WABASH RIVER ENERGY LTD.

2003 PROJECT UPDATE

Operating Experience at the
Wabash River Repowering Project

CLIFTON G. KEELER
Director Plant Operations
Wabash River Energy Ltd.
Wabash River Energy Ltd. Project Update

• 2003 Operating Statistics & Milestones

• Update of Fuel Cell Installation

• ConocoPhillips Acquisition
Wabash Plant Configuration / Rating

• 2,500 tons/day coal or 2,000 tons/day petcoke; all 2003 operation was on petcoke

• Single train gasification unit

• Rated capacity is 1,780 mmbtu/hr or 200 mmmscf/day (22% moisture)

• Spare gasifier, not on-line & not required
Wabash River Energy Ltd. Project Update

2003* Gasification Unit Operating Statistics

*Data through September 30, 2003
### 2003* Gasification Downtime Causes

<table>
<thead>
<tr>
<th>Downtime Cause</th>
<th>% of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remaining 8 average &lt;5 hrs each</td>
<td>0.61%</td>
</tr>
<tr>
<td>Gasket failure at instrument nozzle</td>
<td>0.35%</td>
</tr>
<tr>
<td>Overfilled slag hopper</td>
<td>0.37%</td>
</tr>
<tr>
<td>Fuel supply interruption</td>
<td>0.53%</td>
</tr>
<tr>
<td>Slurry mixer replacement</td>
<td>0.60%</td>
</tr>
<tr>
<td>SRU plant upsets</td>
<td>0.72%</td>
</tr>
<tr>
<td>Cracked derime header in ASU</td>
<td>0.85%</td>
</tr>
<tr>
<td>Refractory breach</td>
<td>0.95%</td>
</tr>
<tr>
<td>Syngas cooler tube leaks</td>
<td>1.10%</td>
</tr>
<tr>
<td>Sodium contamination – ash deposition</td>
<td>6.93%</td>
</tr>
<tr>
<td><strong>Total of all downtime</strong></td>
<td><strong>13.01%</strong></td>
</tr>
</tbody>
</table>

*Data through September 30, 2003
Sodium Ash Deposition

- 80% of pipe diameter was obstructed
- Deposition occurred in less than 24 hours
- Over 50% of syngas cooler tubes were plugged
- Remaining tubes were severely fouled
2003* Gasification Unit Performance

- **Availability = 74.0%**
  \[\text{Availability} = \text{On-stream} \% + \text{Product not required} \% \times [1-(\text{Forced outage rate}/100\%)]\]

- **Forced outage rate = 17.51%**
  \[\text{Forced Outage Rate} = \frac{\text{Unplanned outage hours}}{\text{Unplanned outage hours} + \text{on-stream hours}} \times 100\%\]

- **Annual Loading Factor = 56.1%** (Product not required for 15% of year)
  \[\text{Loading Factor} = \frac{\text{Yearly production}}{\text{rated capacity}}\]

- **YTD* Production = 6,543,502 mmbtu or 30,635 mmscf**

  *Data through September 30, 2003*
Wabash Availability for the Last 4 Years

- 2000: 73.3%
- 2001: 72.5%
- 2002: 78.7%
- 2003: 74.0%
- 03 Adjusted: 82.4%
# Wabash 4 Year* Reliability by Sub-System

Reliability = 1 - \( \frac{\text{Forced Outage Hours}}{\text{Period Hours}} \) \times 100%

<table>
<thead>
<tr>
<th>Sub-System</th>
<th>Reliability</th>
<th>Sub-System</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Syngas Conditioning</td>
<td>100.00%</td>
<td>Sour Water Treatment</td>
<td>99.94%</td>
</tr>
<tr>
<td>Rod Mill &amp; Hopper</td>
<td>100.00%</td>
<td>Particulate Removal</td>
<td>99.80%</td>
</tr>
<tr>
<td>COS Hydrolysis</td>
<td>100.00%</td>
<td>Low Temp Heat Recovery</td>
<td>99.56%</td>
</tr>
<tr>
<td>Chloride Scrubbing</td>
<td>100.00%</td>
<td>Slurry System</td>
<td>99.32%</td>
</tr>
<tr>
<td>Syngas recycle compressor</td>
<td>100.00%</td>
<td>Slag Removal System</td>
<td>99.20%</td>
</tr>
<tr>
<td>2nd Stage Gasifier</td>
<td>100.00%</td>
<td>Sulfur Recovery</td>
<td>99.17%</td>
</tr>
<tr>
<td>Cooling Tower System</td>
<td>100.00%</td>
<td>1st Stage Gasifier</td>
<td>98.70%</td>
</tr>
<tr>
<td>Syngas Moisturization</td>
<td>99.98%</td>
<td>Air Separation</td>
<td>98.63%</td>
</tr>
<tr>
<td>Acid Gas Removal</td>
<td>99.95%</td>
<td>Syngas Cooling</td>
<td>97.48%</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td></td>
<td></td>
<td><strong>92.3%</strong></td>
</tr>
</tbody>
</table>

* Data from 1/1/00 thru 9/30/03
Wabash Availability
(Plant available when product not required.)

- 2000: 79.4%
- 2001: 83.6%
- 2002: 81.9%
- 2003*: 83.7%

*Assumes no ash deposition
2003 Operational Milestones

- 4,100 hour mixers and counting
- Processed 1 millionth ton of petcoke in July
- Over 50 trillion btus of gas produced
- Over 30,000 hours of coal/petcoke operation
- Fuel Cell dedication
- ConocoPhillips acquires E-Gas™ technology
Fuel Cell Demonstration Objective

To demonstrate the significant improvement in efficiency and environmental performance of carbonate fuel cell technology in coal based power generation systems.
Environmental Impact Comparison

![Diagram showing environmental impact comparison between different gasification technologies. The x-axis represents solid waste in lb/MWh, and the y-axis represents SO₂ + NOₓ in lb/MWh. The technologies compared are CGFC, IGCC, AFBC, and PC/FGD.]
Two Fuel Cell Modules at FCE Conditioning Facility in Danbury, CT
Wabash River Energy Ltd. Project Update

DFC 3000 BOP SKIDS BEING INSTALLED AT WABASH
Fuel Cell Dedication – August 13, 2003
Summary of Project Status

- All four balance of plant (BOP) skids are installed and their commissioning is in progress.
- The two Fuel Cell modules are built and are being prepared for delivery.
- Formal dedication of the project was held August 13th, 2003.
- Commissioning of the power plant is planned for first quarter of 2004.
ConocoPhillips Acquisition

- COP acquires E-Gas™ technology, patents and 23 technical personnel
- Services Agreement
  - Technical and management support for Wabash
  - 15 COP personnel at Wabash
  - Seamless operation
- Access Agreement
  - Technology advances / DOE Projects
  - Slipstream testing
  - E-Gas™ marketing
  - Operator training ground for future plants
Advancing Clean Energy with E-Gas™ Technology from ConocoPhillips and Fuel Cell Technology from FuelCell Energy