Filling Your Needs: the NGV Option

Presentation to
Energy 2003: An Energy-Efficiency Workshop and Exposition

August 19, 2003

Why Consider NGVs?

- Cleanest vehicles available

Cleanest Vehicles Available

- Compared to gasoline vehicles with similar emission technology, NGVs produce less:
  - NOx - VOCs - CO
  - Air toxics - Greenhouse gases
- Compared to diesel vehicles with similar emission technology, NGVs produce less:
  - NOx (especially NO_2) - Particulates
  - Air toxics -Greenhouse gases
- This will continue to be true -- even with new emissions technology

Why Consider NGVs?

- Cleanest vehicles available
- Reduces U.S. dependence on foreign oil

Reduces U.S. Dependence on Foreign Oil

- Letting oil continue to dominate the U.S. transportation system is stupid public policy:
  - Restricts military and foreign policy options
  - Worsens balance-of-trade (i.e., weakens economy/ costs jobs)
- Currently, world oil production capacity exceeds demand
- Within 20 years, world oil demand projected to grow by at least 50 %
  - China (150%), FSR (100%), Pacific Rim (120%)
  - Demand projected to outstrip supply capability

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Reduces U.S. Dependence on Foreign Oil

- Prices will continue to rise
  - Real market price will determine allocations
- More gasoline/diesel engine efficiency and petroleum hybrids are a step in the right direction
  - They don't solve the problem
- 85% of natural gas used in the U.S. is produced in the U.S.
  - Virtually all the rest is produced in Canada
- Prices projected to come down beginning next year through at least 2009

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Light Duty OEM NGVs
Model Year 2003

- Ford
  * Crown Victoria sedan (dedicated)
  * Econoline vans/wagons (dedicated)
  * F-150 pickups (dedicated & bi-fuel)
  * E- 450 Cutaway (dedicated)
- Honda
  * Civic sedan (dedicated)
- GM
  * GMC/Chevy 2500 pickup (dedicated)
  * GMC/Chevy vans/wagons (bi-fuel)
  * Chevy Cavalier sedan (bi-fuel)
  * Chevy Express/GMC Savannah 6L Cutaway (dedicated & bifuel)

Medium/Heavy-Duty Natural Gas Engines Available

- Caterpillar 3126; C-10; C-12
- Cummins B5.9; C8.3
- Deere Power Systems 6.8L; 8.1L
- Detroit Diesel 50G; 60G
- Mack E7G
- AFT (N466 Navistar Re-power)
- Crusader/IMPCO 4.3L; 7.0L

Truck Manufacturers Offering Natural Gas Models

- Freightliner
- Peterbilt
- Mack
- Volvo GM
- Crane Carrier
- Athey
- Elgin
- Ottawa
- SISU

Bus Manufacturers Offering Natural Gas Models

- **Transit Buses**
  - Orion
  - NeoPlan
  - El Dorado
  - North American Bus
  - New Flyer
  - NOVA
  - TransTeq
- **School Buses**
  - Blue Bird
  - Thomas Built
- **Shuttles**
  - El Dorado
  - Blue Bird
  - Champion
  - Goshen
  - Metrotrans
  - North American
  - Transit
  - Orion

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- Higher first cost but cheaper to operate

Higher First Cost But Cheaper to Operate

- NGVs cost more to purchase:
  - Primarily cost of tanks
  - Little mass production; Little economies of scale
- Lower fuel cost
  - Only 30% of delivered CNG cost is the fuel
- Lower maintenance cost
- Gasoline and diesel vehicles will be getting more expensive to own and operate

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Many Government Incentives Available

- Over 30 states offer some alt fuel vehicle incentives
  - Some much greater than others
- Existing federal government programs:
  - EPAct mandates
  - CMAQ
  - Clean Cities SEP
  - FAA ILEAV
  - FTA bus program

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Many Government Incentives Available

- New federal government programs:
  - The CLEAR ACT
    - AFV purchase incentives
    - Alt fuel purchase and use incentives
    - Infrastructure construction incentives
  - The Green School Bus Program
    - $245 million over four years to replace of old school buses with AFVs or advanced technology buses

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- Helps transition to hydrogen vehicle future

Helps Transition to Hydrogen Future

- Long-term future:
  - Fuel cell vehicles powered by cheap (possibly, solar) electricity
- Until then, natural gas will be the main hydrogen source
  - Currently, natural gas is primary source for industrial hydrogen
  - Currently, all stationary fuel cells in commercial operation are fueled by natural gas
  - DOE states that natural gas reformed at the fueling station will be the best hydrogen option for at least the next 25 years

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Helps Transition to Hydrogen Future

- Meanwhile, NGVs are paving the way for hydrogen by advancing:
  - High pressure or cryogenic gas storage
  - Gas and cryogenic liquid metering and dispensing
  - Garage and maintenance facilities equipped to handle gaseous fuel vehicles
  - Mechanics, inspectors, etc. trained to work with gaseous fuel vehicles
  - Customers that are comfortable with gaseous fuel vehicles

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Are NGVs for Everybody?

- No -- at least not yet.
- Models not available for all applications
- Cross-country fueling infrastructure doesn't exist
- First cost may be a barrier
- You might not have support from above

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