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Calgary Specific Alternative Fuel and Technology Study

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Presentation Outline

- Corporate Context
- Alternative Fuel Study
- CALAFT Discussion
- Next Steps

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Corporate Context

- Corporate Climate Change Target of 20% reduction by 2020 and 80% reduction by 2050
- Fleet emissions currently fastest increasing source of corporate emissions

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Corporate Context

- Green Fleet program initiated
- Technology
- Fuels
- Fleet Planning & Operation
- Operator Behaviour

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Alternative Fuel Study

- Commissioned consultant to look at alternative fuels and technologies for key subsets of our heavy fleet
- Operational focus
- Economic Impacts
- Environmental Impacts

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What is CALAFT?

- Excel-based modeling framework that compares different vehicle technologies based on pollutant emissions and lifetime cost
- Tool estimates lifecycle and direct GHG and CA pollutant emissions from each technology, based on detailed tailpipe and life cycle emission factors as well cost
- Modeling framework developed by ENVIRON EC (CANADA), INC.

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Pollutants Covered

- Greenhouse Gases
  - Carbon Dioxide (CO_2)
  - Methane (CH_4)
  - Nitrous Oxide (N_2O)
  - Carbon Dioxide Equivalent (CO_2e)
- Criteria Air Contaminants
  - Carbon Monoxide (CO)
  - Oxides of Nitrogen (NO_X)
  - Non-methane Hydrocarbons (NMHC)
  - Particulate matter (PM)

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Data Inputs

- Vehicle Technology
- Fuel Technology
- Annual Operating Distance (km) and Fuel Economy (L/100km)
- Hybrid Fuel Use Reduction (%)
- Vehicle Year
- Application Year
- Life Span and Amortization Period (Years)
- Cost Data
  - Capital Costs (Infrastructure, vehicle purchase)
  - Vehicle Resale Value
  - Annual Costs (Maintenance, operating, fuel)

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Options Considered

- B5, B10, B20 Biodiesel Blends (Soy, Tallow, Canola, Yellow Grease)
- CNG, landfill gas
- Gasoline, Diesel, Propane
- Hybrid technology of various efficiencies
- Combinations of any fuel and hybrid technology

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Emission Estimation

- Development of a Calgary specific operating tailpipe emission factors for different duty cycle heavy-duty vehicles
  - MOBILE6.2
  - Other literature
- Life Cycle Analysis using GHGenius 3.19 model for Alberta

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Life Cycle Considerations

- Included in scope
  - Tailpipe
  - Upstream (Fuel and co-product production)
  - Carbon Credit (Carbon in end-use fuel from CO_2 in air)
  - Vehicle assembly and transport
  - Materials in vehicles
- Variables included
  - Geographical area
  - Source of fuel
  - Fuel type
  - Vehicle class
  - Technology

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CALAFT Applications

- Existing Fleet Scenarios
  - Impact of biodiesel blends use
- Future Fleet Scenarios
  - Combined impact of new technologies (hybrid buses, CNG) and biodiesel blends use

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Questions

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