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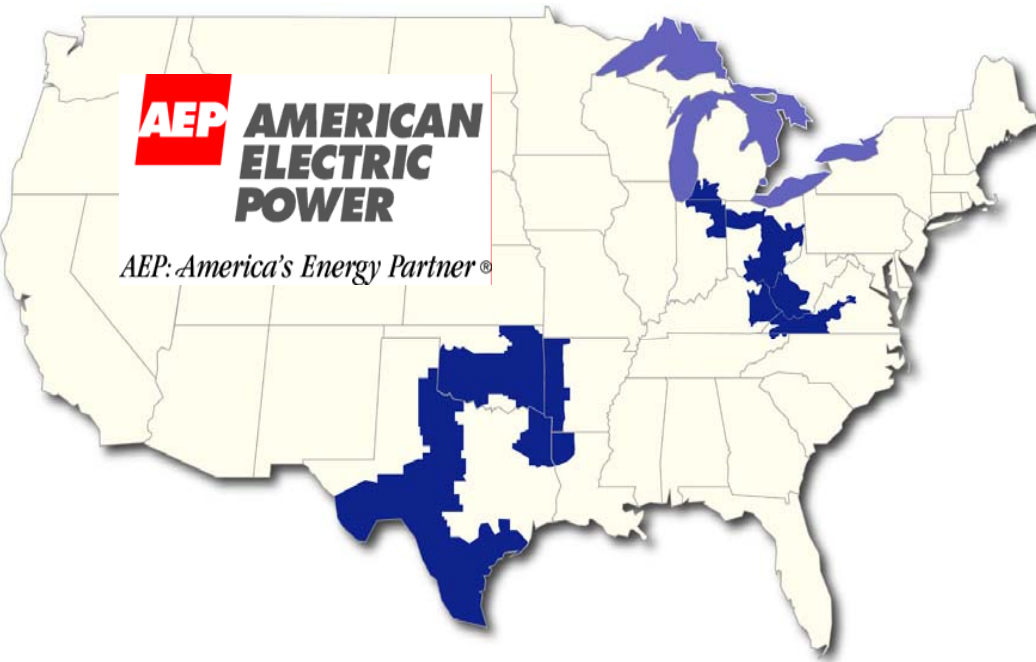
Presented by Mark Dempsey, Vice President External Affairs, AEP Appalachian Power. This talk was presented at the West Virginia Energy Roadmap Workshop on National Coal Issues held in Charleston, WV on November 10, 2004. The meeting was a part of the Energy Roadmap Workshop Series commissioned by West Virginia Governor Bob Wise.

West Virginia Energy Roadmap

National Coal Issues

November 10, 2004

AEP: An Introduction

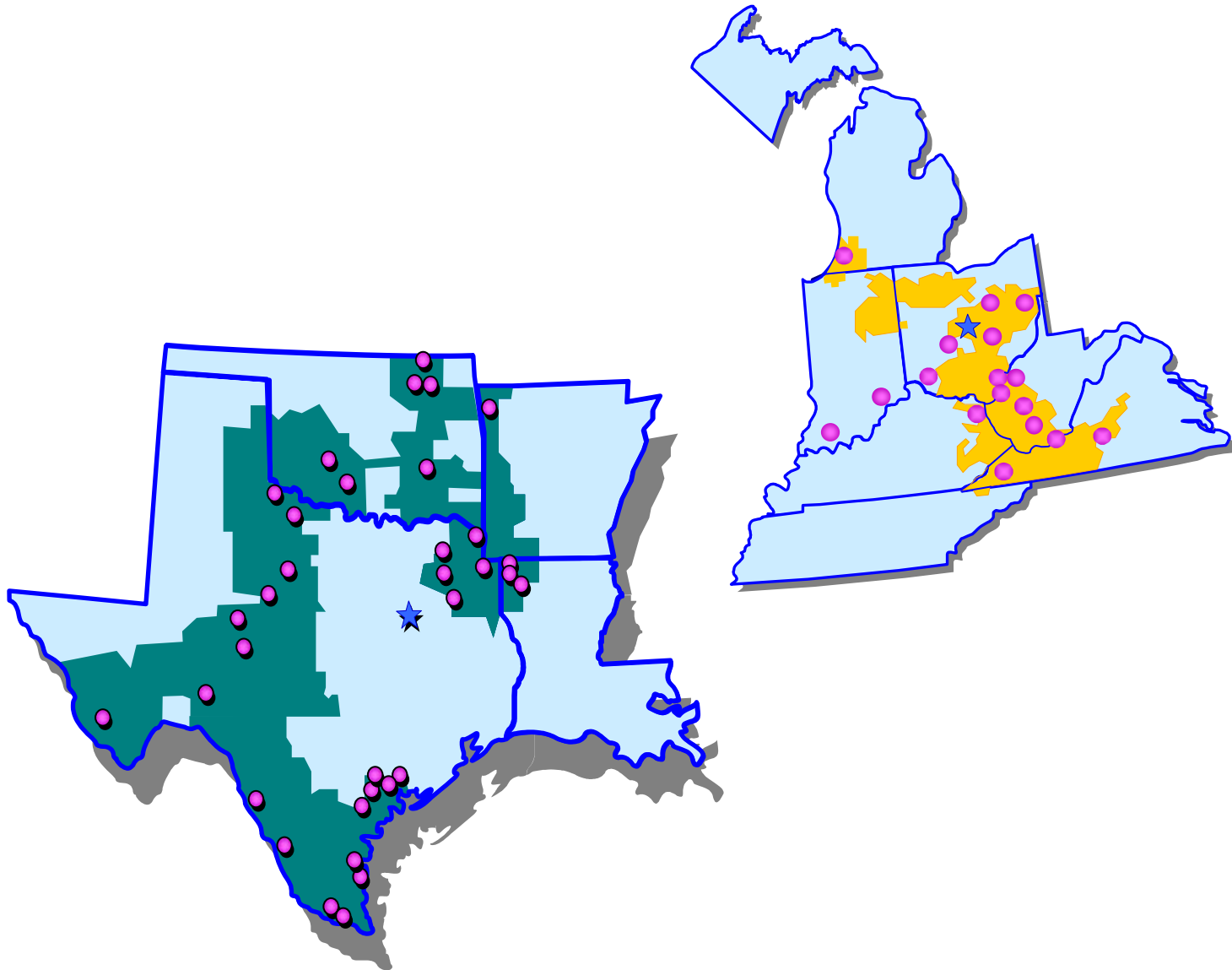


- Largest U.S. electricity generator and coal user
- A leading consumer of natural gas
- Major wind developer
- 220,000+ miles of T&D
- 5 million customers in 11 states

AEP Fuel Portfolio: Increasingly Diverse

	Coal	Gas	Nuclear	Hydro	Wind
1998	88%	0%	9%	3%	0%
Today	70%	20%	7%	2%	1%

AEP power plants



AEP East Emission Reductions

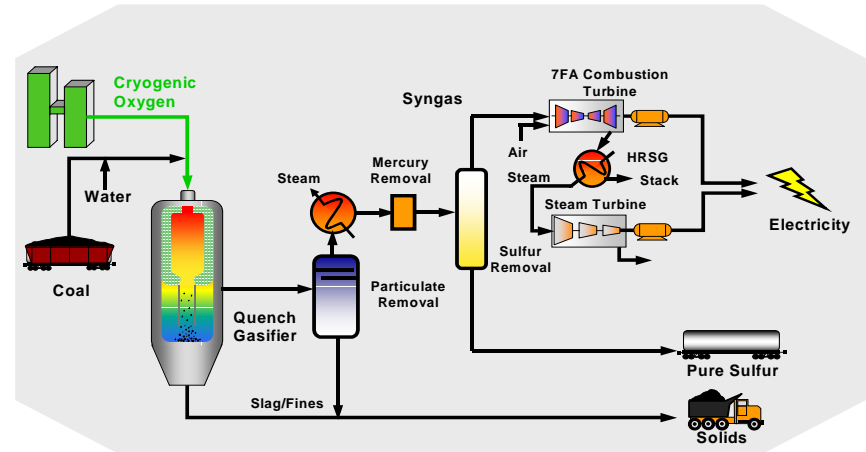
Under Current Law

- **Current Law – Acid Rain (Title IV); Ozone Attainment (Title I) of 1990 Clean Air Act**
- **SO₂ Emissions**
 - Approximately 50% reduction between 1990 and 2005
 - 1990-2002 actual reduction of 44%
- **NO_x Emissions**
 - Approximately 80% reduction in ozone season emissions between 1990 and 2005 (over \$1 billion in capital 2001-04)
 - 1990-2002 actual reduction of 44%
 - By 2005: Approximately 60% annual NO_x reduction
- **Even as demand for electricity from AEP-East coal plants has grown by about 20%**

Generating Technology Options

	PC Subcritical	PC Supercritical	CFB	NGCC	IGCC
EPC Cost, \$/kW	1,250	1,300	1,300	440	1,300
Ave. Heat Rate, Btu/kWh	9,300	8,700	9,800	7,200	8,650
Cost of Electricity \$/MWh	53	53	54	52	55

Source: EPRI estimates



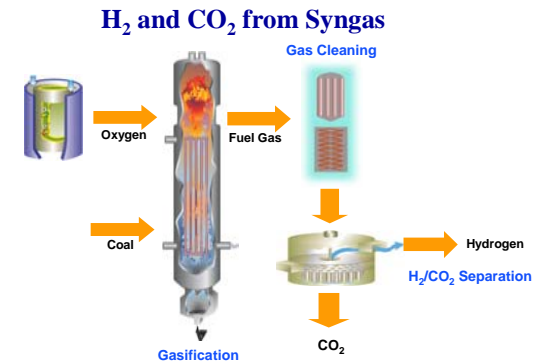
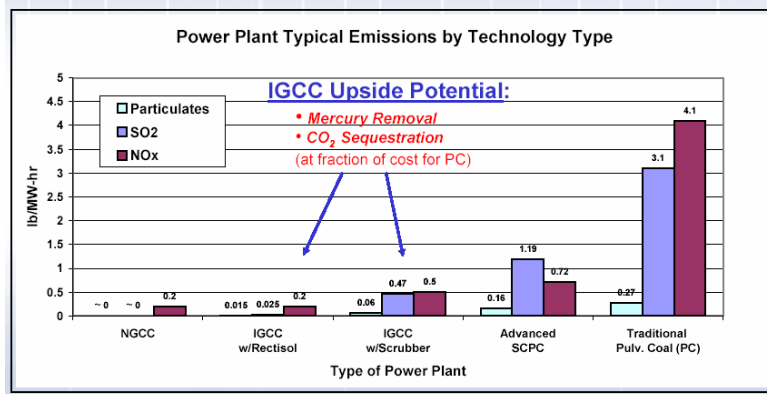
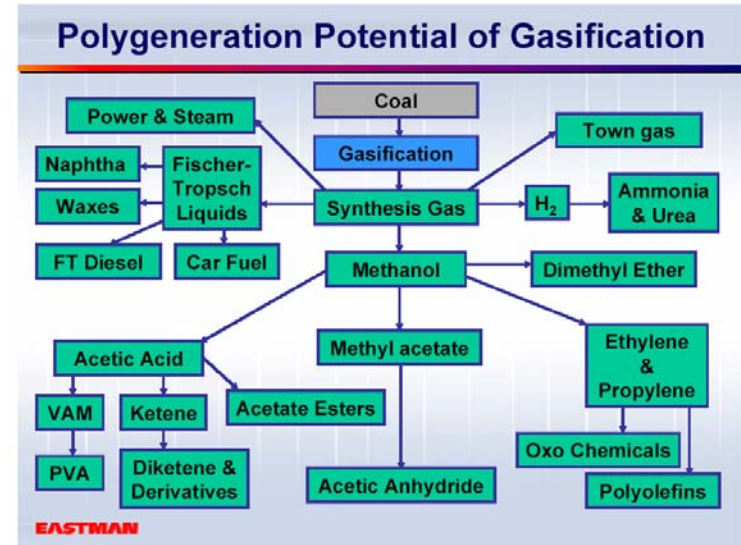
Source US Department of Energy

Integrated Gasification Combined Cycle (IGCC) Plants

Take away: EPRI studies are indicating that IGCC Plant costs are approaching those of conventional technologies; this is yet to be tested in the marketplace with real contracts.

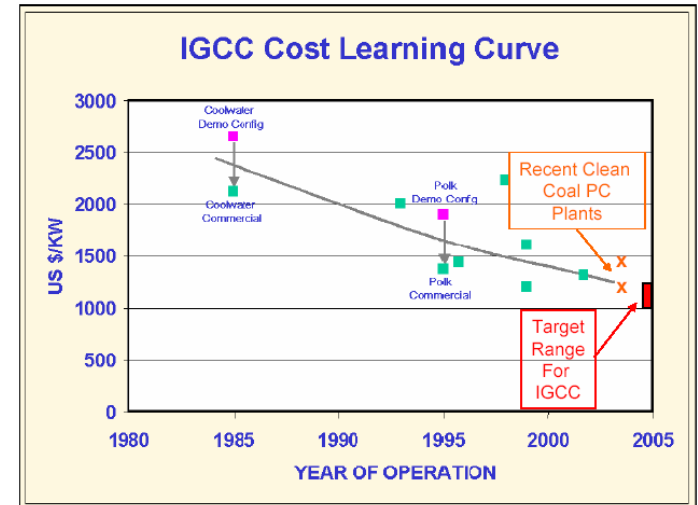
IGCC – The Good, the Bad, and the Ugly

- *The good*
 - Superior efficiency on Eastern Bituminous Coal
 - Superior environmental performance
 - Flexible byproduct processing
 - Tri-generation opportunities
 - Hydrogen production
 - Conducive to Carbon Capture & Disposal



IGCC – The Good, the Bad, and the Ugly

- *The bad*
 - High capital cost
 - More IGCC plants must be built to reduce cost and improve availability
 - Currently not economical for low-BTU coals



IGCC – The Good, the Bad, and the Ugly

- *The ugly*

- The business deal
 - Presently, there are no equipment suppliers, only technology licensors
 - Virtually all of the technology and performance risk is on the plant owner

DOE: We are looking to buy down the cost of the plant by 40-50%, so why are so few utilities considering IGCC ?

Utility: Even if DOE puts up \$500M on a \$1 billion plant, we still have \$500M at risk if the gasifier fails to perform. We are in the power business where reliability is king; we don't want to be 'guinea pigs'; let someone else try first.

PUC Commissioner: What does this gasification system cost per KW, and who is standing behind the performance guarantee?

But – GE Recently purchased Chevron Texaco's gasification business, and will sell IGCC equipment, not just licenses.

making a component of the total plant, we do not want to be liable for delivering power – our units make fuels and by-products.

Lab: A Our research shows that IGCC may not be the best choice for low-rank coals (sub-bituminous, lignite).

?

IGCC's Promise

- **Competitive capital cost** (when mature)
- **Fuel flexibility** (with added capital cost)
- **Highest efficiency** among coal-based technologies (when mature)
- **Best emission** characteristics among coal-based technologies
- Most **carbon-friendly** coal-based technology
- The **technology of choice** to KEEP COAL IN THE MONEY
 - Strategically important to the energy security and economy of our nation