

The background of the slide is a photograph of an industrial facility, likely a coal gasification plant, at dusk. The scene is filled with large cylindrical tanks, complex piping, and structural steel frameworks. Warm lights from the facility illuminate the scene against a darkening sky. A semi-transparent dark grey horizontal band is overlaid across the middle of the image, containing the project title.

Wabash River Coal Gasification Repowering Project

June 12, 2007

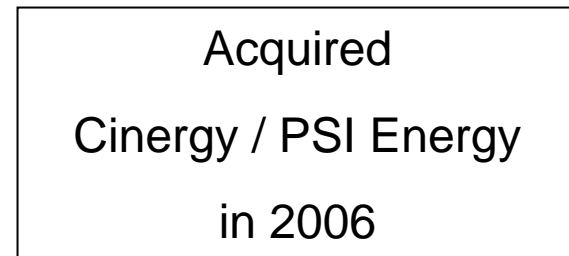
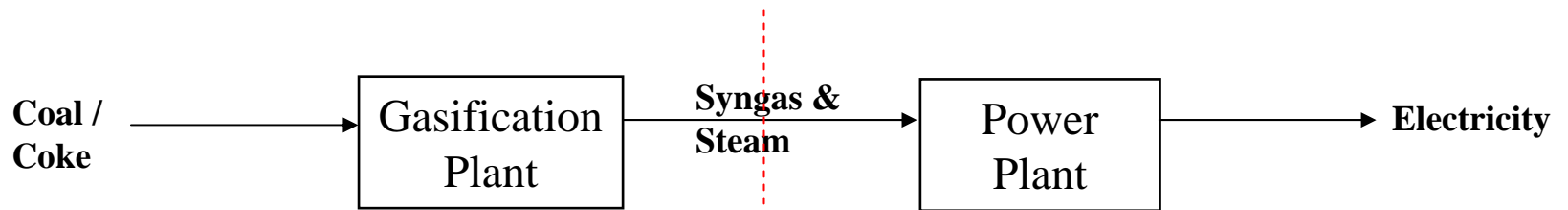


**One of the
Cleanest Coal Fired Power Plants
in the World**

**1.7 million tons of bituminous coal
2.0 + million tons of petcoke**

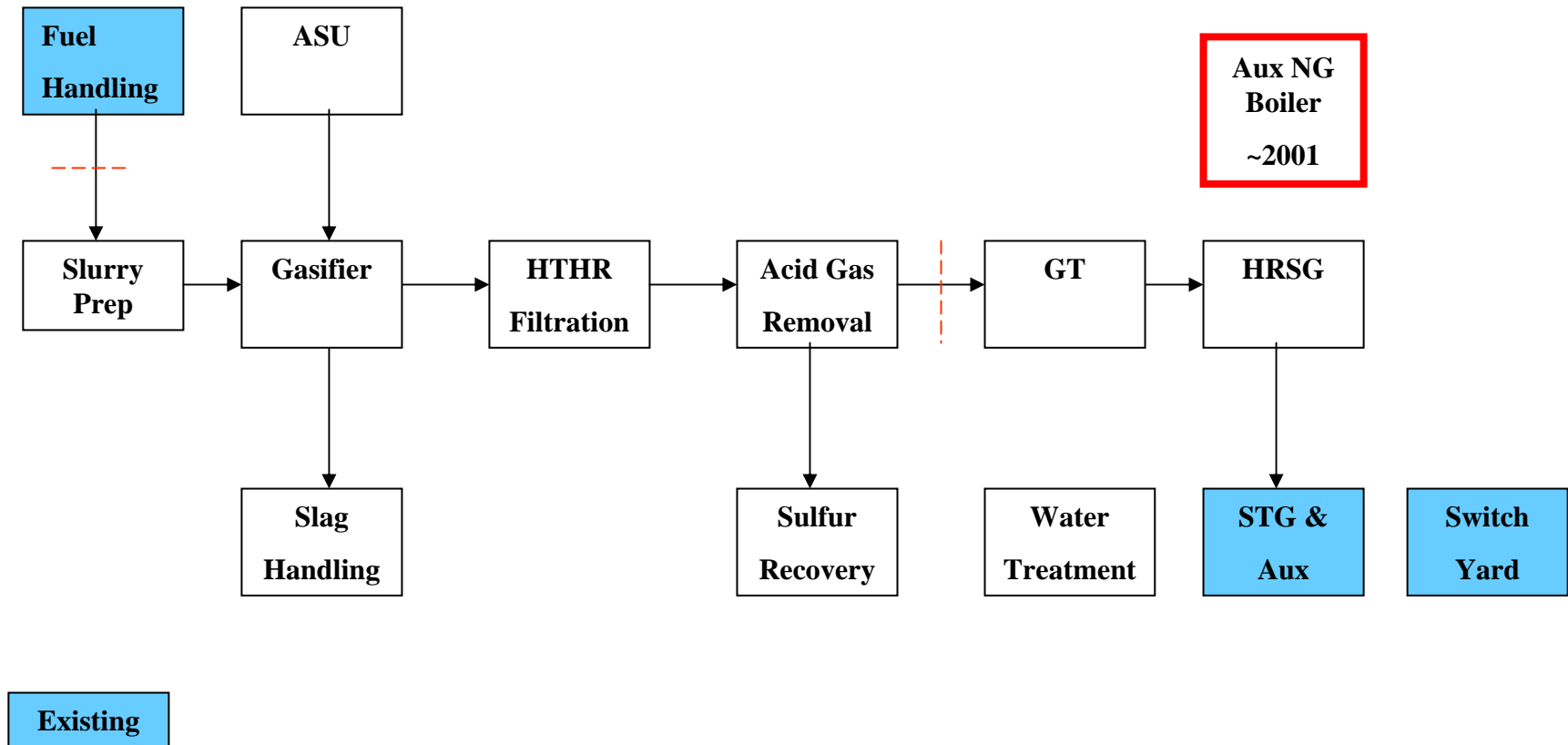
**2500 TPD bituminous coal feed
Operational since 1995 at Duke
Energy's Wabash River Plant
SG Solutions LLC now owns Syngas
Plant, ConocoPhillips provides
professional services on site**

Wabash River Coal Gasification Repowering Project Ownership Split



Wabash River Single Train Gasification System

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Selected in DOE CCT Round IV in 1991

Permits and Certificate of Need in May 1993

Construction Started 3Q 1993

Operational in 1995

Bituminous Coal

1995 – Aug 2000

Petroleum Coke

2000 - current

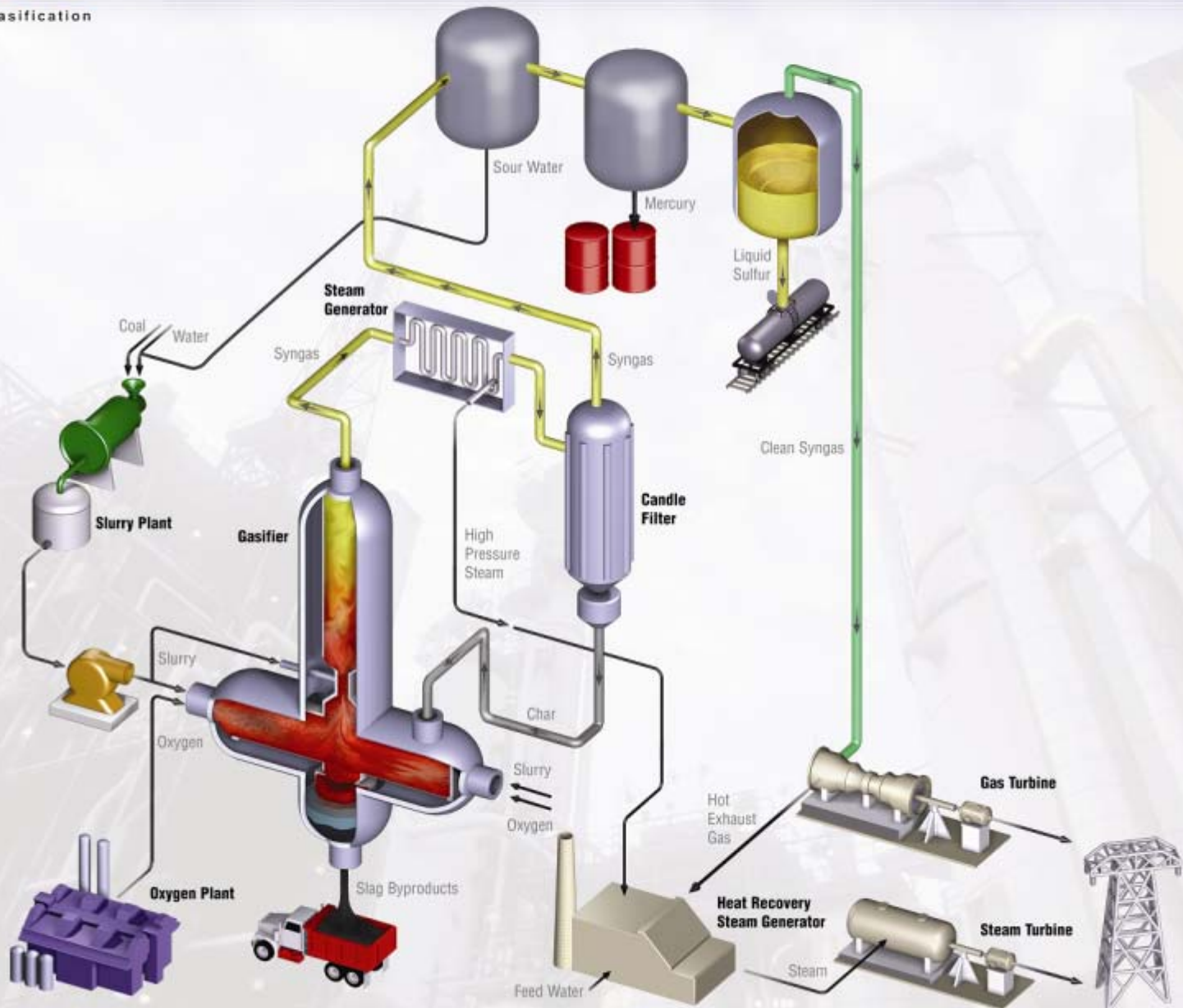
Power Block

- GE 7FA Combustion Turbine (192 MW)
- Westinghouse Steam Turbine (100 MW, original 1953 installation)

Gasification

- Air Liquide 2000 TPD Oxygen Plant
- ConocoPhillips E-Gas Gasification System
- Amine type Acid Gas Removal (AGR)
- Three Stage Claus Sulfur Recovery

A Look Inside the Process



Wabash River IGCC

Gasifier

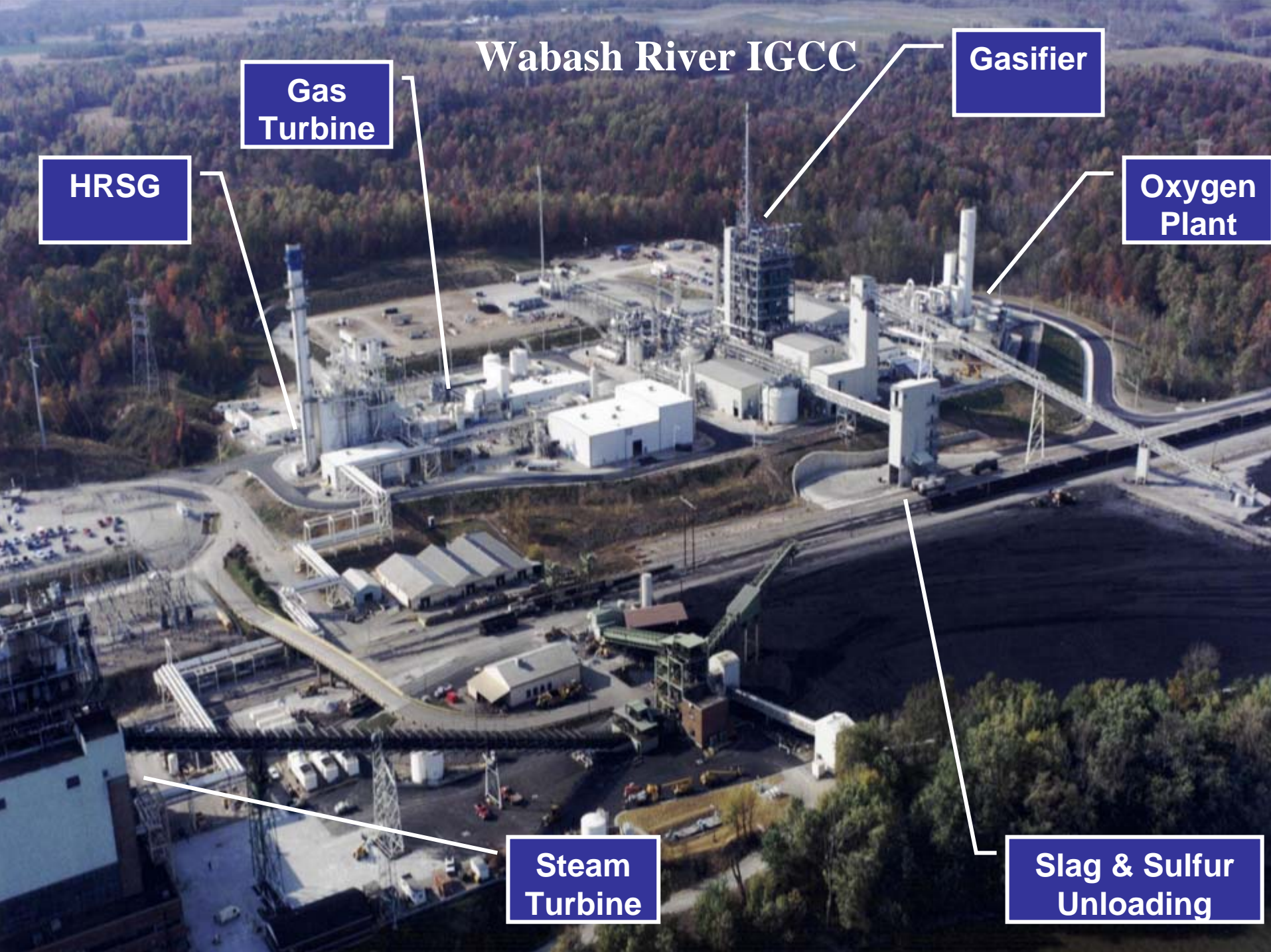
Oxygen Plant

Gas Turbine

HRSG

Steam Turbine

Slag & Sulfur Unloading



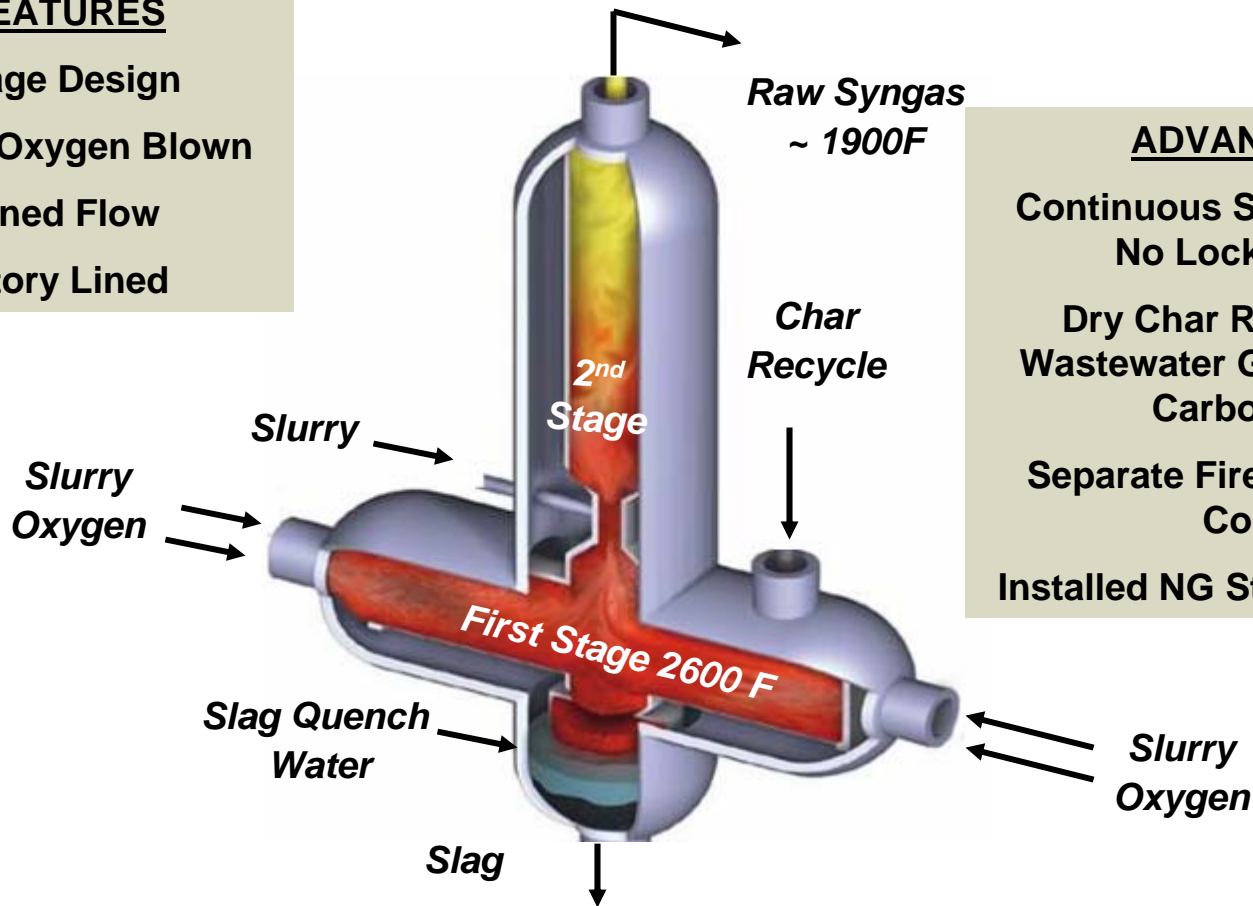
E-Gas™ Technology Gasifier

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Two stage for carbon conversion and heat recovery efficiency

KEY FEATURES

Two Stage Design
Slurry Fed, Oxygen Blown
Entrained Flow
Refractory Lined



ADVANTAGES

Continuous Slag Removal –
No Lockhoppers

Dry Char Recycle – No
Wastewater Generation, No
Carbon Lost

Separate Fire-tube Syngas
Cooler

Installed NG Start-Up Burners

Wabash River Energy Recognition

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Power Plant of the Year 1996 (Power Magazine)

Power Plant Hall of Fame 2000 (Power Magazine)

1996 Certificate of Recognition for Energy Efficiency & Renewable Energy from the US DOE

1997 Certificate of Environmental Achievement from the National Awards Council for Environmental Sustainability

1998 Governor's Award for Excellence in Recycling

Recognition in 2001 National Energy Policy

Cover of DOE's Study on Environmental Aspects of Gasification

Cleanest Coal/Coke Fired Power Plant in the World

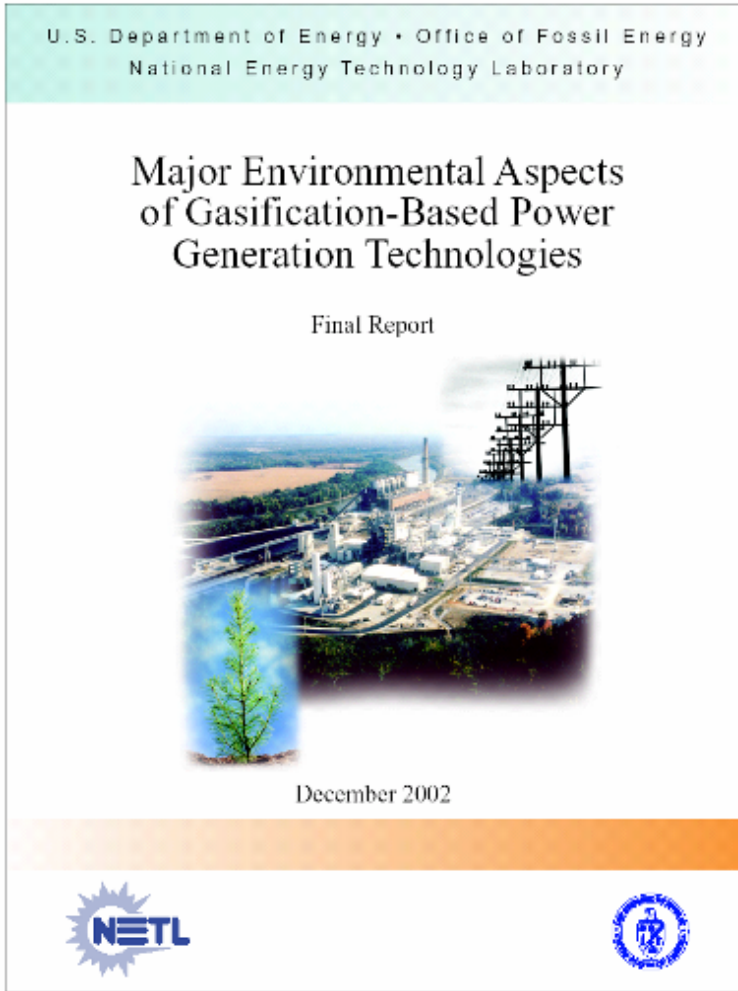
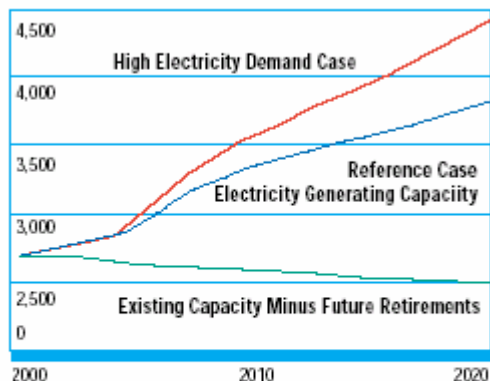


Figure 1-2
The U.S. Needs More Power Plants



The nation is going to require significant new generation capacity in the next two decades. Depending on demand, the United States will need to build between 1,300 and 1,900 new power plants—or about one new power plant a week.

Source: U.S. Department of Energy, Energy Information Administration.

National Energy Policy



Report of the
 National Energy Policy Development

May 2001

Clean Coal Technologies Up Close

The Wabash River Coal Gasification Project in Terre Haute, Indiana, is one of the cleanest, most efficient coal-burning facilities in the country. Partly funded by the Department of Energy (DOE) as part of its Clean Coal Technology Program, the 262-MW coal gasification facility is owned and operated by PSI Energy and Global Energy, Inc. Instead of being directly burned, the coal is gasified and then combusted in a combined-cycle gas turbine. This allows the coal to burn more efficiently—which means it gets more energy than a traditional plant out of the same amount of coal. The Wabash River Facility is over 20 percent more efficient than a typical coal-fired power plant.

The gasification process also allows many of the impurities in the coal to be removed before it is combusted to generate electricity. At the Wabash River project, over 99 percent of the sulfur is removed from the coal and marketed to industrial users of sulfur. Slag is also removed and is marketed to the construction industry. The plant's design allows it to burn other fuels, such as petroleum coke.

DOE is currently working with Global Energy and other industry partners to see if the plant could also be used to co-produce chemical feedstocks and transportation fuels. Additionally, DOE and its partners are studying lessons learned from the project to design a less expensive, more efficient coal gasification facility that would be ready for commercial deployment by 2005.

Wabash Emissions Comparison

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Emissions, lb/MWh	SO ₂	NO _x	CO	PM-10	VOC
Unit 1 before Repowering	38.2	9.3	0.64	0.85	0.03
IGCC (1999 Annual Avg.)	1.075	0.75	0.56	0.09	0.09
EMISSIONS REDUCTION, TPY	5505	1179	(83)	101	(25)

Comparing 100 MW PC unit running 35% availability and
 262 MW IGCC running 75% availability
(5.6 X more megawatt hours produced)

Pollutant Removal Advantages

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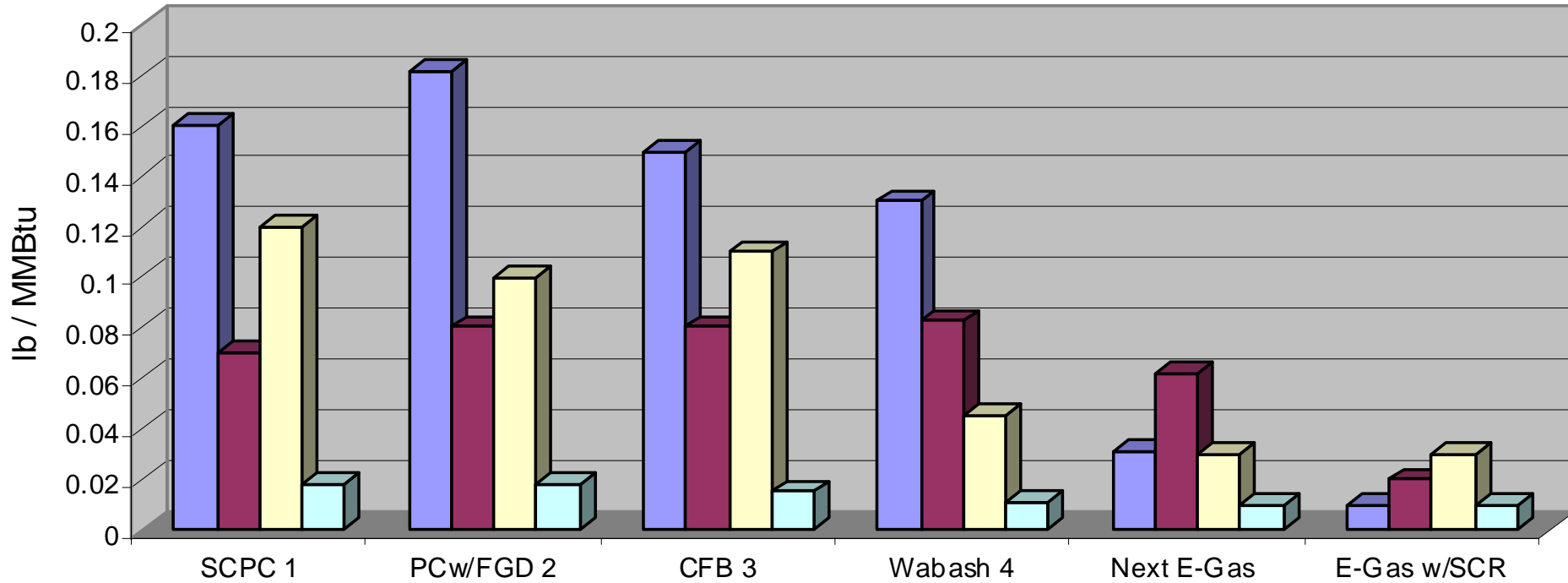
Mercury Removal

- Approximately 50% removal at Wabash
- New Plants will have 90-95% removal utilizing carbon beds

Estimated Emissions of Coal Based Power Plants

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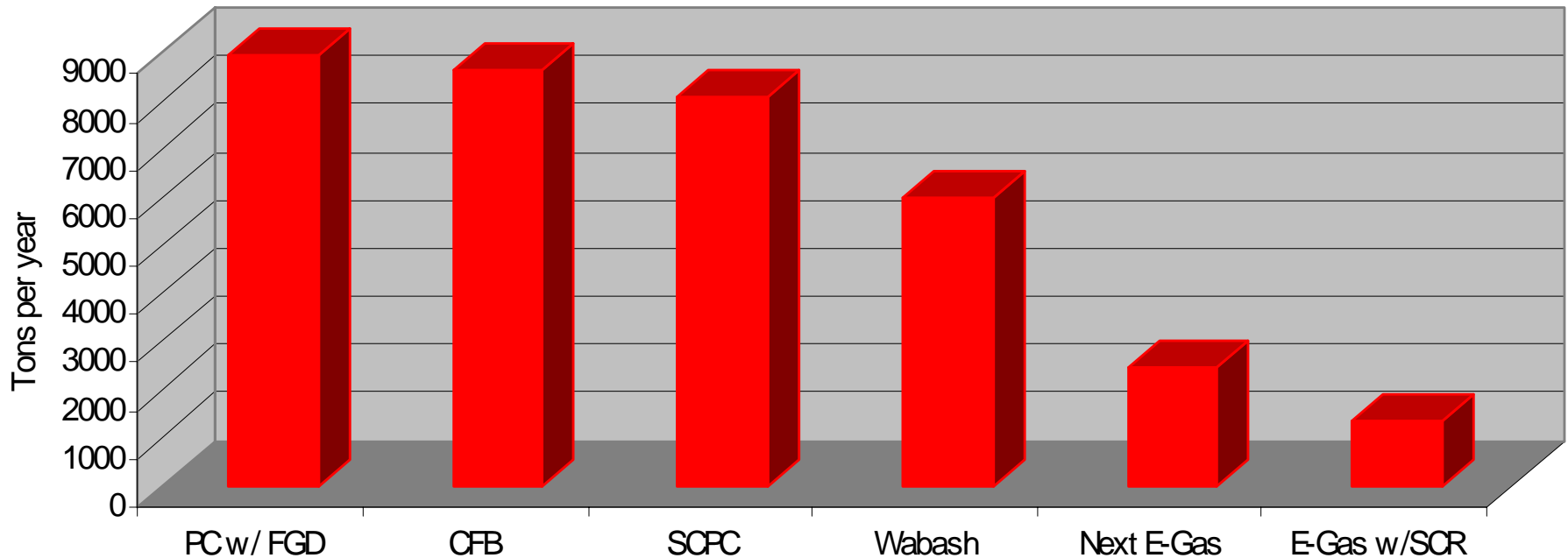
SO₂ NO_x CO PM/PM₁₀



- 1) Wisconsin Electric Power SCPC information from April 2003 Draft Environmental Impact Statement, Elm Road Generating Station, Volume 1, Public Service Commission of Wisconsin & Department of Natural Resources, Table 7-11, p. 155 (Pittsburgh No. 8 coal)
- 2) Evaluation of IGCC to Supplement BACT Analysis of Planned Prairie State Generating Station, May 11, 2003. Prepared by Donald J. Wilhelm SFA Pacific, Inc. for Prairie State Generating Company, LLC.
- 3) Supplemental Information for PSD Permit Application, March 25, 2003, Prepared by Earth Tech, Inc. for Indeck - Elwood, LLC.
- 4) Wabash River Repowering Project, 1999 average reported to IDNR

Estimated Total Annual Air Emissions - Coal Power Plants

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From references cited in previous slide.

All plants scaled to 630 MW at 90% annual capacity factor.

Solid By-products – not Wastes

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Sulfur - 99.99% pure

- 100,000+ tons sold at Wabash
- 400,000,000+ equivalent lbs of SO₂



Slag - Black, glassy sand like material

- Inert, passes TCLP & UTS
- Asphalt
- Construction backfill
- Landfill cover



Water and Wastewater

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Water

Steam Turbine Condenser cooled with River Water

IGCC Consumption is about 1100 gpm

200 GPM Steam Injection

400 GPM ASU Cooling Tower Make-Up

Wastewater

Gasification Island process wastewater ~ 100 gpm

Retrofit with Zero Liquid Discharge system

Cooling Tower and HRSG Blowdown go to WW Pond

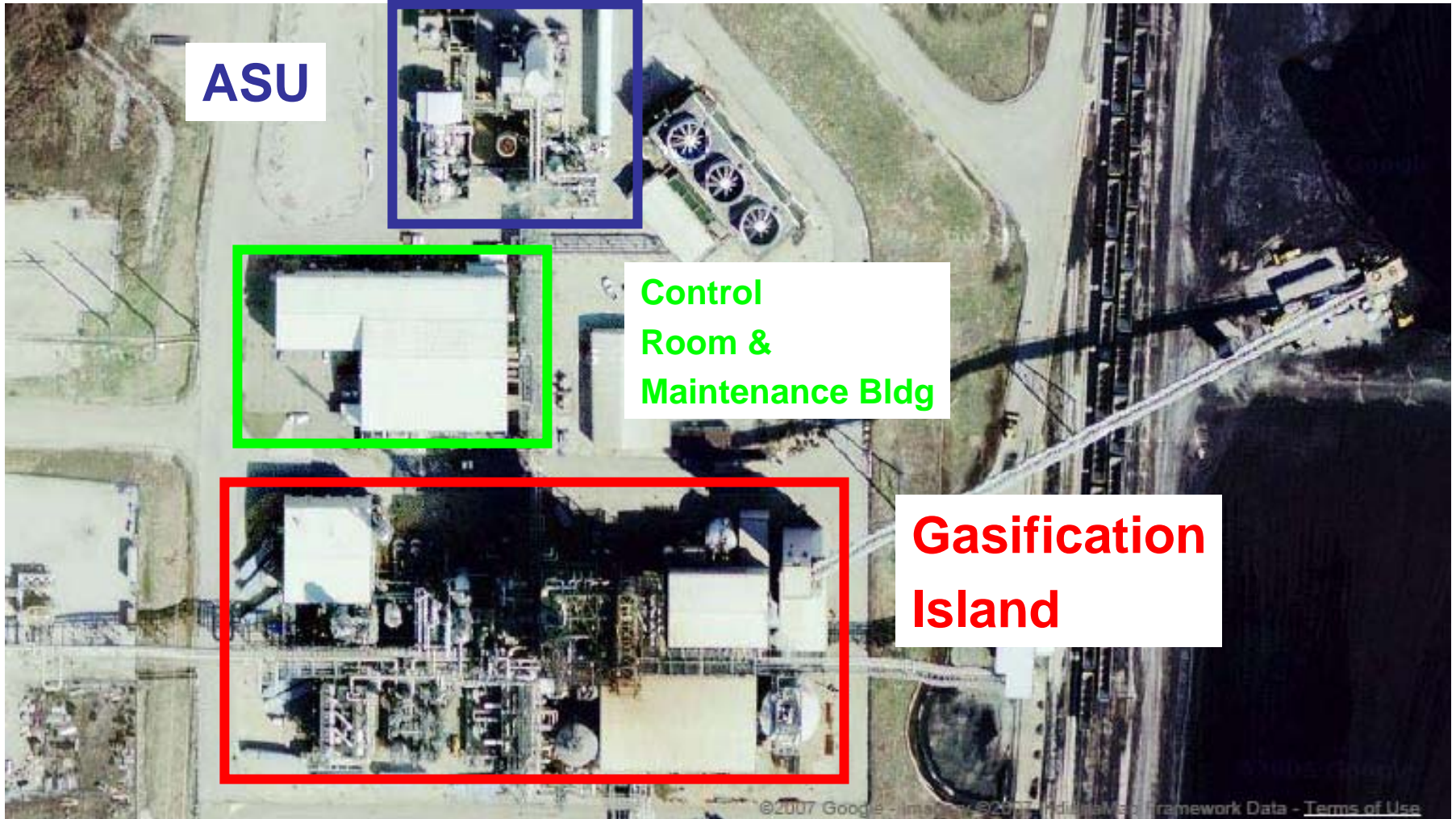
WABASH RIVER IGCC PLOT ~ 20 ACRES

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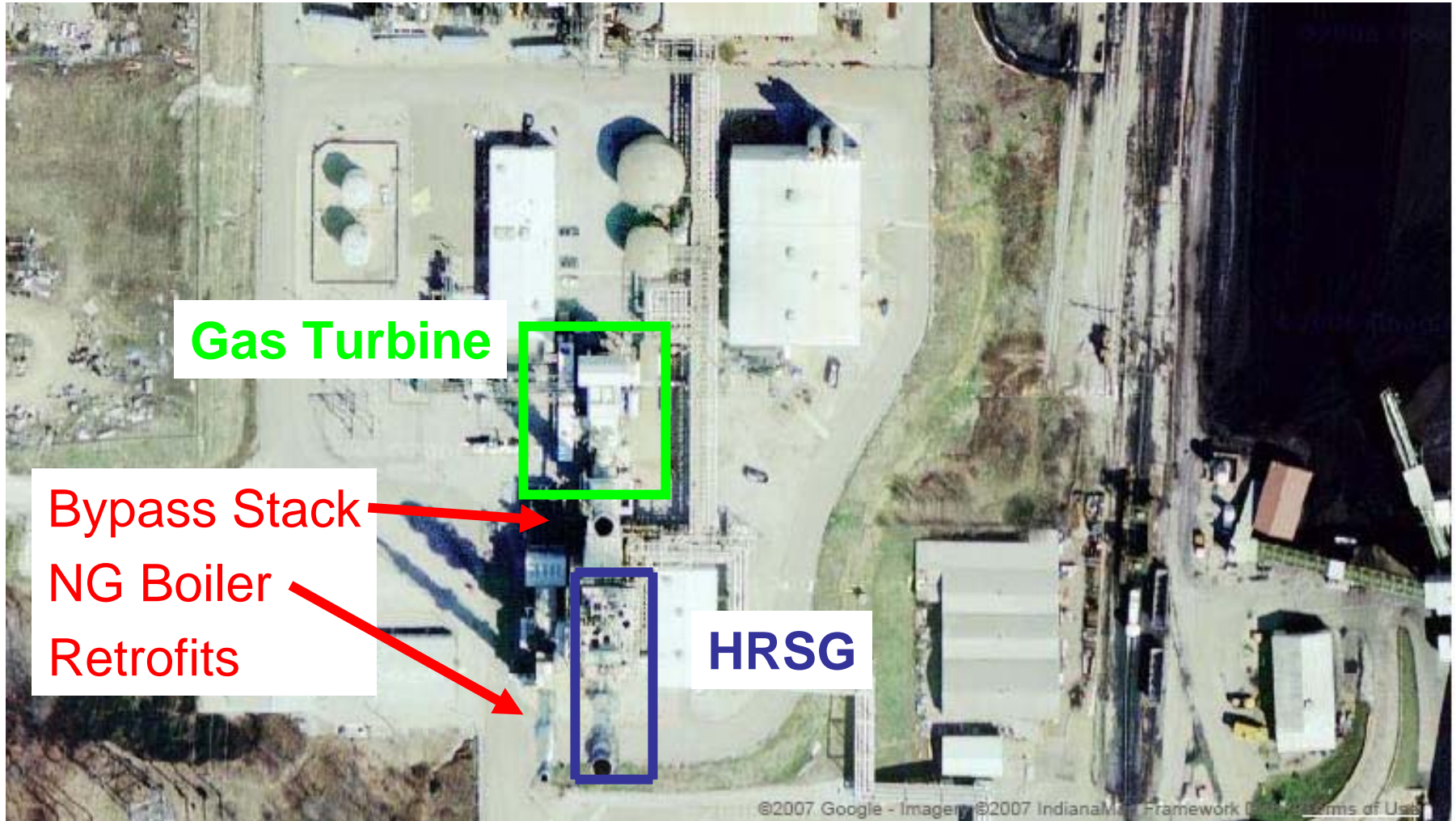
SG Solutions Syngas Facility

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Power Block

Tomorrow...Begins Today



Safety Milestone – The facility completed 21 consecutive months without a TRC incident.

85% Plant Availability in 2007 through June 8

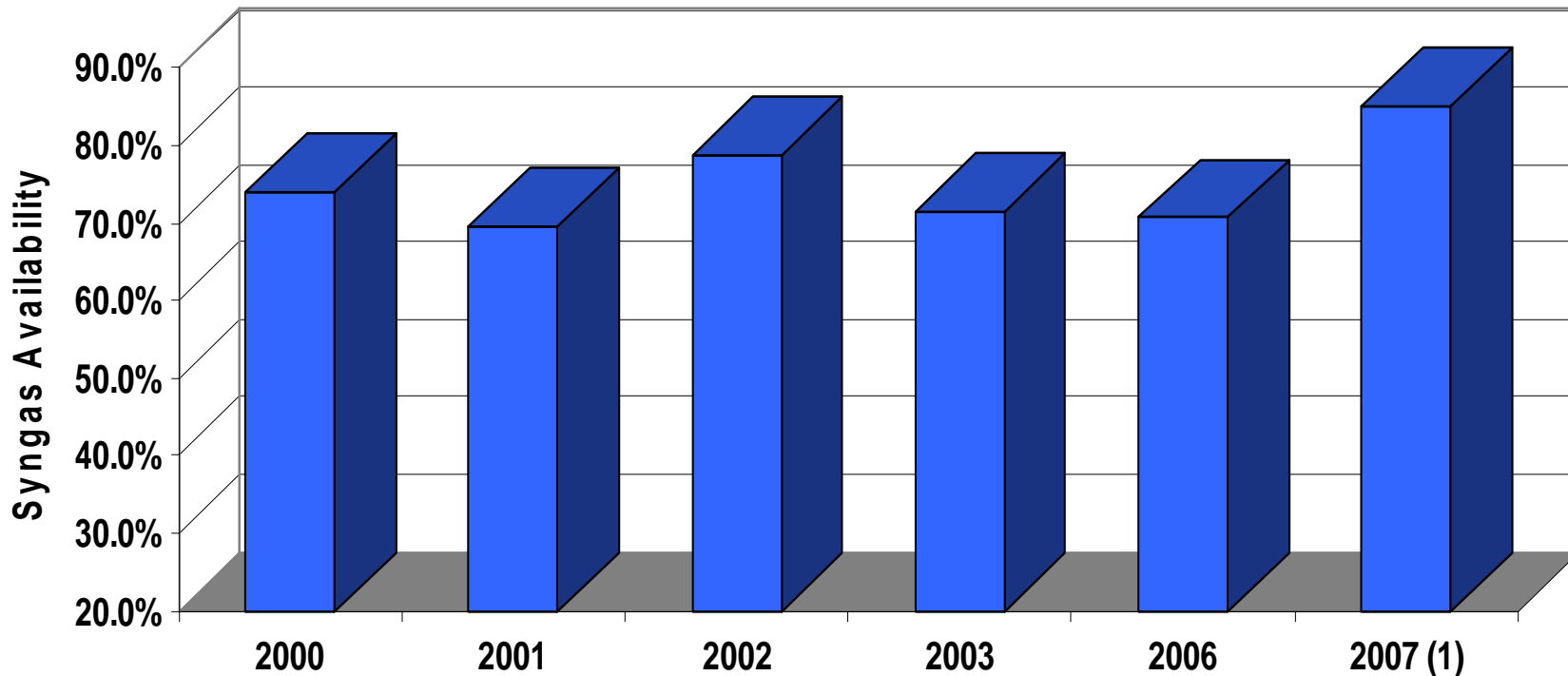
- **Delayed start of Spring Scheduled Outage**

Fuel Milestone – Wabash has gasified >2 million tons petcoke (1.7 million tons of Illinois 6 previously)

Operations Record - 64 days of continuous operation

Maturity of E-Gas Technology at Wabash

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Availability = On Stream % + [Product not Required % * (1-(Forced Outage Rate/100%))]

(1) Through June 8, 2007

Source: SG Solutions, LLC

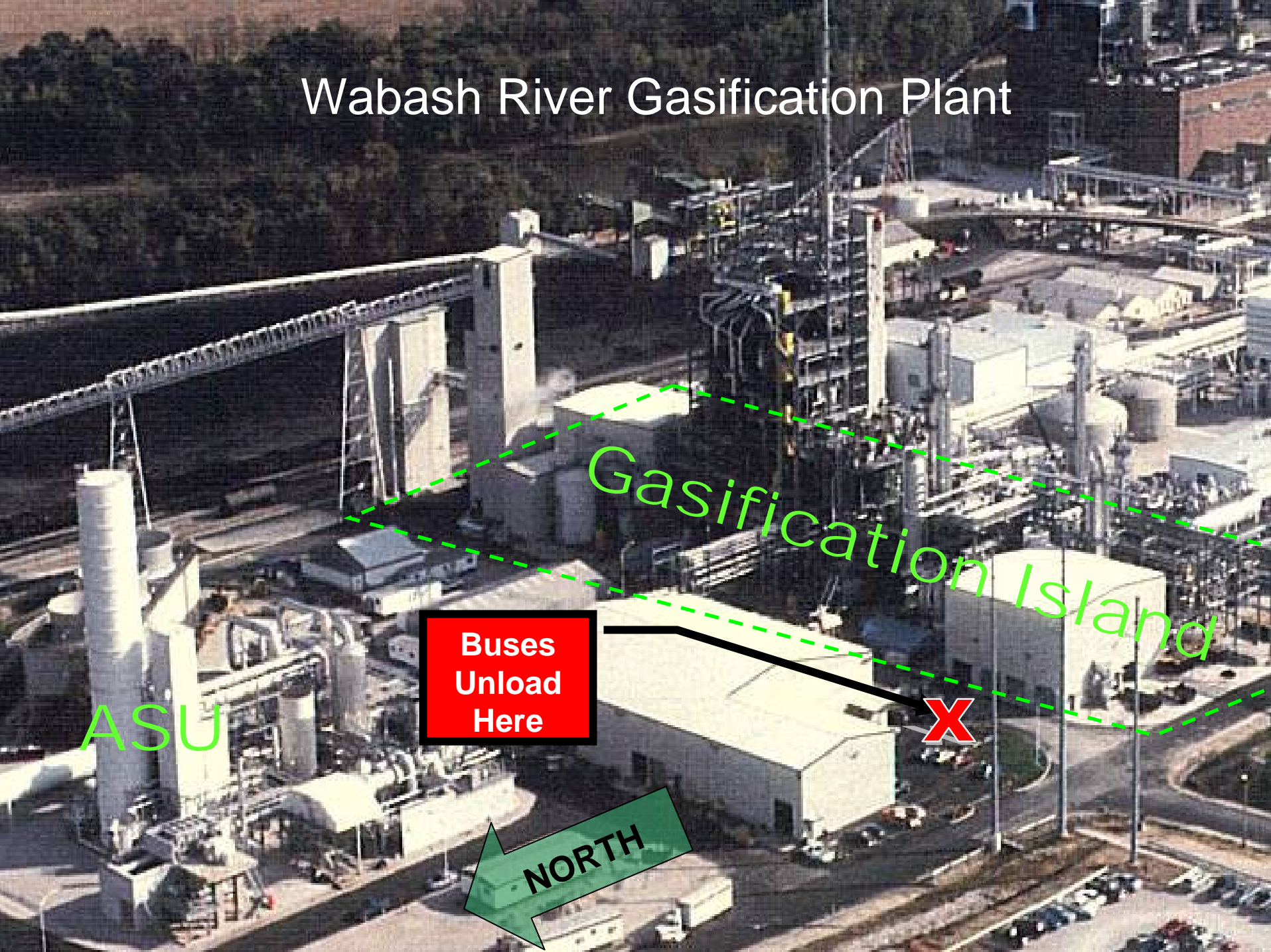
The Plant is in a Major Scheduled Turnaround

- High Maintenance Activity Level
- Three to Five Times the Normal Personnel on Site

Potential Dangers

- Struck By (Overhead Lifts, Overhead Work, Many “Head Knockers”)
- Struck By (Additional Vehicles & Maintenance Equipment)
- Tripping / Falling Hazards (Hoses, Extension Cords, Pipe, etc.)
- Noise, Chemical and High-Pressure Water Hazards
- Pressurized Gas Cylinders
- Airborne Debris from Maintenance Activities

Wabash River Gasification Plant



Gasification Island

Buses
Unload
Here

X

NORTH

ASU

Plant Tour Safety Requirements

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Hard Hats

Safety Glasses with Attached Side Shields

Hearing Protection in Noisy Areas

Stay Out of Restricted Areas (stay on the paving)

Accompanied by a Designated “Tour Guide”

- Phil Amick
- Cliff Keeler
- Tom Lynch
- Richard Payonk
- Newell Carter
- Jeff Stockton
- Gary Devore

In the Event of an Emergency

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Alarm Air Horn Will Sound

- **“Alert”** Air Horn – Continuous series of short blast – All emergencies – Listen for verbal instructions.
- **“All Clear”** Air Horn – Three long blasts – Emergency concluded – Listen for verbal instructions.
- Emergency Horns are tested every Tuesday (**Today**) at Noon

Announcement Will Be Made by Operations

Stay in or Proceed to **Lobby or Large Conference Room**

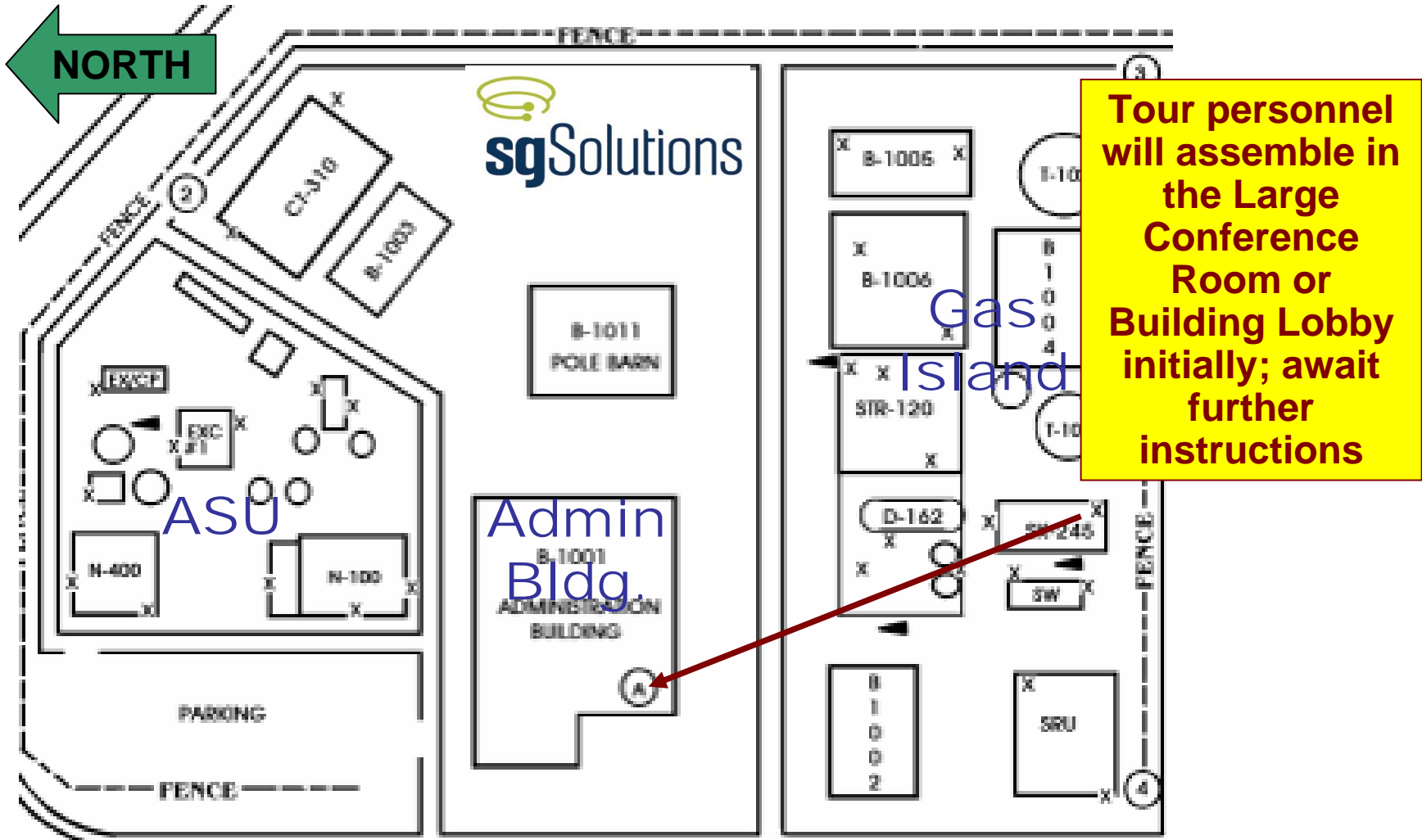
CoP Designate to Check in with Event Recorder

Await Further Instructions

Grab Basic Safety Gear if Evacuation is Announced

Our Emergency Assembly Area

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A photograph of an industrial plant, likely a power generation facility, at dusk. The scene is filled with large cylindrical tanks, complex piping, and metal scaffolding. Several bright lights are visible, illuminating parts of the structure against a darkening sky. The overall atmosphere is industrial and somewhat dramatic due to the low light.

SIMPLE RULES

No cameras

Stay with your tour guide

When we get to the plant site:

- Disembark from buses**
- Divide into groups of 8-10 people**

Enjoy your visit to Wabash River IGCC