

ELECTRIC POWER CLIMATE RISK DISCLOSURE

A Comparison of 2004 Reports Released by American Electric Power, Cinergy, and TXU

APRIL 2005

PREPARED FOR:

CERES

In Collaboration with Members of The Interfaith Center on Corporate Responsibility

About Ceres

Ceres is a coalition of environmental, investor, labor and advocacy groups working together to increase corporate responsibility worldwide. Formed in 1989, Ceres created the Ceres Principles, a pioneering 10-point code of corporate environmental conduct that led to widespread adoption of environmental principles by mainstream companies worldwide. In 1997, Ceres launched the Global Reporting Initiative (GRI), which has become the internationally standard establish standard for corporate reporting on the "triple bottom line" of economic, social and environmental performance. Ceres helped launch the Investor Network on Climate Risk in November 2003. INCR includes three-dozen leading U.S. institutional investors and investment funds with over \$1 trillion of assets, including the California, New York, New York City and Connecticut public pension funds.

About This Report

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Introduction

In the last several years, major institutional investors have realized that climate change presents a significant risk for investment portfolios, and they have begun to raise concerns about climate risks with the companies in which they are invested and others. For example:

- Investors have launched a new Investor Network on Climate Risk (INCR) and a ten-point action plan urging investors, corporate directors, and government policymakers to develop prudent strategies to climate change. The Network, whose participants collectively manage over \$1 trillion in assets, has also published several key reports on climate risk for investors, which can be found at www.incr.com.
- Following Russian ratification, the Kyoto Protocol went into effect on February 16, 2005. The
 international treaty will force industrialized countries to cut emissions of carbon dioxide and other
 global warming pollutants. The treaty is a market signal to companies worldwide and has
 contributed to the growth of a new international financial market in which companies buy and sell
 global warming pollution permits.
- Recent business publications including *Business Week, Financial Times, Fortune, McKinsey Quarterly,* and *The Wall Street Journal* have published prominent articles about climate risk and the need to develop prudent investment and corporate response strategies and solutions.
- In July 2004, eight state attorneys general and New York City filed the first climate change lawsuit against companies when they sued five of the nation's largest electric power generating companies to require the companies to reduce their carbon dioxide emissions.

The electric power industry is also the source of pollutants that are regulated under the Clean Air Act – nitrogen oxides, sulfur dioxide, and mercury. The Environmental Protection Agency has recently issued stronger new standards for these pollutants, which will lead to billions of dollars of investment in controls at existing plants and have implications for the rising tide of concern about climate change and the investments that it will necessitate.

Each one of these developments requires investors to reflect on the consequences of climate risk for their portfolios. Prudence, common sense, fiduciary responsibility, and legal duty impel financial managers to examine the emerging risks with care, and where appropriate, to act. A first step in examining these risks is for companies to disclose their climate risks.

Indeed, many investors, including the members of the Interfaith Center on Corporate Responsibility (ICCR), an association of 275 faith-based institutional investors who have led the corporate social responsibility movement in filings on climate change, have been taking action to address climate risk. In growing numbers, state pension funds, foundations, socially responsible investment firms and ICCR have been leveraging their financial clout as shareholders to insist that large electric power companies with significant emissions improve disclosure of their climate risks to their shareholders. In 2004, four major U.S. power companies – American Electric Power (AEP), Southern, TXU, and Cinergy – agreed to new climate risk disclosure to shareholders.

AEP, Cinergy and TXU, which collectively emit over 250 million tons of carbon dioxide a year, have now issued new reports to shareholders that outline the implications to the companies and their shareholders of

climate change and possible regulatory changes. All three companies deserve credit for responding to requests from shareholders, and providing useful information on the challenges they face and their attempts to address them. This report analyzes and compares the three reports.

This report has three purposes. First, it aims to help investors and financial analysts better understand what aspects of climate change and its risk they should be asking electric power companies about.

Second, it compares the disclosure efforts of the three companies so that all electric power companies can develop a clearer understanding of what shareholders want and expect. With that improved understanding, we hope that all power companies will improve their disclosure to investors on climate risk.

Finally, we issued this report to help all parties – electric power companies, investors, financial analysts and others – develop a model for the preferred method to disclose climate risks. Disclosure of key issues, such as climate change, will evolve over time as both companies and investors recognize needed improvements in the material presented and how to present it. We hope that this report will advance all parties understanding of the best methods for disclosing climate risks.

This development of this report would not have been possible with significant assistance from many of Ceres' partners. I extend our special thanks to our partners at the ICCR – Leslie Lowe, Amy Muska O'Brien of the Pension Boards United Church of Christ, and Julie Tanner of Christian Brothers Investment Services, and to Don Kirshbaum of the Connecticut State Treasurer's Office. All four have been tireless in their pursuit of improved corporate disclosure of climate risk, and this report demonstrates their successes. Amy and Julie helped to develop the framework for assessing disclosure that this report uses. In addition, Ceres thanks David Gardiner & Associates, especially its Research Associate, Christine Stackpole, who developed this report.

Sincerely,

Mindy Lubber President Ceres

Executive Summary and Key Findings

In the last few months of 2004, three electric power companies – American Electric Power, Cinergy, and TXU – have issued reports on climate risk to their shareholders.¹ The companies published these new reports in response to increased shareholder pressure for corporate climate risk disclosure. On behalf of the shareholders who have been pressing for increased disclosure of climate risk, Ceres asked David Gardiner & Associates (DGA) to analyze and compare the three new reports.

The request for increased disclosure is driven by investor recognition that the electric utility industry is the largest source of greenhouse gases in the United States, responsible for 39% of man-made carbon dioxide emissions, and, thus, a likely target for regulation when the country acts to reduce its emissions. In addition, the electricity industry is a significant source of other air pollutants, such as sulfur dioxide, nitrogen oxides and mercury, and the United States Environmental Protection Agency (EPA) is proposing tougher standards for these pollutants.

These future air and climate regulations present a significant economic risk to the companies and their shareholders – and the risk must be managed well. As stated in the American Electric Power report, "Among the most significant economic drivers for coal-based generators are current and future environmental policies, particularly air quality policies and programs."

As demand for electricity continues to increase in the U.S., and power companies propose new power plants to meet that demand, it is critical for companies to explain to their shareholders how they plan to navigate the uncertain regulatory environment. These reports were issued at a time when more than 100 new coal-fired power plants are being proposed², costing more than \$80 billion, with significant implications for investors and the environment.

This analysis compared the company reports on the basis of five key factors that shareholders in power companies believe are critical to understanding the risks that the company faces from climate change and other air pollution policies. Investors believe that companies must disclose information about:

- The company's current position on the science and policy of climate change
- The implications of several plausible future greenhouse gas regulatory scenarios
- The company's understanding of its most cost-effective strategies to reduce greenhouse gases
- Their current and future emissions
- The key assumptions, methods, and the process used to develop the report

The analysis found that:

Climate Policy Uncertainty is the Greatest Industry Challenge

The disclosure reports from AEP, Cinergy, and TXU paint a picture of an industry in which uncertainty abounds. In particular, the greatest challenge that the electricity industry and energy investors face is a period of uncertainty about the future regulation of greenhouse gases. This uncertainty makes it difficult for all to determine the future price of greenhouse gas emissions, to value the assets that emit them, or to

¹ American Electric Power's report can be found at http://www.aep.com/environmental/performance/emissionsassessment/default.htm. Cinergy's report can be found at http://www.cinergy.com/pdfs/AIRS_12012004_final.pdf . TXU's report can be found at http://www.txucorp.com/responsibility/environment/reports/Env_Study100104.pdf.

² Department of Energy, National Energy Technology Laboratory, www.netl.doe.gov/coal/refshelf/New%20Coal%20Plants%20(12-22-04) pdf

project future revenues or profits. This situation will continue until the U.S. government clarifies the future path for regulation through either domestic or international action.

Each company highlighted the financial risks for electric power companies stemming from the uncertainty about U.S. policy on climate change. AEP said "The central challenge the company faces is that of making decisions about large investments in long-lived assets in a setting of uncertain public policy and rapidly evolving technology." TXU argued that any investment in voluntary emissions reductions was unwarranted until the company understood the shape of the future greenhouse gas regulatory program.

Cinergy called for government to set a limit on greenhouse gas emissions to end the uncertainty. Specifically, it said:

"The uncertainties are particularly challenging for Cinergy and other utilities because we must routinely make long-term decisions to continue meeting the energy needs of our customers. It can take from 6 to 12 years to build a large base load generating station on a new site, at a cost in excess of \$1 billion. Early in the process, we must find the optimal location, design the plant, obtain permits, and finalize major engineering decisions. In an uncertain regulatory climate, these decisions must be made at the risk that they will not be optimal once the existing uncertainty is finally resolved. Cinergy works hard to manage this risk, and has done so successfully for years, but clearly, the prompt adoption of a clear long-term federal environmental policy would benefit all." [Emphasis added]

All companies acknowledged that limits on global warming pollutants are going to occur, but say that they do not know the details about the targets they must meet or the timetable by which they must meet them. The reports make clear that how Congress designs the trading program, especially the allocation of permits, will have major implications.

Investors share the risk that companies will make the wrong capital expenditure decisions during this time of uncertainty. Companies are making capital decisions every day, and may well be increasing their costs of complying with coming emission limits. Managing the uncertain policy environment on climate change is one of a number of significant environmental challenges facing electric company executives and investors in the next few years as well as the decades to come. Compounding the uncertainties, efforts to combat climate change come on top of a series of other pressing issues facing the U.S. electric industry. They include:

- Volatility in fuel prices and growing demand for electricity
- Dynamic markets and an uncertain future, as approximately half of the states have deregulated their wholesale electricity markets
- Increased pressure to ensure reliability of electricity supply
- Local concerns about power plant sitings and expansions
- Highly competitive capital markets
- Increasing requirements to reduce emissions of air pollutants
- Introduction of new generation technologies such as fuel cells, biomass, geothermal, solar and wind energy and requirements for their use

Summary of Analysis of Company Reports

Each of the company's reports had strengths and weaknesses:

- American Electric Power did a thorough job analyzing, quantifying, and discussing the
 implications for the company of future regulatory scenarios. It correctly identified current policy
 and technology uncertainty as the "central challenge" facing the company, but neglected to clearly
 state support for ending that uncertainty. The board prepared the report with management and
 also consulted with a range of industry experts including public interest organizations.
- Cinergy presented a thorough discussion of the implications of future regulatory scenarios for the company, and provided some assessment of the financial implications. Cinergy expressed concern about the regulatory uncertainty, and even called for Congress to end the uncertainty. Cinergy also described its greenhouse gas reduction commitment and strategy for achieving actual reductions. The company worked closely with shareholders to develop and release the report, which was also reviewed by its Board of Directors.
- TXU comprehensively explained the risks associated with voluntary actions in the absence of a
 national climate policy, but did not include an examination or quantification of future regulatory
 scenarios a primary request of shareholders. TXU also provided a detailed discussion of the
 company's management systems and qualifications to address existing environmental requirements.
 It did not consult with many outside experts or with shareholders in preparing or releasing the
 report.

AEP and Cinergy Present Position Statements on Climate Science and Policy, While TXU Did Not

Both AEP and Cinergy stated clearly their companies' positions on climate change policy and the science behind it. They have moved beyond arguments over the validity of climate change science, affirming that the science is adequate enough to warrant action. The TXU report addresses neither a company position on climate change nor the science behind it. AEP and Cinergy expect that federal climate change policy will be enacted, and, not surprisingly, are engaging in policy discussions and taking action to position their companies. They asserted that their companies could manage GHG emissions restrictions as long as the policy is "well-constructed." All of the companies state that the uncertain future of environmental policy, in particular climate change policy, is a significant challenge, which makes long-term investment decisions very difficult. Indeed, AEP calls uncertainty the "central challenge" for the company. Furthermore, all of the companies are concerned they will be penalized for early voluntary reductions. Cinergy calls for adoption of legislation to address NOx, SO₂, and mercury now, with a cap on CO₂ at a later date, as the primary mechanism to reduce uncertainty.

Companies Were Mixed in Presenting Future Climate Regulatory Scenarios

American Electric Power did an excellent job of analyzing future scenarios, quantifying their implications, and providing a discussion of them. Cinergy did a good job; it outlined possible scenarios and discussed their implications, but did not quantify them. The TXU report summarized legislative and regulatory proposals but did not quantify the implications of future policy scenarios or discuss what they meant for the company.

AEP and Cinergy Presented Potential Reduction Strategies, While TXU Did Not

All of the companies addressed what activities they were undertaking related to CO₂ emissions reductions, but provided few details on their long-term strategy. Under the voluntary commitments that AEP and Cinergy have made, each company has a large portfolio of current strategies to reduce emissions, including efficiency improvements, sequestration projects, investments in renewable fuels, and support of the

Integrated Gasification Combined Cycle (IGCC) technology with coal. TXU's report does not present any actual CO₂ reduction strategies that the company plans to take in the future. Their report assesses only representative strategies that a company might take *now* and concludes that taking action in advance of mandatory requirements to reduce greenhouse gas emissions not in the interests of shareholders. TXU is purchasing greater amounts than mandated of renewable energy. Future choices, each company suggests, depend upon CO₂ allowance price.

Companies Did Not Comprehensively Report Current and Future Emissions

The companies generally did not systematically reporting absolute and normalized emissions data for sulfur oxides (SO_2), nitrogen oxides (NO_x), mercury, and carbon dioxide (NO_x). Cinergy did the best job of disclosing its emissions data, because it revealed absolute emissions for three out of four – SO_2 , NO_x , and NO_x and NO_x emissions. TXU provided information on NO_x and NO_x emissions. AEP only revealed current NO_x emissions. AEP did provide projections of all of the emissions under study. Both AEP and Cinergy have voluntary commitments to reduce NO_x emissions, while TXU has no public voluntary commitment to lower its NO_x emissions. Indeed, the TXU report argues strongly against taking voluntary action to address climate change, except in limited circumstances, until the rules of a mandatory program are known.

AEP and Cinergy Reports Improved with Board and Expert Involvement

All reports were transparent. Each report defined key assumptions and gave estimates of key variables (e.g., future natural gas cost) with source information for those estimates. The companies used different processes to develop these reports. AEP's report was authored by an independent committee of the company's Board, whereas Cinergy's and TXU's were reviewed by their respective boards. Staff prepared Cinergy's report and two consulting firms developed TXU's. AEP and Cinergy consulted with outside experts from the academic, environmental, and business communities, in addition to shareholders, for input into their analyses. AEP and Cinergy's reports most clearly describe their action plans for the future, which includes the involvement of stakeholder groups.

DETAILED ANALYSIS

Position Statement on Climate Science and Policy

Why Shareholders Care about a Company's Climate Change Position

The position a company takes on climate change indicates whether or not the organization has prioritized the issue. Investors want to ensure that the company is prepared for impending climate change restrictions which may cause significant shifts in how the company operates. Companies that have a proactive position and operate in alignment with that position are likely to do better than companies who are not addressing the issue.

Some companies continue to use uncertainty around climate change science as a reason for inaction or to delay policy. However, moving beyond the debate over science and adopting a proactive stance is likely to increase a company's ability to shape public policy. Proactively reducing greenhouse gas emissions adds to the policy discussion by providing real-world experience.

Additionally, companies are facing not only increasing regulatory pressure, but also competitive and public pressure to mitigate GHG emissions. According to a widely-reported April 2003 Gallup poll, 51 percent of Americans believed the US government was doing too little to protect the environment and 75 percent favor imposing mandatory controls on CO₂ and other greenhouse gas emissions. Having a clear public position is an important step to alleviating such pressure.

Public statements to shareholders and customers will be compared to the positions a company takes in its lobbying efforts. Are the company's positions consistent? Taking inconsistent positions puts a company at risk for a public relations problem if exposed.

Summary of Analysis

- Cinergy and AEP stated somewhat clearly their positions on climate change policy and the science behind it. They have moved beyond arguments over the validity of climate change science, affirming that the science is sufficient to warrant action on the part of the company.
- Cinergy expects that federal climate change policy will be enacted, and, not surprisingly, is engaging in policy discussions and taking action to position their company. They asserted that their companies could manage GHG emissions restrictions as long as the policy is "well-constructed." This company is also voluntarily reducing their emissions.
- The TXU report addresses neither a company position on climate change nor the science behind it.
- TXU does not acknowledge the likelihood of federally mandated greenhouse gas restrictions and argues against early actions to lower CO₂ emissions.
- Regarding U.S. actions, AEP expects that because of "...past reluctance by Congress to consider
 mandatory restrictions on U.S. emissions in the absence of comprehensive and coordinated global
 action..." that "the likelihood for costly, mandated reductions in carbon emissions in the next few

years appears small." However, AEP notes that "mandatory carbon constraints in the long term appear probable," and, not surprisingly, is engaging in policy discussions and taking action to position the company. They asserted that they could manage GHG emissions restrictions as long as the policy is "well-constructed." AEP is also voluntarily reducing their emissions. For example, it participates in the Chicago Climate Exchange, a voluntary emissions reduction and trading program.

• A significant challenge cited by all three companies is the uncertain future of environmental policy, in particular climate change policy. This uncertainty has definite business implications, making long-term investment decisions difficult. Furthermore, they are concerned that they will be penalized for early voluntary reductions. With passage of a well-crafted multi-emissions bill including CO₂, these companies suggest that these concerns would be alleviated.

Company Information

American Electric Power

AEP's report quotes the company's position on climate change, citing "enough is known about the science and environmental impacts of climate change for us to take actions to address its consequences." These actions include participating in the Chicago Climate Exchange. AEP advocates voluntary cap-and-trade programs and is working with the Bush Administration on voluntary measures.

It is not clear from the report how strongly the company opposes or supports mandatory CO_2 emissions reductions. However, the company notes throughout the report that the focus was to evaluate the business issues surrounding uncertain environmental regulation rather than normative policy positions or proposals. AEP concludes, "[A]nalyses prepared for this report suggest that AEP could meet a reasonable constraint at significant but manageable costs – provided that the program was efficiently designed." And the company engages on many levels in the design of any mandatory program. The company, however, opposes the Kyoto Protocol.

A mandatory program, according to AEP, will likely be enacted in the long run in the US though the details are undecided. "Mandatory carbon constraints in the long-term appear probable ... the absence of comprehensive and coordinated global action makes it difficult to expect rapid emergence of the near-term political consensus that could motivate a major policy-level response to global climate change." The report goes so far as to estimate on the timing of passage, pronouncing, and "some initial mandatory reductions of greenhouse gas emissions are likely in the next decade".

AEP affirms "the central challenge the company faces is that of making decisions about large investments in long-lived assets in a setting of uncertain public policy and rapidly evolving technology." The company faces a significant related challenge affecting its voluntary initiatives, "determining the extent to which it can increase its voluntary greenhouse gas abatement investments since unilateral actions will yield little in terms of demonstrable environmental benefits and could place the company and possibly its commercial and industrial customers at a competitive disadvantage."

Cinergy

Cinergy takes a position on climate change and global warming science. In his introduction of the report, Cinergy's Vice President of Federal Affairs, Environmental Strategy and Sustainability John Stowell asserts

that "Although we know there is still much we do not understand, we respect the analyses presented in the report issued by the National Academy of Science in response to questions from the Bush Administration (in "Climate Change Science?: An Analysis of Key Questions."). The NAS assessment states: 1. The earth is warming; 2. It will continue to do so; and 3. Human activity is likely contributing to this warming."

Accordingly, Cinergy's CEO Jim Rogers is quoted in the report as stating "we eventually will operate our business in a carbon-constrained world' and that it is our responsibility to prepare for that likelihood." The company has declared its desire for Congress "to act to pass a long-term, multi-emissions bill that would remove uncertainty out of national environmental policy." Because of the assumed improbability that the current Congress will come to consensus on any bill that addresses greenhouse emissions, Cinergy advocates that those emissions should be considered separately than additional NO_x , SO_2 , and mercury controls.

For greenhouse gases, Cinergy finds that "a well-constructed policy that gradually and predictably reduces emissions can be managed without undue disruption to the company or economy, though even the best plan will have rate impacts on our customers." Toward this end, the company advocates for specific components that they would like to see within any bill, most prominently a market-based emissions trading program that does not favor one fuel over the other.

Cinergy maintains that federal regulation would provide certainty for its business, with qualifications. "The current regulatory regime simply does not work as efficiently as it should, and therefore results in higher costs and rates to customers than are necessary." Furthermore, "The uncertainty Cinergy faces in the current regulatory climate has made it difficult to plan the capital expenditures we will need to make to comply with all environmental requirements while continuing to serve our customers' future energy needs in a reliable manner." Cinergy goes so far as to explain that it prefers a legislative approach as compared to regulations, because the latter are more likely to face lawsuits.

TXU

The TXU report did not include a company position on climate change or global warming science, or even whether the company has one. In fact, they clearly state that this report "does not consider the public policy desirability of the US establishing additional controls on conventional air emissions or initiating mandatory requirements for greenhouse gases. Nor does the study consider the potential "image" or public relations effects of TXU undertaking additional efforts to reduce."

This report also does not share what TXU's position, if any, is on the likelihood of federal-level action to mitigate greenhouse gas emissions. It recognizes that "many commentators believe that mandatory CO_2 controls on electric generators in the US are inevitable at some point, there is little agreement on the timing and the nature." The authors also acknowledge that others favor a cap-and-trade program, noting that the SO_2 emissions trading program is "widely regarded as a general model for the type of program that might be developed for CO_2 ."

Though the authors are silent on any company position on climate change, they address the business issues posed by the uncertainty around possible greenhouse gas legislation. "The case of successive requirements on different types of emissions illustrates the additional complexities that are involved when information on controls is highly uncertain and when sequential interrelated decisions are involved."

The uncertainty around CO_2 emissions is a large part of the report's rationale as to why it would not be in the interest of shareholders to take early action to reduce emissions. Among the specific reasons cited, the report includes "the many uncertainties regarding future legislation or regulation and thus the current inability of TXU to target its activities to reflect the specific requirements that would actually be set [and] the current inability to use the flexibility of the cap-and-trade program that would likely be put in place under a mandatory program." The lack of progress on legislating greenhouse gases had led CO_2 controls to be even more uncertain than other possible emission controls.

Early action to mitigate emissions results in no added revenues to TXU because it is operating in a deregulated market, and thus, TXU cannot recover its costs from consumers of any TXU climate change investments. If a program were mandated in a deregulated market, the costs to meet the new program could be passed on to the consumers, according to TXU. "The important point here is that the presence of a mandatory program for all electricity generators would provide the opportunity for at least some of the CO_2 abatement costs that TXU incurred to be passed through to customers, rather than absorbed..."

Future Greenhouse Gas Regulatory Scenarios

Why Shareholders Care about Analyzing Future Scenarios

Shareholders consider analysis of possible future scenarios an important part of assessing future risks for companies. Especially in an uncertain world, scenario analysis reveals possible futures in which the company may be operating, exposes risk, presents new opportunities, and provides a framework from which to discuss alternatives.

Scenario analysis is a particularly important exercise for electric power companies given the nearly definite future tightening of emissions requirements on all four pollutants, coupled with uncertainty about the timing and exact details of these policies. Further federal and state action on air emissions and climate change will affect the value of the plants that each company operates and the profitability of the company.

For the purpose of this research, scenario analysis is defined as having three components:

- At least two scenarios. Scenario analysis must include two distinct descriptions of possible futures. Typically one scenario will be a baseline that is, what policy outcome the company believes is most realistic, even if it is the status quo. The other scenario is an outcome based on another realistic policy outcome. These scenarios are given by possible regulatory or legislative action and include some carbon limit.
- Quantified implications of these futures on the company. These implications could include the cost per ton of CO₂ reduced, net present value (NPV) of the cost to manage the implications, or impacts on electric power rates seen by the consumer or at the wholesale level, among others.
- A discussion on how this future would affect the company's operations and/or profits. This discussion might include when a company would change its mix of fuels, retire a generating plant, or purchase CO₂ allowances.

Beyond the process, the results of the exercise inform investors on how the company is positioned and may be positioned in the future. The results not only expose vulnerabilities but also new opportunities. Where does the business have a competitive advantage in a future scenario? How might the corporation change its operations in response? Scenario analysis answers these and others questions.

Summary of Analysis

Table 1
Scenario Analysis: How the Companies Stacked Up

Components of Analysis	AEP	Cinergy	TXU
Two Scenarios (at least)	✓	✓	✓
Quantified Implications	✓		
Qualitative Discussion of Implications	✓	✓	

- AEP fully undertook the scenario exercise (See Table 1). It presented three alternative scenarios,
 quantified the implications of each scenario for the company and its shareholders, and presented a
 discussion of the implications. AEP fulfilled its purpose to "examine the costs to AEP of alternative
 environmental scenarios and assess the impact of these uncertainties on the company's current and
 future capital investment decisions."
- AEP states that the company had a significant business interest in conducting CO₂ analyses and, from its reports, this appears to be a company priority. According to AEP, "among the most significant economic drivers for coal-based generators are current and future environmental policies, particularly air quality policies and programs."
- The range of policy proposals considered in these reports was consistent. AEP summarized and
 compared the McCain-Lieberman Climate Stewardship Act, Carper's Clean Air Planning Act,
 EPA's Clean Air Interstate Rule and mercury rule, and the Bush Administration's Clear Skies
 proposal. In doing a more thorough analysis, AEP described and arrived at implications for all of
 these except Clear Skies.
- AEP went beyond scenario analysis to recommend specific attributes of possible future legislation, including a market-based emissions trading program.
- AEP addressed fluctuations in CO₂ allowance prices. They quantified their fuel mix under a low and high price case under McCain-Lieberman.
- AEP did not have significant foreign operations as of the time of the report. AEP acquired 4,000 MW of coal-fired generation in the UK in December 2001, which in 2005 would likely face CO₂ emission restrictions. However, the company has divested these assets.
- Cinergy discussed relevant policy proposals and generally addressed where the company was at risk, but did not quantify the implications of these scenarios on their business. The report did discuss the implications of the scenarios for the company, but this discussion was located throughout the report, rather than in one central place.
- Cinergy states that the companies had a significant business interest in conducting CO_2 analyses and, from their reports, this appears to be a company priority. Cinergy states that conducting air policy analysis "is critical to maximizing the effectiveness of their voluntary CO_2 reduction strategies and then drawing lessons for any imposed system of CO_2 reduction."
- The range of policy proposals considered in these reports was consistent. Cinergy summarized and compared McCain-Lieberman, Carper's Clean Air Planning Act, EPA's Clean Air Interstate Rule and mercury rule, and the Bush Administration's Clear Skies proposal. In a few cases, the company took positions on specific proposals, such as Cinergy's recounting its support of the Administration's Clear Skies Initiative.
- Cinergy went beyond scenario analysis to recommend specific attributes of possible future legislation, including a market-based emissions trading program.
- Cinergy addressed fluctuations in CO₂ allowance prices. Although they did not address specific actions, they suggested that their activities would change based on CO₂ price.

- Cinergy and TXU do not have foreign operations as of the time of the report, and therefore, are not subject to the Kyoto Protocol.
- The TXU report summarized legislative and regulatory proposals but did not discuss or quantify the implications of future policy scenarios. The TXU report made an assumption that "the issues and concerns that lay behind" a 2004 shareholder resolution involved three issues whether the company has institutions and procedures in place to analyze and address the financial consequences of air emissions and climate change regulations; whether the company takes appropriate action to maximize shareholder value in responding to current and past regulations, and how much the company should spend to voluntarily reduce greenhouse gas emissions prior to the adoption of climate policies. Instead, shareholders were seeking a more complete analysis of future policy scenarios. TXU's report is largely supportive of the company's current methods and processes for evaluating climate change proposals and argues strongly that the company should not act now to lower emissions voluntarily.
- TXU places the value of their report squarely on meeting the shareholder's request to conduct this analysis. The company does not state a significant business interest in conducting CO₂ analyses and, from their report, this appears to not be a company priority.
- The range of policy proposals considered in TXU's report was consistent. They summarized and compared McCain-Lieberman, Carper's Clean Air Planning Act, EPA's Clean Air Interstate Rule and mercury rule, and the Bush Administration's Clear Skies proposal.
- TXU did not advocate specific proposals or components in its report and did not acknowledging
 specific attributes of possible future legislation, including a market-based emissions trading
 program.
- TXU basically did not discuss the implications of fluctuations in CO₂ allowance prices, though did suggest that a company would adjust its plans based on allowance price.

Company Information

American Electric Power

AEP studied three ambient air emissions scenarios and three climate change policy scenarios. For the purpose of this report we focus only on the climate scenarios: a status quo scenario in which federal voluntary programs and individual state regulations continue for CO_2 emissions and tightened SO_2 , NO_x , and mercury controls are enacted; a four pollutant program with CO_2 regulation (the Carper Bill, S. 843); and an economy-wide GHG cap-and-trade program (the McCain-Lieberman amendment) with tightened SO_2 , NO_x , and mercury controls. The study considered the impact of passing McCain-Lieberman now versus in 2009. For each of the climate scenarios, AEP included the corresponding reduction in CO_2 emissions; the net present value (NPV) of overall projected costs including component costs such as fuel and new plant capital. For the McCain-Lieberman scenario only, AEP presented the options for reducing CO_2 . The results of the climate scenarios are presented in Table 2.

Table 2
Results of AEP's Climate Change Scenarios

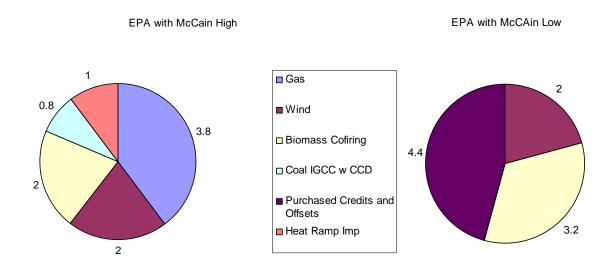
Result	EPA Proposed Regulations	EPA Proposal w/ McCain- Lieberman in 2009 (Low - High CO ₂ Price)	Carper Bill (Low - High CO ₂ Price)
New Plant Capital, NPV (2004-2030 \$billions)	3.5	+3.0 — +3.4	+2.8 — +3.9
Total Costs, NPV (2004-2030 \$billions)	2.6	+3.1 — +3.3	+5.6 +9.0
Cumulative CO ₂ Permit Purchases (MMTons by 2020)	0	+30 + 0	515 — 449

Source: AEP.

The company used a range of CO_2 allowance prices in each policy scenario. Prices came from outside studies done by Charles River Associates and the Energy Information Administration further. The studies defined the CO_2 price range by year: 2010, 2015, and 2020 with prices increasing over time.

AEP reveals that their options for reducing CO₂ emissions change depending on allowance price. The company's fuel mix is significantly altered by 2020 when CO₂ price is high (\$37 per ton) compared to low (\$15 per ton) under McCain-Lieberman. For example, with the low allowance price, roughly 44 percent of the company's reductions would come from purchased credits/offsets while under a high allowance price, AEP would purchase no credits/offsets and would seek reductions from gas, wind, biomass co-firing, IGCC with carbon capture, and heat rate improvements. This level of detail is not provided for the Carper Bill.

Chart 1 AEP CO₂ Emission Reductions



AEP leaves out of each scenario a discussion on what the rate impacts would be on customers, and what, if any of the costs of meeting environmental requirements get passed on to the consumer. However, the company has noted that it would be highly speculative to discern the actions of AEP's regulators in its 11 state jurisdictions over the next two decades. This not only concerns how and to what degree costs will be recoverable in rates, but also whether in ten or fifteen years states will be regulated, partially deregulated or fully deregulated.

Cinergy

The Cinergy report discusses three current legislative and regulatory proposals to address ambient and greenhouse gas emissions – McCain-Lieberman, Carper's Clean Air Planning Act, and EPA's Clean Air Interstate Rule and mercury rule – in addition to the Bush Administration's Clear Skies proposal. Cinergy does not evaluate these scenario's potential implications, but describes which aspects of each proposal it preferred and did not prefer, and why.

Cinergy advocates for specific components of any mandatory climate change program. The company finds it unlikely that CO_2 prices would be very high, but qualifies this by stating a need for some safety cushion. Cinergy maintains that CO_2 price caps, in addition to other components, must play a role in any legislation.

Instead of quantifying the implications of particular regulatory scenarios, Cinergy chose to examine the impacts of a range of CO₂ prices from \$0-100 per ton on its customers. A CO₂ price, for example, of \$15 per ton would correspond to an increase of roughly 25 percent from the current electricity rate of \$0.050 per KWh. It does not take a specific position on a specific CO₂ price range, though does suggest that three studies by MIT, EIA, and Charles River Associates offer a range of realistic CO₂ prices. "Moderate" CO₂ prices are somewhere in the range of \$14 per ton by 2020, and a footnote defines McCain-Lieberman as moderate under an MIT study's assumptions but not under an EIA's study (\$49 per ton). This wide range of potential prices implications provides investors very little guidance about what future policy scenarios actually mean for the company.

If the price of CO_2 rises too high for too long a period of time, Cinergy concludes that the policy "would not last long because of political reaction" resulting from consumer backlash. Its investment decisions to reduce CO_2 emissions will depend on whether building emissions controls will be less costly than purchasing allowances. Cinergy is using eight projects that it is engaging in 2004 to gather data on CO_2 price. However, the company does not state what it would or would not do with variability in CO_2 prices.

Though some argue that investments made to address CO_2 emissions should be made alongside other investment decisions to address the SO_2 , NOx, and mercury, Cinergy takes an opposing view. The report finds "this construction program [one of its recent actions], with its emphasis on installing multi-emissions controls on our larger units [for NO_x , SO_2 , and mercury], makes economic sense regardless of whether GHGs are ultimately regulated."

TXU

The report by TXU consultants, NERA Economic Consulting and Marc Goldsmith & Associates, was issued in response to a 2004 shareholder resolution that states:

"RESOLVED: The shareholders request that a committee of independent directors of the Board assess how the company is responding to rising regulatory, competitive and public pressure to significantly reduce carbon dioxide and other emissions and report to shareholders (at reasonable cost and omitting proprietary information) by September 1, 2004."

TXU did not do what its shareholders requested on a number of fronts. First, the company used outside consultants to develop the report. Second, the report does not fully assess "how the company is responding to… pressure to significantly reduce carbon dioxide." The consultants interpreted the concerns behind the shareholder resolution, and then addressed these concerns. They do this by analyzing TXU's institutions and processes used to evaluate air emissions and climate change; surveying actions in response to current air emissions regulations; reporting on TXU activities related to potential future air emissions and climate change requirements; and discussing impacts on TXU shareholders of TXU taking actions now to reduce CO₂ emissions.

The discussion of future activities includes an overview of potential federal legislation and regulation and the information that TXU is taking actions related to air emissions and CO₂. The McCain-Lieberman proposal, Carper's bill, Jeffords' bill, and the Administration's Clear Skies proposal are summarized in addition to a review of state initiatives related to CO₂. On addressing the likelihood of their implementation, the authors dismiss presenting this analysis, noting "It is simply difficult to assess whether one of these (or another) bills will pass, when it might pass, and what specific requirements it might involve, particularly with regard to CO₂ requirements." This report does not evaluate the potential implications to TXU of any of these policies. The authors report that this analysis has been completed by TXU, and the reader must assume that its findings were not made public.

Furthermore, TXU recently completed a long-term fuel plan for its lignite-burning facilities. The plan however only takes into account "potential future emissions regulations – including those related to NO_x , SO_2 , and mercury." Its analysis leaves out CO_2 , suggesting that the company may have future regulatory risks that would affect the value of its plants that it is ignoring. The results of this evaluation were also not provided in this report.

In a future regulatory environment with mandatory CO_2 limitations, the report suggests that the price of allowances would affect a company's options. For example, that a company would not build a Combined Cycle Gas Turbine (CCGT) plant unless the expected CO_2 allowance price would be \$50/ton - the marginal abatement cost of CCGT estimated in this study.

Strategies to Reduce Greenhouse Gases

What Shareholders Care About in Analyzing Potential Reduction Strategies

Shareholders want to know that the company is acting prudently to assess specific strategies to reduce emissions. This enables investors to assess if management is taking climate change seriously as a strategic issue. It also helps them assess how companies will be positioned in the future under stricter controls. Some companies will choose to prioritize re-powering plants from coal to natural gas while others may emphasize new coal technologies such as Integrated Gasification Combined Cycle (IGCC). Investors could then choose to follow market developments surrounding these priorities to assess the resulting competitive position of the company.

Investors will be interested to see whether a company is adopting a portfolio approach to its planning, or putting all of its eggs in one basket. Is the company relying solely on one outcome to the policy discussions or on one technology to reduce its CO_2 emissions? A portfolio approach may lower the risk that any one reduction strategy will fail to meet the company's expectations.

Also, investors will be interested in the progress towards implementing any plans. This can indicate whether a company is ahead of the learning curve on regulations that most view as certain to be enacted. Early reductions, such as by participating in voluntary cap-and-trade programs, can help build organizational infrastructure and skills to more cost-effectively manage emissions; taking action in advance of requirements can also inform the debate on appropriate greenhouse gas policies and encourage improved emissions management, along with other benefits.³

Summary of Analysis

- AEP addressed the range of activities they were undertaking related to CO₂ emissions reductions.
 Under the voluntary commitments that the company has made, it has a large portfolio of current strategies to reduce emissions, including efficiency improvements, sequestration projects, investments in renewable fuels, and strongly promote IGCC technology with coal.
- AEP offers a broad portfolio of strategies: off-system reductions, deployment of IGCC with coal, and biomass co-firing. AEP includes fuel switching and nuclear in the mix of strategies; however, it does put much of an emphasis on demand-side management, given the absence of regulatory support for such utility programs in most of its service territory. (AEP does support federal and state energy efficiency initiatives, and has played a lead role in the Business Roundtable's Climate Resolve Initiative ~AEP's CEO Mike Morris serves as the Vice Chairman of the Roundtable's Environment, Technology & the Economy Task Force—which has as its main thrust improving corporate energy efficiency.) While wind and biomass cofiring are part of AEP's portfolio of strategies, AEP did not find other sources of renewable power to be economic in its scenario study. Future choices, the company suggests, depend upon CO₂ allowance price.
- AEP offered some analysis of McCain-Lieberman by quantifying the use of specific reduction strategies under both high and low CO₂ prices. AEP does not present this level of analysis for the Carper bill. (However, it does indicate in the report and Annex E that the vast majority of its GHG

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³ The description of benefits is adapted from http://www.chicagoclimatex.com/about/mission.html.

- reductions in Carper would be met through allowance purchases—reaching 58 million tons of CO2 per year by 2020)
- AEP made sweeping statements and did not always provide details about what they are doing. The company states "Promising alternatives to traditional direct demand-side management alternatives exist, however, including appliance and building efficiency standards." The report does not, however, address what if anything AEP is doing on this strategy. . (Dan—See previous bullet point above)
- AEP cited concerns that they might not receive credit for early reductions by future legislation.
 However, AEP did not cite this as one of the reasons not to take action in advance of policy enactment.
- Cinergy addressed the range of activities they were undertaking related to CO₂ emissions reductions. Under the voluntary commitments that the company has made, it has a large portfolio of current strategies to reduce emissions, including efficiency improvements, sequestration projects, investments in renewable fuels, and strongly promote IGCC technology with coal.
- Cinergy offers a similarly broad portfolio of strategies: off-system reductions, deployment of IGCC with coal, and biomass co-firing. Cinergy puts an emphasis on demand-side management. The company did not state strong support of renewable energy beyond biomass co-firing and wind. Future choices, the company suggests, depend upon CO₂ allowance price.
- Cinergy provided in depth detail on its strategy, including a list of specific projects coupled with a commitment of \$21 million.
- Cinergy made sweeping statements and did not always provide details about what they are doing.
 The company suggests that on-system reductions, such as IGCC, will help reduce its emissions in
 the long-term but is not explicit how.
- Cinergy cited concerns that they might not receive credit for early reductions by future legislation. However, they did not cite this as one of the reasons not to take action in advance of policy enactment.
- TXU addressed the range of activities they were undertaking related to CO₂ emissions reductions. TXU is purchasing greater amounts than mandated of renewable energy. Given the company's report findings, the reader can assume that this amount of renewable energy sales is market-driven.
- TXU cited concerns that they might not receive credit for early reductions by future legislation. The company used this fear as one of the reasons to not take action in advance of policy enactment. TXU's report does not present any actual CO₂ reduction strategies that the company plans to take in the future. Their report assesses only representative strategies that a company might take *now* and concludes that taking action in advance of mandatory requirements to reduce greenhouse gas emissions is uneconomic.

Company Information

American Electric Power

AEP presents several broad strategies in the body of its report for any power company seeking to reduce emissions including installing emissions control technologies, changing the composition (fuel mix) of generating units, managing its demand profile, and reducing emissions off-system. According to AEP, it is currently engaged in all of them and states that although they "would be expected to apply to less certain future requirements, these tools are not as fully developed in terms of addressing greenhouse gas emissions as they are for currently regulated air emissions."

Below summarizes AEP's discussion of these strategies as they relate to greenhouse gases.

- Control technologies. Next generation power plants will perhaps be able to capture carbon; elsewhere in the report AEP recognizes that there is long-term potential to capture carbon with IGCC technology.
- Fleet composition (fuel switching/re-powering). AEP asserts that markets, not policies, should determine fuel use in power plants. AEP relies on coal and lignite to fuel its current generation fleet, which is 65 percent coal/lignite, 26 percent gas, 7 percent nuclear, and 2 percent hydroelectric and other. New power technologies are expected to play a future role and, in particular, AEP "recognizes sizable operational, policy, and economic benefits" of IGCC technology. In light of these benefits the company "has committed to emerging as a leader and first-mover in advancing IGCC." Biomass co-firing and wind "are the primary options for generating electricity on a large scale from renewable energy" but the company expects their future potential to be limited by land and capital availability. In addition, nuclear power is promising though significant challenges need to be addressed, and to this end AEP "supports a proactive approach from government and industry to addressing the challenges facing nuclear power." Finally, distributed power and storage technologies will complement these others but have not yet reached their potential.
- Demand-side options. The programs are largely discounted because of AEP's prior experience; they did not deliver returns on investment in most cases within AEP's service territory. For the future, AEP notes "Promising alternatives to traditional direct demand-side management alternatives exist, however, including appliance and building efficiency standards."
- Off-system reductions. Off-system reductions and trading are important current and future strategies for AEP. To date AEP's participation in the Chicago Climate Exchange has resulted in reductions of CO₂ from both efficiency improvements (on-system) and off-system reductions, including forest carbon sequestration projects.⁶ Off-system reductions are discussed in greatest detail. AEP engages in and advocates for off-system reductions to be included in any future program, and names this strategy as part of its long-term strategy. "Off-system reductions of greenhouse gas emissions work in the interest of the company's shareholders, customers, and

⁴ In the report's appendix, AEP goes on to affirm that although IGCC is not a "silver bullet," the technology must become a company priority and reach commercial availability by 2015. Currently, the cost of electricity with IGCC is \$55 per MWh verses \$53 per MWh with conventional coal generation. In addition, AEP mentions its participation in the FutureGen program, the 10-year DOE project to build coal-based, near-zero emission electricity and hydrogen plant with sequestration.

⁵ The company is seeking a 20-year operating license for the Donald C. Cook Nuclear Plant in Michigan.

⁶ AEP has participated in carbon uptake projects on its own company lands, in Louisiana, and abroad in Bolivia and Brazil.

government and community stakeholders as a highly cost-effective instrument for addressing global climate change."

In the discussion of the scenario results in the appendix, AEP quantifies its fuel mix by 2020 under a McCain-Lieberman scenario with high CO_2 prices and with low CO_2 prices. There primary difference is that purchased credits/offsets disappear under a high CO_2 price and are replaced with heat rate improvements, gas, and coal with IGCC. With high CO_2 prices, some IGCC with carbon capture is installed (about 115 MW). IGCC is expected to become economic in 2016.

Under a mandatory program, the amount of off-system reductions, fuel switching, and renewable energy use will depend in the long-term on the CO_2 allowance price. AEP suggests that switching to natural gas combined cycle plants from some of its coal facilities only makes sense with a high CO_2 price. Each reduction strategy will be a part of AEP's long-term efforts to reduce CO_2 . Reduction amounts depend on CO_2 allowance price.

Cinergy

Cinergy reports that it is committed to a portfolio approach to reducing overall CO_2 emissions. The company is using several different strategies to meet its current voluntary commitment to reduce emissions by an average of 5 percent below its 2000 CO_2 emissions between 2010 and 2012. The company will invest \$21 million between 2004 and 2010 to accomplish this. Eight projects were approved to receive funding of \$3 million in 2004 (see Table 3). Cinergy will use these projects to learn how it can most effectively reduce CO_2 emissions for application under a mandatory program.

Table 3
Cinergy's 2004 CO₂ Reduction Projects

Project	Cost to Cinergy	CO ₂ Reduction (tons per year)	5-year Cost (\$/ton)
Heat Rate Improvement Projects	\$1,940,000	349,882	\$1.11
A software upgrade	\$285,000	7,400	\$7.70
The Nature Conservancy Reforestation Project	\$180,000	1,000	\$36.00
Cincinnati Zoo Education Center Solar Project	\$150,000	33	\$909.09
Vestar-Oldenburg Academy Energy Conservation Project	\$90,000	62	\$290.32
Renewable Energy Demonstration Project	\$55,000	35	\$314.29
Purchase of Hybrid Cars	\$20,000	26	\$153.85
EPRI-sponsored research project	\$250,000	n/a	n/a

Source: Cinergy

Cinergy addresses reduction strategies for both its current voluntary commitment and a long-term strategy in a future system with limits on carbon dioxide. These strategies include:

• Renewable energy. Cinergy writes that renewable energy "will become relatively more competitive... [and] a greater part of our generation portfolio" with any addition of CO₂ costs. However, owing to the limited availability in Cinergy's mid-western market, renewable energy is unlikely to become

a major part of the company's portfolio. The report provides a table with estimates of the portfolio potential for renewable energy, illustrating that these energy forms could comprise 325-1,265 MW or 3-12 percent of current coal-fired capacity. No timing is associated with these estimates.

Cinergy has investments or "is investigating" several types of renewable energy. These include landfill gas and biomass projects, wind, solar photovoltaic, biomass co-firing with coal, biogas, and small hydro. The company currently purchases output from a 3 MW landfill gas facility in Indiana and has an investment in a small hydro facility (run-of-the-river) of 35 MW on the Ohio River in southern IN. Cinergy is also erecting a small 10 kW wind turbine in Indiana as a demonstration.

- Fuel switching and Re-powering. Cinergy already has converted a coal station into a CCGT plant, which generates 50 percent of the CO₂/MWh but operates more frequently than the old coal plant so has overall increased CO₂ emissions. According to the company, a wholesale switch from coal to natural gas would not be economically sound, even under CO₂ restrictions, due to high natural gas prices. It is not a strategy that Cinergy is currently considering, and it seems unlikely that the company will convert any more of their coal facilities to gas.
- IGCC. Cinergy suggests that bringing IGCC technology to commercial viability is a company priority. Cinergy participated in the development of an IGCC unit that fuels a 295 MW generator in Terre Haute, IN. Cinergy is assessing either re-powering an existing plant or building a new one using the technology; the company is conducting a feasibility study to construct a 500-600 MW plant. The reduction in CO₂ emissions from a conventional coal plant is estimated at 14 percent. Finally, Cinergy is investing in research and development of carbon capture from IGCC units.
- Demand-side management. "Cinergy is retooling and expanding DSM efforts... seeking approval to implement a portfolio of residential and small business programs, including programs that encourage the installation of Energy Star appliances, with the intent to save over 1 billion KWh between 2004 and 2009." It is expected that end use efficiency will help mitigate CO₂ emissions and the company is "well positioned with Cinergy Solutions, a business unit whose primary service is to help customers use energy more efficiently."
- Off-system reductions. The company has spent \$1 million in carbon sequestration and forestation
 projects in the US and abroad. Their goal is that at least two-thirds of its reductions will come from
 on-system.

Cinergy notes that participation in any external trading programs, for example in the Chicago Climate Exchange, is not viewed as cost effective owing in part to the presence of more high-priced sellers than buyers in the market. The company states that it is already "well acquainted with emissions trading through the management of today's regulated pollutants, we feel there is little to gain by participating in voluntary markets at this time." The company also expresses concern that it will be penalized for early reductions under any future legislation.

Cinergy does not provide details on the company's long-term strategy. The reader does not learn what the range of these options is to reduce Cinergy's CO_2 emissions or change its generating fleet. The report does state that details will come as Cinergy learns lessons from its initial CO_2 reduction projects and with the passage of any legislation.

TXU

The TXU report addresses the current actions that the company is taking related to potential future air emissions and climate change policies. Currently, TXU is purchasing wind power, monitoring potential future policy requirements, testing and researching lignite and mercury emissions, and evaluating the implications on TXU of potential future policies.

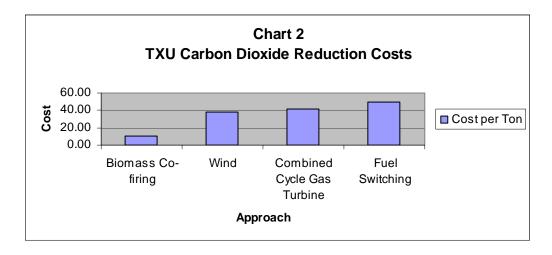
The report does not present actual reduction strategies that the company is planning to or might take in the future. It assessed the overall strategy of taking action now in advance of mandatory requirements to reduce greenhouse gas emissions. The conclusion: "If TXU were to act unilaterally right now to reduce CO2 emissions from its generating units, it would incur costs without the prospect of any corresponding increase in revenues." The report concludes that the company should take no actions now to mitigate CO_2 emissions, and argues that the company should wait until it knows the full details of climate change legislation before it takes any steps to reduce emissions.

Although the report takes a strong position against acting voluntarily, it does outline exceptions for when TXU might be justified in taking action now:

- 1) The cost per ton of CO₂ reduced is less than the risk-adjusted expected future CO₂ allowance price estimate and the time to implement the investment would be longer than the likely time period before the mandatory program takes effect
- 2) The investment would provide learning benefits, reduce cost uncertainties, expand the range of cost-effective CO₂ reduction alternatives, or otherwise allow better direction of future resources toward the most cost-effective approaches (assuming also that such advances would not be made without TXU investments) or
- 3) The investment would yield other benefits (e.g., reductions in other emissions, improvements in facility efficiency) that make the alternative "pay for itself."

The report describes four representative options to reduce CO₂ emissions and presents their costs per displaced MW coal, CO₂ emissions reduced per year, marginal cost (\$/ton CO₂), and the annual financial effects of each option. The options are to modify the generation mix; co-fire with biomass; build a new CCGT plant; and build or buy a new wind facility. (Note: These options are options that TXU might take now, not options that the company is currently considering taking.)

These options to reduce CO_2 reinforce the report's conclusion that taking action to reduce CO_2 now is costly with no opportunity to recover these costs from increased electricity prices, causing TXU's profits to decline. In the absence of a mandated program, environmental costs do not result in increased revenues. Biomass co-firing is estimated at \$10/ton CO_2 , wind at \$38.1/ton CO_2 , CCGT at \$41.4/ton CO_2 , and changing the fuel mix at \$49.8/ton CO_2 (See Chart 2.). NPV of costs for taking these options now range from \$165.1 million for the biomass co-firing to \$3.1 billion for modifying generation mix.



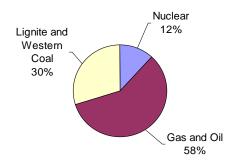
On other ways to reduce CO₂ emissions, the TXU report concludes:

- Programs to voluntarily trade emissions are not sensible to pursue given the low price of current CO₂ allowances; the report provides an example of \$1 per ton of CO₂.
- Renewable energy is being sold into the market at a greater than required rate, and owing to TXU's argument against voluntary actions to reduce CO₂, the reader must assume these technologies are cost competitive. The current fuel mix of TXU-owned generating units is: 58 percent gas/oil, 30 percent lignite/western coal, and 12 percent nuclear (See Chart 3). TXU sells renewable energy in its retail sales operation. "In 2003 the company provided 1 million MWh of renewable energy to its customers.... At the end of 2003 TXU had over 5x the renewable energy capacity mandated by the state."
- The current Texas regulatory scheme "does not currently reward their importance in resolving reliability problems...the lack of sufficient compensation means that there are insufficient incentives to displace the older units with more efficient ones with lower emission levels."
- TXU acknowledges that demand-side management is an option "to affect" CO₂ emissions from electricity generation. However, it is dismissed as, "demand side management would not be an option for a generator [like TXU] in a deregulated market such as ERCOT."

The company added more than 2,850 MW of electricity with zero emissions since 1990. It is unclear what fuel is used to produce this electricity. The report does not consider specifically improved power plant efficiency, which would both reduce emissions and reduce operating costs.

The TXU consultants recognize that there could be potential benefits to reducing CO_2 now. "These include "co-benefits" due to reductions in non- CO_2 emissions, potential advantages gained from becoming familiar with CO_2 -reducing technology...as well as the opportunity to make an investment now to reduce any future liabilities under any mandatory program." These and other benefits are generally discounted because of the economic gains from delaying implementation.

Chart 3
TXU Power Production by Source



Current and Future Emissions

Why Shareholders Care about Current and Future Emissions

Investors seek disclosure of emissions data – both absolute emissions and emission rates ((absolute emissions divided by total electricity produced) – from companies to help them assess regulatory risks. In general, companies with larger absolute emissions or emissions rates likely will face more regulatory risk than those with fewer emissions. Companies generally report this information to the Environmental Protection Agency, and, therefore, can easily make this information more readily available to investors.

Shareholders also seek information about a company's plan to manage those risks. Most agree that the United States will eventually enact legislation to curb and reverse the growth of CO₂ and other greenhouse gas emissions, though the timing and details are uncertain. If a company has a plan to address carbon dioxide emissions, this indicates it is better prepared for likely future requirements to reduce greenhouse gas emissions. Participation in a voluntary cap-and-trade program or database, for example, indicates that the company has one or more elements of a management framework to encourage measurement of GHG emissions. In fact, participation in a cap and trade voluntary program such as CCX requires a framework to deal with monitoring and verification in addition to measurement for the efficacy of the trading program.

Summary of Analysis

- AEP did not report historic absolute and normalized emissions data for SO₂, NO_x, mercury, and CO₂. In addition, it did not report actual mercury emissions or normalized emissions for any of the pollutants under consideration. However, much detail is contained in the Annexes on trends from current to future emissions for all four emission categories⁷.
- AEP did not report that it was reducing SO₂, NO_x, and mercury from some of its generating
 facilities in anticipation of EPA's CAIR and mercury rules. AEP expects to spend \$3.5 billion to
 meet these proposed regulations, though they did not state that it was acting in advance of the
 requirements.⁸
- AEP has a voluntary commitment to reduce CO₂ emissions. Their commitment falls under its
 participation in the Chicago Climate Exchange (CCX), a GHG emission reduction and trading
 pilot program for emission sources and offset projects.
- Cinergy and TXU generally did not systematically report absolute and normalized emissions data for SO₂, NO_x, mercury, and CO₂. In addition, these companies did not report actual mercury emissions or normalized emissions for any of the pollutants under consideration.

⁷ The company notes that the scope of the report (based on the comments from all of those interviewed including the company's shareholders) was to assess the risks to the company's shareholders of current and future potential emission policies. As a result the focus of the report was the company's actions and management of these risks as well as the specific quantification under scenario analysis looking forward. Accordingly, historic emissions data was not reported in the body of the report. The company also notes that it provides detail information about historical emissions of regulated emissions through its regular environmental performance reports and website. at http://www.AEP.com/environmental/performance/envreport/compliance]

 $^{^8}$ At the time of its report, AEP had only contractually committed to those scrubbers and SCR investments needed to comply with the Clean Air Act's current SO₂ program under Title IV and the NOx SIP Call. The company is planning and beginning engineering at the other facilities needed to comply with CAIR and the mercury rules, and believes it would be unwise for any major generating company, much less the nation's largest, to wait until implementation of the rules to begin investing in the infrastructure necessary for compliance.

- Cinergy disclosed some emissions data, because it revealed absolute emissions for three out of four
 SO₂, NO_x, and CO₂ for multiple years.
- Cinergy's reveals carbon dioxide emissions in 2000.
- Cinergy reported that it was reducing SO₂, NO_x, and mercury from some of its generating facilities in anticipation of EPA's CAIR and mercury rules.
- Cinergy has a voluntary commitment to reduce CO₂ emissions. They're a participant in the Department of Energy's Climate Challenge program, committing to reduce its CO₂ emissions voluntarily. Environmental Defense is assisting Cinergy in this effort.
- TXU provided information on SO₂ and CO₂ emissions. The data went back to 1996 and is projected through 2018.
- The TXU report that it was not reducing SO₂, NO_x, and mercury from some of its generating facilities in anticipation of EPA's CAIR and mercury rules. The company revealed no specific reduction or other goals for these pollutants.
- TXU has no public voluntary commitment to lower its CO₂ emissions.

Company Information

American Electric Power

As part of analyzing future scenarios, AEP presents projected emissions for 2005-2020 for SO_2 , NO_x , and mercury but does not provide current or normalized amounts. The text also does not give expected reduction amounts for SO_2 , NO_x , and mercury.

 CO_2 emissions in 2004 are roughly 165 million tons, and are projected out to 2020 in a graph in the appendix. As a founding member and participant in the Chicago Climate Exchange, AEP has committed to reduce or offset 18 million tons of CO_2 by 2006. This represents a 4 percent decrease in its CO_2 emissions from a baseline average of 1998-2001 emissions.

Cinergy

Cinergy's report shows SO_2 and NO_x emissions dropping from 1999-2003. Overall SO_2 emissions decline from 565 to 515 thousand tons, though increase in 2002 and 2003. Emissions of NO_x drop over 20 percent from 163 to 127 thousand tons. Neither mercury emissions nor normalized values for other emissions are presented. Cinergy's plan to reduce SO_2 , NO_x , and mercury in advance of the CAIR and mercury rules is targeted at the company's Indiana coal-fired units, equal to or larger than 500 MW. The company will install scrubbers, SCR equipment, and activated carbon injection baghouses.

The company's CO_2 emissions measured 74 million tons in 2000 and the company plans to reduce them by 5 percent to 70 million tons from 2010-2012.

TXU

TXU report authors include SO_2 emissions of 273,594 tons in 2003, addressed in the context of meeting the current Federal Acid Rain program requirements. NO_x , mercury, and any normalized emissions data are not disclosed. The report acknowledges that caps on SO_2 , NO_x , and mercury are coming in the foreseeable future but does not reveal a reduction amount that the company will be required to meet or any voluntary goal.

TXU's fossil fuel plants emitted 59.4 million tons of CO_2 in 2002, and emissions are graphically shown from 1996-2018. The projection is for current CO_2 emissions to grow slightly through 2009 and then remain roughly constant through 2018 at 62 million tons. No future goal for these emissions is stated.

Key Methods and Assumptions

Why Shareholders Care about Transparency and Engagement

Investors in AEP, Cinergy, and TXU asked for a published assessment of company activities related to global climate change. As a Cinergy shareholder explained, "Climate change due to global warming poses significant risk to both our planet and our company as it impacts the region where Cinergy operates, and society develops strategies to reduce greenhouse gas and other emissions. All of these impacts will involve costs that affect shareholder value."

To reflect the high level of priority that investors give to climate change, shareholders requested that the company's Board of Directors be engaged in the analysis. Board involvement adds weight to the report and makes it more likely the company will follow any recommendations.

Including both investors and external stakeholders in the development of these reports can ensure that shareholders' concerns are addressed and their resolutions fulfilled. Outside experts add a level of objectivity and a perspective that is unlikely to be found within the company. Beyond the report's completion, shareholders will seek opportunities for input during the ongoing decision-making process. Companies should have outlets for investor and stakeholder engagement.

Summary of Analysis

- AEP's report was authored by a committee of independent directors of the Board.
- AEP consulted with outside experts from the academic, environmental, and business communities, in addition to shareholders, for input into their analyses. Although it is unclear whether shareholders had ongoing influence as the report was developed, AEP interviewed its investors (and many others) for its report.
- AEP's report was transparent. It defined key assumptions and gave estimates of key variables (e.g., future natural gas cost) with source information for those estimates.
- AEP did a good job in laying out an action plan for the future that includes the involvement of stakeholder groups.
- Cinergy worked collaboratively with shareholders and other stakeholders in the process of developing these reports.
- After consulting with shareholders and receiving their assent, the Cinergy board of directors
 provided review and oversight. Staff prepared Cinergy's report.
- Cinergy consulted with outside experts from the academic, environmental, and business communities, in addition to shareholders, for input into their analyses. Cinergy continually involved its shareholder who requested the report.
- Cinergy and TXU's report was transparent. Their reports defined key assumptions and gave estimates of key variables (e.g., future natural gas cost) with source information for those estimates.

- Cinergy suggests that a variety of groups will be involved in laying out an action plan for the future.
 It said, "Because we are a stakeholder-focused company it is our goal to weigh the interest of all of
 our stakeholders and come to a balanced result."
- TXU and AEP had mixed results in following exactly what the shareholders requested in the process of developing these reports.
- After consulting with shareholders and receiving their assent, the TXU board of directors provided review and oversight. Two consulting firms developed their report.
- Two consulting firms prepared TXU's report with the input of TXU officials. It does not appear that they consulted with outside experts from the academic, environmental, and business communities, in addition to shareholders, for input into their analyses.
- The TXU report suggests that there might be additional engagement with shareholders and stakeholders on climate change issues, and it identifies various industry groups and research activities related to air emissions and climate change in which the company is active.

Company Information

American Electric Power

The Office of the Treasurer of the State of Connecticut, Trillium Asset Management, and Christian Brothers Investment Services, Inc. filed a shareholder resolution that led to the creation of this report. The resolution asked that "a committee of independent directors of the Board assess the actions the company is taking to mitigate the economic impact on our company of increasing regulatory requirements, competitive pressures, and public expectations to significantly reduce carbon dioxide and other emissions." AEP met the request of its shareholders, substantively and by having a subgroup of the Policy Committee of the AEP Board prepare the report. Furthermore, a draft of the report was shared with the full AEP Board of Directors in July 2004.

Beyond interviews, the report does not reveal whether shareholders and external stakeholders reviewed drafts or otherwise participated in the report's development. Twenty-eight people were interviewed for the report, "having a diversity of views and expertise on the issues of air emission." These individuals are listed in the report's appendix and include representatives of the shareholder groups that called for the report in addition to the academic, federal government (legislative and executive agency), environmental NGO, finance (investment bank and hedge fund), and industry R&D communities. In addition, various state Public Service Commission staff members provided input.

AEP's report is transparent, defining major assumptions and going so far as to include sections on "Major Analytic Assumptions" and "Caveats and Uncertainties" in its analysis. For example, the company assumes that GHG allowances are allocated on a historical basis rather than auctioned as both the McCain-Lieberman and Carper bills propose. AEP then also looks at the case that their assumption is incorrect, finding a ten-fold increase in their CO₂ offset and/or purchase requirements that would result. Estimates for fuel prices, pollution control and new plant costs, emission rates and the other inputs to their analysis are also provided.

The AEP authors recommend an action plan for going forward on climate change. The plan calls for

- Shaping the design of control regimes by utilizing AEP's experience with emissions trading
- Leading technology development particularly those technologies that facilitate clean, coal-based energy such as IGCC
- Achieving reliable and efficient plant operations in part by acquiring new skills
- Using advanced decision-making tools to manage emissions
- Striving toward transparency in its actions and communications with stakeholders
- Working in partnerships

Notably, the authors do not always specify the details or how AEP will go about accomplishing this plan. The reader does not, for example, learn how AEP will "advocate effectively in policy and regulatory forums for the most efficient program designs" or exactly what these policy designs are beyond generalities. Though not always specific, the authors outline a future in which shareholders and a variety of stakeholders could have input.

Cinergy

The Committee on Mission Responsibility through Investment of the Presbyterian Church (U.S.A.) called for the development of this report through a shareholder proposal. The proposal requested that Cinergy present "a review of climate risks facing the company, potential costs of major public policy proposals for reducing greenhouse gas and other emissions, and Cinergy's plans to mitigate and manage these risks and costs." Substantively, Cinergy carried out the review of risks and a discussion of its plans to manage these risks, although the report did not quantify potential costs.

Cinergy staff members – Kevin Leahy, Robert McElfresh, and Vice President of Federal Affairs, Environmental Strategy, and Sustainability John Stowell—served as the primary authors. Cinergy notes in the appendix that there is a committee on the Board with direct oversight responsibility for environmental affairs.

Shareholders and related representatives provided input and/or reviewed drafts. These included Rev. William Somplatsky-Jarman of the Committee at the Presbyterian Church and Carl F. Evert, University of Cincinnati electrical and computer engineering professor and Elder of Cincinnati's Pleasant Ridge Presbyterian Church in addition to Dan Bakal of Ceres. Reverend Somplatsky-Jarman wrote an introductory message to the Cinergy report in which he commends Cinergy and its management team who produced the report and endorses the leadership that the report represents.

Numerous Cinergy personnel provided input throughout the development of the report. In addition, many external stakeholders from the consulting, academic, environmental not-for-profit, and government organizations "helped increased our understanding of the issue of Climate Change. Several provided invaluable help in reviewing the document." Cinergy names these individuals in the report. In addition to the development process, the report itself is transparent and defines its assumptions, for example, that there will be no imminent, short-term federally mandated GHG emissions restrictions.

Cinergy's report was released alongside a press release. The report is posted on the company's home page.

Going forward the report suggests that shareholders and external stakeholders will be involved in the process. The company has partnerships with and memberships in a variety of not-for-profit, government, and industry entities that have involvement in the climate change policy debate, including Environmental

Defense, the Pew Center on Climate Change's Business Environmental Leadership Council, the Department of Energy's Climate Challenge program, and the Electric Power Research Institute (EPRI). In addition, the company names one of its key challenges with its climate change positioning as "to create a flexible compliance plan that accounts for and balances the interests of all our stakeholders.

TXU

TXU's report responded to a 2004 shareholder resolution initiated by shareholder groups; a year prior the Benedictine Sisters asked for a similar report. The resolution requested, "a committee of independent directors of the Board assess how the company is responding to rising regulatory, competitive and public pressure to significantly reduce carbon dioxide." As discussed previously, TXU summarized policy pressure that the company faces but did not fully assess how the company is responding to this pressure.

TXU has a Board committee with direct oversight responsibility for environmental affairs. Consulting firms, NERA Economic Consulting and Marc Goldsmith & Associates, conducted the assessment and authored this report for TXU. In addition to the authors, a group of 17 TXU officials provided input, though none were Board members. The authors note, "Our review of the shareholder resolutions and discussions with TXU officials provided the basis for an assessment of the issues and concerns that lay behind the resolutions." Neither shareholders nor outside experts appear to have been directly engaged either. However, the environmental and energy research group, Resources for the Future, provided the summaries of proposed legislation and regulation that is included in the report's appendix.

The report is available on the company website.

It appears that TXU will continue to engage with groups on air emissions and climate change policy. The report says that the company is considering further engagement with shareholders and stakeholders, pending a decision that the information is appropriate to share with these groups. The report lists several groups, primarily industry organizations, which TXU belongs to, and these include: Edison Electric Institute, Utility Air Regulatory Group, Association of Electric Utilities of Texas, National Mining Association, Electric Power Research Institute, North Texas Clean Air Coalition, Northeast Texas Air Care, Clean Air Act Advisory Committee Utility MACT Working Group, and the Texas Renewable Energy Industries Association. The company also "interfaces with numerous governmental agencies... and supports research at colleges and universities on emissions control technologies." However, the specifics of these relationships are not provided and it is unclear what the future holds for them.