MMEA Presentation

Building New Baseload Generation in the Midwest

Black & Veatch
May 11, 2006
Process Steps for New Generation

1. Feasibility Study
   - Licensing / Permitting
   - Market Assessment
   - Plant Configuration Study

2. Preliminary Schedules
   - Systems Analysis
   - Preliminary Cost Estimates
   - Conceptual Engineering

3. Select Major Equipment
   - Project Schedule
   - Soils Testing
   - Monte Carlo Analysis

4. Detailed Cost Estimates
   - Arrangement Drawings
   - Commercial Construction Strategies
   - System Definitions

5. Engineering Review
   - Project Planning & Controls
   - Construction Management
   - Operator Training

6. Project Completion
   - Startup Assistance
   - Procurement Assistance
   - Beyond

Feasibility / Initial Engineering  ➔  Conceptual / Definition Engineering  ➔  Project Execution

Over 80 GW of Planned New U.S. Coal Projects

Of the 16 Units Under Construction, We Are Involved In 6
## Black & Veatch Current Coal Projects

<table>
<thead>
<tr>
<th>Owner</th>
<th>Project</th>
<th>Project Size</th>
<th>Scope</th>
<th>COD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sumitomo Corporation</td>
<td>Tanjung Jati B Power Plant</td>
<td>2 x 660 MW</td>
<td>EP</td>
<td>2006</td>
</tr>
<tr>
<td>PT Sumber Segara</td>
<td>Primadaya (PT S2P)</td>
<td>2 x 300 MW</td>
<td>OE</td>
<td>2006</td>
</tr>
<tr>
<td>Xcel Energy</td>
<td>King Rehabilitation Project</td>
<td>600 MW</td>
<td>Ep</td>
<td>2007</td>
</tr>
<tr>
<td>BESCL</td>
<td>Bhilai, India</td>
<td>2 x 250 MW</td>
<td>Ep</td>
<td>2007</td>
</tr>
<tr>
<td>Black Hills Energy</td>
<td>Wygen 2 Unit 4</td>
<td>1 x 90 MW</td>
<td>OE / P</td>
<td>2008</td>
</tr>
<tr>
<td>WPSC</td>
<td>Weston Unit 4</td>
<td>532 MW</td>
<td>Ep, Field Engr., SU</td>
<td>2008</td>
</tr>
<tr>
<td>OPPD</td>
<td>Nebraska City Unit 2</td>
<td>663 MW</td>
<td>EPC</td>
<td>2009</td>
</tr>
<tr>
<td>CWLP</td>
<td>Dallman Unit 34</td>
<td>201 MW</td>
<td>EPC</td>
<td>2009</td>
</tr>
<tr>
<td>CPS</td>
<td>J.K. Spruce Unit 2</td>
<td>758 MW</td>
<td>EPC</td>
<td>2010</td>
</tr>
<tr>
<td>LS Power</td>
<td>Plum Point Energy Station</td>
<td>665 MW</td>
<td>EPC</td>
<td>2010</td>
</tr>
<tr>
<td>Big Stone II Ownership Group</td>
<td>Big Stone II</td>
<td>600 MW</td>
<td>EpCM</td>
<td>2011</td>
</tr>
<tr>
<td>Chugach Electric Association, Inc.</td>
<td>Alaska Coal Project</td>
<td>1 x 130 MW</td>
<td>Conceptual Engineering / Cost Estimate</td>
<td>2011</td>
</tr>
<tr>
<td>PPGA</td>
<td>Whelan Energy Center 2</td>
<td>220 MW</td>
<td>Conceptual Design / Permitting Support</td>
<td>2012</td>
</tr>
</tbody>
</table>

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CWLP Dallman 34, Springfield, Illinois

- 201 MW PC Subcritical Unit
- Designed to Burn High Sulfur Illinois Coals
- Contract Signed: October 3, 2005
- B&V Role: EP
- KIC Role: C
- EPC JV: KIC and B&V
- FW Boiler, Toshiba Turbine Generator
- FF, Wet FGD, Wet ESP
- Scheduled Completion: September 2009
New Generation Project Layout and Design Basis
Coal Pile

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Cooling Tower

- Sound Wall
- Drainage Trench
- Sound and Plume Abated Cooling Tower
- Lake Springfield
City of Springfield 3-D Model
Project Schedule

-38
Start Phase 1 Engr

-25
Phase 1 Complete

-24
Issue RFQ

-16 -15
Begin EPC Spec Prep / RFQ Responses Due

-11 -10
Issue EPC RFP

-5
Receive EPC Bids

-4
Select EPC Bidder Start Negotiations

-2
EPC Contract Award

0
NTP Mobilization Start Site Modification

5
Start Construction

47
Guaranteed Power Delivery Sept 2009

CWLP

-10
Permit Application Submitted

5
Receive Permit

5
Start Phase 2 Engr and Permitting

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Actual U.S. Coal Plant Construction Schedules

- 75 – 100 MW: 34 months (37 months)
- 100 – 200 MW: 28 months (37 months)
- 250 – 400 MW: 40 months (44 months)
- 425 – 500 MW: 40 months (50 months)
- 600 – 700 MW: 46 months (58 months)

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Market and Sourcing Example – Pipe Material to Fabricator Lead Times

Significant Factor in Project Schedules

<table>
<thead>
<tr>
<th>Weeks</th>
<th>April 2004</th>
<th>October 2004</th>
<th>April 2005</th>
<th>January 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>52</td>
<td>68</td>
<td>72</td>
<td>76</td>
</tr>
</tbody>
</table>

Monday, October 2004

Wednesday, April 2005

March 2006

Wednesday, January 2006

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Market and Sourcing Example –
Total Structural Steel Mill Order Lead Times

Significant Factor in Project Schedules

Mill Order Times:
- 2003 to 2005 = 8 Wks
- 2006 = 12 to 16 Wks

Weeks

2003 2004 2005 2006

16 16 16 20 to 24

20 15 10 5 0
Market and Sourcing Example – Steam Turbine Lead Times

Significant Factor in Project Schedules

- Dec 2003: 18 months
- May 2005: 20 months
- Sep 2005: 20 months
- January 2006: 22-24 months
Escalation Summary – Market and Sourcing

Increasing Coal Plant Costs

- Price Escalation on Commodities Such as Steel, Copper and Alloy Have Driven Prices and Lead Times Up Dramatically

- AQCS Equipment Extremely Tight Market Due to Ongoing Retrofit Work (30% Materials Required)

- Boiler Prices Increasing (30% Materials Required)

The E&C Industry Is Also “Tight” With a Limited Number of Capable Players
Escalation Example – Steel

36% Increase

$ / Ton

Jan '04 Dec '04 Jan '05 Dec '05 Jan '06

Month

Total Mill Price

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### Escalation – Labor
As-Stated Escalation Rates for Midwest Coal Project

<table>
<thead>
<tr>
<th>Craft</th>
<th>2005 Rate</th>
<th>2006 Rate</th>
<th>2007 Rate</th>
<th>Annual Escalation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operators</td>
<td>$28.06</td>
<td>$29.56</td>
<td>$31.06*</td>
<td>5.3%</td>
</tr>
<tr>
<td>Laborers</td>
<td>$19.50</td>
<td>$20.70</td>
<td>$21.90*</td>
<td>6.1%</td>
</tr>
<tr>
<td>Millwright</td>
<td>$30.00</td>
<td>$31.85</td>
<td>$33.70</td>
<td>6.2%</td>
</tr>
<tr>
<td>Ironworker</td>
<td>$25.10</td>
<td>$26.95</td>
<td>$28.80</td>
<td>7.4%</td>
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<tr>
<td>Carpenter</td>
<td>$25.65</td>
<td>$27.50</td>
<td>$29.35</td>
<td>7.2%</td>
</tr>
<tr>
<td>Pipefitter</td>
<td>$32.73</td>
<td>$34.83</td>
<td>$36.93</td>
<td>6.4%</td>
</tr>
<tr>
<td>Electricians</td>
<td>$30.73</td>
<td>$32.58*</td>
<td>$34.43*</td>
<td>6.0%</td>
</tr>
<tr>
<td>Boilermaker</td>
<td>$27.80</td>
<td>$28.60</td>
<td>$30.10</td>
<td>5.2%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>6.2%</strong></td>
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</table>

*Future Estimate
Total Craft Labor Full Time Equivalents (FTEs)

Based on U.S. Coal Projects Slide (Units and COD)

<table>
<thead>
<tr>
<th>Year</th>
<th>FTEs</th>
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<tbody>
<tr>
<td>2002</td>
<td>0</td>
</tr>
<tr>
<td>2003</td>
<td>0</td>
</tr>
<tr>
<td>2004</td>
<td>2,000</td>
</tr>
<tr>
<td>2005</td>
<td>4,000</td>
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<tr>
<td>2006</td>
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<tr>
<td>2007</td>
<td>8,000</td>
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<tr>
<td>2008</td>
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<tr>
<td>2009</td>
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<tr>
<td>2010</td>
<td>12,000</td>
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<tr>
<td>2011</td>
<td>6,000</td>
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<tr>
<td>2012</td>
<td>2,000</td>
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<tr>
<td>2013</td>
<td>0</td>
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<tr>
<td>2014</td>
<td>0</td>
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Equipment Suppliers – Boilers

**Domestic Based**
- Alstom Power
- Babcock & Wilcox
- Foster Wheeler
- Babcock Power

**International Based**
- IHI, Inc.
- Mitsubishi Power
- Mitsui Babcock
- Babcock Hitachi
Equipment Suppliers – STGs

- Alstom Power
- General Electric
- Mitsubishi Power
- Siemens Westinghouse
- Toshiba
- Hitachi
- Fuji
# Equipment Suppliers – FGD, Fabric Filters and Electrostatic Precipitators

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Dry FGD</th>
<th>Wet FGD</th>
<th>FF</th>
<th>Dry ESP</th>
<th>Wet ESP</th>
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</thead>
<tbody>
<tr>
<td>Alstom Power</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Babcock Power</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Babcock &amp; Wilcox</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Chiyoda</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Hamon RC</td>
<td>X</td>
<td></td>
<td>X</td>
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<td>Hitachi</td>
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<tr>
<td>Wheelabrator</td>
<td>X</td>
<td>X</td>
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<td>AdvaTech (MHI &amp; URS)</td>
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<td>X</td>
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<tr>
<td>Marsulex</td>
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