US Light Duty Natural Gas Vehicles – Role of NGV’s and Implications for Regional Manufacturing

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Shale Gas: Implications for America’s Regional Manufacturing Economies
National Academy of Engineering, Carnegie Mellon University
US Natural Gas Vehicle Considerations

Policy Incentives

Fuel based

Privileges based

Vehicle based

Refueling Station Proximity, Density and Access

Fuel Price Differential versus gasoline

2500 HD / 3500 HD Full Size Van
Dedicated CNG Van Offerings – 6.0L

¾ Ton and 1 Ton 135” and 155” Wheelbase Cargo

Shipment of our Chevrolet Express and GMC Savana CNG Cargo Vans began in late January 2011 with over 2400 units produced.
2500HD Extended Cab Pick-up Truck
Bi-fuel CNG – 6.0L (LC8)
Chevrolet Silverado and GMC Sierra
Available with long or short bed
Available in both 2WD and 4WD

2013 Model Year introduction with over 1300 orders
Hurdles for LIGHT DUTY Natural Gas Vehicles

- Direct Injection – Technical Pathway
- Increase Energy Density - Storage Systems
- Vehicle Price Premium

Low and High bound on incremental costs used to model range of uncertainty in projections.
With assumptions used, significant reductions in incremental costs are possible.

Source: National Petroleum Council – August 2012
Compressed Natural Gas (CNG) Cylinder Types

Type 1: Steel, 100%

Type 2: Aluminum, 70%
- Hoop-wrapped composite, steel or aluminum liner

Type 3: Fully-wrapped composite, aluminum or stainless steel liner, 60%

Type 4: Fully-wrapped composite, plastic liner, 40%

For illustration purposes only
Achieving maximum fuel economy potential, while meeting requirements for quality, emissions and performance with advanced engine and transmission fuel saving features in conjunction with CNG variants pose challenges:

- Advanced Combustion
- Variable Valve Timing
- Active Fuel Management
- Downsize boost
- Electronic Returnless Fuel System
- 6 Speed Transmission
- Stop/Start
Six Things We Need to Get Right

- Market analysis
- Technical features
- Customer experience
- Public education
- Public policy
- Advanced features and new opportunities

Everything BEGINS & ENDS with GREAT PRODUCTS