Propane In North America: Positioned for Renewed Growth

LP Gas: Exceptional Energy for North America and Europe

February 9, 2011
WLPGA North American-European Summit
Washington, D.C.

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ICF Forecast of U.S. Propane Demand

Propane Consumption by Sector

- Internal Combustion
- Agriculture
- Industrial
- Resellers
- Commercial
- Residential

-3.6%
-5.2%
-1.5%
-4.3%

Forecast: -2.0%
ICF Forecast of U.S. Propane Demand With Current Market-Building Efforts


<table>
<thead>
<tr>
<th>Percent of Incremental Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
</tr>
<tr>
<td>New Home Construction</td>
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<tr>
<td>New Technologies</td>
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<tr>
<td>Other Residential Programs</td>
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<tr>
<td>Commercial</td>
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<tr>
<td>New Technologies</td>
</tr>
<tr>
<td>Other Commercial Programs</td>
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<tr>
<td>Engine Fuel</td>
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<tr>
<td>On-Road Vehicle Programs</td>
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<tr>
<td>Commercial Mower Programs</td>
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<tr>
<td>Outdoor Equipment Programs</td>
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<tr>
<td>Other Engine Fuel Programs</td>
</tr>
<tr>
<td>Agricultural</td>
</tr>
<tr>
<td>Agriculture Engine Applications</td>
</tr>
<tr>
<td>Other Agriculture Technologies</td>
</tr>
<tr>
<td>Total Incremental Growth</td>
</tr>
</tbody>
</table>

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Residential Products

Micro-CHP
- 5 IC Engine
- 4 Stirling Engine
- 6 PEM Fuel Cell
- 6 Solid Oxide FC
- 3 Other External Combustion

Home Generators

Tankless Water Heaters
- Bosch — Pictured
- Rinnai
- Paloma
- Takagi
- Noritz

Combi Boilers
Vehicle Use

OEM – Bi-fuel
Chevrolet Matiz + several others

Ford Falcon – E-Gas

OEM– Dedicated

Hyundai Elantra

Conversions

ICOM JTG HP direct-injection system
AG, ICOM, Prins, BRC, Eurogas, Landi, Lima, Romano, Zavoli
North American LPG Supply

New Opportunities from the Application of Technology
Quarterly Distillate and Propane Net Imports, 2005 - 2010

Source: Energy Information Administration
Rapid growth of unconventional gas.

Historically, tight gas has been dominant

Shale will become the dominant source.
Natural Gas Production From the Shales to Double Over the Next 5 Years

- Production from the Haynesville, Marcellus, and Fayetteville will account for almost all of the growth.
- The Barnett has matured and is likely to decline.
- Eagle Ford rises as gas is a byproduct of liquids production.
- Woodford increases modestly in pockets.
Evolution of Stimulation Practices

**Early Horizontal Well Completion Practices**

Stage 3  Stage 2  Stage 1

1,500'

**Latest Gas Shale Well Completion Practices**

Stage 12  Stage 11  Stage 10  Stage 9  Stage 8  Stage 7  Stage 6  Stage 5  Stage 4  Stage 3  Stage 2  Stage 1

5,000'
Shale Formations of the U.S.

- Shale formations are widely distributed.
- Wide range of geologic age
- Some are dry, others are wet
- Wide depth range

Source: NEB, “Understanding Canadian Shale Gas,” 2009
## U.S. Liquids Production And Reserves

### Recoverable Gas and Liquids from Eagle Ford Shale, 60 Acre Spacing

<table>
<thead>
<tr>
<th></th>
<th>Dry Gas (Billion cubic feet)</th>
<th>Lease Condensate / Crude Oil (Million Barrels)</th>
<th>Ethane (Million Barrels)</th>
<th>Propane (Million Barrels)</th>
<th>Butane (Million Barrels)</th>
<th>Pentanes Plus (Million Barrels)</th>
<th>Total (Million Barrels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMBtu/bbl</td>
<td>74,199</td>
<td>4,614</td>
<td>3,062</td>
<td>1,292</td>
<td>958</td>
<td>1,494</td>
<td>127,704</td>
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<tr>
<td>Trillion Btu</td>
<td>76,425</td>
<td>26,764</td>
<td>8,529</td>
<td>4,968</td>
<td>4,091</td>
<td>6,927</td>
<td>127,704</td>
</tr>
<tr>
<td>Fraction of Btus</td>
<td>60%</td>
<td>21%</td>
<td>7%</td>
<td>4%</td>
<td>3%</td>
<td>5%</td>
<td>100%</td>
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Concluding Thoughts

LPG in a Globalized World