Long-Term Power Supply
Presentation to the Kansas Senate Utilities Committee
By
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Westar Utility Operations

Kansas’ largest electric provider

Key Operational Facts:
- 644,000 customers
- 6,000 MW of generation
  - 20% Planning Reserve Margin for 2004 (SPP Requirement)
- 11,000 sq mile service territory
- 34,500 miles of T & D
- 2,000 employees

Service Territory
Westar Energy’s Generating Capacity

**Coal**

- Abilene Energy Center
  - Capacity: 72 MW
  - Fuel: Gas

- Jeffrey Energy Center
  - Capacity Share: 1,857 MW
  - Fuel: Coal

- Tecumseh Energy Center
  - Capacity: 242 MW
  - Fuel: Coal/Gas

- Lawrence Energy Center
  - Capacity: 539 MW
  - Fuel: Coal

- La Cygne Energy Center
  - Capacity Share: 681 MW
  - Fuel: Coal

- Stateline Combined Cycle
  - Capacity Share: 200 MW
  - Fuel: Gas/Waste Heat

- Hutchinson Energy Center
  - Capacity: 479 MW
  - Fuel: Gas, No. 2 Fuel Oil and No. 6 Fuel Oil

- Gordon Evans Energy Center
  - Capacity: 834 MW
  - Fuel: Gas, No. 2 Fuel Oil and No. 6 Fuel Oil

- Murray Gill Energy Center
  - Capacity: 317 MW
  - Fuel: Gas/No. 6 Fuel Oil

- Wolf Creek Generating Station
  - Capacity Share: 548 MW
  - Fuel: Uranium

- Neosho Energy Center
  - Capacity: 63 MW
  - Fuel: Gas/No. 6 Fuel Oil
Competitive Low-Cost Generation Portfolio

Installed Capacity

- Gas/Oil: 34%
- Coal: 57%
- Uranium: 9%

As Optimized

- Coal: 80%
- Uranium: 15%
- Gas/Oil: 5%

Fuel Cost by Source
$/MWh

- Uranium: $4.08
- Coal: $12.08
- Gas/Oil: $37.77

Avg. Fuel Cost: $11.54
Westar Energy’s Capacity Profile

- **Base Load** – Operates at a constant rate over a long period of time.
- **Intermediate** – Operates occasionally to bridge the energy needs between Base Load and Peaking resources.
- **Peaking** – Operates briefly during peak load times to meet the energy needs above the Intermediate resource and during emergency system conditions.

### Capacity (Nameplate)

- Base Load: 66%
- Intermediate: 22%
- Peaking: 12%
Typical Winter Day Obligation
Typical Summer Day Obligation

[Graph showing the energy generation for different times of the day. The graph illustrates the base load, intermediate load, and peaking load generation throughout the day.]
# New Plant Characteristics

<table>
<thead>
<tr>
<th></th>
<th>55 MW Aero-CT (Peaking)</th>
<th>150 MW Combustion CT (Peaking)</th>
<th>500 MW CC (Intermediate)</th>
<th>600 MW Coal (Base Load)</th>
<th>Wind (????)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital Cost ($/KW)</strong></td>
<td>$450</td>
<td>$360</td>
<td>$510</td>
<td>$1,400</td>
<td>$1,300</td>
</tr>
<tr>
<td><strong>Heat Rate (Btu/kWh)</strong></td>
<td>10,400</td>
<td>10,800</td>
<td>7,120</td>
<td>9,700</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Variable O&amp;M ($/MWh)</strong></td>
<td>$2.75</td>
<td>$2.00</td>
<td>$2.00</td>
<td>$1.40</td>
<td>$5.00</td>
</tr>
<tr>
<td><strong>Fixed O&amp;M ($/KW-year)</strong></td>
<td>$6.00</td>
<td>$6.00</td>
<td>$13.00</td>
<td>$40.00</td>
<td>$25.00</td>
</tr>
<tr>
<td><strong>Capacity Factor</strong></td>
<td>10%</td>
<td>10%</td>
<td>25%</td>
<td>80%</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Total Cost ($/MWh)</strong></td>
<td>$157.50</td>
<td>$138.20</td>
<td>$84.20</td>
<td>$46.50</td>
<td>$30.00</td>
</tr>
</tbody>
</table>

CT = Combustion Turbine  
CC – Combined Cycle  
* Based on $5.00/MMBtu Natural Gas Prices; $0.75/MMBtu Coal Price
Monthly Wind Energy Profile

Westar Control Area Load vs. Expected Peak Generation from 200-MW Wind Resource
Typical Construction Timelines

For Large Coal Unit:
- Alternatives Identified, Participant Discussions
- Conceptual Engineering & Permitting
- Begin Detailed Engineering & Procurement
- Begin Construction
- Commercial Operation

Year: 0 1 2 3 4 5 6 7 8 9 10

For Combined Cycle:
- Conceptual Engineering & Permitting
- Begin Detailed Engineering & Procurement
- Begin Construction
- Commercial Operation

Year: 0 1 2 3 4 5

For Combustion Turbine:
- Conceptual Engineering & Permitting
- Begin Detailed Engineering & Procurement
- Begin Construction
- Commercial Operation

Year: 0 1 2 3 4
Unit Cost Comparisons – Gas @ $6.00

Aero
CT
CC
Coal

Capacity Factor

$/MWH

$0.00
$25.00
$50.00
$75.00
$100.00
$125.00
$150.00
$175.00
$200.00

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Unit Cost Comparisons – Gas @ $5.00

[Graph showing unit cost comparisons for different capacity factors, with lines representing Aero, CT, CC, and Coal.]
Questions?