Environment Canada Environnement Canada

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Canada

Canada's *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations* for Model Years 2011-2016

Briefing for WP.29

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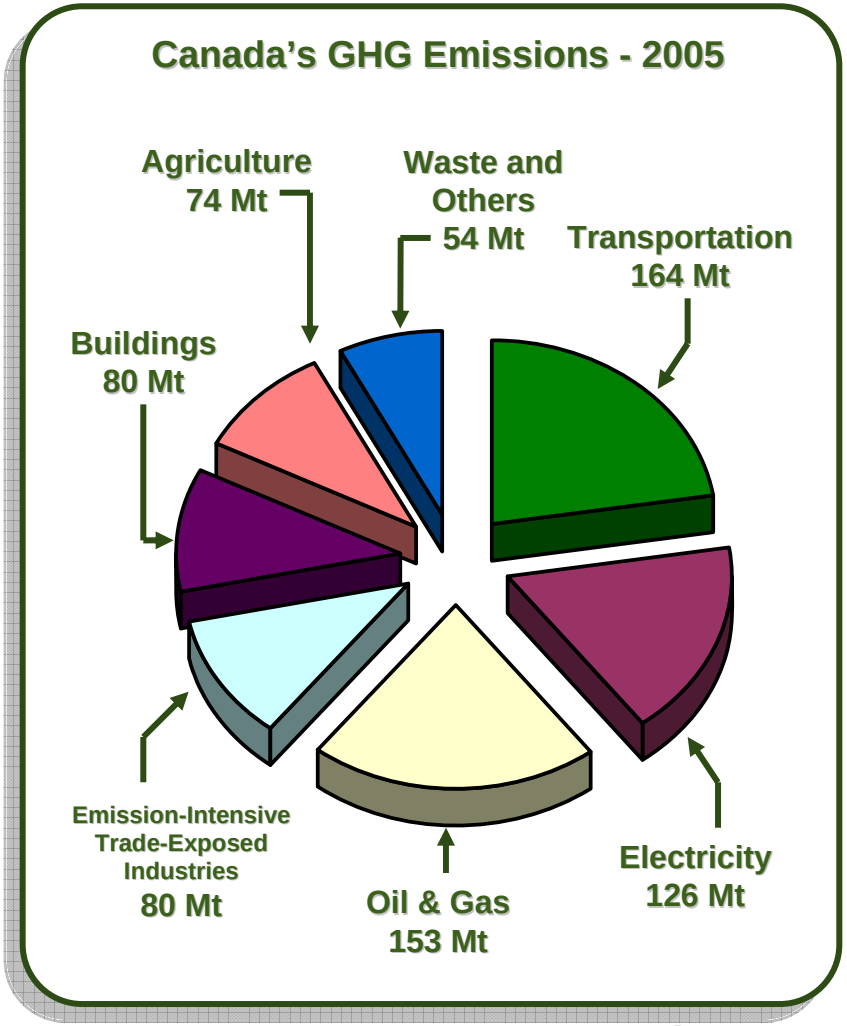
Outline

- Canada's development of *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*
- Main Elements of the Final Regulations
- Impact of the Regulations
- Summary

Canada's Commitment to Take Action on Climate Change

- Government of Canada is committed to reducing Canada's total greenhouse gas emissions (GHGs) by 17% from 2005 levels by 2020
- Transportation is one of the largest sources of GHGs in Canada – 22% of total emissions in 2005
- Vehicle regulations are an important element of the Government's national approach to reduce air pollutants and GHGs to protect the health and environment of Canadians



Development of Canadian GHG Regulations for Cars & Light Trucks

- On April 4, 2009, a Notice of Intent was published, signaling the Government of Canada's commitment to develop national GHG regulations for cars and light trucks under CEPA, 1999, in alignment with U.S. standards
- The final *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations* were published in the *Canada Gazette*, Part II on October 13th
- On October 16, 2010, the Government of Canada published a Notice of Intent to develop progressively stringent standards for model years 2017 and beyond

Heavy-Duty Vehicles

- In October 2010, Government of Canada released consultation document regarding development of GHG regulations

Canada-U.S. Cooperation

- Canada-U.S. auto industries are highly integrated – in 2008, 96% of Canadian automotive industry exports were destined for the U.S.
- The Government of Canada worked closely with the U.S. to ensure the implementation of stringent common standards

- The key objectives of Canada's regulation are to reduce GHG emissions from new cars and light trucks of the 2011 and later model years by:
  - establishing emission standards and test procedures that are aligned with U.S. national standards
  - providing regulatory certainty and setting an enforceable level playing field
  - minimizing regulatory compliance burden on the CDN auto industry

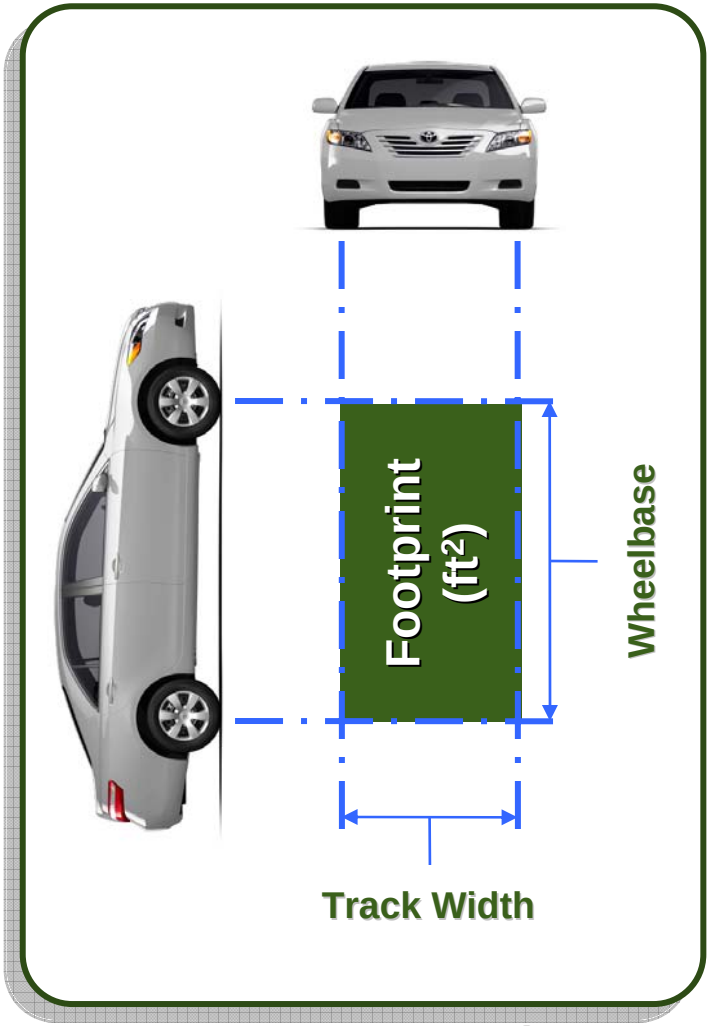
Main Elements of the Final Regulations

Scope and Application

- Regulations apply to new "passenger automobiles" and "light trucks" of the 2011 and later model years
- A company's "fleet" refers to all passenger automobiles or light trucks of a specific model year that a company manufactures in Canada or imports into Canada for the purpose of sale of those vehicles to the first retail purchaser
- Regulations do not apply to:
  - used vehicles imported into Canada
  - vehicles being exported from Canada
  - vehicles imported on a temporary basis for the purposes of exhibition, demonstration, evaluation and testing
  - emergency vehicles of the 2011 model year (if elected by company)

How will the Regulations Reduce GHG Emissions?

- Establish increasingly stringent annual fleet average CO_2 emissions standards for <u>new</u> passenger automobiles and light trucks that must be met by each company manufacturing or importing vehicles for sale in Canada beginning in 2011
- Define unique standards for each company based on the physical size (*footprint*) of the vehicles in their respective fleets
- Fleet-average standards become progressively more stringent over the 2011-2016 model years, in alignment with U.S. standards
- Individual vehicle standards to reduce exhaust emissions of other GHGs (CH_4 and N_2O)



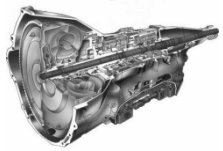
Expected Improvements in Conventional Technologies

- GHG emissions reductions required to meet these standards through to 2016 can be achieved by a range of **currently available technologies**

Potential Conventional Vehicle Technologies

Vehicle Technologies
- Low Rolling Resistance Tires to reduce friction during driving
- Improved Aerodynamics to reduce air resistance during high-speed driving
- Others…

Engine Technologies
- Improved valve control and timing to increase engine efficiency
- Cylinder Deactivation to reduce fuel use in during low engine load
- Others…



Transmission Technologies
- Improved controls in automatic transmissions to reduce losses during gear shifts
- Continuously Variable Transmissions to reduce efficiency losses due to discrete gear ratios
- Others…

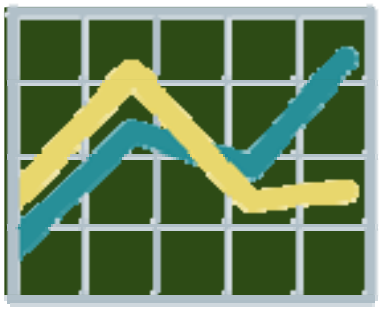
Compliance Flexibilities for Auto Companies

- The Regulations include a range of compliance flexibilities for auto companies:
  - Generation of emission credits for companies that overcomply with the standards in a given model year
  - Allowances for vehicles capable of operating on alternative fuels, such as E-85
  - Allowances for companies that improve the efficiency or reduce leakage rates of air conditioning systems
  - Early action credits for companies that perform better than CAFE or California standards in model years 2008 to 2010
  - Allowances for innovative technologies that are not captured during standards laboratory testing
  - Allowances for the introduction of advanced technology vehicles (electric vehicles, plug-in hybrid vehicles, fuel cell vehicles)

Impact of the Regulations

Key Results from Cost-Benefit Analysis

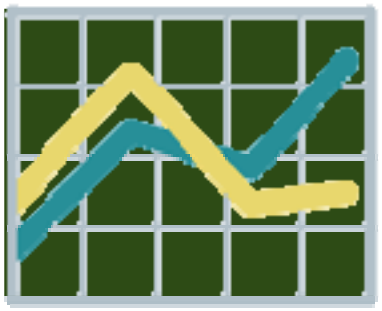
GHG Emissions



- Estimated cumulative reduction of **92 Mt $CO_{2\text{-}e}$** during the lifetime of the vehicles of the 2011-2016 model years
- 77% of reductions are attributable to downstream vehicles sources, remaining 23% are attributable to upstream operations related to reduced petroleum extraction and refining to fuel the vehicle fleet
- To meet the standards in 2016, it is estimated that the Canadian new vehicle fleet will emit, on average, 246 gCO_2/mile
- The cumulative lifetime reduction in GHG emissions resulting from the Regulations is valued at **$1 billion**

Key Results from Analysis (cont'd)

Consumer Impacts

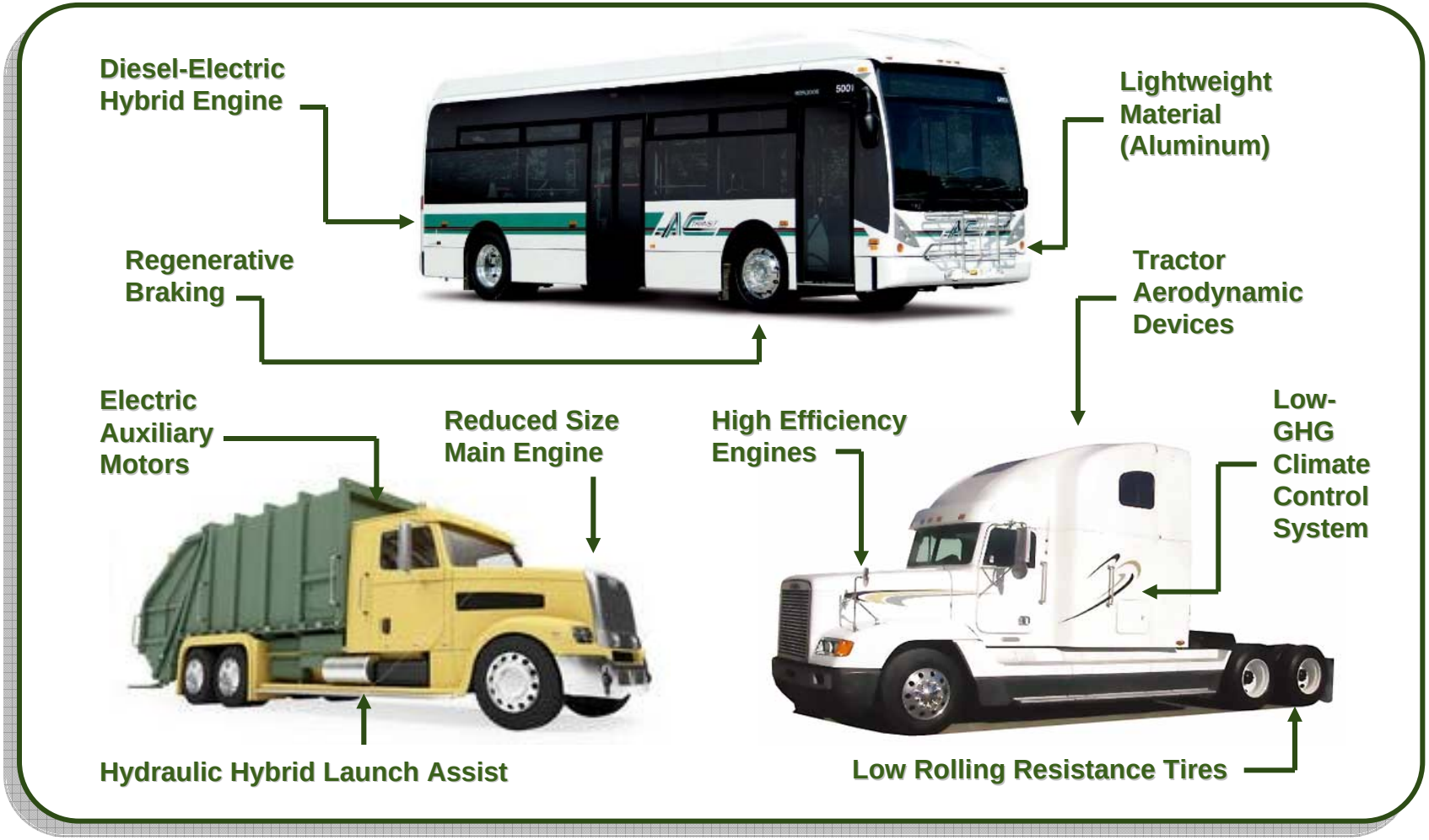


- To meet the standards in 2016, it is estimated that the per-vehicle purchase cost will increase in increments of :
  - Passenger Cars : $1,057 per vehicle
  - Light Trucks : $1,419 per vehicle
- The cumulative aggregated fuel savings over the lifetime of the six model years is estimated as **28 billion litres**
- The cumulative aggregated fuel savings will allow for the incremental increases in purchase costs to be paid off in an average of **1.5 years**
- The total lifetime net benefit from the 6 model years is estimated as **$9.2 billion**

Moving Forward on GHG Regulations for Heavy-Duty Vehicles

- In May 2010, Canada and the U.S. announced intent to regulate heavy-duty GHG emissions – Canada's regulations will be aligned with the U.S.
- In October 2010, Canada released a consultation document outlining the general direction for consideration in Canadian regulations
- Canada has been consulting provinces, vehicle manufacturers and truck operators
  - General support of proposed approach
  - Stakeholders will continue to be consulted throughout the regulatory process
- Proposed regulations are expected to be published in mid-2011 and will come into force for model year 2014, in alignment with the U.S.
- The U.S has estimated that the proposed standards would result in some heavy-duty vehicles achieving GHG emission reductions of up to 20 percent compared to 2010 baseline vehicles

Potential Technology Strategies to Reduce GHG Emissions for Heavy-Duty Vehicles



Summary

- Transportation is one of the largest sources of GHGs in Canada, accounting for 22% of total emissions in 2005
- Passenger automobiles and light trucks account for almost half of transportation emissions in Canada
- The Regulations will ensure significant improvements in the GHG emission performance of the new vehicle fleet of cars and light trucks in Canada
- There are significant environmental and economic benefits to an aligned approach, both nationally and across North America
- Canada will continue working closely with the U.S. to develop more stringent GHG emission standards for new passenger automobiles and light trucks of the 2017 and later model years

Supplemental Slides

Examples of Vehicle Emission Targets

	Model	Model Footprint (ft^2) *2011 Model Year*	2016 CO_2 Emissions Target (grams/mile)
Passenger Cars			
Compact car	Ford Focus	**42**	**210**
Midsize car	Chevrolet Malibu	**47**	**233**
Fullsize car	Chrysler 300	**48**	**238**
Light-duty Trucks			
Small SUV	Honda CR-V	**44**	**260**
Midsize crossover	Nissan Murano	**49**	**277**
Minivan	Chrysler Town and Country	**55**	**303**
Large pickup truck	GMC Sierra	**56**	**306**

Model Year 2016 GHG Emission Standards