

# **AEP Greenhouse Gas Strategy and Emissions Trading**

**Duke Center for Environmental  
Solutions – 9th Colloquium on  
Environmental Law and Institutions  
November 16, 2004**

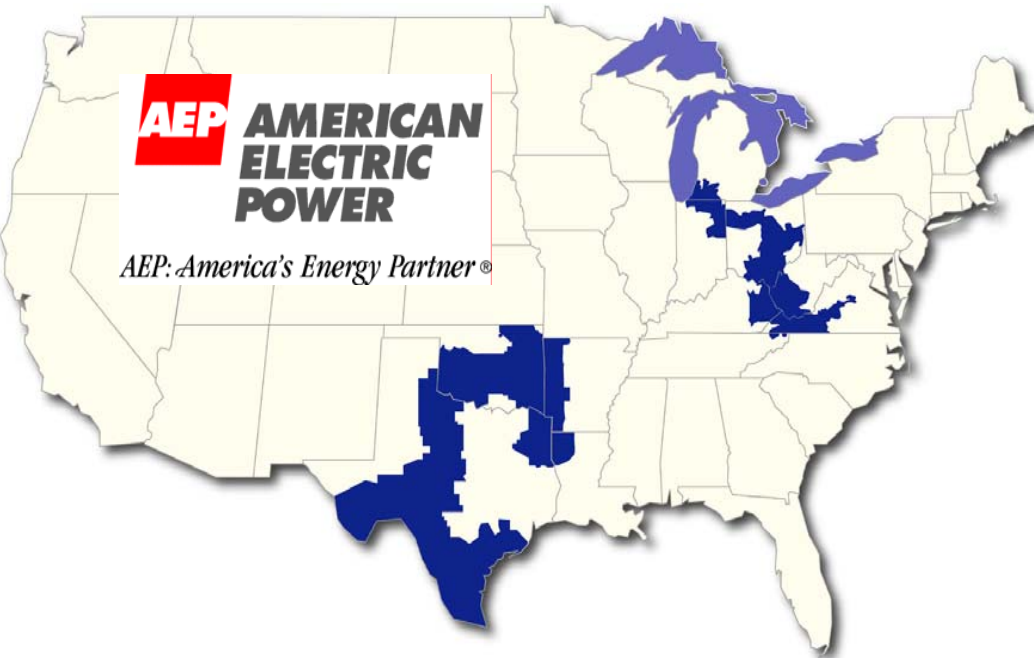


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# AEP: An Introduction

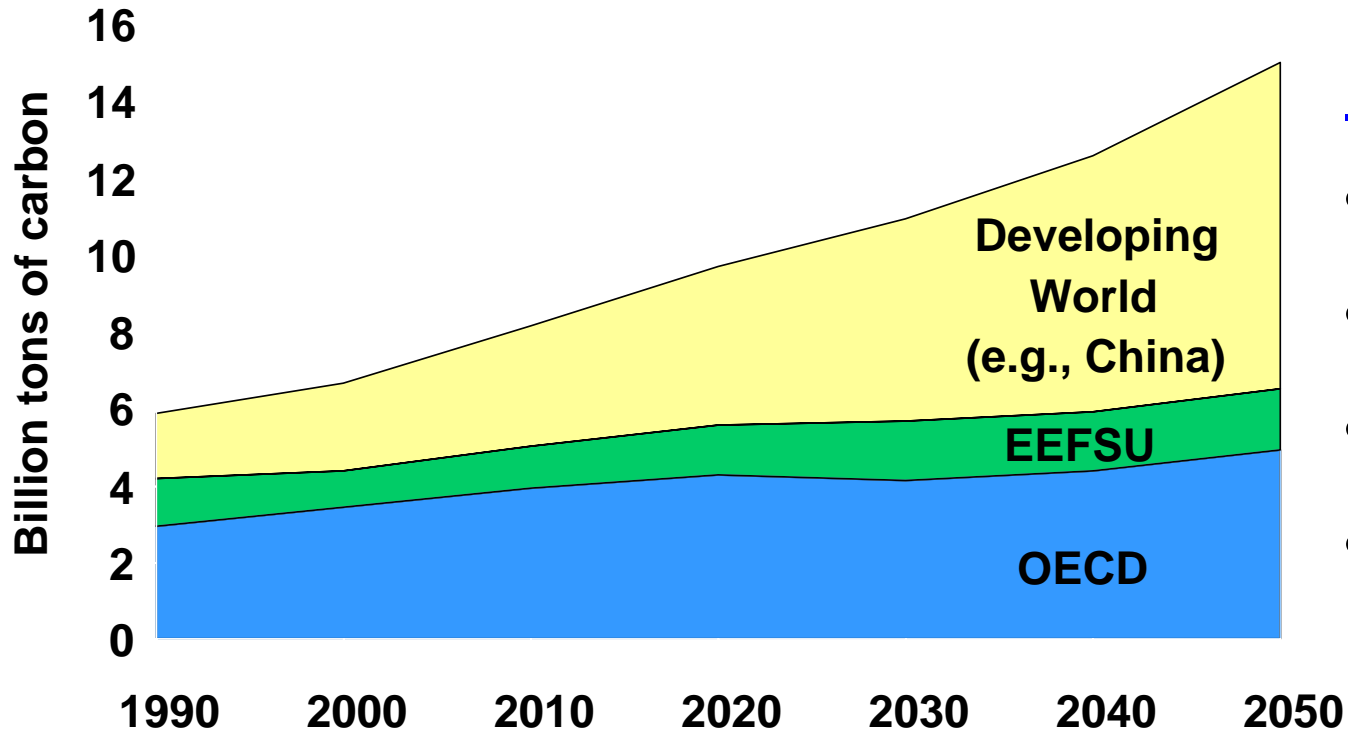


- Largest U.S. electricity generator and coal user
- A leading consumer of natural gas
- Major wind developer
- 220,000+ miles of T&D
- 5 million customers in 11 states

**AEP Fuel Portfolio: Increasingly Diverse**

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

# Global Carbon Dioxide Emissions



Source: U.S. Energy Information Administration

## Drivers:

- Population
- GDP/Capita
- Energy/GDP
- Carbon/Energy

# AEP GHG/CO2 Strategy

## Acknowledge risk and need to take action

### Active engagement in GHG issue

- Support research on science of climate change
- Pursue policy, research, technology, and business opportunities
- Position paper on Global Climate Change

### Advocate market mechanisms and flexibility

- Avoidance, reduction, **and** sequestration options
- Advocate trading, banking, offsets, early action credit (CCX)
- Reform NSR to allow for efficiency investments

### **Short Run – Voluntary cost-effective actions to reduce GHGs**

- **Improve generation efficiency, renewables (biomass & wind), forestry**

### **Long Run – Technology development and deployment**

- **Low/zero carbon coal generation (e.g., FutureGen, geologic sequestration)**

**Bottom Line: Reduce financial risk associated with GHGs**

# AEP Board Subcommittee Emission Assessment Report to Shareholders

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- ***“An Assessment of AEP’s Actions in Mitigate the Economic Impacts of Emissions Policies”***
  - Assessed AEP’s actions to mitigate economic impacts of possible requirements to reduce CO2 and other emissions
  - Interviews of 28 individuals with diverse views and expertise; Management interviews to determine AEP actions; AEP provided Board technology assessment and scenario cost analysis
- **Central challenge for AEP:** Making large investments at long-lived assets ***(\$5 billion by 2020 for air pollution control)*** given major policy and technology uncertainties
- **Subcommittee concludes:** ***“AEP actions over the last decade constitutes solid foundation for future efforts”***
  - Among recommendations: Commit to being an industry leader in development of IGCC technology ***(AEP to build at least one large IGCC)***

# AEP's Portfolio of Current Initiatives

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- **Proactive participation in international and national policy**
  - Pew Center Business Environmental Leadership Council member
  - Board of Directors of International Emissions Trading Association (IETA)
- **EPA Climate Leaders program (w/GHG reduction target)**
  - Also Natural Gas Star & SF6 programs
- **Business Roundtable Climate *RESOLVE* Initiative**
- **e7 CDM projects**
  - Wind development in Galapagos and Chile
- **Chicago Climate Exchange (CCX)**
- **Renewables**
- **Terrestrial sequestration**
- **Geologic sequestration**

# Renewables

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- **Principal activities:**

- AEP 2<sup>nd</sup> largest US wind generator in 2002
- Additional purchases to double wind generation by 2006
- Biomass co-firing in US and UK

- **AEP's key development principles:**

- Permanent Production Tax Credit (PTC) for all renewables
- Integration into state energy plans



- **Wind advantages:**

- Zero emissions
- Vast “technical” potential

- **Wind constraints:**

- Intermittent
- High capital
- Remote/Transmission

# 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

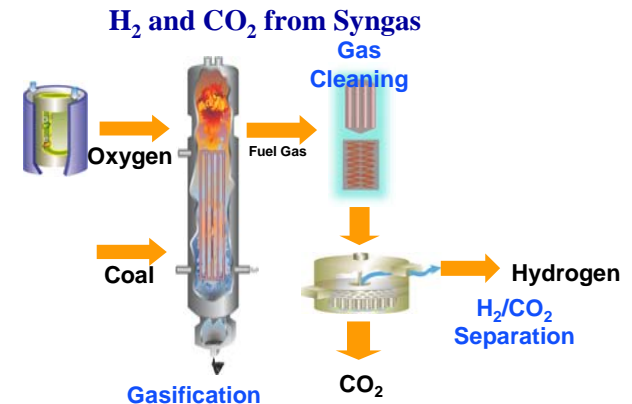
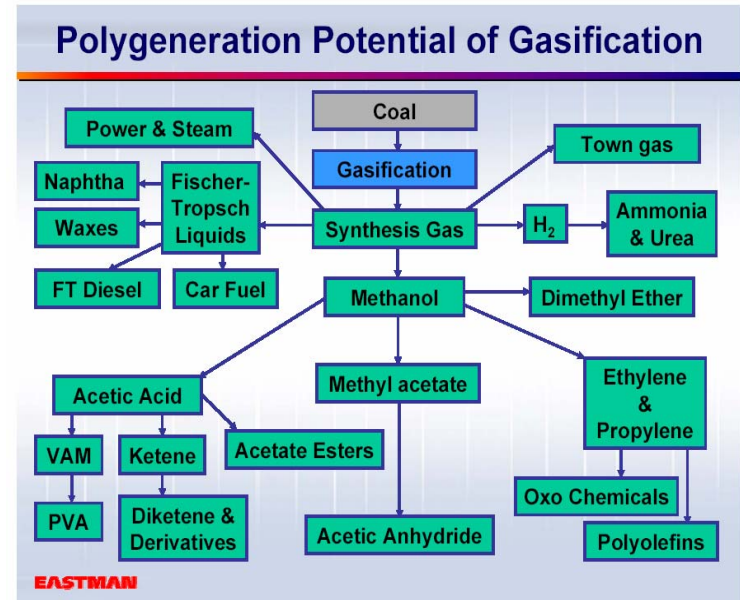
## The bad...

- High capital cost
- Currently not economical for low-BTU coals
- More IGCC must be built to reduce cost

## ...and the ugly

- The business deal: (1) no equipment suppliers, only technology licensors
- (2) virtually all technology/performance risk on plant owner

***But ... GE purchased Chevron Texaco's gasification business***

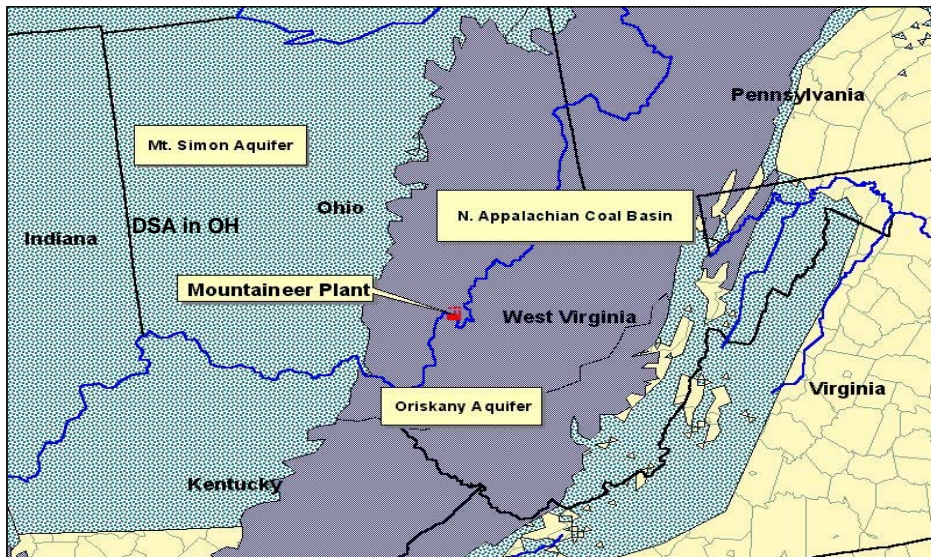




# Future of Coal Technology

## AEP's Mountaineer Plant Sequestration Demonstration

*On 11/21/02, the U.S. DOE announced that AEP, Battelle and our collaborators would lead a \$4.2 million research project on geologic CO<sub>2</sub> disposal.*



*Major sponsors include DOE, Battelle, AEP, Ohio Coal Development Office, BP, and Schlumberger*

## FutureGen

*\$1 Billion, 10-year demo project to create world's first coal based, zero-emission electricity and hydrogen plant with sequestration*



*Major sponsors include AEP, Cinergy, CONSOL, Kennecott, PacifiCorp, Peabody, RAG American, Southern, North American Coal, TXU*

# AEP and Emissions Trading

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- **AEP is among largest US electricity & gas traders and leading traders of emission allowances**
  - Leading purchaser of SO<sub>2</sub> allowances at annual EPA auctions.  
Gross trading in the millions of allowances since beginning SO<sub>2</sub> trading.
  - Purchaser of NO<sub>x</sub> emission allowances for SIP call compliance
- **Board of Directors: Chicago Climate Exchange (CCX) and International Emissions Trading Association (IETA)**
- **Why trade emissions?**
  - Helps increase “supplier” competition
  - Price discovery and knowledge of the markets
  - Spurs cost effective reduction opportunities and technology improvements
  - **Environmental objectives achieved sooner and with no enforcement problems**

# Chicago Climate Exchange ... and AEP



- Unprecedented voluntary GHG reduction/trading pilot
- AEP founder (70+ total)
- 4% reduction in GHG emissions by 2006;  
10% cumulative reductions  
=16 MM metric tons of CO2
- Why CCX?
  - Policy precedent
  - Low cost insurance; learning by doing
  - Voluntary commitment
  - Integral to strategy

# What is Needed for a Successful Trading Market?

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- **Volume/liquidity and some homogeneity** (e.g., national/international, not state/regional only; one common currency – an “allowance”)
- **Reasonable supply/demand balance** (e.g., if too stringent trading value is limited)
- **Risk hedging mechanisms: derivatives, forward contracts, storage** (e.g., emissions “banking” is very important)
- **Accounting/verification with consistent regulations** (e.g., known emissions cap established for a number of years)

# GHG Trading: Design Principles

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- Include ALL greenhouse gases on a carbon equivalent basis
- Include ALL sectors (including vehicles!)
- Banking is a ‘win-win’ (e.g., yielded 20% more SO<sub>2</sub> reductions than required in US during 1995-99 and helped lower costs)
- All reduction options and GHG offsets should be treated equally (e.g., “forestry” is just as good as “renewables”)
- CDM and JI should be strongly encouraged; avoid the pitfall “the perfect is the enemy of the good”