Natural gas – a tool to economically decarbonize transportation in Ontario

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Agenda

• The size of the market
• Economies of scale impacts
• The potential with Renewable Natural Gas
• Barriers and solutions
• Conclusions and Summary
The size of the Ontario heavy duty market

Potential: 6.7 Billion DLE + 2.7 MtCO2e + $3B savings/year by 2035
Economies of scale are critical to success

Mileage = 120,000 miles/year for 5.0 years at 6.50 MPUSG with CNG premium = $65,000 (160 DGE tank @75% useful = 690 mile range)
Renewable Natural Gas

**LANDFILL GAS SYSTEM**

- Collect and process raw methane (50% CH₄) to pipeline quality gas
- Reduces methane leakage to the environment + displace fossil gas
- Significant GHG reduction possible – 80 to 170%
Potential GHG reductions due to RNG Production in Ontario

RNG can displace up to 16% of the conventional gas consumed in the province and provide significant GHG reduction benefits.

Source: www.uniongas.com/about-us/regulatory/rate-cases/eb-2011-0283-rng
CNG Potential Pump Price with RNG

Mileage = 120,000 miles/year for 5.0 years at 6.50 MPUSG
GHG Reduction Potential in Ontario with RNG Blending

GHG Reduction Potential in Ontario Medium and Heavy Duty Transportation with RNG blending

- **0% RNG** - GHG reduction @ 17%
- **12% RNG** - GHG reduction @ 25%
- **30% RNG** - GHG reduction @ 37%
- **50% RNG** - GHG reduction @ 51%

Potential GHG reduction (Mt CO2e/year)
Barriers and solutions

• CNG/LNG Vehicle premium & station infrastructure
  – Ontario support for 50% of vehicle premiums and public access stations

• CNG tank technology and costs
  – promote made in Ontario and target development of adsorbed CNG

• Current ~15% inefficiency of Spark Ignited vs. diesel engines
  – R&D to reduce or eliminate

• RNG Supply & Cost
  – Utilities pay market rates for portion of portfolio and blend in to CNG

• Fuel price uncertainty
  – excise tax exemption on natural gas

• Getting to scale – all of the above to the “tipping point”
Conclusions & Summary

• Cap and Trade is a “once in a lifetime” opportunity

• Natural gas can lower GHG emissions in Ontario's heavy duty transport sector **AND** save Ontario billions of dollars / year

• Renewable Natural Gas decarbonizes the natural gas system and the transportation sector

• Funding from the Greenhouse Gas Reduction Account is required to mitigate barriers

• As the market develops, the economic & GHG savings will become compelling - transforming the transportation sector