Peak Day Gas Analysis

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• The intention of the information contained in this presentation is to drive additional discussion on the value of firm gas transportation and should be considered for educational purposes only.

• The data used in calculations is based on a hypothetical generator example
Introduction

- January 2014 weather raised questions relating to the global cost of gas on peak gas demand days
  - Gas costs on secondary market peaked at $123 per MMBtu
- Analysis performed looked at the number of peak days gas needed to cover cost of firm transportation reservation fee
- Analysis is NOT attempting to estimate probability of peak day events

The numbers used for calculation purposes are based on estimates. The results of the calculations are intended for educational and discussion purposes only.
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Market East Gas Cost Estimates (January 2014)

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Annual Firm Transportation Reservation Fee

(Peak Day Gas Costs – Peak Day Firm Transportation Costs)
Firm Transportation Assumptions

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- Only generators with **interstate** gas interconnections were included in study
- Highest reservation rate used, if generator has multiple interstate gas interconnections
- Nomination quantity is equal to the gas needed at maximum hourly generation
  - Ratable takes
Peak Day Gas Cost Assumptions

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1. Gas burn quantity is equal to maximum generation over a 24 hour period
   - Limitations were inferred for generators unable to run for 24 straight hours

2. Peak gas price was equal to the average of the top 5 gas prices at the plant’s applicable gas hub
Peak Day Firm Transportation Cost Assumptions

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  - Ratable takes
Other Assumptions

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- Plants are able to obtain gas each day, regardless of whether generator is firm or interruptible.
- Plants pay tariff rate for gas transportation.
- Plants will use all gas purchased/scheduled and will not be required to sell any gas back into marketplace or incur any imbalance charges.
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Single Generator Example
The numbers used for calculation purposes are based on estimates. The results of the calculations are intended for educational and discussion purposes only.

<table>
<thead>
<tr>
<th>Plant X</th>
<th>Operating Capacity (MW)</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Heat Rate</td>
<td>9,500</td>
</tr>
<tr>
<td>Pipeline Y</td>
<td>Reservation Rate</td>
<td>$ 0.40</td>
</tr>
<tr>
<td></td>
<td>Usage Rate</td>
<td>$ 0.01</td>
</tr>
<tr>
<td>Production Price for Gas</td>
<td></td>
<td>$ 3.50</td>
</tr>
<tr>
<td>Applicable Peak Gas Price</td>
<td></td>
<td>$ 75.00</td>
</tr>
<tr>
<td># of Peak Days Annually</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>
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**Annual Firm Transportation Reservation Fee**

(Peak Day Gas Costs – Peak Day Firm Transportation Costs)
Annual Firm Transportation Fee

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\[
\text{Annual Firm Transportation Reservation Fee} = \text{Firm Transportation Rate} \times \text{Gas Nomination Quantity} \times 365
\]

\[
\downarrow
\]

\[
\text{Firm Transportation Rate} \times (\text{Operational Capacity} \times (\text{Heat Rate}/1000) \times 24 \text{ Hours})
\]

\[
\downarrow
\]

\[
(\$0.40 \text{ per MMBtu}) \times (800 \times (9,500/1000) \times 24) \times 365
\]

\[
\downarrow
\]

\[
\text{Annual Firm Transportation Reservation Fee} = \$26,630,400
\]
The numbers used for calculation purposes are based on estimates. The results of the calculations are intended for educational and discussion purposes only.

\[
\text{Peak Day Gas Cost} = \text{Gas Nomination Quantity} \times \text{Applicable Peak Gas Price} \times \frac{\text{Operational Capacity} \times (\text{Heat Rate}/1000)}{24 \text{ Hours}} \times \text{Applicable Peak Gas Price}
\]

\[
= (800 \times \frac{9,500}{1000} \times 24) \times 75.00
\]

\[
\text{Peak Day Gas Cost} = $13,680,000
\]
Peak Day Firm Transportation Cost

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Gas Nomination Quantity x (Firm Transportation Rate + Usage Rate + Commodity Cost)

(182,400 Gas Nomination Quantity) x ($0.40 + $0.01 + $3.50)

Peak Day Firm Transportation Cost = $713,184
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**Annual FT Reservation Fee / (Peak Day Gas Costs – Peak Day FT Costs)**

$26,630,400 / ($13,680,000 - $713,184)

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**# of Peak Days Needed to Break Even = 2.05**