



# Heavy-duty NG Vehicles

ARPA-E NG Vehicles Workshop  
Afternoon Breakout

1/26/2012

# Session Insights, Group 3: Heavy-duty NG Vehicles

- **Infrastructure for Heavy Duty Vehicle Adoption:**

- Partial bypass to city gates installed, with bypasses to highways
- Pipeline gas is cheaply cleaned and monitored upstream to ASTM Stds for LNG conversion
- Markets established for all NG components
- High Pressure Gas lines coated to make them tolerate much higher pressures, or pipe-in-pipe high pressure lines.

- **Heavy Duty Vehicles**

- Long Haul: LNG is main fuel, with high energy capacity for CNG from sorbant-filled tanks. CNG is on the trailer, Rectangular LNG is on tractor.
  - Skirted trucks auto-organize to make long distance truck-centipedes for air resistance.
  - Pressure vessels have become structural components of the trailers (40' long walls made of bamboo-like synthetic materials)
  - Effective connection between tractor and trailer gas lines
- Short Range Fleets: CNG is main fuel

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- **Trailers are slow-refueled with CNG when parked or unloading**
- **LNG Boil-off is managed for use, not vented from tanks**
  - Small APUs on vehicle
- **CNG is used to convert into LNG on-demand at hybrid stations**
  - Compressors are cheap enough and fast enough to meet demand
  - Cost of CNG vs. LNG Stations equalize by on-the-fly generation
- **LNG refueling requires no shields and aprons**

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## *Problems encountered with a CNG/LNG Hybrid Tractor-Trailer*

- **Structural Strength of Trailer Tanks**
  - Make Trailers last 10 years
  - Make Tractors last 600-650k miles without overhaul
    - (could be less, depending on cost of fuel, or hourly usage)
- **Connection of Fuel System Safely**
  - Connection to tractor
- **Fleet Management of Trailers versus Tractors**
- **Maintenance is critical**
  - Inspectors and repair technicians have all been trained, and facilities staffed