OVERVIEW

• Addressing greenhouse gas and air pollutant emissions
  ➢ Engagement at the International Maritime Organization
  ➢ Domestic efforts
  ➢ Port-side initiatives
  ➢ Ship Technology R&D
  ➢ Noise from Ships
  ➢ Pan-Canadian Framework on Clean Growth and Climate Change

• Climate change adaptation and resilience
Transport Canada leads Canadian engagement at the International Maritime Organization (IMO)

IMO’s Marine Environment Protection Committee (MEPC) is responsible for developing measures to address GHGs from international shipping:

- The Energy Efficiency Design Index (EEDI) for new ships
- The Ship Energy Efficiency Management Plan (SEEMP) for all ships
- MEPC 69 agreed on draft amendments to MARPOL Annex VI to implement a mandatory data collection system for ship-specific GHG- and fuel-efficiency
- MEPC 69 also agreed to establish a working group at MEPC 70 (October 2016) to consider appropriate next steps for addressing GHG emissions
ADDRESSING AIR POLLUTANT EMISSIONS

- North American Emission Control Area limits the sulphur content of fuel and NOx emissions
  - 0.1% sulphur content fuels
  - Tier III NOx standards for vessels built after January 1, 2016

- Fleet Averaging Regulatory Regime: domestic vessels on the Great Lakes and St. Lawrence
  - Declining sulphur content of fuel standards (0.1% by 2020) + Tier III NOx standard

- IMO implementing a global 0.5% cap on sulphur content of fuels
  - In force 2020 or 2025, subject to a low sulphur Fuel Availability Review
  - Review expected for consideration at MEPC 70 in October 2016
PORT EMISSIONS INVENTORY TOOL (PEIT)

- Developed by Government of Canada to facilitate port emission inventories:
  - improve understanding of port and terminal contributions to air pollutant and GHG emissions
  - identify potential efficiency improvements and emission reduction opportunities
- Completed inventories for all 18 Canadian Port Authorities in 2010
- Working with Green Marine and the International Council on Clean Transportation (ICCT) to facilitate use of PEIT domestically and internationally
- Simplified web-based version of PEIT (goPEIT) is under development
SHORE POWER TECHNOLOGY FOR PORTS

- Contribution program that provides funding for shore power implementation

- Shore power technology allows properly equipped vessels to turn off diesel engines/generators while at port and use electricity from the local electrical grid to meet the vessel’s power needs

- Program runs until March 31, 2018

- By the end of the program most Canadian cruise ship terminals will offer shore power services to their clients

- Funding is also supporting projects involving container ships (Centerm & Deltaport at PMV) and ferry services (Seaspan Ferry, B.C. Ferries Inc.)
PORT-TRUCKING

- Contribution funding at Canada’s major container ports for the deployment of technologies and practices that improve port-trucking efficiency and environmental performance by:
  - Improving truck flows and reducing congestion along key trade corridors (i.e. reducing truck wait times, idling and emissions); and
  - Alleviating delays on port access roads and at terminal gates – resulting in time and fuel savings.

  - **Port Metro Vancouver**
    1. *Container Drayage Truck Efficiency Program using Global Positioning Systems (GPS)*
    2. *Common Data Interface System Implementation*

  - **Port of Montreal**
    1. *Port-Trucking Improvement Project (IREP) using Radio Frequency Identification Tags (RFID)*
Transport Canada is investing in research and development that looks to find, assess feasibility, and validate emerging technologies with the potential to reduce GHG and air pollutant emissions.

Research is conducted within partnerships:
- Industry, academia, other government departments

Technological breakthroughs can produce applicable technologies in the 3-10 year time frame:
- Alternative fuels (batteries, fuel cells, electrification/hybridization, natural gas)
- Novel scrubbers (SOx, NOx)
- Underwater hull cleaning
- Boat design
LIQUEFIED NATURAL GAS AS A MARINE FUEL

- Liquefied Natural Gas (LNG) appears to hold great promise as a marine fuel in Canada
- Canadian Marine LNG Supply Chain Project conducted in partnership with industry, academia, provinces and various government departments:
  - Addresses the barriers to use of natural gas as a marine fuel in Canada
  - Provides technical and operational guidance for regulatory oversight
  - Phase 1 (West Coast) has been completed and the final report is available online at: http://www.cngva.org/media/35832/04-2014_-_liquefied_natural_gas_-_a_marine_fuel_for_canada_s_west_coast__en_.pdf
  - Phase 2 (Great Lakes and St. Lawrence) and Phase 3 (East Coast) to be completed and available Summer 2016

- LNG reduces emissions; supports compliance with ECA requirements
- A few new LNG-fueled vessels are either being put into service (STQ), or have been announced (BC Ferries) for delivery in Canada
UNDERSTANDING NOISE FROM SHIPS

• Noise emitted from ships is fast emerging as an issue for the sector
  ➢ IMO guidelines published in 2014

• Scientific study of effects on marine life, but still much left to understand
  ➢ DFO has been investigating noise for approximately 15 years
  ➢ 18 marine mammals listed as endangered under the Species at Risk Act; noise listed as a major concern for survival/rehabilitation

• Noise emissions are lost energy. Technological solutions to reduce noise will improve ship efficiency: reduce fuel use, air pollutant and GHG emissions

• Transport Canada partnerships on ship noise reduction:
  ➢ Working with DFO to address the issue
  ➢ Joined Port of Vancouver and partners to install a hydrophone array to:
    ▪ obtain statistically relevant noise signatures over time to determine which areas of a ship’s construction is most energy inefficient from a noise perspective
    ▪ provide testing capacity for noise reduction technologies with simultaneous energy efficiency evaluation (in conjunction with Environment Climate Change Canada)
  ➢ Green Marine has developed a comprehensive report on noise from ships
  ➢ University of Victoria assessed the potential of adding noise as a parameter for propulsion system optimization
• Paris Agreement reached by Parties to the United Nations Framework Convention on Climate Change (UNFCCC) at COP 21 in December 2015
  ➢ Canada intends to achieve an economy-wide target to reduce GHG emissions by at least 30% of 2005 levels by 2030

• Federal, Provincial and Territorial governments are developing a Pan-Canadian Framework on Clean Growth and Climate Change
  ➢ Achieving reduction target will require new efforts, including transportation which accounts for approximately 23% of domestic GHG emissions (3.5% from shipping)
  ➢ Work will also cover Adaptation & Resilience, Carbon Pricing, and Clean Technology, Innovation & Jobs
Transport Canada report on climate risks and adaptation practices for the transportation sector assesses the state of knowledge on this issue.

Climate change presents both risks and opportunities for the marine transportation sector:
- Extreme precipitation, storm surges and sea level rise can flood and damage port facilities.
- Variable water levels can affect shipping loads, access to ports, and increase dredging costs.
- Melting sea ice is slowly opening up Arctic waters to new navigation routes, but can present hazards to vessel navigation (e.g., detached sea ice).
Some practices employed by the marine sector may help reduce the risks posed by the changing climate, including:

- Port Saint John’s long term port modernization plans account for sea level rise
- Real-time weather and wave forecasting tools, such as the “SmartAtlantic” inshore weather buoy, are helping ports adapt to changing and variable weather and hydrological conditions
- Advanced communications technologies are helping navigators adapt to variable water levels and ice conditions (e.g., Onboard Draft Information systems and other electronic navigation services, radar and satellite)
Maritime shipping provides an energy-efficient means of transporting goods and people

- Prime mover of global trade
- Internationally, most efficient mode of transportation

Innovative solutions are needed for the future of the transportation sector

You can submit and view ideas on:

- the Pan-Canadian Framework on Clean Growth and Climate Change [canada.ca/climateaction](http://canada.ca/climateaction) and on Twitter #CANClimateAction, and
- on more general views on the future of the Transportation Sector in Canada [http://tc.sondages-surveys.ca/s/FT_AT/?l=en](http://tc.sondages-surveys.ca/s/FT_AT/?l=en)
THANK YOU

Questions?

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