

**Wabash River Energy Ltd. Project Update**

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**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.**

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*October 13, 2003*



# **Wabash River Energy Ltd. Project Update**

- 2003 Operating Statistics & Milestones
- Update of Fuel Cell Installation
- ConocoPhillips Acquisition

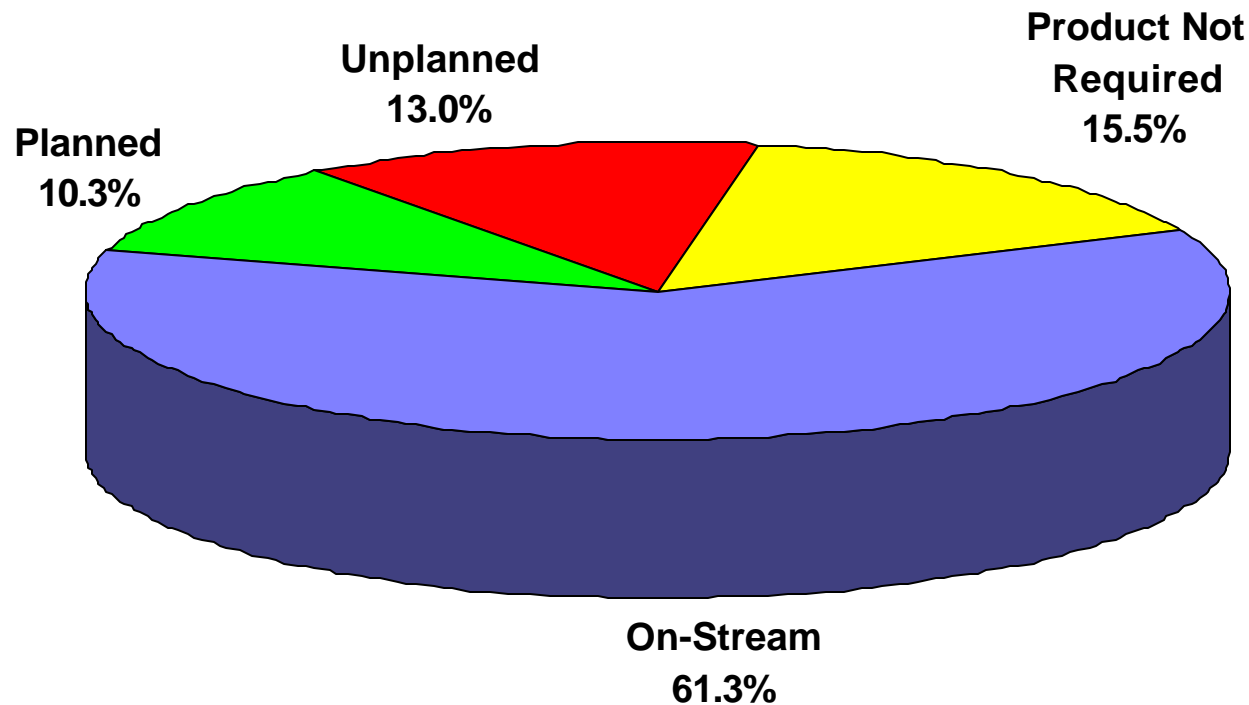
## **Wabash Plant Configuration / Rating**

- 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 mmscf/day (22% moisture)
- Spare gasifier, not on-line & not required

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# 2003\* Gasification Unit Operating Statistics



\*Data through September 30, 2003

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# 2003\* Gasification Downtime Causes

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

\*Data through September 30, 2003

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## 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



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## 2003\* Gasification Unit Performance

- **Availability = 74.0%**

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

- **Forced outage rate = 17.51%**

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)

Loading Factor = Yearly production / rated capacity

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

\*Data through September 30, 2003

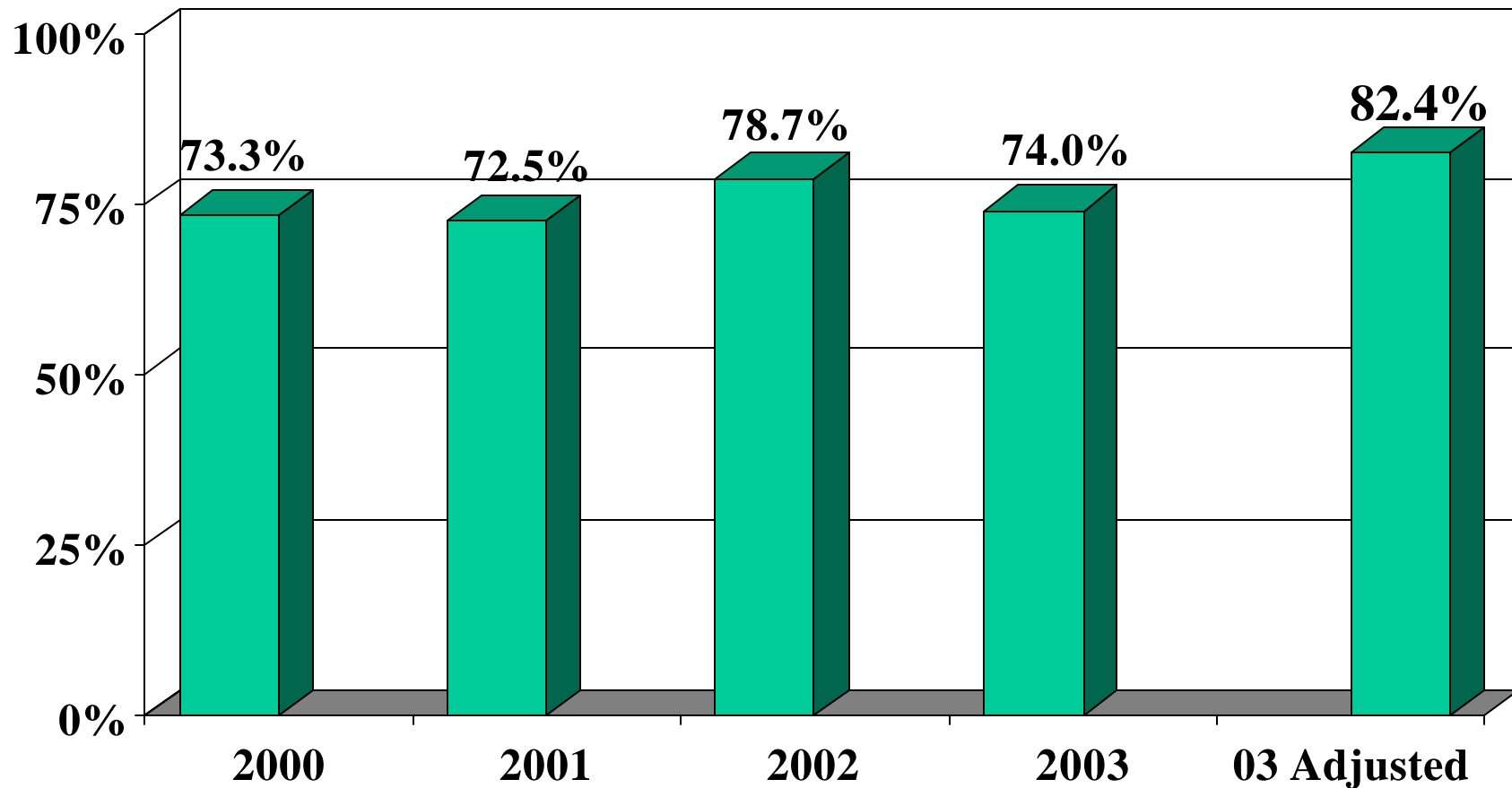
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# Wabash Availability for the Last 4 Years



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**Wabash River Energy Ltd. Project Update****Wabash 4 Year\* Reliability by Sub-System**

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

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

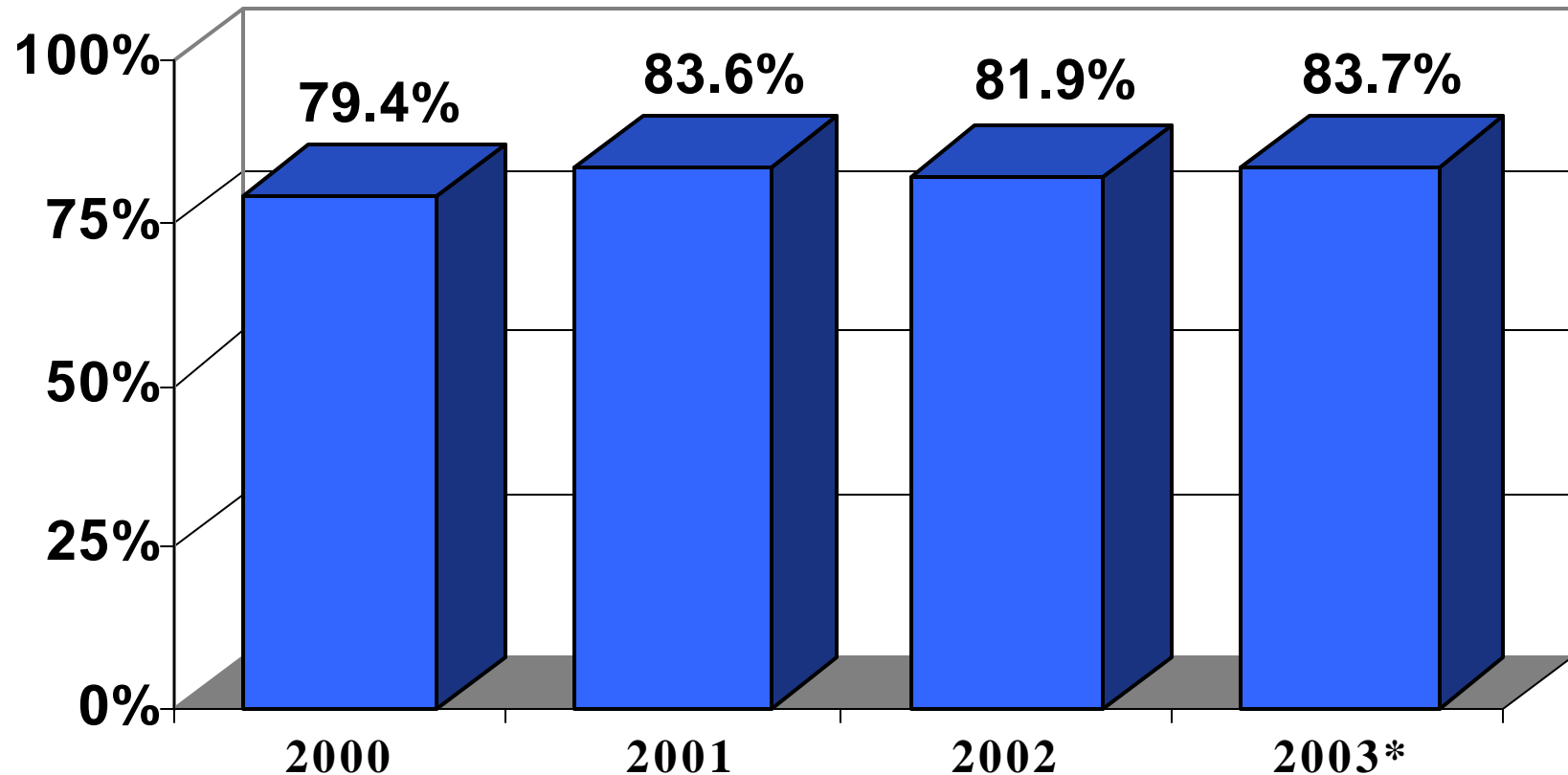
\* Data from 1/1/00 thru 9/30/03

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# **Wabash Availability** (Plant available when product not required.)



\*Assumes no ash deposition

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## **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

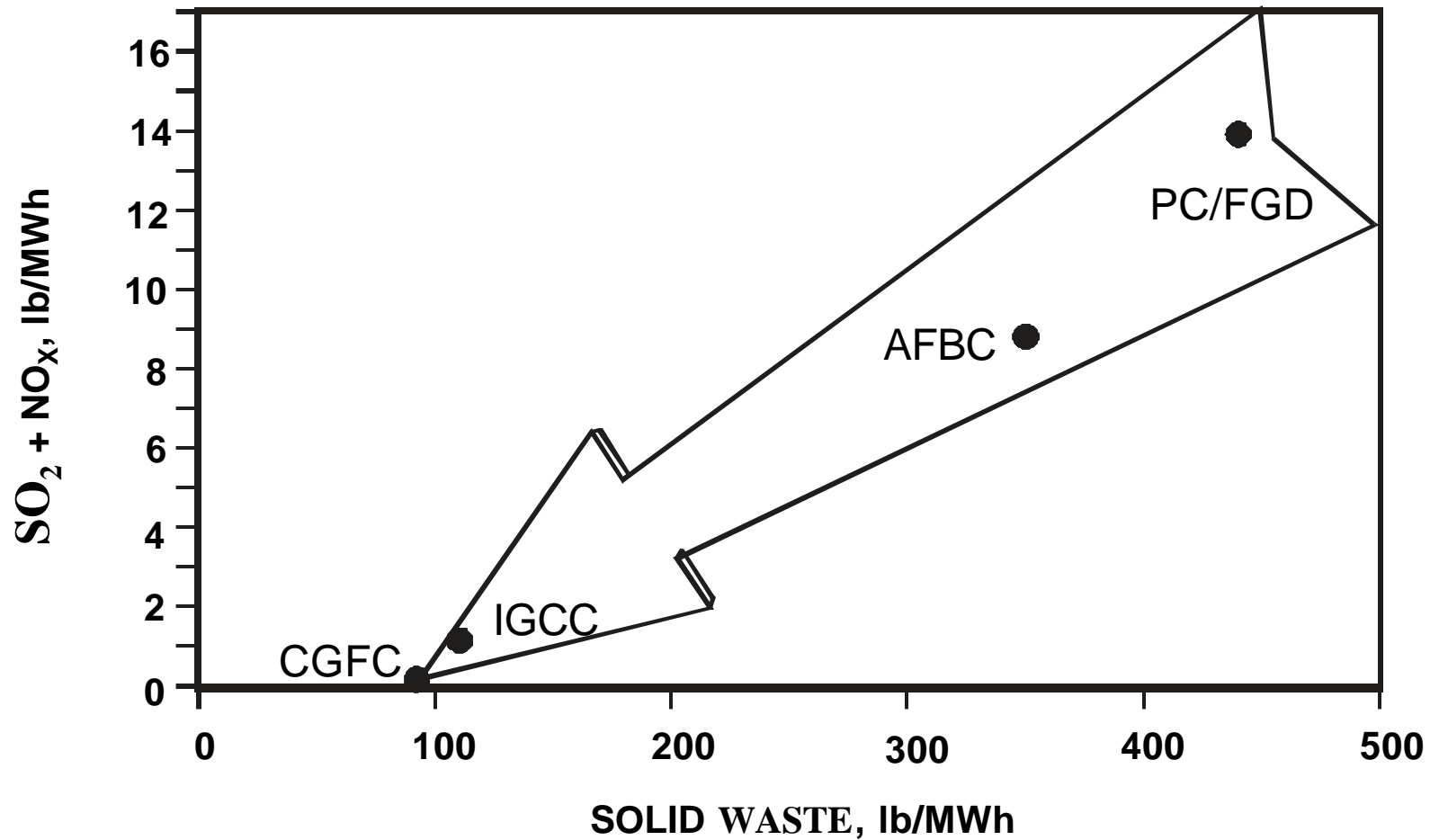
# **Fuel Cell Demonstration Objective**

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



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# Environmental Impact Comparison



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# **Two Fuel Cell Modules at FCE Conditioning Facility in Danbury, CT**



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# **DFC 3000 BOP SKIDS BEING INSTALLED AT WABASH**

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# Fuel Cell Dedication – August 13, 2003



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# 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 13<sup>th</sup>, 2003.**
- **Commissioning of the power plant is planned for first quarter of 2004.**



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# **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

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Advancing Clean Energy with  
E-Gas™ Technology from

 **ConocoPhillips**

and Fuel Cell Technology from



FuelCell Energy



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