Alternative Fuels Overview
Overview Alternative Fuels

David Hagopian
David@AdvancedVTech.com
847-777-5000
Alternative Fuels

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5. Quality and Skill of Installation
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Overview Alternative Fuels

1. Liquified Petroleum Gas (Propane, LPG, or AutoGas)
2. Compressed Natural Gas (CNG)
3. BioDiesel (B100)
Natural Gas or CNG

- Methane (CH4).
- Extracted from gas and oil wells.
- Existing pipeline distribution system.
- The USA has an abundance on natural gas.
- Lower emissions (40% less than Gasoline engines).
- On average $2 per gallon less in cost than Gasoline.
- Infrastructure investment required.
CNG System
Propane, LPG, or AutoGas

- Formula C3H8.
- Byproduct of petroleum refinement.
- Extensive distribution system, especially in rural areas.
- Lower emissions (20% less than Gasoline engines).
- On average $1.20 per gallon less in cost than Gasoline.
- Fueling tank and pump often provided by LPG supplier (for onsite fueling of vehicles).
Propane System
Bio Diesel

- Mainly derived from corn
- Known as B100
- 10-20% reduced fuel cost
- 80% GHG reduction
- Can be retrofitted to current diesel fleet
- Requires separate B100 tank.
What is a GGE?

- Gasoline gallon = 114,500 BTU
- Natural gas therm = 100,000 BTU
- Natural gas gallon with equivalent energy to gasoline gallon
  - Natural gas GGE = 1.145 therms = 114,500 BTU
- If therm cost = $0.436/therm
- Then GGE cost = $0.436 \times 1.145 = $0.499/GGE
- Cost of compression – electricity $0.10 - $0.20 / GGE
- Cost of compression equipment
Operating Savings – Police Example

- Average Police Fuel Usage is 6 to 10 gallons per shift
- 2 shifts a day, 6 days a week 50 weeks a year
- 3,600 to 6,000 gallons of Gasoline per year
- LPG savings of $4,300 to $7,200 per year
- CNG savings of $7,200 to $12,000 per year
Operating Savings (continued)

- LPG Ford Police Utility Interceptor Cost about $8,400
- CNG Ford Police Utility Interceptor Cost about $10,400
- **Payback is two years!**
- With 4 year service life savings range from $17,200 to $48,000 per vehicle
Why Gaseous Fuels?

- Alternative fuel used since WWII.
- Alternative fuels are being used by municipal and business fleets across the nation.
- Fleets around the world have converted almost every vehicle platform.
- Cost savings are measurable and significant.
- Technology is currently being used in the Wisconsin and Illinois.
  - Jefferson County, WI
  - Port Washington, WI
  - University of Illinois Chicago (Illinois State Police)
  - Elmhurst, IL
Examples: F250 LPG
F150 with ReFueling and Police Tahoe CNG
F350 Fire Rescue CNG
Safety and Environmental Regulations

1. Department of Transportation (Tanks)
2. National Fire Protection Association (52 & 58)
3. US EPA / California Air Resources Board Certified
Quality of System Design & Installation

1. Know the system manufacturers
2. Seek Comments from end users
3. Experience matters
Quality & Installation Skill
Quality & Installation Skill
Quality & Installation Skill
Quality & Skill of Installation
Quality & Skill of Installation
Poor Installations
Poor Installations
Poor Installations

A view of the car destroyed in a CNG kit explosion near general bus terminal at Haji Camp on Grand Trunk Road, Peshawar on Monday. The blast killed a newly-wed couple.— Sardar Mahmood ul Hassan.
Diagnosis & Maintenance Expertise

- Alternative Fuel is not rocket science
- For bi-fuel it is a secondary fuel system
  - Control System, Injectors, Low Pressure, Regulator, High Pressure, Safety Components, Tank
- Alternative Fuel Systems are just like traditional fuel systems……
Diagnostics & Maintenance Expertise

• They will eventually need service.
• Successful programs will have diagnostics and maintenance service providers that will NOT deflect responsibility, but WILL keep the vehicles running smoothly.
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