Economic, Environmental & Performance Impact of Propane Autogas
Key Drivers to Deployment

Fleet Research (300 of top 500 fleets in North America):

• Economic
• Performance
• Environmental
• Serviceability
• Quality
• Infrastructure
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Performance Impact:

The Zero Compromise Alternative Fuel Solution
Performance

2011 Ford E-250 w/ 5.4L V8 Engine

Gasoline/Propane Power and Torque Comparison

Torque (ft-lbs) / Power (hp)

RPM

- Gasoline Torque
- Gasoline Power
- Propane Torque
- Propane Power

800.59.ROUSH
ROUSHcleantech.com
Environmental Impact:

Reducing Emissions & Carbon Footprints
Environmental Impact

ROUSH CleanTech Liquid Propane Autogas Vehicles

- 60% Less Carbon Monoxide
- 24% Fewer Greenhouse Gases
- 20% Less Nitrogen Oxide

Ferrellgas’ ROUSH CleanTech Ford F-250

- 47,000 miles plus travelled
- 5,954 fewer lbs of CO2
- $3,500 saved in fuel costs
# Environmental Savings Calculator

## C02 Emissions Reduction: Ford E-450

### 2011 Ford E-450

<table>
<thead>
<tr>
<th>Emissions Reductions</th>
<th>Gasoline</th>
<th>Propane</th>
<th>Difference (Gasoline - Propane)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Vehicle Life (miles)</td>
<td>200,000</td>
<td>200,000</td>
<td>0</td>
</tr>
<tr>
<td>Average Miles per Gallon</td>
<td></td>
<td>10.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Gallons of Fuel Used Over Life of Vehicle</td>
<td>20,000</td>
<td>22,222</td>
<td>(2,222)</td>
</tr>
<tr>
<td>Carbon Mass per Gallon Fuel (lb / gal.)</td>
<td>5.10</td>
<td>3.47</td>
<td></td>
</tr>
<tr>
<td>Mass of CO2 per Gallon Fuel (lb / gal.)</td>
<td>10.70</td>
<td>12.72</td>
<td></td>
</tr>
<tr>
<td>Total Lbs of CO2 Produced During Vehicle Life:</td>
<td>373,912</td>
<td>282,627</td>
<td>91,285</td>
</tr>
</tbody>
</table>

**Fewer Lbs of CO2 Produced Using Propane Autogas:** 91,285

### Assumptions:

- Fuel Properties Used
  - Gasoline: C8H18
  - Propane: C3H8
- Fuel Density (lb / gal): Gasoline 6.07, Propane 4.23
- Energy Density (BTU / gal): Gasoline 114,100, Propane 84,300
- Main Consituents (% by weight): Gasoline 84C 16H, Propane 82C 18H
Return On Investment:

A Positive Return, Even Without Government Incentives
### 2011 Ford E-250

<table>
<thead>
<tr>
<th>Capital Costs</th>
<th>Gasoline (5.4L V8)</th>
<th>Propane (5.4L V8)</th>
<th>Savings or (Cost) to Convert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Ford Vehicle Purchase Price</td>
<td>$28,400.00</td>
<td>$20,400.00</td>
<td>$10,900.00</td>
</tr>
<tr>
<td>Roush Propane System Conversion Price</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal Alternative Motor Vehicle Tax Credit (propane only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Capital Savings or Investment to Convert</strong></td>
<td><strong>$28,400.00</strong></td>
<td><strong>$39,300.00</strong></td>
<td><strong>($10,900.00)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Costs (fuel)</th>
<th>Gasoline (5.4L V8)</th>
<th>Propane (5.4L V8)</th>
<th>Savings or (Cost) Over Life of Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Vehicle Life (miles)</td>
<td>200,000</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>Average Miles per Gallon</td>
<td>13.0</td>
<td>11.7</td>
<td></td>
</tr>
<tr>
<td>Gallons of Fuel Used Over Life of Vehicle</td>
<td>16,385</td>
<td>17,054</td>
<td></td>
</tr>
<tr>
<td>Fuel Price (per gallon)*</td>
<td>$3.00</td>
<td>$2.00</td>
<td></td>
</tr>
<tr>
<td>+ Federal excise tax credit / gallon (propane only)</td>
<td>-</td>
<td>$(0.50)</td>
<td></td>
</tr>
<tr>
<td>+ Adjusted Fuel Price (per gallon)</td>
<td>$3.00</td>
<td>$1.50</td>
<td></td>
</tr>
<tr>
<td><strong>Total Fuel Savings or Cost Over Life of Vehicle</strong></td>
<td><strong>$46,153.85</strong></td>
<td><strong>$25,641.03</strong></td>
<td><strong>$20,512.82</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Costs (misc.)</th>
<th>Gasoline (5.4L V8)</th>
<th>Propane (5.4L V8)</th>
<th>Savings or (Cost) Over Life of Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance Rate per mile (tune-ups, oil, engine life, etc.)</td>
<td>$0.000</td>
<td>$0.015</td>
<td></td>
</tr>
<tr>
<td>Maintenance Costs</td>
<td>$6,000.00</td>
<td>$3,000.00</td>
<td></td>
</tr>
<tr>
<td>Fuel Loss from Pillage &amp; Theft ($100 per year)</td>
<td>$700.00</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td><strong>Total Misc. Savings or Costs Over Life of Vehicle</strong></td>
<td><strong>$56,700.00</strong></td>
<td><strong>$33,000.00</strong></td>
<td><strong>$3,700.00</strong></td>
</tr>
</tbody>
</table>

**Gross Vehicle Lifetime Savings or Loss:** $24,212.82

**Net Vehicle Lifetime Savings or Loss (minus investment to convert):** $13,312.82
## 2011 Ford E-450 Cutaway

### Capital Costs
- **Base Ford Vehicle Purchase Price**: $30,175.00
- **ROUSH Propane System Conversion Price**: $13,900.00 (propane only)

**Total Capital Savings or Investment to Convert:** $30,175.00

### Operating Costs (fuel)
- **Total Vehicle Life (miles)**: 200,000
- **Average Miles per Gallon**: 8.0
- **Gallons of Fuel Used Over Life of Vehicle**: 25,000
- **Fuel Price (per gallon)**: $3.00 (Gasoline), $2.00 (Propane)
- **Federal excise tax credit / gallon (propane only)**: $0.50
- **Adjusted Fuel Price (per gallon)**: $3.00

**Total Fuel Savings or Cost Over Life of Vehicle:**
- **Gasoline**: $66,666.67
- **Propane**: $37,500.00

**Savings or (Cost) to Convert**: $29,166.87

### Operating Costs (misc.)
- **Maintenance Rate per mile (tune-ups, oil, engine life, etc.)**: $0.030 (Gasoline), $0.015 (Propane)
- **Maintenance Costs**: $6,000.00 (Gasoline), $3,000.00 (Propane)
- **Fuel Loss from Pillage & Theft ($100 per year)**: $700.00 (Gasoline), $50.00 (Propane)

**Total Misc. Savings or Costs Over Life of Vehicle:**
- **Gasoline**: $6,700.00
- **Propane**: $3,000.00

**Savings or (Cost) to Convert**: $3,700.00

### Gross Vehicle Lifetime Savings or Loss:
- **Gasoline**: $32,866.67

### Net Vehicle Lifetime Savings or Loss (minus Investment to convert):
- **Gasoline**: $18,966.67
ROUSH and Propane Autogas:
Our Competitive Advantage
The ROUSH CleanTech Difference

Over 30 Years of Engineering Experience
- CNG
- Electric
- Electric Hybrid
- Hydrogen

Rigorous Customer Research, Development, and Testing

Seamless Customer Experience
- Service Centers
- Vehicle Warranty

Wide Variety of Product Offerings:
- Ford F-250 / F-350
- Ford E-150 / E-250 / E-350
- Ford E-350 DRW Cutaway
- Ford E-450 DRW Cutaway
- Ford F-450 / F-550