



# U.S. Coast Guard Parallel Event

October 16, 2009, New York

## Marine Pollution Prevention: The Challenge for Canadian Regulators





# Overview

- Background: reducing CO<sub>2</sub>
- International Maritime Organization Framework
  - Technical measures
- Canada's domestic approach
  - Transport Canada's role



# Marine mode is efficient, BUT...

- IMO estimates ships emit 3.3% of all GHGs
  - If world shipping were a country, it would be in the top 20 major GHG emitters
  - This is expected to grow with trade
  - Doing nothing means by 2050 ships would be responsible for 12-18% of all CO<sub>2</sub> emissions, as other sectors are controlled under ambitious plans
- Future fuel prices could drive change
- IMO estimates efficiency could be improved by 25 to 75%



# Reducing CO<sub>2</sub> from shipping

*Where do the reductions come from?*

<b>DESIGN (New ships)</b>	<b>Saving of CO<sub>2</sub>/tonne-mile</b>	<b>Combined</b>	<b>Combined</b>
Concept, speed & capability	2% to 50%+	10% to 50%+	25% to 75%+
Hull and superstructure	2% to 20%		
Power and propulsion systems	5% to 15%		
Low-carbon fuels	5% to 15%*		
Renewable energy	1% to 10%		
Exhaust gas CO <sub>2</sub> reduction	0%		
<b>OPERATION (All ships)</b>		10% to 50%+	
Fleet management, logistics & incentives	5% to 50%+		
Voyage optimization	1% to 10%		
Energy management	1% to 10%		

- from the *Second IMO GHG study 2009*



# IMO Framework being developed

Agreed interim measures (July 2009):

- Energy Efficiency Design Index
- Energy Efficiency Operating Indicator
- Shipboard Energy Efficiency Management Plan

Still under development:

- Proposed Market-based Measures
  - Cap and trade
  - Global levy on marine fuel



# Energy Efficiency Design Index

*for designing new ships*

EEDI index =

$$\frac{\left( f_1 \cdot \prod_{j=2}^M f_j \right) \left( \sum_{i=1}^{nME} C_{FMEi} SFC_{MEi} P_{MEi} \right) + C_{FAE} SFC_{AE}^* P_{AE} + \left( \sum_{i=1}^{nPTI} P_{PTIi} - \sum_{i=1}^{nWHR} P_{WHRi} \right) - \left( \sum_{i=1}^{neff} f_{eff} P_{eff} C_{F_{eff}} SFC_{MEi} \right)}{(f_i \cdot Capacity) \cdot V_{ref} \cdot f_W}$$

OR

CO<sub>2</sub> emitted by main engines – CO<sub>2</sub> saved by technology

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Transport Canada work to be done  
(cargo capacity and reference speed)



# Energy Efficiency Operating Indicator

*for operating ships*

$$\sum_i \sum_j (FC_{ij} \times C_{Fj})$$

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$$\sum_i (m_{cargo,i} \times D_i)$$

- *j* is the fuel type;
- *i* is the voyage number;
- $FC_{ij}$  is the mass of consumed fuel *j* at voyage *i*;
- $C_{Fj}$  is the fuel mass to CO2 mass conversion factor for fuel *j*
- $m_{cargo}$  is cargo carried (tonnes) or work done (number of TEU or passengers) or gross tonnes for passenger ships; and
- *D* is the distance in nautical miles corresponding to the cargo carries or work done.



# Shipboard Energy Efficiency Management Plan

*for operating ships*

Needs support of ships' crew and owners

- Plan sets goals and monitoring of progress

Plan should consider individual ship's activities

- Operational practices
  - e.g., speed, routes, trim, cargo handling
- Maintenance
- Refitting, where cost-effective



# Canada's view at IMO

- Global rules on ships' GHGs are needed
  - Differentiated approach will not work for a globalized industry
- Proposed global rules must be acceptable to all IMO members
- One option: Separate rules for energy efficiency and carbon efficiency:
  - Set energy efficiency rules under MARPOL, Annex VI, to support shift to distillate fuels
  - Set carbon efficiency rules, as optional Annex



# The road to Canadian regulations

- Canada's domestic fleet differs from the international fleet
  - Older ships, need modernization
  - Inland trade competes with land-based modes
  - Fleet renewal a potential opportunity
  - Support for short sea shipping
- Voluntary implementation of IMO Framework to be followed by regulations
  - Provide case data for how far can we go



# Domestic measures in Canada

- Consultation meetings planned in November
  - Encourage Canadian firms to adopt IMO Framework in 2010
  - Will aim to work with Associations
- Joint measures with U.S. can be explored
- Transport Canada will prepare regulations based on experience with IMO Framework
- Canada will report to IMO on experience gained – October 2010



# Questions?

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# References

## Transport Canada

- Marine Safety - <http://www.tc.gc.ca/marinesafety/menu.htm>
- Environmental Protection - <http://www.tc.gc.ca/marinesafety/oep/environment/menu.htm>
- Marine Policy - <http://www.tc.gc.ca/policy/acf/menu.htm>
- Environmental Policy - <http://www.tc.gc.ca/policy/acs/menu.htm>
- Environmental Programs - <http://www.tc.gc.ca/programs/environment/programs-index.htm>

## Environment Canada

- Climate Change - <http://www.ec.gc.ca/cc/>

IMO - <http://www.imo.org/> (Marine Environmental Protection Committee – MEPC 59 report)