Implications of an Emerging NGV Market

Natural Gas Vehicles: Fuel savings, emission reductions, and energy independence

February 8, 2012
What’s Driving Interest in NGVs?

Current fuel price differential between natural gas and gasoline / diesel is very favorable, $1.25 - $1.65 per Gas Gallon Equivalent (GGE) in NC (includes all applicable taxes)

Primary Source: EIA
E85Prices.com
PNG Rate 142

As of 1/27/12
What’s Driving Interest in NGVs?

This price advantage is expected to be maintained, given ample natural gas supply and rising world oil demand.

As of 1/27/12
Natural Gas Is An Abundant U.S. Energy Resource

• Our natural gas resource base is enormous – with potential benefits to the economy, environment and security
• The benefits depend upon access and responsible development
What’s Driving Interest in NGVs?

• Natural gas is increasingly viewed as a green, low-carbon fuel and this perception casts NGVs in a very favorable light as the U.S. moves toward a greener, more efficient economy

Source: US Department of Energy
Also, power is not sacrificed with today’s natural gas vehicles. Natural gas has a 117 octane rating that results in higher compression ratios, improved engine performance, reduced maintenance, higher reliability, and cleaner air. And typically, every other oil change can be skipped.

What’s Driving Interest in NGVs?

- NGVs produce lower levels of most exhaust pollutants than gasoline or diesel vehicles
- Compared to diesel, natural gas engines reduce emissions
  - Carbon monoxide by 70%
  - Non-methane organic gasses by 87%
  - Nitrogen oxides by 87%
  - Greenhouse gasses by 24%
- Natural gas is 40% - 50% less expensive than diesel or gasoline on an equivalent energy basis
- 98% percent of natural gas consumed in the United States is domestically produced
What is the Value Proposition for CNG Customers?

- Operating cost reductions
- Reliability/uptime improvement – big for forklift operators
- Compliance with federal EPACT or state petroleum displacement goals
- Local air quality improvement, particularly for non-attainment areas
- Diversity of fuel supply (hedging against future fuel availability or price)
- Convenience of on-site fueling
- Carbon footprint (GHG) reduction
- Sustainability goals (example: AT&T’s justification was due to desire to lead)
- “Green” publicity
- Preference for US-produced fuel
What Size Market Are We Talking About?

- According to EIA, in 2009 over 5 billion gallons of gasoline and diesel were used as transportation fuels in North Carolina.

- This would equate to 680 million dt of natural gas.

- By comparison, total sendout by gas utilities in NC for 2010 was 283 million dt.
Piedmont’s Transmission Pipeline Network
What are System Infrastructure Implications?

- Average fill up by customers using our stations in Nov 2011 was 10.74 GGE, or 13.53 therms = 1.353 dts
- Among the cities in our NC territory, our system can absorb demand ranging from thousands of dts/d in each smaller city to tens of thousands of dts/d in Charlotte before significant system infrastructure spending will be required.
- This means that we can serve many tens of thousands of high-mileage fleet vehicles in NC before significantly impacting system cost structure; we currently have a little over 100 third party vehicles filling up.
- Moreover, NGVs don’t all fill up at once -- load is spread over the day and year, making it an efficient system load (vs a furnace which pulls hardest on winter mornings).
# Current CNG Stations & Customer Usage

<table>
<thead>
<tr>
<th>Active Stations</th>
<th>Customer Sales 1</th>
<th>Conversion To Therms</th>
<th>Equivalent Homes 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charlotte</td>
<td>3,633 GGE/mo</td>
<td>4,578 th/mo</td>
<td>79</td>
</tr>
<tr>
<td>Nashville, TN</td>
<td>2,744 GGE/mo</td>
<td>3,457 th/mo</td>
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<tr>
<td>Greensboro</td>
<td>2,430 GGE/mo</td>
<td>3,062 th/mo</td>
<td>53</td>
</tr>
<tr>
<td>Greenville, SC</td>
<td>1,257 GGE/mo</td>
<td>1,584 th/mo</td>
<td>27</td>
</tr>
<tr>
<td>High Point</td>
<td>314 GGE/mo</td>
<td>396 th/mo</td>
<td>7</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>10,378 GGE/mo</strong></td>
<td><strong>13,077 th/mo</strong></td>
<td><strong>226</strong></td>
</tr>
</tbody>
</table>

1 Activity for November 2011
2 Based on 5 year average of 63.9 dts/yr and Nov run rate
# Current CNG Stations & PNG Usage

<table>
<thead>
<tr>
<th>Active Stations</th>
<th>PNG Fleet Usage</th>
<th>Conversion To Thers</th>
<th>Annualized Net Gasoline Savings²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charlotte</td>
<td>4,502 GGE/mo</td>
<td>5,673 th/mo</td>
<td>$165,009</td>
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<tr>
<td>Nashville, TN</td>
<td>2,868 GGE/mo</td>
<td>3,614 th/mo</td>
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<tr>
<td>Greensboro</td>
<td>2,973 GGE/mo</td>
<td>3,746 th/mo</td>
<td>$108,578</td>
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<tr>
<td>Greenville</td>
<td>1,151 GGE/mo</td>
<td>1,450 th/mo</td>
<td>$38,307</td>
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<tr>
<td>High Point, SC</td>
<td>335 GGE/mo</td>
<td>422 th/mo</td>
<td>$11,752</td>
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<tr>
<td>Totals</td>
<td>11,829 GGE/mo</td>
<td>14,905 th/mo</td>
<td>$424,290</td>
</tr>
</tbody>
</table>

¹ Activity for November 2011
² Run rate based on avg gasoline price paid for Nov of $3.36
Piedmont CNG Stations and Charges

- 5 stations currently, 10 or more total by end of 2012, and 12 – 14 by 2013
- NC margin rate for sales of gas for transportation use under Rate Schedule 142 is $0.25/therm, similar to a large commercial customer
- Tariff also allows for an additional rider up to $0.40/therm to charge customers for the cost of the station compression equipment
- Other taxes are collected (federal & NC excise, NC road tax & inspection fee)
Diversity of Customers
Customers Waiting for Service.....