Volvo Group Position on Alternative Fuels for Commercial Vehicles
Volvo and the Alternative fuels

The Volvo Group products are almost exclusively driven by fossil diesel fuel

➔ Improve vehicle efficiency
➔ Increase the use of renewable fuels

Must be sustainable for **all** the stakeholders

✓ Adapted to customer operations
✓ Efficient “well to wheel”
✓ Economically viable without subsidies
Evaluation of fuel pathways

- Minimized climate impact
- Energy efficiency
- Efficiency of land use
- Fuel potential
- Vehicle adjustment
- Fuel costs
- Fuel infrastructure

Source: Volvo Sustainability Report 2013
Volvo’s position on alternative fuels

Trucks and buses

**Long distance applications**

- Liquid methane and DME are the main prioritized alternatives. Dynamic electric charging is an additional alternative long term.

**Medium distance applications**

- Compressed methane and DME are the main prioritized alternatives. Dynamic electric charging is an additional alternative long term.

**Urban applications**

- Electricity and compressed methane are prioritized
Trucks need range and power to deliver

Horsepower / Torque

Distance traveled before refueling

Compression Ignition
LNG / DME

Spark Ignition
CNG

Spark Ignition
LNG

Not to Scale
Operational efficiency

• Alternatives must be compatible with HD truck applications
  – Clear back of Cab
  – Fast fill
  – Same maintenance intervals as Diesel

• Truck efficiency in operations
  – No significant weight increase
  – Engine efficiency
  – Short wheelbase

• On-truck fuel stability and venting management to limit GHG impact (no venting preferred)
End customer payback sensitivity

- Hypothesis
  - Typical regional haul application using LNG
  - LNG retail price calculated from Henry Hub spot prices
  - No incentive taken into account

⇒ Compression ignition for more stable ROI
⇒ Need at least 2015 price scenario for decent payback
Takeaways and key messages

- GHG emission reduction is a must
- Same or improved operational efficiency as today’s solution
  - Fuel and truck cost
  - Transport capacity
  - As simple as possible

⇒ Overall efficiency is mandatory