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From emissions to policy
Case of ship emissions

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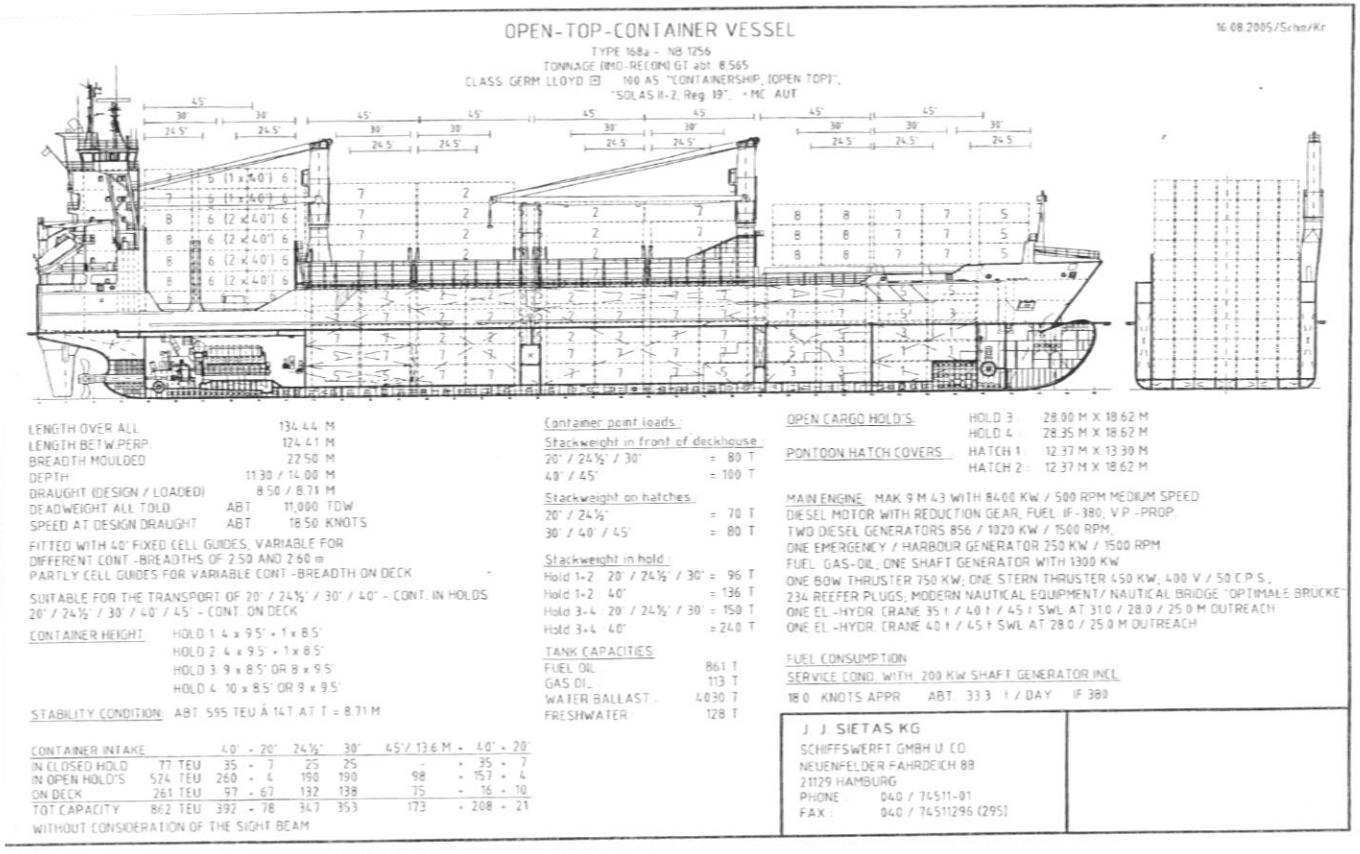
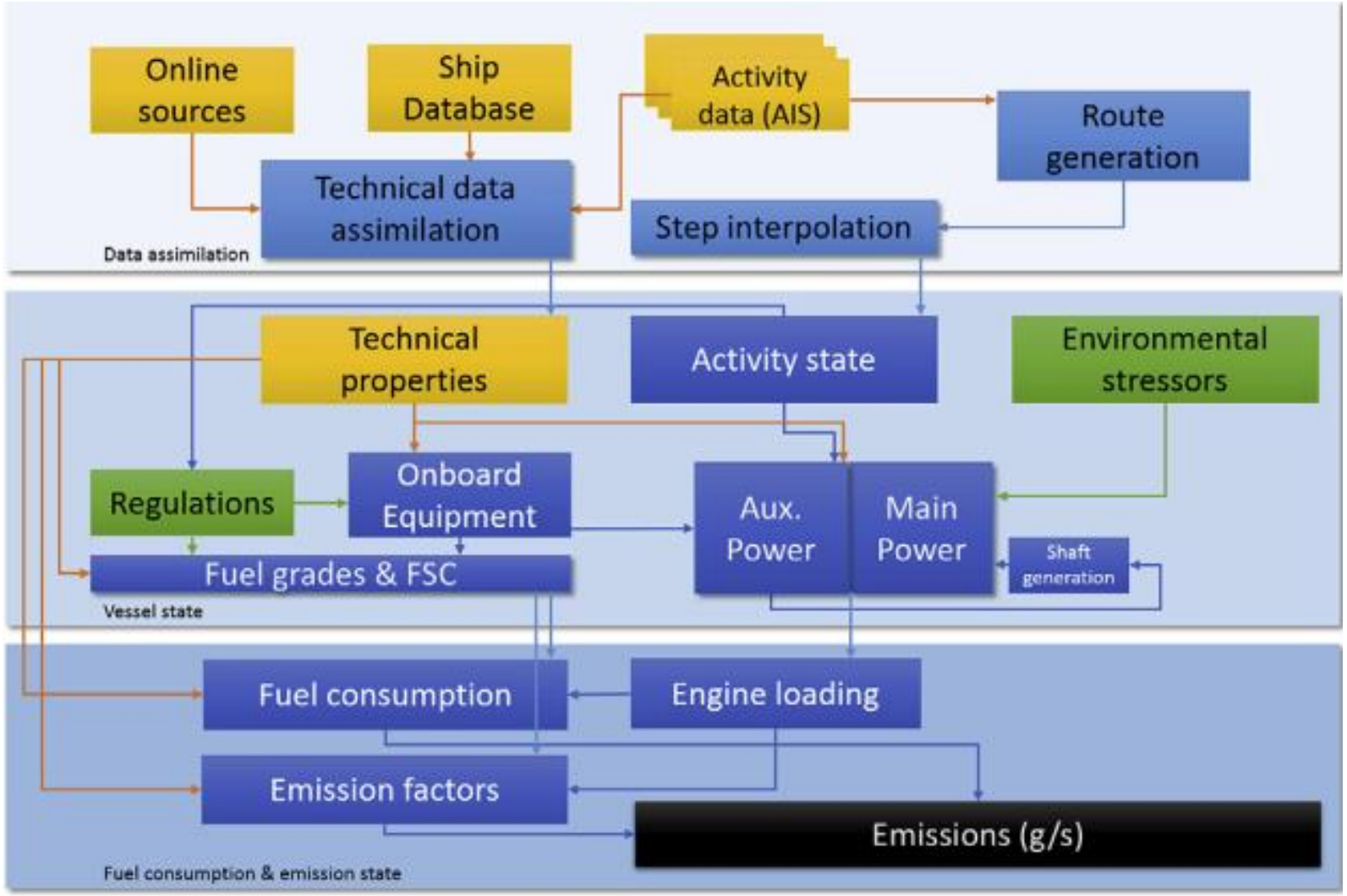
Outline

- Emission modeling
  - Approach, capabilities
- Policy support
  - Past experiences, upcoming possibilities
- On-going efforts
  - Future work
- Common interests

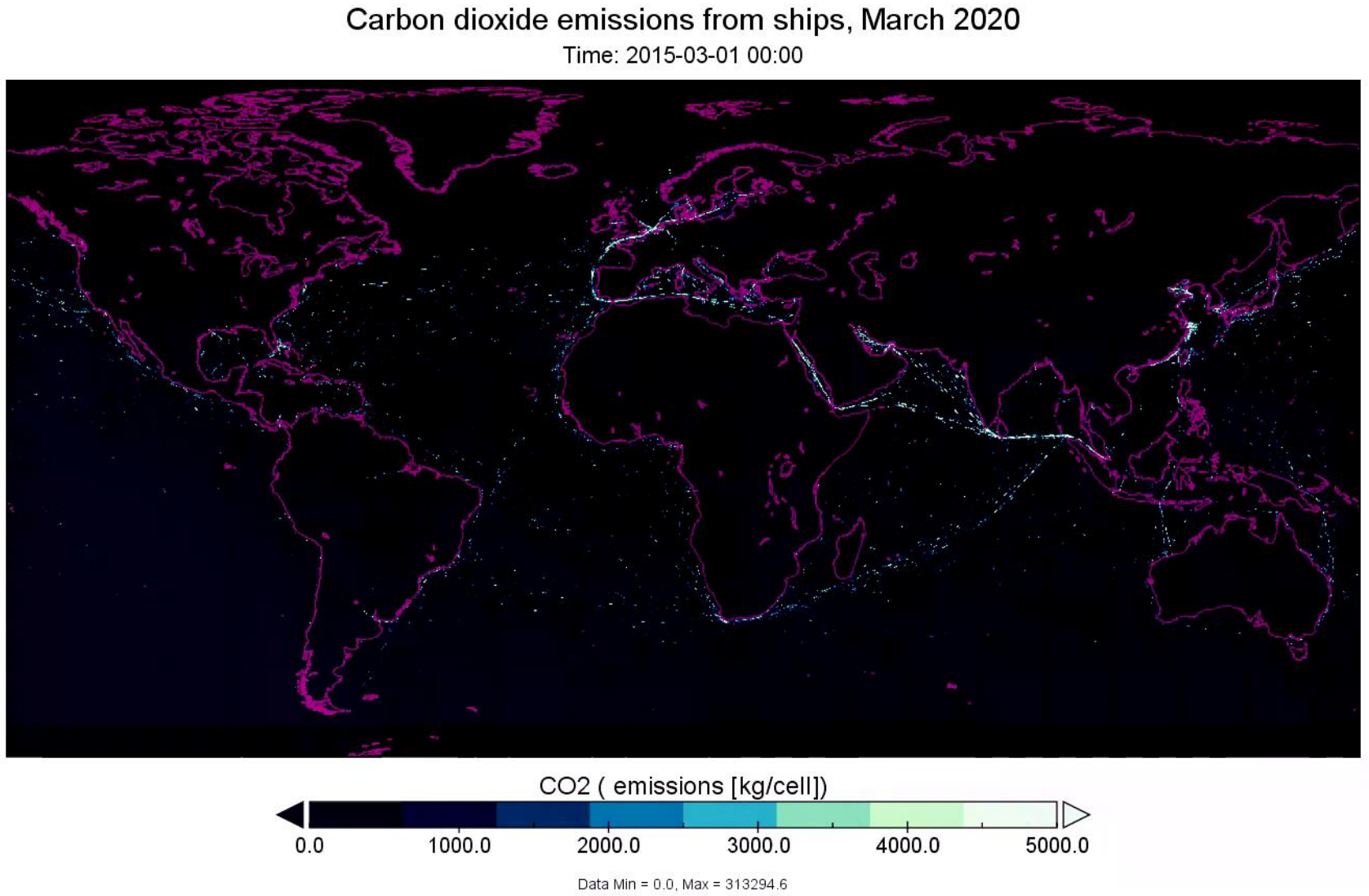


Ship Traffic Emission Assesment Model at a glance



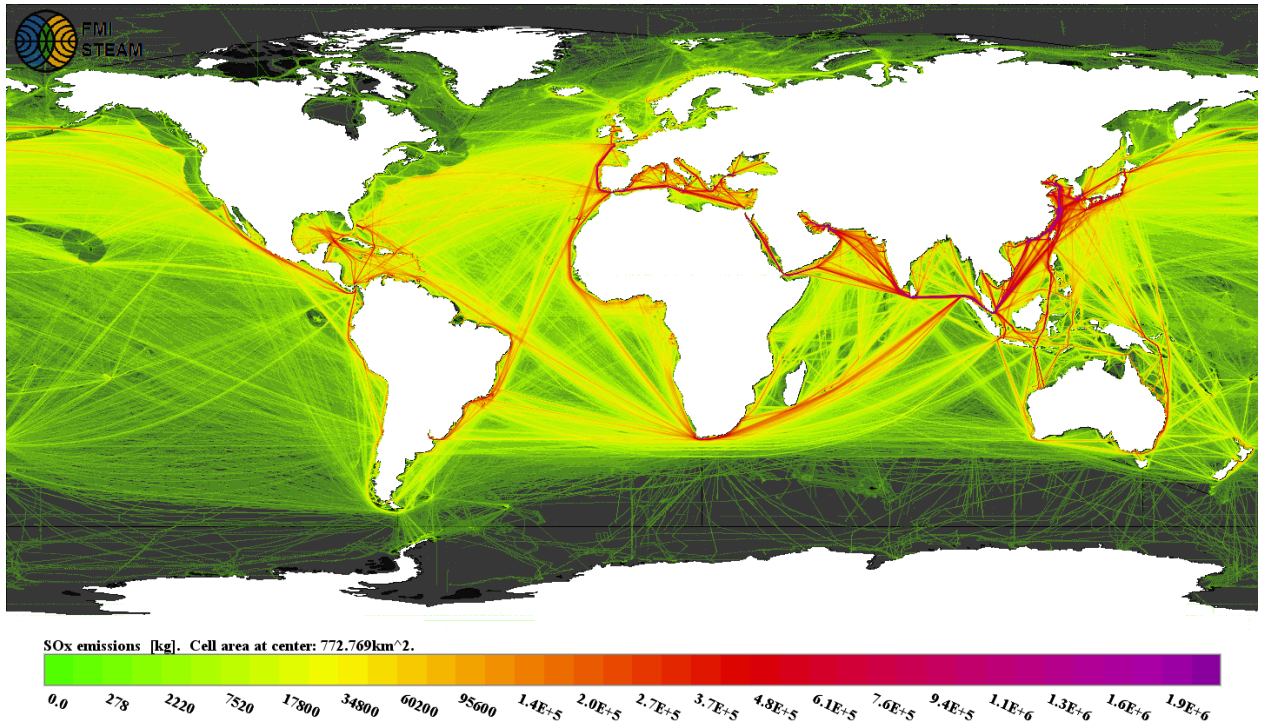
Johansson L., Jalkanen J.-P. and Kukkonen J., "Global assessment of shipping emissions in 2015 on a high spatial and temporal resolution", Atm. Env., 167 (2017) 403-415

Ship emission: CO_2 example



Capabilities

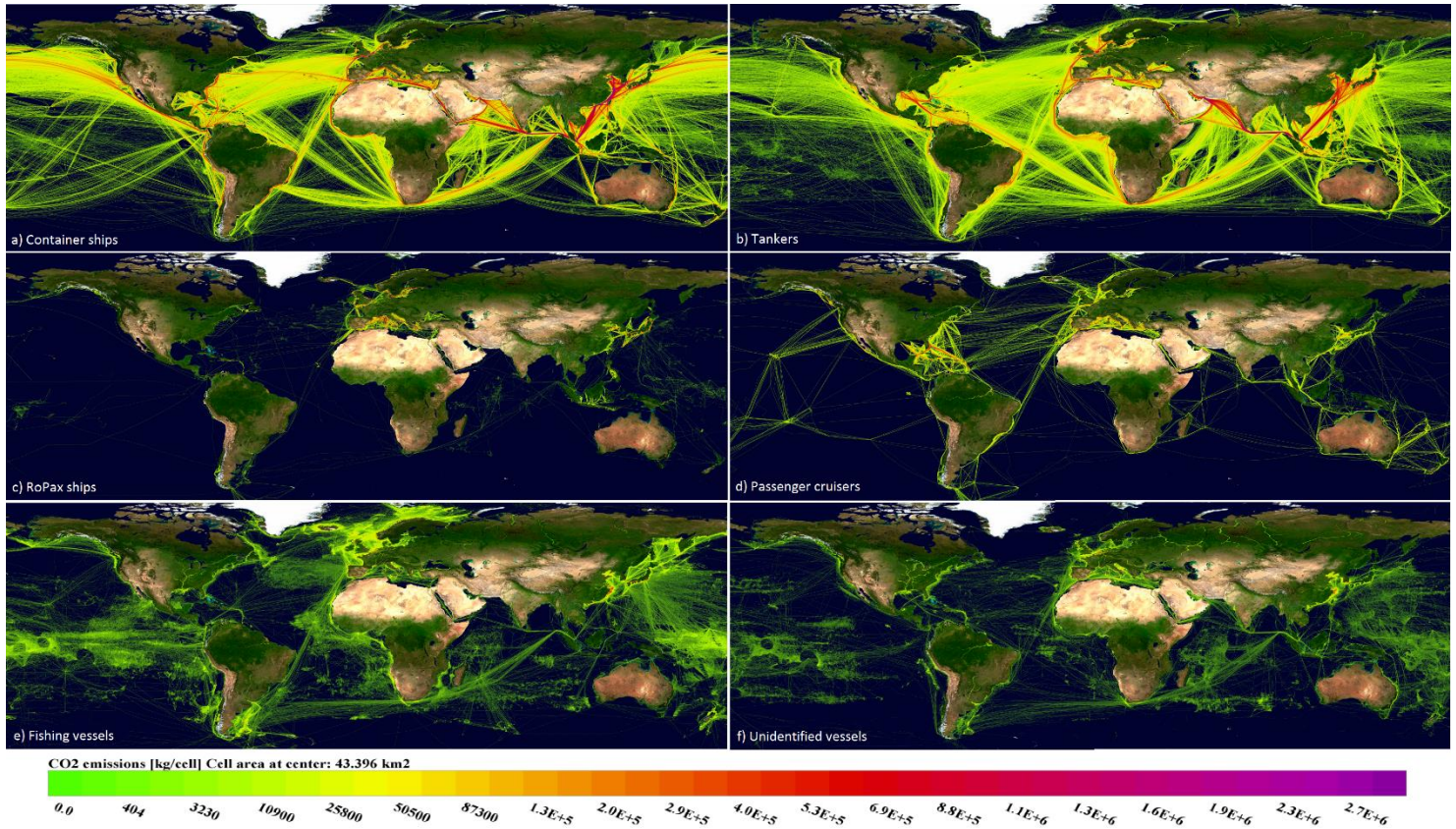
- Same approach, regardless of scale
- Vessel specific, full bottom up
  - Can include sea ice, currents, waves, wind
    - Not included routinely
- Fully dynamic inventories
  - Both geographical and temporal variation
  - Ocean shipping vs inland shipping
- Global emissions 2014 onwards
  - Both satellite (s) and terrestrial (t) AIS
  - Baltic Sea 2006- (t)
  - North Sea 2009, 2011 (t)
  - EU, 2011 (t)



SOx from ships, 2016

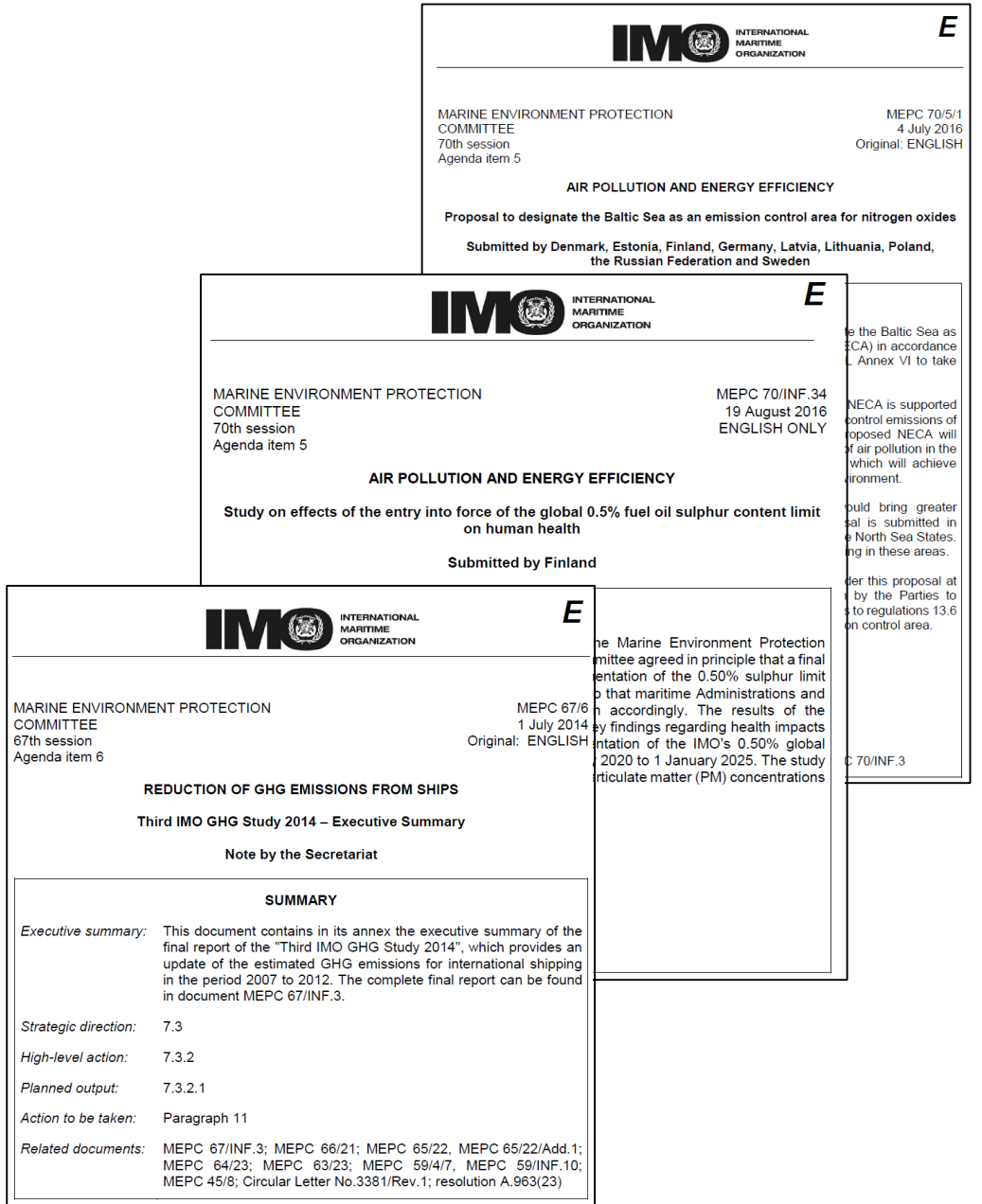
Possibilities

- National/international split vs inland/ocean shipping
- Emissions by
  - EEZ
  - Vessel type
- CAMS-81 cooperation
  - Covers the routine generation of inventories, not development work
- Emission factors, primary/secondary PM, description of semivolatile fraction, efficiency of emission abatement techniques
- Extensions to water/noise pollution
- Black Carbon, new ECAs…



Policy support activities

- Scenario runs for Emission Control Areas
  - Baltic Sea, North Sea
- Regular reporting for the HELCOM member states
  - 2018 onwards: Water/noise pollution included
- Global reduction of sulphur in marine bunkers
- IMO GHG
- ESSF
- National initiatives
  - Costs of shipping environmental legislation changes to national economy
  - Sulphur task force, compliance monitoring
  - Support for national IMO delegation



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MARINE ENVIRONMENT PROTECTION COMMITTEE
70th session
Agenda item 5

MEPC 70/5/1
4 July 2016
Original: ENGLISH

AIR POLLUTION AND ENERGY EFFICIENCY

Proposal to designate the Baltic Sea as an emission control area for nitrogen oxides

Submitted by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, the Russian Federation and Sweden

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MARINE ENVIRONMENT PROTECTION COMMITTEE
70th session
Agenda item 5

MEPC 70/INF.34
19 August 2016
ENGLISH ONLY

AIR POLLUTION AND ENERGY EFFICIENCY

Study on effects of the entry into force of the global 0.5% fuel oil sulphur content limit on human health

Submitted by Finland

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MARINE ENVIRONMENT PROTECTION COMMITTEE
67th session
Agenda item 6

MEPC 67/6
1 July 2014
Original: ENGLISH

REDUCTION OF GHG EMISSIONS FROM SHIPS

Third IMO GHG Study 2014 – Executive Summary

Note by the Secretariat

SUMMARY

Executive summary:	This document contains in its annex the executive summary of the final report of the "Third IMO GHG Study 2014", which provides an update of the estimated GHG emissions for international shipping in the period 2007 to 2012. The complete final report can be found in document MEPC 67/INF.3.
Strategic direction:	7.3
High-level action:	7.3.2
Planned output:	7.3.2.1
Action to be taken:	Paragraph 11
Related documents:	MEPC 67/INF.3; MEPC 66/21; MEPC 65/22, MEPC 65/22/Add.1; MEPC 64/23; MEPC 63/23; MEPC 59/4/7, MEPC 59/INF.10; MEPC 45/8; Circular Letter No.3381/Rev.1; resolution A.963(23)

Food for thought; A path forward

+ Synergy with Copernicus
  - Compatibility of data needs?
+ Can be done fairly quickly
+ Uniform methodology applied
  + Global & regional emission datasets
- Commercial datasets, currently funded by various projects
- How to deal with national/international split
  + Emissions inside economic zones are feasible
  + Emissions in sea areas/inland waterways are feasible

On-going efforts and common interests

- **Revision** of emission factors→ESSF
  - Load, engine age/type, fuel
    - MDO, MGO, HFO, LNG, biofuels
  - Modern engines vs old engines
    - Lloyds Register 1995 EFs still in use, revision needed
  - Need for extensive measurements; PM, VOCs, BC…
  - Impact of aftertreatment techniques
- Combination of various dataset to overcome weaknesses of each
  - AIS, LRIT, VMS, arrival/departure times
- **Validation** of emissions and energy consumption using measurements
  - Satellites, on-board campaigns, fuel reports, (MRV, IMO Data Collection System)
- Regular reporting of global/regional ship emissions

Summary

- Some synergy already exists
  - TFEIP-ESSF-CAMS
  - Science part of ESSF definitely continues
- Need a roadmap to plan the activities and links
  - Linking with relevant parallel activities (ESSF), to maintain consistency
  - Ensure the long-term viability of ship emission reporting