (MARPOL Annex V)



First results: waste quantities

- Example: sludge
- The amount of sludge generated depends on
 - Fuel type (HFO, including ULSFO, generates sludge, MGO hardly so)
 - Amount of fuel used
 - Fuel equipment (some ships have fuel treatment equipment that separates a fixed share of the fuel as sludge)
 - Ranges from 1% - 2% of the amount of HFO consumed
- The amount of sludge that is disposed depends on
 - Waste management policy of the ship or the shipping company (some shipping companies do not treat waste on board)
 - Treatment: incineration or evaporation of water (evaporation can reduce the amount of sludge by up to 50%).

Some observations: prevention of waste

- Much domestic waste is associated with supplies. Often, the crew lacks the time to unpack immediately. The waste is disposed of in a next port or treated.
- Suppliers do not appear to be taking back packaging material.
- Even though many ships have a water purifier on board, the crew often prefers bottled water. Plastic bottles and packaging material are the largest share of plastic waste.

Some observations: waste segregation and treatment

- Food waste is often divided in two streams.
 - Organic waste, which is often grinded (and in some cases added to the sewage water) to be discharged at sea.
 - All other galley waste, which is generally stored and disposed of in ports.
- Several ships do not incinerate waste even when they have an incinerator. Sometimes it is company policy not to incinerate.
- In some cases the incinerator is not used for plastic waste. Not all plastics can be safely incinerated and the crew often lacks the expertise to separate plastics.
- In some cases cooking oil (Marpol V) is treated as Marpol I and added to sludge for incineration.

Some observations: use of record books, IOPP and WMP

- We witnessed two cases in which the IOPP was incorrect (not all tanks were mentioned); and one case in which the garbage management plan was incorrect (actual storage capacity was lower than stated in the plan).
- We witnessed one case in which the ORB did not contain the mandatory weekly entries
- In some cases cooking oil is registered in ORB (if it is added to sludge)
- Record of incineration of garbage Cat C is sometimes kept in ORB, not in garbage book.
- Sludge incinerator ashes are not always recorded in the ORB, but possibly in the garbage record book of both residues (Marpol I and V)

Some observations: use of record books, IOPP and WMP

Use of record books (continued)

- The amount of cargo residues (annex V) is not registered in the garbage record book, as it is not given to PRF but to the stevedore. Only in one case the ship registered a discharge at sea of cargo residues.
- The amount of cargo residues is often not recorded or notified, because it is generated during the discharge and washing of cargo holds (so after the notification) and because it often is collected by the stevedore and not by the waste handler.

Some observations: classification of waste

- There is a mismatch between the Marpol Annex V classification, the WNF classification, the classification used by waste handlers and the practice on board, e.g.
 - Marpol Annex V has one plastics category, waste handlers use at least 2 (clean and dirty) and often more
 - Streams that are separated on board such as paper, oily rags and fluorescent lamps are not reflected in Marpol or WNFs
 - ‘Operational waste’ is sometimes used to classify wastes relating to cargo handling, and sometimes for ‘other domestic wastes’.

Some observations: classification of waste

- As a result of the mismatch,
 - Waste is misclassified:
 - Waste collection form a delivery that is notified as “Plastic contamination with food a/o Hazardous waste” in in the Garbage book notified as Category C; Domestic wastes.
 - Quantities are hard to compare and inspection becomes more difficult:
 - The waste handler uses more categories than the GRB and the WNF, and units are sometimes different (kg or units instead of m³).

Next steps

- Waste flow diagrams and waste quantities will be validated through an internet survey;
- A review of innovative technologies to handle or treat waste and to reduce the amount of waste will be undertaken.
- The report will be submitted to EMSA by the end of 2016

Thank you for your attention!

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