

**AEP's Strategy for Managing  
Climate Change Risks:  
The Value of GHG Reductions**

**EPA's SF<sub>6</sub> and the Environment Conference  
December 1, 2004**



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# Introduction

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- **Overview of AEP**
- **AEP's Environmental Strategy**
- **AEP Board of Directors Emission Assessment Report to Shareholders**

# 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%

# Our Strategy

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- **Asset diversification and optimization**
  - Multi-fuels (coal, gas, renewables)
- **Coal has important long-run role**
  - Substantial air emissions compliance –  
**\$5 billion in retrofit controls thru 2020**
  - IGCC/new technology –  
**Build new IGCC plant in next 5-7 years**
- **Integrated environmental/energy strategy**

# AEP GHG/CO2 Strategy

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## 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)***

# Conclusions from Economic Analysis

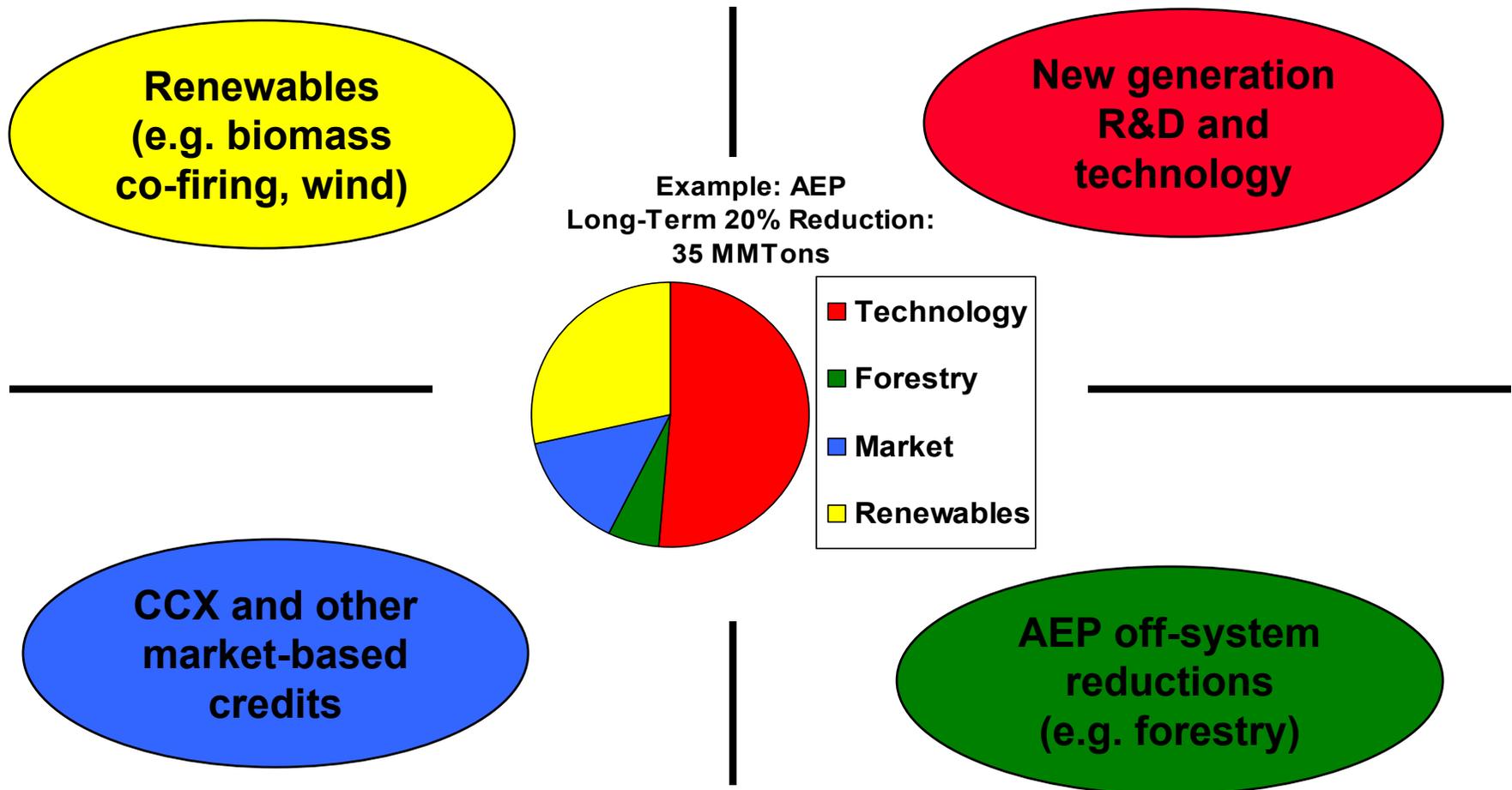
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- **AEP's near-term investment decisions in scrubbers and SCRs at its existing plants are unaffected by possible future greenhouse gas legislation (e.g., Carper or McCain-Lieberman)**
  - These investment decisions are “robust” because they are being made at AEP's lowest cost plants
  - Only when marginal retrofit decisions need to be made (post-2010) would a CO<sub>2</sub>-constraint affect the decision
- **Carper bill costs AEP substantially more than McCain-Lieberman largely because of its allocation of CO<sub>2</sub> reductions/allowances**
  - This demonstrates how economic impacts are affected by policy design considerations independent of actual greenhouse gas reduction benefits

# AEP's Long Term Greenhouse Gas Strategy: A Portfolio Approach



## Long Term GHG Strategy



# 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 & SF<sub>6</sub> programs
- **Chicago Climate Exchange (CCX)**
- **Business Roundtable Climate *RESOLVE* Initiative**
- **e7 CDM projects**
  - Wind development in Galapagos and Chile
- **Renewables**
- **Forestry/terrestrial sequestration**
- **Coal IGCC and geologic sequestration**



# Chicago Climate Exchange

## ... and AEP



- Unprecedented voluntary GHG reduction/trading pilot
- AEP founder (70+ total members)
- 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

# Renewables

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- **Principal activities:**

- AEP 2<sup>nd</sup> largest US wind generator in 2002; doubling 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



# AEP Terrestrial Sequestration Projects

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- **Noel Kempff Mercado Climate Action Project**
  - Largest forestation project in the world
- **Guaraquecaba Climate Action Project**
  - 7-9 MMT of CO<sub>2</sub> sequestered
- **Catahoula National Wildlife Refuge Project**
  - \$6 million investment; approximately 5 MMT of CO<sub>2</sub>
- **UiltiTree Carbon Company and PowerTree Carbon Company**
  - UTCC: 41 utilities; \$3.2 million investment; 3 MMT of CO<sub>2</sub>
  - PTCC: \$3 million funding; 3,800 acres; over 2 MMT of CO<sub>2</sub>
- **US DOE Climate Challenge Tree Planting & Forestry Management**
  - \$11.95 million investment; 30,000 acres; 22 million trees; 9.1 MMT of CO<sub>2</sub>
- **Land Restoration** (The Wilds, ReCreation Land)

**AEP has planted 60 million trees since the 1940's**

# IGCC – The Good, the Bad, and the Ugly

## The good...

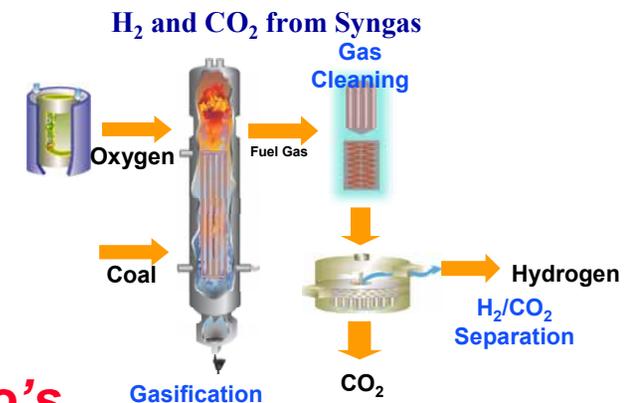
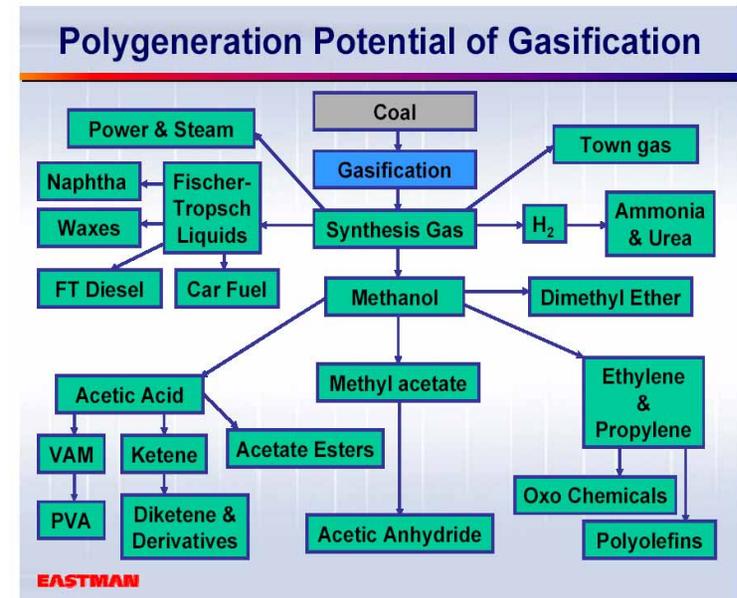
- Superior efficiency on Eastern bituminous coal
- Superior environmental performance
- Flexible byproduct processing
  - Tri-generation opportunities
  - Hydrogen production
- Conducive to carbon capture & disposal

## 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

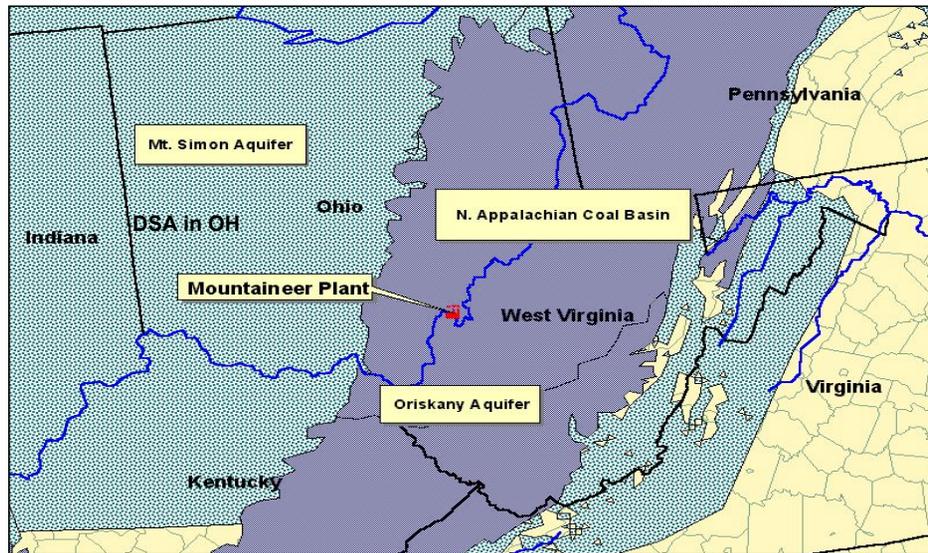


***But ... GE recently purchased Chevron Texaco's gasification business***

# 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

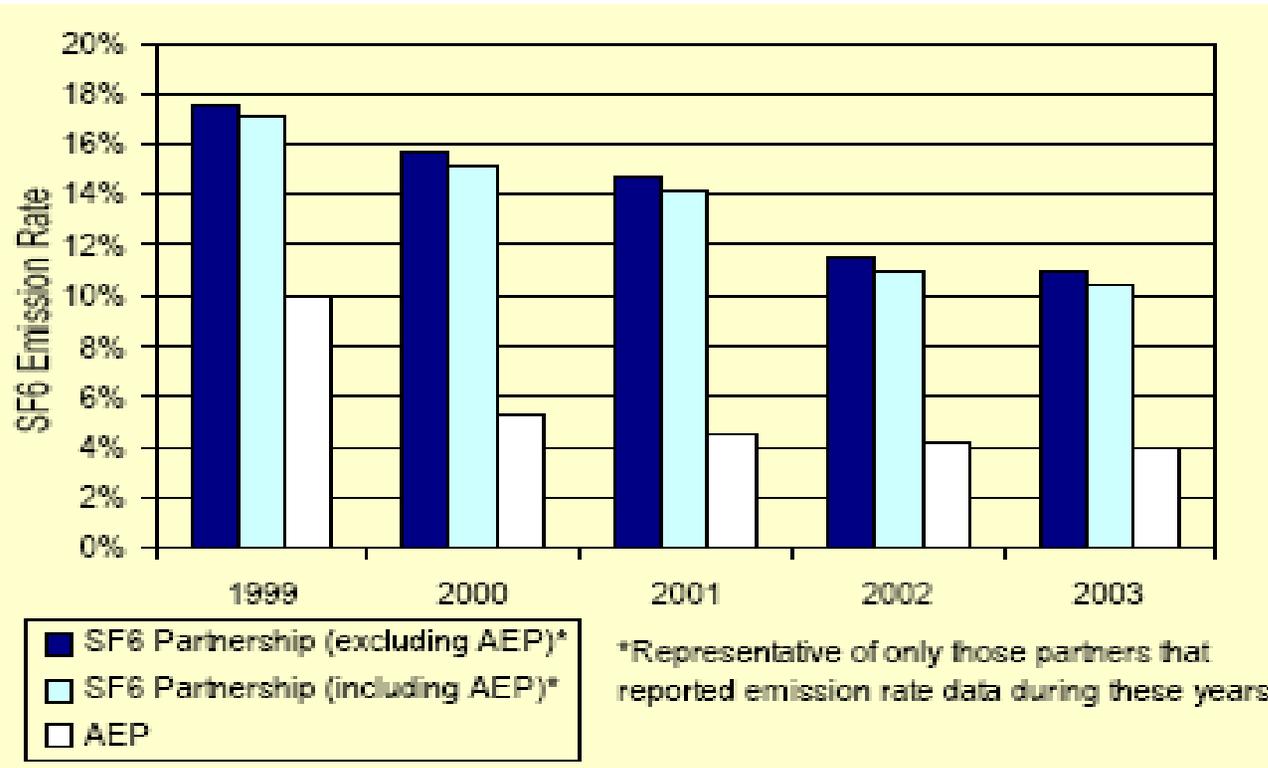
*\$1 Billion, 10-year demo project to create world's first coal based, zero-emission electricity and hydrogen plant with sequestration*



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

# AEP's Participation in EPA's SF<sub>6</sub> Program

- AEP charter partner (1999)
  - 1999 SF<sub>6</sub> emissions: 19,778 lbs. (Rate: 10%)
  - 2003 SF<sub>6</sub> emissions: 12,929 lbs. (Rate: 4%)
  - Total SF<sub>6</sub> emissions prevented (1999-2003): 32,538 lbs. (0.3 MMT CO<sub>2</sub>-equivalent)



## AEP's SF<sub>6</sub> Actions

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- Monitor purchases of SF<sub>6</sub>; Recycling/Reuse
- Review/implement preventative maintenance
- Training on proper handling
- Replace leaking circuit breakers
- Encourage development of lower-leak breakers
- Annual reports, conferences, etc.
- Implement best-practices
- Laser imaging video

- *Efforts paid for themselves through avoided gas purchases*
- *Annual savings exceed \$50,000 in SF<sub>6</sub> gas purchases*
- *Subsequent activity will increase savings even more*