



SUSTAINABLE ENERGY INSTITUTE



U.S. BUSINESS ACTIONS TO ADDRESS CLIMATE CHANGE: CASE STUDIES OF FIVE INDUSTRY SECTORS

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EXECUTIVE SUMMARY

This report on U.S. industry sector approaches to addressing greenhouse gas emissions first examines U.S. greenhouse gas policy on both the federal and state levels, before turning to the actions of selected industries in tackling climate change. Based on interviews with numerous individuals associated with selected companies, we examine the approaches that five different industry sectors (aluminum, chemicals, electric power, forestry and paper products, and pharmaceuticals) have taken toward climate change. A final section of conclusions discusses common trends or themes that exist among the industry sectors.

Policy Overview

Measures addressing greenhouse gas emissions in the United States can be grouped into three categories: federal legislation and initiatives, state level activities, and voluntary industry efforts. This report examines all three components.

The Bush Administration

In addition to its **Global Climate Change Initiative**, which seeks to cut greenhouse gas “intensity,” President Bush has promoted his Administration’s **Climate VISION** and **Climate Leaders** programs, both of which represent voluntary public-private partnerships to reduce U.S. greenhouse gas emissions. Furthermore, the Administration touts its support for climate change research, as exemplified by its **Climate Change Research Initiative** and **National Climate Change Technology Initiative**. But these proposals do not represent a dramatic departure from the status quo, and are doing little to silence the growing chorus of critics of the Administration’s climate change policies.

Congress

Consequently, pressure is slowly building in Congress for legislative action on this issue. For example, bipartisan proposals included specific measures to cap emissions, such as the **Climate Stewardship Act of 2003** – which was introduced by Senators John McCain (R-Arizona) and Joe Lieberman (D-Connecticut). That bill targeted the four main sectors which emit greenhouse gases – electric utilities, industrial plants, transportation and large commercial facilities. A House version of the McCain-Lieberman bill was also introduced earlier this year by Representatives Wayne Gilchrest (R-MD) and John W. Olver (D-MA). Furthermore, other proposals – such as the Clean Power Act of 2003 (the so-called “four-pollutant” bill), the Clean Air Planning Act of 2003, and the legislative versions of President Bush’s Clear Skies Act – specifically target emissions from electric power plants.

Still, while acknowledging the positive trend of increasing congressional activity on this topic, it seems very unlikely that significant legislation will pass Congress in the near future, given the current political composition of both legislative chambers.

State Activities

Thus, as has been the case since the Bush Administration took office in 2001, it has fallen upon state governments across the country to exhibit leadership on this issue. There are now dozens of programs on the state level which address a wide range of climate change-related issues, including emission reductions, carbon sequestration, energy demand, renewable portfolio standards, energy efficiency, smart growth, and transportation. This report briefly highlights the efforts of three of these states in particular – **California, Connecticut and West Virginia**. Furthermore, regional associations – such as one between New England governors and Canadian premiers to produce a climate action plan – are buttressing the efforts of individual states.

Of course, the very diversity of this patchwork of state programs and goals runs into its own limitations. The absence of one clear federal policy on climate change means that many states do not have to take steps to address this subject, thereby limiting the progress that can be made in reducing greenhouse gas emissions, and that companies operating in multiple states may face a confusing array of regulations. Still, **the concerted effort by an increasing number of states to move forward on the climate change issue suggests that pressure for federal involvement will continue to build, slowly but steadily.**

Industry Sector Approaches to Addressing GHG Emissions

Absent a federal mandate to reduce carbon emissions, some U.S. industries and specific companies have decided to take the initiative and adopt **voluntary measures** to reduce their emissions. In fact, all of the companies we examined in this report (to varying degrees) believe that the time for action, rather than debate, has arrived. Many companies believe that a carbon-constrained regulatory future is inevitable. Accordingly, some of these companies desire **regulatory certainty** over a significant time horizon in order to make the right decisions concerning large capital investments. Significantly, **emissions reductions can be viewed as desirable as a part of a larger strategy to achieve a more sustainable business operation**. Overall, several industries and companies support a corporate strategy of “getting out in front” of the policy debate and addressing the issue of global warming while simultaneously opposing regulations that will penalize earlier adopters of emissions reduction measures.

One example of this trend is emissions trading. Three of the companies we surveyed – **DuPont, AEP, and International Paper (IP)** -- belong to the **Chicago Climate Exchange (CCX)**. Also, several of the companies surveyed have set voluntary emissions reduction targets. For example, **Alcoa** will reduce its direct GHG emissions to 25% below the 1990 baseline on a worldwide basis by 2010. **DuPont** will reduce GHG emissions by 65 percent from 1990 levels by 2010. **Pfizer** pledged to reduce its greenhouse gas emissions by 35 percent per dollar of revenue from 2000 to 2007 and **IP** has established a goal of reducing absolute greenhouse gas emissions by 15% by the year 2010 from a year 2000 baseline.

In addition to groups such as the CCX, recent activities by the insurance industry are driving the private sector to take greater action to address climate change. Specifically, this industry plays a critical role in managing and reducing environmental risks such as those related to climate change. For example, the insurance sector influenced the decision of two power companies -- American Electric Power and Cinergy – to report publicly on how they plan to address growing

demands for GHG and other emission reductions, and on the potential impacts of these responses on the profitability of the companies. Our report discusses the relationship of the insurance industry to climate change in some detail.

We then examine in some detail the climate change countermeasures of five industries—the aluminum, chemical, electric power, paper products and forestry, and pharmaceutical sectors. The selected industries serve as a good representative mix of energy consumers and electric utilities. Furthermore, within each sector, we examine specific companies as case studies. It should be noted, however, that the case studies feature companies which have adopted fairly progressive positions on climate change relative to other companies in their respective sectors, and are therefore not necessarily representative of the sectors as a whole.

Aluminum Industry

The United States aluminum industry is the world's largest, and annually produces about \$40 billion in products and exports. The industry is a particularly large user of electricity and incurs more than \$2 billion annually in electricity costs, making energy conservation an important goal for the industry. Accordingly, the industry has actively pursued opportunities to reduce its use of electricity. For example, the industry has promoted recycling as an energy saving measure. In fact, the industry claims that the recycling efforts of Americans, combined with the industry's aluminum reclamation system, reduce the overall energy consumption in U.S. aluminum production by 46%. The aluminum sector is responsible for a relatively large portion of greenhouse gas emissions: the sector was responsible for 3 MMTCE (million metric tons of carbon equivalent) of emissions in 1998, the last year for which figures are available, mainly in the form of perfluorocarbons (PFCs).¹

Our report reviews the industry's voluntary greenhouse gas emission reduction program (the **Voluntary Aluminum Industrial Partnership -- VAIP**). Additionally, we examine in detail the climate change efforts of **Alcoa**, the world's largest producer of primary aluminum, as a case study.

The Chemical Industry

As a \$450 billion industry, chemical manufacturing in the United States is a key component of the nation's economy. The industry is also one of the largest energy consuming sectors. It uses oil, natural gas and natural gas liquids to power its production facilities and processes. Interestingly, the chemical industry's attitude toward climate change policy has evolved since the 1990s. At that time, at least one industry group, the Chemical Manufacturers Association (CMA), belonged to the conservative Global Climate Coalition, an organization which had been formed to block ratification of the Kyoto Protocol in the U.S. Since that time, however, large chemical manufacturing companies such as Dow and DuPont have led the way in pursuing progressive policies in the area of greenhouse gas emissions reductions.

¹ Sources of GHGs in the United States, 1998. www.pewclimate.org/global-warming-basics/facts_and_figures/fig14.cfm

In addition to providing a broad overview of the industry's climate change efforts as a whole, our report provides a case study which focuses on the efforts of **DuPont**, the number two chemical manufacturer in the United States.

The Electric Power Industry

The United States electric power industry is a \$ 218-billion industry and contributes 4% of real GDP to the U.S. economy. In the last 30 years, demand for electricity has grown dramatically in the U.S., and that growth is expected to continue (a projected growth of 51% from 2002 to 2025).² In 2002, more than 70% of the nation's electricity was generated from fossil fuels (50.1 % of which was from coal).³ With more than half of its power generation fueled by fossil fuels, this industry is the biggest GHG emitter in the U.S., producing an estimated 40% of total U.S. GHG emissions.

This report identifies several industry-wide, voluntary GHG emissions reduction programs, including **Power Partners** - a joint partnership between the Edison Electric Institute (EEI) and the U.S. Department of Energy.⁴ In addition, we closely look at the climate change strategies adopted by three distinct power companies: **American Electric Power** (AEP), the largest generator of electricity in the U.S. (and biggest polluter due to its heavy reliance on coal); **Entergy**, the fourth largest power company and second largest nuclear operator in the U.S.; and the **Florida Power & Light (FPL) Group**, the largest wind producer in the U.S. and a significant nuclear operator as well.

The Paper Products and Forestry Industry

The United States is the world's largest producer of paper and forest products. (For purposes of this survey, we include manufacturing pulp, paper, paperboard, wood and related products as parts of this industry.) The forest products industry is also one of the most energy-intensive, and energy conservation programs have taken on a high significance. Although the industry is nearly 60 percent self-sufficient (using non-carbon generating biomass), it is forced to turn to natural gas, coal, fuel oil and purchased electricity to meet the balance of its energy needs, which in turn generates an increased amount of carbon emissions. On the other hand, the forest product industry's use of renewable fuels represents the equivalent of about 205 million barrels of oil per year - and offsets the carbon dioxide emissions of approximately 16 million automobiles annually.⁵ The industry is the nation's number one producer of co-generated electricity, producing more than 41% of the nation's self-generated electricity through cogeneration. (Approximately 85% of that onsite electricity is generated from renewable resources.)

Our report reviews the climate change efforts of the industry's national trade association, the **American Forest and Paper Association**. Additionally, we review the efforts of **International Paper**, the world's largest paper and forest products company, as a case study.

² Energy Information Administration, www.eia.doe.gov

³ Edison Electric Institute (EEI), www.eei.org

⁴ EEI is the trade association for shareholder-owned power companies in the U.S.

⁵ <http://www.afandpa.org/Template.cfm?Section=Energy1&template=/ContentManagement/ContentDisplay.cfm&ContentID=32860>

The Pharmaceutical Industry

The pharmaceutical industry is one of America's most research-intensive. The industry is also a mainstay of the American economy, and one of a few industries which show a clear growth trend (nationally, as well as globally). The Pharmaceutical Research and Manufacturers of America (PhRMA), the industry's main trade association, has a membership of approximately 90 companies. The companies belonging to PhRMA have adopted a variety of approaches to GHG emissions reductions, and the largest companies have been the most progressive.

In addition to providing an overview of the sector as a whole, our report examines the climate change activities of **Pfizer**, the world's largest research-based pharmaceutical company, as a case study.

Conclusions

The approaches of the aluminum, chemical, electric power, paper products and forestry, and pharmaceutical sectors in addressing greenhouse gas emissions vary considerably, but **none of the companies surveyed rejected the need to reduce greenhouse gas emissions out of hand**. In fact, every company surveyed is measuring its net greenhouse gas emissions and establishing internal emissions reduction and/or efficiency targets. It is also noteworthy that while all of the companies preferred voluntary over mandatory measures, companies are generally concerned that a lack of regulatory certainty over a significant time horizon will begin to impact significantly on capital investment decisions.

Other trends within and across industry sectors help explain the willingness of these surveyed companies to take at least some voluntary actions. For example, many energy consuming companies have not found reaching their voluntary emissions reductions goals to be financially burdensome. In fact, in most cases, these companies have found that increased energy efficiency and conservation measures have generated higher profits. (Energy producing companies, on the other hand, describe a more mixed economic picture.) Additionally, companies in the manufacturing sector are having a relatively easy time reaching their declared emissions reduction targets. On the other hand, emissions trading allocation systems are a problem in the utilities sector. Power companies disagree on the allowance allocation method that should be implemented as part of a national CO₂ cap-and-trade emissions program.

Finally, given the current federal regulatory uncertainty (and patchwork of state regulations) surrounding climate change policy in the United States, it is worth reiterating that many companies hope that national or global level policy may present the solution. Time will tell whether the newer state-level policies will prompt U.S. companies to adopt more aggressive GHG emissions reduction programs. It is worth noting, though, that one recent development is driving just such a trend, at least in certain sectors. Shareholder movements demanding a more progressive response to climate change have become a factor in the energy producing sector, especially in the oil industry. The insurance industry is also playing an increasingly critical role in the evolution of corporate climate change policies. Of course, the outcome of the upcoming Presidential election in November could have the most significant implications for possible new regulations.

The matrix on page viii identifies the highlights of the profiled companies' GHG emissions reduction commitments and achievements, and their positions on emissions trading. The table in Appendix 2 offers a more detailed and comprehensive summary of each company's approach to reduce its GHG emissions.

**Profiled Companies' GHG Reduction Targets/Achievements
and Positions on Emissions Trading**

	AEP	Alcoa	DuPont	FP&L	Entergy	IP	Pfizer
Voluntary GHG Emissions Reduction Target	10% based on 1998-2001 levels from 2003-2006: 1% in 2003, 2% in 2004, 3% in 2005, and 4% in 2006; plans to commit to a new target for the post-2006 period.	25% from 1990 levels by 2010.	65% from 1990 levels by 2010.	18% based on 2001 levels between 2003 and 2008.	Stabilization of emissions at 2000 levels through 2005; will commit to a new target by end of 2004.	Reduction of absolute GHG emissions by 15% based on 2000 levels by 2010.	Reduction of GHG emissions by 35% per dollar of revenue from 2000-2007.
Achievements in GHG Emissions Reductions	Reduced GHG emissions by 23.2 Million tons from 1991-2002. AEP confident that it will meet its 2003 1% GHG emissions reduction goal.	In 2003 achieved 25% GHG emissions reduction goal from 1990 levels.	In 2001 exceeded 65% GHG emissions reduction goal from 1990 levels.	Making good progress towards 18% target.	Has reduced its CO ₂ emissions by 18% since 2001.	N/A	CO ₂ avoided through co-generation increased from 87,000 metric tons in 1999 to 174,000 tons in 2001.
Support for GHG Emissions Trading	Yes; founding member & participant of CCX.	Yes; system should be global, comprehensive, and use allocation procedures based on 1990 levels.	Yes; has worked with Entergy and others on pilot emissions trading and has completed small trades in the U.K. & Canada.	Yes, but has not yet participated in existing carbon trading programs.	Yes; has done demonstration trades with DuPont and international emissions trading with Elsam.	Yes; founding member and participant of CCX.	Favors emissions trading, but absent a formal market, believes it is premature to engage in trading.

1.0 INTRODUCTION

This report on U.S. industry sector approaches to addressing greenhouse gas emissions first examines U.S. greenhouse gas policy on both the federal and state levels, before turning to the actions of selected industries in tackling climate change. Based on interviews with numerous individuals associated with selected companies, we examine the approaches that five different industry sectors (aluminum, chemicals, electric power, forestry and paper products, and pharmaceuticals) have taken toward climate change. A final section of conclusions discusses common trends or themes that exist among the industry sectors.

2.0 OVERVIEW OF FEDERAL AND STATE GREENHOUSE GAS POLICIES

Efforts are under way to address greenhouse gas emissions in the United States on both the federal and state levels. While the effectiveness of these widely varying policies may be called into question, they do reflect a growing awareness in the United States that climate change is real and that proactive measures need to be taken to address it. The following sections provide a brief overview of what is being done by the Bush Administration, Congress and the states to combat climate change.

2.1 The Bush Administration

The essence of the Administration's approach to climate change issues essentially remains unchanged since we last reported on this issue last year. In addition to its **Global Climate Change Initiative**, which seeks to cut greenhouse gas "intensity" by 18% over the next ten years, President Bush has promoted its **Climate VISION** and **Climate Leaders Programs**, both of which represented voluntary public-private partnerships to reduce U.S. greenhouse gas emissions. (Both of these programs are discussed in more detail in Appendix 1). Furthermore, the Administration touts its support for climate change research, as exemplified by its **Climate Change Research Initiative** and **National Climate Change Technology Initiative**. Common threads connecting these initiatives, of course, continue to be an emphasis on **voluntary** actions, and a strong focus on research.

Specifically, the Administration still believes that there are too many scientific uncertainties surrounding the issue of climate change to justify aggressive action. Particularly in a presidential election year, however – in a campaign in which President Bush's environmental record will likely be heavily criticized – the Administration can be expected to trumpet its efforts to increase funding for climate change research as evidence that it is committed to tackling the issue.

A new report from the U.S. government's Climate Change Science Program, which acknowledges the link between climate change and human activities, could signal a shift in the Bush Administration's approach to global warming. However, critics of the Bush Administration have downplayed the significance of this report for its delayed recognition of a long-established view by a large part of the scientific community, many characterizing it as a Presidential campaign strategy. In addition, the report was criticized by various industry groups. (The report was delivered to Congress in late August 2004 by Bush official James Mahoney and can be accessed online: <http://www.usgcrp.gov/usgcrp/Library/ocp2004-5/default.htm>.)

2.1.1 Climate Vision

In fact, on all fronts, the Administration asserts that it is strongly committed to fighting climate change. For instance, in its efforts to help reduce GHG intensity, the Climate VISION program has focused on energy intensive industries. Business associations representing 12 industry sectors have become program partners, and have announced their intention to meet specific targets for reducing GHG emissions intensity. In December 2003, for example, oil groups

(including the American Petroleum Institute) announced new greenhouse gas guidelines.⁶ (Please refer to Appendix 1 for more information about this program.)

2.1.2 Climate Leaders

Similarly, the Administration can point to the expansion of its Climate Leaders program as evidence of its commitment to the issue. When launched in February 2002, the Climate Leaders program consisted of 11 charter partners; the program now can boast of more than 50 partners, whose revenues add up to more than 6 percent of the United States' gross domestic product. Most recently, in January 2004, 10 corporations (including **International Paper** and Kodak) announced targets to reduce greenhouse gas emissions. With that announcement, 20 of the 54 companies in the program have set emissions reduction goals -- EPA estimates those reductions would prevent a total of 7.5 million metric tons of carbon equivalent per year.⁷ (Please refer to Appendix 1 for more information about this program.)

2.1.3 Climate Change Research

Finally, as already noted, the Administration highlights its commitment to supporting climate change research. This effort received a boost in February 2004 when the National Academies of Sciences' National Research Council released a report which evaluated the research program. The group, which had criticized the first version of the plan in November 2002, contended that the plan was "much improved," broader in scope and more ambitious than the earlier version. But the committee also warned that in order for the research to succeed, it would need increased funding.⁸ In that regard, the panel noted that "There is no evidence in the plan or elsewhere of a commitment to provide the necessary funds" for newer or expanded program elements. Additionally, and significantly, the NAS panel stressed that the Climate Change Science Program needed to maintain its scientific independence and the credibility of its research work. This is noteworthy since the Bush Administration has been repeatedly accused by critics such as the Union of Concerned Scientists of politicizing science in a wide range of areas. These critics have cited climate change, in particular, as an issue which has been affected by such political interference.

Overall, though, even critics of the Administration's climate change policies praise the research efforts. The Pew Center on Global Climate Change, for example, acknowledges that "The current U.S. Administration is supportive of research and development of new climate-friendly technologies, which is one important component of the needed domestic response." The Center cited DOE's **FutureGen** project as one example of this support.⁹ However, the Center also goes on to point out that, "The Administration has proposed no policies that would create a market for such technologies," policies such as a GHG "cap and trade" program. Instead, as noted by the Center, "the Administration has rejected the Kyoto Protocol without proposing an alternative

⁶ <http://www.climatevision.gov/mission.html>

⁷ <http://yosemite.epa.gov/opa/admpress.nsf/b1ab9f485b098972852562e7004dc686/df3979e129d138c485256e1a0060e213?OpenDocument>

⁸ <http://www4.nationalacademies.org/news.nsf/isbn/0309088658?OpenDocument>

⁹ The FutureGen project aims to develop a full-scale commercial demonstration of an integrated coal gasification combined cycle power plant with carbon capture and geological sequestration.

international framework, set a voluntary domestic GHG intensity target that would allow U.S. emissions to actually increase by 12% by 2012, and established no mechanism for ensuring that even that target will be met.”¹⁰ Consequently, advocates of aggressive action to fight climate change are increasingly depending on Congress and, particularly, state governments for meaningful emission reduction measures.

2.2 Congress

Since the Administration’s proposals do not represent a significant departure from the status quo, pressure is slowly building in Congress for legislative action on this issue. Of course, given the current political composition of both chambers of Congress, dramatic action is unlikely in the immediate future. Both the House of Representatives and Senate are currently controlled by conservative Republicans who are largely skeptical of the need for, and hostile to the call for, mandatory emission reductions.¹¹ Furthermore, even if Democrats are able to wrest control of one chamber in this November’s elections (a Democratic takeover of both legislative bodies is considered unlikely), the chamber would still likely be too closely divided to prevent any significant action (and the other chamber would be able to block legislative action on this issue, in any case).

Still, even if passage of a cap on carbon emissions is not likely to happen in the immediate future, it is worth noting that congressional activity on this issue has increased, corresponding with the rising amount of scientific evidence. For example, in the 105th Congress (1997-1998) seven climate-change related proposals were introduced. In 2001-2002, by contrast, over 80 measures were introduced, and in the current Congress, nearly 70 proposals were introduced in 2003 alone. Additionally, it is worth noting that these proposals are being offered by members of both the Democratic and Republican parties. As the Pew Center on Global Climate Change notes,

The growing interest suggests that a bipartisan consensus is developing around certain legislative proposals, including measures to require the reporting and disclosure of greenhouse gas emissions, protect companies reducing GHG emissions from being penalized [for such early action] under a future GHG reduction program, and promote carbon sequestration.

Still, as recognized by the Center, “the challenge of climate change will ultimately require a more comprehensive set of approaches,” such as a cap and trade program or new efficiency standards. “Enactment of such policies,” the Pew Center warns, “will likely be a longer-term proposition.”¹²

¹⁰ *Climate Change Activities in the United States – 2004 Update*, The Pew Center on Global Climate Change, p.5. This report can be found at:

<http://www.pewclimate.org/docUploads/74241%5FUS%20Activities%20Report%5F040604%5F075445%2Epdf>

¹¹ Senator James Inhofe (R-Oklahoma) symbolizes the formidable obstacles that confront those who favor strong congressional action on this issue. Senator Inhofe, the chairman of the Senate Environment and Public Works Committee, has stated that he believes that global warming is the greatest hoax ever perpetrated on the American public.

¹² *Climate Change Activities in the United States – 2004 Update*, The Pew Center on Global Climate Change, p.6. This report can be found at:

<http://www.pewclimate.org/docUploads/74241%5FUS%20Activities%20Report%5F040604%5F075445%2Epdf>

2.2.1 The Climate Stewardship Act of 2003

Perhaps the most significant piece of climate legislation to be addressed in Congress in recent years has been the **Climate Stewardship Act of 2003**. Otherwise known as the “McCain-Lieberman bill” (after its primary sponsors, Senators John McCain (R-Arizona), and Joseph Lieberman (D-Connecticut)), the legislation would:

- Cap U.S. GHG emissions after 2010 at the level emitted in 2000; and
- Cap emissions of 6 major GHGs from the electricity generation, transportation, industrial and commercial sectors (which combined account for 85% of U.S. emissions).

Those subject to the cap would be required to hold emission allowances equal to their actual emissions. The bill would allow unlimited trading of emission allowances among those subject to the cap. Furthermore, an entity subject to the cap would be allowed to satisfy up to 15% of its total allowance requirements by submitting:

- Tradable allowances from another country’s GHG market;
- A well-documented net increase in carbon sequestration;
- A well documented GHG emission reduction by a non-covered entity; and
- Allowances “borrowed” from future years.¹³

While the legislation was rejected in the Senate in October 2003, it nonetheless represented the first congressional vote on a proposal to limit U.S. economy-wide GHG emissions. It also collected more support (43 votes, out of 100) than expected, and Senator McCain has made it abundantly clear that he intends to bring up the legislation again for consideration. Indeed, in July 2004 McCain and Lieberman offered the Climate Stewardship Act as an amendment to S.2062, the Class Action Reform bill, which stalled in the Senate on July 8. Other efforts have included a May 2004 hearing on the “Impacts of Climate Change and States’ Actions,” presided over by McCain. At the hearing, Senator McCain highlighted that the United States is not doing enough to regulate and/or trade emissions allowances. In addition, McCain noted he hoped the hearing would push Congress to reconsider and pass the McCain-Lieberman Climate Stewardship Act.

House Representatives Wayne Gilchrest (R–MD) and John W. Olver (D–MA) also introduced a bill to cap U.S. greenhouse gas emissions while providing for market-based trading of emission allowances. This companion legislation to the McCain-Lieberman Climate Stewardship Act was introduced in the House on March 30, 2004, also proposing a cap on aggregate emissions of the electricity generation, transportation, industrial, and commercial economic sectors at the 2000 baseline by 2010.

¹³ *Climate Change Activities in the United States – 2004 Update*, The Pew Center on Global Climate Change, p.5. This report can be found at:
<http://www.pewclimate.org/docUploads/74241%5FUS%20Activities%20Report%5F040604%5F075445%2Epdf>

2.2.2 “Multi-pollutant” Legislation

While the McCain-Lieberman bill received the most attention – and advanced the farthest – of all of the major climate change bills in this current Congress, there have been other notable efforts. Specifically, different forms of multi-pollutant legislation – bills which sought to limit the emissions of sulfur dioxide, nitrogen oxides, mercury and carbon dioxide – further energized the debate over this issue. Legislation introduced by Senator James Jeffords (I-Vermont), the former chairman of the Senate Environment and Public Works Committee, would have reduced power plant CO₂ emissions to 1990 levels by 2009 (a similar bill was introduced in the House of Representatives by Representative Henry Waxman (D-California)). A second bill, introduced by Senator Thomas Carper (D-Delaware) (and echoed in the House of Representatives by Representative Charles Bass (R-New Hampshire)), would have reduced those emissions to 2001 levels by 2013.

Finally, President Bush’s proposed legislation – **the Clear Skies Act** – was introduced in both chambers by Senator James Inhofe (R-Oklahoma, the current chairman of the Senate Environment Committee) and Representative Billy Tauzin (R-Louisiana) (the former chairman of the House Energy and Commerce Committee). Significantly, this legislation would have limited the emissions of the first three pollutants but **would not have limited CO₂**. While these bills were the subject of several congressional hearings in 2003, none of them were voted on, in part because of strong differences over how to handle CO₂ emissions.¹⁴

2.2.3 The Energy Policy Act of 2003

In addition to bills which specifically are targeted toward climate change, the current Congress has also sought to pass broader legislation which has included climate change provisions. Most significantly, the ongoing efforts to pass comprehensive energy legislation have been quite revealing. Over the last two years, the debate over the comprehensive energy bill (the most recent version is currently languishing in – and unlikely to pass – the Senate), included some discussion of climate change provisions. The Senate version of the legislation originally contained climate change sections; the House of Representatives’ bills did not.

Specifically, the 2002 version of the Senate bill would have required the development of a U.S. National Climate Change Strategy with the goal of stabilizing GHG concentrations in the atmosphere. The bill also would have established an Office of National Climate Change Policy within the Executive Office of the President. Additional provisions would have provided for voluntary disclosure of GHG emissions; mandatory disclosure by the largest emitters would have been triggered if fewer than 60% of U.S. GHG emissions were reported voluntarily.

In addition to the climate specific measures, the Senate has generally been more supportive of other climate friendly provisions – for example, it has generally provided more support for renewable energy (including a renewable portfolio standard) and energy efficiency. Both chambers have been supportive of extending production tax credits for wind, solar, and geothermal power, as well as creating tax incentives for energy-efficient equipment. Both the

¹⁴ *Climate Change Activities in the United States – 2004 Update*, The Pew Center on Global Climate Change, p. 7

House and Senate have also backed a “clean coal technology tax credit” and research into carbon capture and sequestration.¹⁵

It should be noted that efforts to reconcile the competing versions of the 2002 House and Senate Energy bills failed in part because of the differences over the climate provisions. As already noted, the 2003 version of the legislation has also stalled and is unlikely to pass – but not because of climate change. The climate change provisions have been stripped out of the most recent versions of the bill.

2.2.4 Other Efforts

Of course, there have been other legislative efforts which are linked to climate change, but the measures which potentially could have the most impact have been rejected. For example, both chambers have tried to increase automotive fuel efficiency without success. Even symbolic measures have faced difficulty garnering congressional support, particularly in the House of Representatives. Both the Senate Foreign Relations Committee and the House International Relations Committee have passed resolutions (which would not *mandate* anything) which have urged the United States to participate in international negotiations with the goal of getting U.S. participation in a future binding climate change treaty, and the resolution was included in a Senate-passed version of the comprehensive energy bill. The House Energy and Commerce Committee, however, rejected the resolution.¹⁶

2.2.5 Congressional Outlook

Thus, for all of the positive trends of increasing congressional activity on these issues, it seems very unlikely that *significant* legislation will pass Congress in the near future, unless the current political composition of these legislative bodies changes dramatically. Such a marked partisan shift seems unlikely.

Perhaps the one event which could alter the prospects for congressional action is the upcoming presidential election. Senator John Kerry, the Democratic nominee for president, has been an outspoken proponent of addressing global warming, and has also advocated significantly increasing fuel efficiency standards. Perhaps just as significantly, Senator Kerry has also made it clear that he prefers a much more multilateral approach to addressing issues of global concern (such as global climate change) than the Bush Administration does. In addition to sending a message to the rest of the world that the United States would likely be reengaging in international discussions on this issue, the election of Senator Kerry in November could signal a significant departure from current U.S. policies.

Whether the election of Senator Kerry would translate into congressional action on climate change in the near future is still questionable, however. As already noted, regardless of who wins the presidential election, the partisan split in Congress is likely to remain very close. Even if a President Kerry launched an ambitious and aggressive drive to change U.S. climate change policy, it is not at all clear that he would succeed. Still, presidential leadership on this issue at

¹⁵*Climate Change Activities in the United States – 2004 Update*, The Pew Center on Global Climate Change, pp. 4-6

¹⁶ *Ibid*, p.8

least would make change possible; without such leadership, prospects for major congressional action in the near future seem bleak.

To fill the void left by the lack of concrete measures emerging at the presidential and congressional levels, advocates of fighting climate change have increasingly turned to the states.

2.3 State Activity

Again, since the Bush Administration took office, it has fallen upon state governments across the country to exhibit leadership on this issue. As the Pew Center notes, “Through their authority over areas affecting the environment, such as land use, transportation, utilities, and taxation, states are creating their own programs and policies that lessen their contribution to climate change.” These states, the Center elaborates, “are taking a range of approaches, from comprehensive, cost-cutting programs to those more narrowly focused on issues such as energy, air pollution, agriculture, transportation, natural resources, and education.” Interestingly, measures that have been controversial on the federal level – such as renewable portfolio standards -- have often been implemented “with little dissent” in the states.¹⁷

State government actions to address climate change have expanded significantly over the last year. Most recently, at the end of May, **Maryland** Governor Ehrlich signed into law a renewable portfolio standard that requires the state’s electricity suppliers to generate increasing percentages of their electricity from renewable sources beginning in 2006. Additionally, earlier in the month, **Massachusetts** announced its new **Climate Protection Plan**, which identified several near-term actions the state will take under existing authority to reduce its greenhouse gas emissions.¹⁸

States are also teaming up to address climate change issues, establishing groups such as the Regional Greenhouse Gas Initiative (RGGI), among others. In addition, states have joined to pursue legal actions against energy producers for their lack of action to address global warming.

2.3.1 Categories of Activity

The actions taken by this diverse – and growing -- list of states fall into several categories. Those categories include:

- **Developing strategies or action plans to reduce net GHG emissions.** Cumulatively, at least 28 states and Puerto Rico have done so (or are in the process of doing so);
- **Completing GHG inventories of their total GHG emissions.** At least 39 states and Puerto Rico have done so, and one more state has an inventory in progress;
- **Carbon Sequestration.** Georgia, Nebraska, West Virginia and Ohio are among the states which are exploring ways to sequester carbon dioxide.
- **Energy Efficiency.** A variety of states, including California, Maryland, Oregon, New York, Indiana and Missouri, are pursuing measures which increase energy efficiency and which, in turn, reduce greenhouse gas emissions. These measures include conservation

¹⁷ *Climate Change Activities in the United States – 2004 Update*, The Pew Center on Global Climate Change, p.9

¹⁸ http://www.pewclimate.org/what_s_being_done/in_the_states/news.cfm

initiatives, tax incentives and targeted financial assistance. Additionally, at least 23 states have authorized “public benefits funds” (or similar devices) to collect funds from utility customers to fund energy efficiency and other environmentally friendly programs.

- **Renewable Energy.** At least 13 states have established renewable energy mandates, which require that utilities generate a share of their electricity from renewable sources. Other state programs to promote renewable energy include trust funds and landfill gas recovery projects. At least 23 states require that customers be informed about the sources of energy used to generate their electricity, and approximately 40 states allow some customers with their own electric generating systems to sell unused electricity back to their local utility. Furthermore, utilities in at least 35 states offer customers the option of “green pricing,” where customers pay a premium on their electric bills to have a portion or all of their energy provided from renewable sources.
- **Agriculture.** Several states contend that improving livestock waste management can produce clean energy. For example, Wisconsin helps one of its largest dairy farms with manure-to-energy technology that generates 750 kW of electricity, eliminating 26,250 tons of carbon-equivalent emissions through methane capture and displacement of coal-fired generation.
- **Transportation.** States are adopting different tactics to reduce emissions in this sector. California has enacted legislation to adopt GHG emission standards for cars and light-duty-trucks, while other states (such as Maine and Missouri) are pursuing better fuel efficiency for their state vehicles. Additionally, several states are promoting incentives for alternative fuel vehicles.¹⁹

The following sections briefly highlight the efforts of three states in particular.

2.3.2 California

2.3.2.1 GHG Emission Standards for Cars

In some ways, California has been one of the most aggressive states to tackle the issue of climate change. Most significantly, the state passed legislation in the summer of 2002 which required the state’s Air Resources Board (ARB) to set **greenhouse gas emission standards for new passenger cars and light-duty trucks**, to be applied to model years 2009 and later. More specifically under the legislation, the Board is required to adopt standards that will achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles, taking into account environmental, social, technological, and economic factors.²⁰ On September 24, 2004, the ARB voted in favor of issuing regulations to implement the 2002 legislation. The standard set by the Board will require that GHG emissions from new vehicles produced in 2012 be reduced by 22%, and by 30% from 2016 model-year cars. These regulations will not take effect before January 1, 2006, in order to provide the Legislature time to review (and amend, if necessary), but the Board is required by law to adopt standards by January 1, 2005. The Board is required to provide flexibility in meeting the regulations, as long as alternative methods of compliance result in equivalent (or greater) reductions.

¹⁹*Climate Change Activities in the United States- 2004 Update*, The Pew Center on Global Climate Change, pp.9-20

²⁰ Greenhouse Gas Standards for Vehicles. <http://www.pewclimate.org/states.cfm?ID=51>

Given the size of California's economy and the fact that in 1999, the transportation sector accounted for almost 60% of its GHG emissions, this legislation could have a significant impact. (Californians drove 730 million miles per day in light-duty vehicles in 2000, emitting more than 350,000 tons per day of greenhouse gases.)²¹

2.3.2.2 Zero Emission Vehicle Incentive Program

In addition to the GHG standards for vehicles, the state has launched **The California Zero-Emission Vehicle (ZEV) Incentive Program**. This program provides grants of up to \$9,000 per vehicle toward the purchase or lease of new zero-emission vehicles. (During the program's first year, California placed 2500 ZEV's into service, which avoided approximately 3,700 metric tons of carbon emissions.)²²

2.3.2.3 Renewable Energy Program

Furthermore, The California Energy Commission's **Renewable Energy Program** supports renewable electricity generation technologies and helps develop a renewable energy market to avoid greenhouse gas emissions. The Program administers \$540 million collected from the ratepayers of Southern California Edison Company, Pacific Gas and Electric Company, and San Diego Gas and Electric Company. Program officials estimate that the quantity of California's electrical generation produced from overall renewable resources will increase from 12 percent in 2000 to 17 percent in 2007. (Through June 2001, the program resulted in more than 60 million kilowatt-hours of electricity generated from renewable energy, which displaced fossil fuel generation and which has resulted in a reduction of at least 25,000 tons of carbon emissions annually.)²³

2.3.3 Connecticut

As already stated, Senator Lieberman from Connecticut has been at the forefront of congressional efforts to fight climate change, and politicians on the state level are following suit. In early May 2004, the Connecticut legislature passed legislation which established **a state goal of reducing greenhouse gas emissions to 1990 levels by 2010, to 10 percent below 1990 levels by 2020, and eventually to a level 75 to 80 percent below current levels over the long term**. The legislation requires the Governor's Steering Committee on Climate Change to develop a climate action plan by January 1, 2005 to achieve these first two reduction goals and to develop a plan by January 1, 2008, to achieve the long-term goal. The bill also requires the Department of Environmental Protection to establish a GHG registry, to which all entities and facilities will be required to report direct greenhouse gas emissions, beginning July 1, 2006. Starting July 1, 2008, all entities and facilities with combined direct and indirect greenhouse gas emissions exceeding 10,000 tons carbon equivalent will be required to report both direct and indirect emissions.²⁴

²¹ Greenhouse Gas Standards for Vehicles. www.pewclimate.org/states.cfm?ID=51

²² Zero-Emission Vehicle Incentive Program. www.pewclimate.org/states.cfm?ID=16

²³ Renewable Energy Program. www.pewclimate.org/states.cfm?ID=18

²⁴ www.pewclimate.org/what_s_being_done/in_the_states/news.cfm

2.3.4 West Virginia

2.3.4.1 **GHG Reporting Requirement**

In his 2004 State of the State message, West Virginia Governor Bob Wise announced his plan to establish a **state requirement for reporting of greenhouse gases**. As Governor Wise stated, “We can no longer bury our head in the sand on the issue of greenhouse gases. To protect the vitality of West Virginia’s energy-based economy, we must continue to take a leadership role on climate change issues.” The proposed legislation would have granted the state’s Department of Environmental Protection the authority to develop reporting requirements.²⁵

It is noteworthy that even West Virginia, with its heavy dependence on the coal mining industry in its economy, is beginning to address this challenge. Of course, despite the Governor’s rhetoric, it must be noted that West Virginia will likely never be a leader on this issue – after all, the Governor’s proposal merely addressed the issue of “reporting requirements” and had nothing to do with actual reductions. The legislation did not come up for vote before the end of the 2004 legislative session. But nonetheless, even in states like West Virginia, it appears that the issue is beginning to gain at least some traction.

2.3.4.2 **Promoting Wind Energy Production**

In May 2001, West Virginia made two adjustments to its tax code to promote wind energy tax production -- a lowered property tax on utility-owned wind turbines and a lowered Business and Operation (B&O) tax for utilities using wind power generation. Since there are expected to be 210 turbines, the wind industry is expected to save around \$5 million annually. (The adjustments went into effect on July 1, 2001.) The Pew Center notes that

If the wind power plants now being built in West Virginia generate power twenty-five percent of the time, they will create approximately 690,000 MWh of electricity annually. If this were to displace an equivalent amount of West Virginia’s current energy mix, which is almost entirely coal, it would prevent approximately 690,000 tons of CO₂ emissions a year.

The same report also notes, however, that “Since West Virginia exports energy to other states on the grid..., the addition of wind power generation is likely to displace a more complex mixture of electric generation, as surrounding states use a higher percentage of petroleum and natural gas as fuel sources than does West Virginia.”²⁶

2.3.5 Regional Activities

Of course, in addition to the variety of activities being pursued on the individual state level, we would be remiss if we did not address those activities being pursued on a regional level. For example, in August 2001, **governors of states in New England signed an agreement with the Eastern Canadian Premiers** for a comprehensive **regional Climate Change Action Plan** to

²⁵ www.pewclimate.org/what_s_being_done/in_the_states/news.cfm

²⁶ Promoting Wind Energy Production through the Tax Code. www.pewclimate.org/states.cfm?ID=48

jointly reduce regional GHG emissions. The plan seeks to reduce regional emissions to 1990 levels by 2010, and to 10% below those levels by 2020. The plans also calls for a regional standardized GHG emissions inventory and registry, and potentially a trading mechanism. The plan also includes measures to adapt regional economies and infrastructure to negative impacts which may result from climate change. (In the summer of 2003, Maine became the first state to sign this agreement into law.)

Also in 2003, Governor George Pataki (R-New York) invited the governors of 10 Northeast states to participate in the development of a regional CO₂ cap-and-trade program for power plants. Eight states responded with interest and two – Maryland and Pennsylvania – are participating as “observers.” The group, known as the **Regional Greenhouse Gas Initiative**, hopes to complete the program design by April 2005.

Furthermore, in September 2003 **the governors of three western states – Oregon, California and Washington** – agreed to work together to produce policy recommendations for reducing GHG emissions. The recommendations will likely address issues such as: fuel-efficient vehicles, emission reductions from diesel fuel, and renewable energy production.²⁷

Of course, the very diversity of this patchwork of state and regional programs and goals runs into its own limitations. The absence of one clear federal policy on climate change issues helps limit the progress that can be made in reducing greenhouse gas emissions. Furthermore, companies operating in multiple states may face a confusing array of regulations. Still, the concerted effort by an increasing number of states to move forward on the climate change issue suggests that pressure for federal involvement will continue to build, slowly but steadily.

2.3.6 Legal Activities

States are also engaging in legal activity to force power companies to do more to prevent climate change. In what can be described as an uncommon legal action by states, on July 21, 2004 the Attorneys General of 8 states -California, Connecticut, Iowa, New Jersey, New York, Rhode Island, Vermont and Wisconsin- sued AEP, Southern, Xcel, Cinergy, and the Tennessee Valley Authority for emitting carbon dioxide and demanded that they reduce their GHG emissions by increasing efficiency, investing in cleaner technologies, and increasing the use of their existing cleaner and more efficient electricity generation facilities. This is the first time that states have undertaken this type of legal activity, based on the argument that CO₂ is a pollutant that endangers the health of their citizens.

²⁷ *Climate Change Activities- 2004 Update*, The Pew Center on Global Climate Change, pp. 10-11

3.0 OVERVIEW OF INDUSTRY SECTORS AND GHG EMISSIONS REDUCTION INITIATIVES

Lacking any mandatory requirements from the federal government or from most state governments to cut GHG emissions, various corporations nonetheless have taken it upon themselves to address climate change through a variety of initiatives and collaborative efforts. In this overview and analysis of these efforts, we have chosen to focus on five industry sectors – aluminum, chemicals, forestry and paper, pharmaceuticals and electric power. The selected industries serve as a good representative mix of energy consumers and electric utilities. Furthermore, within each sector, we examine specific companies as case studies. It should be noted, however, that the case studies feature companies which have adopted fairly progressive positions on climate change relative to other companies in their respective sectors.

Of course, the diversity of these industries makes it difficult to generalize about their approaches to greenhouse gas reduction. Still, it is fair to say that many companies within these industries believe that a carbon-constrained future is coming, but are supportive in the meantime of reducing carbon emissions through *voluntary* measures.

For example, among the companies we have surveyed for this report, Alcoa pledged to reduce its direct GHG emissions to 25% below the 1990 baseline on a worldwide basis by 2010 (and, in fact, has already met that goal). DuPont will reduce GHG emissions by 65 percent from 1990 levels by 2010. Pfizer pledged to reduce its GHG emissions per dollar of revenue by 35 percent from 2000 to 2007, and IP has established a goal of reducing absolute GHG emissions by 15% by the year 2010 from a year 2000 baseline. Additionally, companies are voluntarily purchasing more green power for their manufacturing processes through mechanisms such as the **Green Power Market Development Group**. (This Group is discussed in more detail in Appendix 1.)

Simultaneously, however, the more progressive companies also generally support some type of federal regulations. Upon closer inspection, this apparent paradox can be explained. Generally, the corporate order of preference is to first do things voluntarily if possible. However, if companies believe that a carbon-constrained future is likely (as an increasing number of American companies do), these companies would then prefer federal regulations because they desire regulatory certainty over a significant time horizon. They need such certainty in order to make large capital investment decisions.

Referring to emissions trading in particular, the **Chicago Climate Exchange** – which is explained in more detail in Appendix 1 -- has articulated some of these concerns, noting that “these emerging [carbon] markets, and an international market linking them, are still in their infancy. This results in large transaction costs and market inefficiencies.” According to the Exchange, barriers to trading included:

- Regulatory uncertainty;
- A lack of a clear, widely accepted definition of the commodity;
- A lack of standards for monitoring, verification and trade documentation;
- A lack of standards for eligibility of project-based emission offsets; and

- A lack of organized markets and clear market prices.

Three of the companies surveyed in this report – DuPont, AEP, and International Paper (IP) -- belong to the CCX and support its goals.

The Role of the Insurance Industry

Significantly, some of these questions of uncertainty articulated by the CCX are beginning to be addressed in other ways by the insurance industry. While the insurance industry is not an active producer of GHG emissions, it does play a critical role in managing and reducing environmental risks such as those related to climate change. This industry's techniques for understanding uncertainty, identifying and quantifying risk, and responding to risk are key tools for managing climate change. For example, the work of this sector is crucial for the functioning of an efficient emissions trading system. Insurers provide risk financing products and services to parties engaged in carbon trading, including "buyer protection," compensation, and mechanisms for hedging risk. The insurance sector has also played an important role in the decision of two power companies -- American Electric Power and Cinergy – to report publicly on how they plan to address growing demands for GHG and other emission reductions, and on the potential impacts of these responses on the profitability of the companies.

Most importantly, it is expected that similar actions could be required of other industries as well, specifically of those (such as the oil and gas industries) most likely to be affected by environmental regulations. **Pension fund leaders are demanding that the federal Securities and Exchange Commission (SEC) require that all companies provide better disclosure of the financial risks they are exposed to from climate change.** The Coalition for Environmentally Responsible Economies (CERES), a group of investors and environmental organizations, is a key component of this shareholder movement. Shareholder groups associated with and advised by CERES have filed resolutions against additional electric utilities and other companies asking for greater transparency in their plans to address climate change related risk. CERES also released a study in 2003 which discussed how the 20 largest carbon-emitting companies are failing to adequately disclose the financial risks they face from global warming.²⁸

Ultimately the insurance sector could be the industry most affected financially as a result of potential climate change impacts on property and human lives. According to an Executives Briefing Paper by the United Nations Environmental Program Finance Initiative (UNEP FI) Climate Change Working Group, worldwide annual economic losses due to natural disasters could approach \$150 billion over the next decade, of which a significant portion will be insured. Nonetheless, new business opportunities are emerging for the insurance industry in addressing these threats. In property insurance, for example, there could be an increase in: a demand for risk transfer and other services; insurance of mitigation initiatives such as clean energy projects; and innovative risk transfer solutions for those sectors most vulnerable to global warming.²⁹ There will also be an increasing demand for life and health insurance, as human health risks rise from exposure to climate change.

²⁸ CERES. "Corporate Governance and Climate Change: Making the Connection." July 2003.

²⁹ UNEP FI Climate Change Working Group. "CEO Briefing: Climate Risk to Global Economy."

The following chapters examine the aforementioned industries. We further examine how specific companies within those industries have chosen to address the issue of GHG emissions.

4.0 THE ALUMINUM INDUSTRY

4.1 Introduction

The United States aluminum industry is the world's largest, and annually produces about \$40 billion in products and exports. U.S. companies are also the largest single producer of primary aluminum. The U.S. industry operates more than 300 plants in approximately 35 states, produces more than 23 billion pounds of metal annually and employs over 100,000 people with an annual payroll of at least \$3.5 billion.³⁰ The top markets for the aluminum industry are transportation (car manufacturing), beverage cans and packaging, and building materials. More specifically, Americans consume aluminum primarily in transportation (32%), containers and packaging (21%), and building and construction (13%).

The aluminum industry is a major industrial user of electricity and consumes more than \$2 billion annually in electricity costs, making energy conservation an important goal. The energy intensive electrolytic process is the only commercially proven method of producing aluminum. Therefore, the industry has actively pursued opportunities to reduce its use of electricity. The American aluminum industry has also promoted recycling as an energy saving measure. Recycling saves almost 95 percent of the energy needed to produce aluminum from its original source, bauxite ore.³¹ Thus, the industry claims that the recycling efforts of Americans, combined with the industry's aluminum reclamation system, reduce the overall energy consumption in U.S. aluminum production by 46%.

The aluminum sector is responsible for a relatively large portion of greenhouse gas emissions: the sector was responsible for 3 MTE (million metric tons of carbon equivalent) emissions in 1998, the last year for which figures were available, mainly in the form of perfluorocarbons (PFCs).³² Accordingly, the industry has a voluntary greenhouse gas emission reduction program in place.

4.2 The Voluntary Aluminum Industrial Partnership (VAIP)

Launched in 1995, VAIP is a pollution prevention program developed jointly by the Environmental Protection Agency and the primary aluminum industry. Within the program, "Participating companies (partners) work with EPA to improve aluminum production efficiency while reducing perfluorocarbon (PFC) emissions..." Specifically, participants are committed to reducing two "potent" PFCs, tetrafluoromethane (CF₄) and hexafluoroethane. Membership includes 12 of the country's 13 primary aluminum producers, representing 22 smelters and 94% of U.S. production capacity.

Partners have signed a Memorandum of Understanding with EPA in which they agree to "undertake technically feasible and cost-effective actions to reduce PFC emissions." The company also submits periodic reports to track its reductions. In return, EPA "agrees to work to improve the available information and understanding of the factors that influence the generation

³⁰ www.aluminum.org/template.cfm?Section=The_Industry

³¹ *Ibid*

³² Sources of GHGs in the United States, 1998. www.pewclimate.org/global-warming-basics/facts_and_figures/fig14.cfm

of PFCs, to encourage other aluminum producing countries to include PFC emissions in their respective Climate Change Action Plans, and to provide public recognition of the partners' efforts."

In March 2002, EPA recognized VAIP with a Climate Protection Award for reductions in PFC emissions achieved from 1990 to 2000.³³ (The companies had met their 2000 goal to reduce PFC emissions from primary aluminum smelting by 45% (the equivalent of 2.2 million metric tons of CO₂ annually.)

4.3 Current Views

In addition to its efforts through the VAIP, the industry recognizes that the automotive industry offers opportunities for further reductions. The Aluminum Association cites studies which show that "replacing two pounds of steel with one pound of aluminum to lightweight a vehicle can save on a typical mid-size sedan 20 pounds of CO₂ emissions over the lifetime of that vehicle." The industry also notes that the use of automotive aluminum has doubled since 1991 and is expected to double again by 2005. Given the fact that transportation already represents the top market for the aluminum industry, this trend is particularly important.

Policy statements from 2002 further detail the industry's position on climate change. Seeking to be recognized for the voluntary initiatives it has already taken, the industry "strongly supports policies and programs that credit for early action taken in reducing greenhouse gases since 1990." It also supports emissions trading programs and registries that recognize these reductions.

Furthermore, the industry notes that it "supports and participates in public/private partnerships to spur precompetitive research to reduce greenhouse gas process emissions and to promote energy saving aluminum product applications." The Aluminum Association concludes by stating that the industry

supports a responsible approach to growth in demand for its products and the consequent growth in activity and related emissions, noting that solutions to the climate change issue involve both reducing emissions at source and also over the full lifecycle of the material or products.³⁴

4.4 Case Study: Alcoa

4.4.1 Background

Based in Pittsburgh, Pennsylvania, Alcoa Inc. is the world's largest producer of primary aluminum, fabricated aluminum and alumina, and is "active in all major aspects of the industry – mining, refining, smelting." The company notes that it "serves the aerospace, automotive, packaging, building and construction, commercial transportation and industrial markets," and

³³www.epa.gov/highwpl/vaip/overview.html

³⁴www.aluminum.org/Content/NavigationMenu/The_Industry/Government_Policy/Climate_Change/Climate_Change.htm

also makes and markets a variety of consumer brands (such as Reynolds Wrap aluminum foil). Alcoa has 120,000 employees in 41 countries.³⁵

The company is notable for its relatively early – and outspoken – attention to the issue of climate change. In a March 1998 presentation to the Aluminum Association, former Alcoa chairman of the board and CEO Paul O’Neill (who would go on to be the first Secretary of the Treasury in the Bush Administration) specifically addressed the issue in a speech titled “Science, Politics and Global Climate Change.” Despite the uncertainty which surrounded the issue, O’Neill challenged the industry directly to act:

This [climate change] is going to become a more serious issue. We need to get out in front of it. We need to create a fact base that we all believe in -- that we can share – that is, in fact, bulletproof. We may not like some of what we find, but we should do it, and we shouldn’t wait for the government to pay us to do it. We shouldn’t argue about it; we ought to just get on with it.....

What we do in our individual lives and responsibilities matters, and the global climate change issue is one where I think those of us in positions of responsibility, if we’re going to pretend to be leaders, need to actually lead and not wait for somebody to hammer us into submission.³⁶

4.4.2 Climate Change Targets

Alcoa subsequently pledged to reduce its direct GHG emissions by 25% by 2010, “with the potential for significant additional reductions through major technology improvements.”³⁷ Additionally, Alcoa will pursue a variety of other measures, including:

- measuring its significant GHG emissions and having its baseline data and inventories certified by independent third parties;
- rapidly deploying “appropriate best practice technologies to reduce GHG emissions;”
- evaluating the effectiveness of GHG sequestration approaches;
- supporting an emissions trading regime “that is efficient, global, comprehensive and utilizes initial allocation procedures based on a 1990 baseline;” and
- evaluating and utilizing “cooperative mechanisms to reduce greenhouse gases using agreed international protocols.”³⁸

In 2003, the company already reached its 25% reduction goal for 2010, and is considering new goals. In fact, Patrick Atkins, the Director of Environmental Affairs at Alcoa, informed us that the company will be setting new goals this year – possibly by October. He explained, “We are working on inert anodes for our smelting process that will cut our CO₂ emissions

³⁵ www.alcoa.com/global/en/about_alcoa/overview.asp

³⁶ “Science, Politics and Global Climate Change,” Speech by (former) chairman Paul O’Neill to the Aluminum Association, March 6, 1998. The speech can be found at: www.alcoa.com/global/en/environment/pdf/global_climate_change.pdf

³⁷ www.alcoa.com/global/en/environment/position_papers/climate_change.asp

³⁸ *Ibid.*

significantly. We expect commercialization of this technology as early as 2010.”³⁹ (Alcoa officials have speculated that the new anode technology could reduce Alcoa’s emissions an additional 25%.)

4.4.3 Specific Programs for Addressing Greenhouse Gas Emissions

In pursuing its emission reduction goals, Alcoa currently stresses its support for improved energy efficiency in its operations, and for international cooperative action to reduce and manage GHG emissions (including all sources and sinks and trading programs that also “protect those who have taken early action to reduce emissions.”)⁴⁰ That support is reflected in Alcoa’s decisions to join a variety of federal and private sector initiatives and partnerships. Specifically, in addition to the Voluntary Aluminum Industrial Partnership (VAIP) (which is detailed in section 4.2) the company has joined:

- The Pew Center on Global Climate Change’s Business Environmental Leadership Council;
- The World Business Council for Sustainable Development;
- The Green Power Market Development Group;
- EPA’s Climate Leaders; and
- DOE’s Climate VISION

While Alcoa’s specific role in some of these partnerships is outlined below, general descriptions of the collaborative efforts are described in Appendix 1.

4.4.3.1 The GHG Protocol: Corporate Accounting and Reporting Standard

First produced by the World Business Council for Sustainable Development and the World Resources Institute (WRI) in September 2001 and revised in April 2004, the Protocol “helps companies and other organizations to identify, calculate and report GHG emissions.” (For more detailed information about the Protocol, please refer to Appendix 1.)

As noted by Alcoa’s Ken Martchek at a Climate Leaders workshop in January 2004, **this reporting standard formed the basis for Alcoa’s current GHG emissions inventory.** (Climate Leaders is discussed in more detail below, as well as in Appendix 1.)

Martchek described Alcoa’s GHG Data Management System in some detail. The company has achieved a significant reduction in annual CO₂ equivalents from 1990-2002, and Martchek noted that these reductions occurred despite the fact that the company had made significant acquisitions and integration. (In fact, he noted, approximately 50% of primary production facilities were not owned by Alcoa in 1990, and thus, significantly, **reductions have occurred despite an overall growth in aluminum production.**)

Furthermore, for third party verification of its GHG emissions, Alcoa hired the accounting firm PriceWaterhouseCoopers (PwC). The firm was to look at the company’s GHG Data

³⁹ Email Interview with Patrick Atkins, April 29, 2004.

⁴⁰ www.alcoa.com/global/en/environment/position_papers/climate_change.asp

Management System as a whole, as well as the performance of two representative Alcoa facilities. In its final report to the company, Price Waterhouse concluded that, “Alcoa has a robust and coherent system to manage the GHG inventory for its operations.”⁴¹

4.4.3.2 Green Power Market Development Group

Alcoa is also a founding member of the Green Power Market Development Group (GPMDG). Founded in 2001, this group is “a collaboration of 12 leading corporations and the World Resources Institute dedicated to building corporate markets for green power.”⁴² (For more general information about the GPMDG, please refer to Appendix 1.)

Alcoa’s involvement with GPMDG is reflected in the use of Renewable Energy Certificates (RECs).^{43,44} Vince Van Son, the Manager of Environmental Finance and Business Development at Alcoa, discussed Renewable Energy Certificates in some detail at WRI’s Sustainable Enterprise Summit in March 2004. He noted that in September 2003, nine GPMDG member companies (including Alcoa) and WRI completed the largest purchase of RECs in the United States. (The annual purchase was roughly equivalent to the electricity consumption of 24,000 homes.) Among other points, Van Son concluded that RECs “are becoming an increasingly attractive renewable energy product for companies interested in reducing the environmental impact of their business activities.”⁴⁵

A September 2003 publication co-authored by Van Son elaborates about the corporate GHG benefits of buying RECs:

Among the environmental attributes represented by a REC are the associated avoided CO₂ emissions when one MWh of electricity from a renewable power facility displaces one MWh of power from fossil fuels in the plant’s wholesale market or power pool. By

⁴¹ “Measuring, Reporting and Verifying Greenhouse Gas Emissions,” Presentation of Ken Martchek, Alcoa, Climate Leaders Partners Workshop, January 13, 2004

Martchek also elaborated on the importance of GHG tracking mechanisms. Noting that “climate measures may in the future significantly impact aluminum reduction costs and capital flows,” Martchek specifically talked of the need for GHG measurement, reporting and verification, contending that “requirements will become more rigorous as we progress from voluntary reporting toward regulatory compliance and/or emissions trading.” There was “a need for accuracy and consistency to minimize duplication of efforts.”

⁴² www.thegreenpowergroup.org/aboutus.html

⁴³ As defined by WRI and its partners, these RECs

are a renewable energy product that companies can purchase to reduce the environmental impact of their business activities. A REC represents the environmental attributes – for example, avoided CO₂ emissions – that are created when electricity is generated using renewable resources instead of using fossil fuel sources...RECs can be sold separately from their associated electricity and thus enable customers to purchase the environmental attributes of renewable power generation independently of their retail power supply.”

⁴⁴ “Renewable Energy Certificates: An Attractive Means for Corporate Customers to Purchase Renewable Energy,” by Craig Hanson and Vince Van Son, *Corporate Guide to Green Power Markets – Installment 5*, World Resources Institute, September 2003

⁴⁵ “Renewable Energy Certificates” Presentation, Vince Van Son, 2004 World Resources Institute Sustainable Enterprise Summit, March 18, 2004

purchasing a REC, a company can claim these avoided emissions to help it meet its own voluntary corporate GHG emissions goals or meet targets established in voluntary GHG emissions reduction programs [such as Climate Leaders].⁴⁶

(RECs are discussed in more detail in Appendix 1.)

4.4.3.3 Climate Leaders

Launched in February 2002 by the Environmental Protection Agency, Climate Leaders is a voluntary industry-government partnership which “encourages companies to develop long-term comprehensive climate change strategies” (please refer to Appendix 1 for a more general overview of the program).⁴⁷

Alcoa joined EPA’s Climate Leaders Program as a charter member in 2002. At the aforementioned January Workshop, Martchek of Alcoa discussed measuring, reporting and verifying GHG emissions, and spoke of how the company improved its own system. He noted the “Aluminum Sector Greenhouse Gas Protocol,” which had been developed by industry representatives via the International Aluminum Institute, and adopted the general principles of the WRI / WBCSD GHG Protocol. More complete industry specific appendices include calculation methods for PFC emissions and direct carbon dioxide emissions resulting from aluminum reduction and supporting processes.⁴⁸

4.4.3.4 Climate VISION

Launched in February 2003 by the Department of Energy, Climate VISION is a presidential public-private partnership initiative which seeks to promote President Bush’s goal of reducing greenhouse gas intensity by 18% over the next ten years.⁴⁹ (Please refer to Appendix 1 for a more general overview of the initiative.)

In an August 2003 letter to the acting administrator of the EPA, the Aluminum Association (and its members participating in VAIP, including Alcoa) pledged its participation “to further PFC reduction commitments on a carbon intensity ... basis as a part of the Climate VISION program.” The letter of agreement also further commits VAIP members “to reductions in direct carbon dioxide emissions emitted from the consumption of anode carbon during the primary aluminum production process.” Primary producers also agreed to continue to try to reduce indirect CO₂ emissions through improvements in energy efficiency. And, VAIP members agreed to try to improve energy efficiency by pursuing improvements in the management practices of their facilities.⁵⁰

VAIP specifically is targeting a 53% total carbon equivalent reduction by 2010 from 1990 levels – the new commitment represents an additional direct carbon-intensity reduction of 25% since

⁴⁶ Hanson and Van Son, September 2003.

⁴⁷ <http://www.epa.gov/climateleaders/overview.html>

⁴⁸ Martchek, January 13, 2004

⁴⁹ <http://www.climatevision.gov/mission.html>

⁵⁰ Aluminum Association commitment letter to EPA acting administrator Marianne Horinko, August 4, 2003. The letter can be found at: www.climatevision.gov/sectors/aluminum/pdfs/aa_letter.pdf

2000. The Climate VISION commitments build on the efforts of VAIP, which had reduced PFC emissions by over 45% in 2000 (compared to the 1990 baseline.)⁵¹

4.4.3.5 Other Activities

In addition to the initiatives and groups listed above, Alcoa is involved in state renewable energy programs in Maryland and Pennsylvania; climate change programs in Quebec, Norway, Spain, Italy, Australia, the UK, and Brazil; and the World Economic Forum's Global Greenhouse Gas Register.

4.4.4 Achievements

4.4.4.1 Climate Change Team

In addition to meeting its 25% emission reduction goal last year, Alcoa's most recent climate change efforts include the work of a Climate Change Strategy Team, which is comprised of 15 experts on climate issues based at Alcoa sites around the world. This team is "responsible for reviewing how Alcoa's programs and products are part of the solution to climate change." In late 2003, the team "reviewed progress on cutting emissions and started working on plans and programs for meeting and maintaining the company's current 2010 goal" of a 25% GHG reduction from 1990 levels.

The team also reviewed progress on the company's greenhouse gas inventory management systems. Most recently, Alcoa's current global GHG tracking program will be directly linked this year to a new GHG information system for Alcoa Primary Products. (This Primary Products information system estimates GHG emissions from 40 major facilities consistent with established protocols, and is integrated with production databases "to provide monthly feedback on emission reduction performance at each location.") "These system improvements," the report concludes, "will allow for more active management of greenhouse gas emissions and more real-time communications within the company on progress and opportunities."

Not surprisingly, the teams also stressed the importance of a worldwide database of GHG and compatible reporting protocols for all governments, and reviewed the company's role in these protocols.⁵² (These protocols will be discussed in greater detail below).

4.4.4.2 Other Achievements

Alcoa highlights a variety of other measures it has taken to address climate change. These actions include:

⁵¹ <http://www.climatevision.gov/sectors/aluminum/index.html>

⁵² *Alcoa 2003 Sustainability Report* The report can be found at:
www.alcoa.com/global/en/about_alcoa/sustainability_report_2003/sustainability_report_2003.asp

Reducing PFC emissions⁵³

The company has reduced perfluorocarbon (PFC) gas emissions by 54% from 1990 to 2000, with approximately one-third of the company's smelters achieving reductions of 80% or better (Alcoa had voluntarily agreed to reduce PFC from anode effects by at least 40% in the year 2000 relative to emissions in the base year of 1990). Alcoa achieved its reductions by "concentrating on reducing both the frequency and duration of anode effects" throughout its worldwide smelting system. **The company has since adopted a new goal of reducing PFC emissions 27% from the levels achieved in 2000 by 2005.**⁵⁴

Agreeing to Reduce Greenhouse Gas Emissions in Quebec

In January 2002, the Aluminum Association of Canada – and its member companies, which included Alcoa – signed a framework agreement with the Quebec government which aimed to reduce, on a voluntary basis, greenhouse gas emissions from their Quebec-based facilities by approximately 200,000 tonnes by the end of 2007. This was the first agreement of its kind in both Quebec and Canada.

The agreement provided that each company would set emissions targets which took into account the specificity of each. Additionally, the agreement hoped to improve the industry's performance in voluntarily reducing emissions "by recognizing the level of reductions already achieved."⁵⁵

Improving Furnace Efficiency

Between 2000 and 2003, Alcoa's Warrick Operations in Indiana cut natural gas consumption by 25%, saved \$1.4 million in energy costs, and reduced greenhouse gases and other emissions by about 9,100 metric tons (10,000 tons) — with zero capital dollars spent. It did so by reengineering how aluminum ingots are preheated prior to hot rolling.⁵⁶

The initiative reduced the preheating cycle time by more than 25%, thus reducing the amount of natural gas consumed and the metallurgical variability from load to load. Additionally, Warrick "used a furnace prediction model that determined more aluminum ingots were being heated than was required by the customer—Warrick's cold mill. This linkage of furnace performance with customer usage lowered the number of furnaces operating at any given time..." thereby cutting energy usage.⁵⁷

⁵³ Aluminum smelters periodically emit small amounts of a GHG known as PFC. According to the company, the emissions usually occur when there is an unplanned interruption to the electrolytic smelting process, known as an anode effect.

⁵⁴ www.alcoa.com/global/en/environment/initiatives/greenhouse_gases.asp?initCountry=1000

⁵⁵ www.alcoa.com/global/en/environment/initiatives/emissions.asp?initCountry=1000

⁵⁶ As noted by Alcoa, "Preheating aluminum ingots to around 499° Celsius (930° Fahrenheit) prior to rolling is necessary to impart required metallurgical properties and to make the metal sufficiently pliable for rolling. Warrick's 42 preheat furnaces, each of which holds six 18.4-metric-ton (20.5-ton) ingots, were taking 12 to 30 hours to heat the ingots to the required rolling temperature."

⁵⁷ www.alcoa.com/global/en/environment/initiatives/furnace_efficiency.asp?initCountry=9

Reducing Greenhouse Gases in Australia

By improving the performance of smelting pots at Alcoa's Portland Aluminum in Australia, Alcoa achieved a 3% reduction in energy consumption per metric ton of aluminum (and a corresponding reduction in GHG) associated with the electricity used by the smelter during a year's production. The annual GHG savings are equal to a reduction of approximately 0.6 metric tons of CO₂ emitted per metric ton of aluminum produced.

Specifically, this Portland smelter pot stability project, which was initiated in 1994 and completed ahead of schedule in September 2002, focused on optimizing the magnetic compensation of the smelting cells. The project also studied operating changes to improve pot stability.^{58, 59}

Improving Energy Efficiency

The company has made clear that it "remains committed to improving energy efficiency in all operations through appropriate combinations of best practice technologies to further reduce" GHG emissions. (The economic advantages of these energy efficiency efforts are discussed in more detail in section 4.4.5)

Developing and Using Efficient Transportation Projects

Alcoa has also expressed its interest in "the development and use of transportation products that will contribute to substantial life-cycle GHG reductions and an increase in the use of recycled metal." For example, the company is working with its aerospace customers to develop new technologies to make aircraft more efficient and reliable. Similarly, regarding ground transportation, Alcoa is seeking to help manufacturers "design and build vehicles that deliver improved performance, safety, fuel efficiency, and environmental performance."^{60, 61}

4.4.5 Economics of Cutting Emissions

In its 2003 Sustainability Report, Alcoa defines sustainability as "using our values to build financial success, environmental excellence, and social responsibility through partnerships in order to deliver net long-term benefits to our shareholders, employees, customers, suppliers, and the communities in which we operate." Those values include integrating environment and health and safety concerns with manufacturing issues.

⁵⁸ Alcoa notes that, "Aluminum smelting cells require magnetic compensation to reduce the effect of the magnetic field that is produced when the low voltage but very high amperage electrical current flows through the cells.

Improvements to the original design of this aspect of the smelting cell allowed a significant reduction in voltage. This technological achievement reduced energy consumption, improved environmental performance, and reduced operating costs by 6.3%."

⁵⁹ www.alcoa.com/global/en/environment/initiatives/ghg_australia.asp?initCountry=1000

⁶⁰ According to Alcoa and the International Aluminum Institute, "In terms of greenhouse emissions, a kilogram (2.2 pounds) of aluminum used in a typical automobile will reduce the greenhouse gas generation by that car over its lifetime by 20 kilograms (44 pounds) more than the greenhouse gases that were produced in the manufacture of the aluminum and the aluminum parts used in the car. Greenhouse gas savings in excess of 40 kilograms (88 pounds) can be achieved in trucks and up to 200 kilograms (440 pounds) in trains by the use of a kilogram of aluminum."

⁶¹ www.alcoa.com/global/en/environment/initiatives/climate_change.asp?initCountry=1000

More specifically, Alcoa operates under what the company calls the **Alcoa Business System (ABS)**. As defined by Alcoa, ABS is “an integrated set of principles and tools used to manage Alcoa businesses.”⁶² The three dominant principles are:

- Make to Use (based on customer usage, as opposed to making to inventory);
- Eliminate Waste; and
- People Linchpin the System.

The company notes that this system has led to both product improvements and substantial cost savings in recent years. Specifically, at the end of 2003, the company completed a three-year program which resulted in annual savings of slightly more than \$1 billion, exceeding its \$1 billion goal. (Alcoa had achieved similar annual savings of \$1.1 billion during the previous three-year period.) In January 2004, the company launched its new goal of \$1.2 billion in annual savings by the end of 2006.⁶³

Clearly, the pursuit of these savings has not disrupted the company’s efforts to reduce GHG emissions. As already noted, the company has already achieved its 2010 goal of a 25% emissions reduction, and more generally, GHG emissions associated with smelting pot operations have been reduced by more than 75% at several locations.

Furthermore, through the Alcoa Energy Efficiency Network, the company has identified significant energy savings opportunities (currently more than \$59 million) and has captured over \$16 million per year in these energy savings to date. More than \$50 million in annual energy cost reductions are expected by 2007 due to efficiency upgrades.⁶⁴

4.4.6 Corporate View on Federal and State Policy Options

Regarding federal involvement on climate change issues, Alcoa has supported the recent McCain-Lieberman legislation which would establish a cap and trade system for greenhouse gases, including carbon dioxide. However, as noted below, Alcoa believes that even national legislation would be less than ideal from its perspective.

Specifically, in testimony before the Senate Commerce Committee in January 2003, Randy Overbey, the President of Alcoa’s Energy Business, stated,

We recognize and support the broad scope of this draft legislation and encourage you to address, as directly as possible, GHG emissions from all major sectors of the economy.

We believe a cap and trade system will provide the incentives and rewards necessary for all parties to initiate reductions in GHG emissions. We also believe the caps and allowances are critical in their design. Any design must recognize the economy and our ability to compete, as well as the impact on emissions.

⁶² www.alcoa.com/global/en/investment/pdfs/Alcoa02AR.pdf

⁶³ www.alcoa.com/global/en/about_alcoa/abs.asp

⁶⁴ www.alcoa.com/global/en/about_alcoa/sustainability_report_2003/sustainability_report_2003.asp

Overbey outlined several characteristics of a cap and trade system preferred by Alcoa. For example, he stated that “the initial free allocation of emission certificates for impacted sources [should] be at least 85% of the total allowance that the source’s effective year needs.” Overbey added that,

As the market develops and the full economic impacts of the cap and trade program are better understood, the allocation levels can be modified to ensure that the goals of the act are achieved in the least economically disruptive manner possible. Otherwise, our primary aluminum plants...may be put at significant economic risk. We also recommend that ultimate allocations be on a company-by-company basis to better recognize those companies that have taken early action to reduce GHGs.

Overbey also noted support for:

- the inclusion of all six of the GHGs recognized under the UN Framework on Climate Change;
- credits for reductions occurring after 1990 “issued at the comparable rate as the base year allowances to recognize and reward” early GHG reduction efforts;
- a national GHG database and registry in support of the cap and trade system; and
- “a bonus for accelerated reductions for covered entities who sign agreements to reduce their GHG emissions below 1990 levels.”⁶⁵

Despite its backing of McCain-Lieberman, however, the company has also made it clear that it would prefer a worldwide approach to a national one. As Alcoa’s Atkins stated in an interview, “A worldwide approach would be best. **I don’t know that a U.S. position is much better than separate state positions as long as the U.S. is not aligned with the rest of the world.** Alcoa is a worldwide company, so we would like a worldwide program.”

As for McCain-Lieberman, although the legislation was rejected by the Senate in the fall of 2003, Senator McCain has made it clear that he is going to continue to press the issue. Still, Alcoa’s Atkins may have the most realistic assessment about climate change developments on the federal level, at least in the near term. He observed that “**I think the U.S. will continue to try to use voluntary programs to address climate change, but without success. We must have more public education on the issue before the Congress will move.**”⁶⁶

4.4.7 Outlook

It seems safe to conclude that Alcoa will continue to be an industry leader in attempting to address climate change. Ranking as one of America’s “most admired companies” (according to *Fortune*) and ranking second in terms of social responsibility, Alcoa is reaping the benefits of positive publicity, in part because of its progressive approach toward environmental issues such

⁶⁵ Testimony of Randy Overbey, “Climate Change: Greenhouse Gas Reductions and Trading Systems” Hearing, Senate Commerce Committee, January 8, 2003

⁶⁶ Email Interview with Patrick Atkins, April 29, 2004.

as climate change. One can easily imagine that the company would be loath to take steps which might hurt its public image.

But the most convincing argument to believe that Alcoa will continue its present course is that it makes sound business sense. As already noted, Alcoa is a worldwide company and would benefit from having one set of worldwide – or at least, national – standards to live by. The company clearly recognizes the potential relationship of carbon dioxide with global warming and notes that

Aluminum production is especially energy intensive, and thus is a significant producer of CO₂. **Therefore, prudence suggests that Alcoa should consider efficiency, conservation, fuel selection and alternative energy sources (for new facilities and major retrofits) when designing strategies for CO₂ management. Long term strategy should include the development of modified or new production processes to reduce CO₂ generation.** Recycling can also be an important component of this strategy since the energy content of recycled metal is considerably less than that of primary metal.

The company continues,

Through generation of CO₂, Alcoa has a role in the global warming issue. Therefore, our businesses should conduct self analyses to determine our priorities for company-wide CO₂ management strategies. **It is probable that improvements in practices with emphasis on energy use will produce significant and cost-effective reductions in CO₂ emissions.** More complex decisions eventually will be made concerning processes, fuels, raw materials, product mix and material substitution. Our contribution to these decisions can be more "fact based" and scientifically sound if we initiate the process as early as possible.⁶⁷

⁶⁷ www.alcoa.com/global/en/environment/position_papers/carbon_dioxide.asp

5.0 THE CHEMICAL INDUSTRY

5.1 Introduction

Chemical manufacturing in the United States, a \$450 billion industry, is a key component of the nation's economy. It is the nation's largest exporting industry, accounting for ten cents out of every dollar in U.S. exports. Chemical companies invest more in research and development than any other business sector and employ more than one million people.⁶⁸

The chemical industry is one of the largest energy consuming sectors as well. It uses oil, natural gas and natural gas liquids to power its production facilities and processes. Sales of chemical products made from energy-based raw materials exceeded \$200 billion last year. The sector is highly energy intensive. Natural gas liquids are converted into ethylene, which is used to make hundreds of other chemical products that, in turn, are used to make consumer products such as food packaging, carpet, antifreeze, paper coatings, crayons, and window frames.

Given this conversion process, it is not surprising that the overriding energy concern of the chemical industry is the lack of adequate supplies of natural gas. The shortage is especially acute considering that natural gas as well as other petroleum-based products are used both for fuel and, as already noted, as feedstocks in the manufacturing processes themselves. According to industry representatives and independent analyses, high natural gas prices are driving chemical production offshore, resulting in a significant loss of American jobs. Additionally, the gas shortage – and the industry's fear of declining profits caused by that shortage – has been at least partly responsible for the industry's opposition to environmental legislation such as the Clear Skies Act. The industry has expressed that the legislation could increase residential demand for natural gas but not do enough to promote alternatives such as clean coal technology.⁶⁹ Since natural gas-fired plants would primarily be responsible for replacing the older coal plants that would be regulated out of existence by the legislation, the American Chemistry Council (ACC) -- the trade association that represents the industry -- fears that natural gas supply to the industry could be reduced because of its increasing use for power production (rather than for manufacturing).

Since energy input costs can be as high as 85% for the manufacturing of some products, ACC has developed awards for corporate energy efficiency. Furthermore, the ACC merged with the American Plastics Council in 2002, a move which incorporated a slightly different sector into its fold. Since the sector is so energy intensive, one of the ACC's major programs (the Continuous Improvement Program (CIP)) promotes energy efficiency improvements in manufacturing. In addition to the CIP, the industry promotes the use of energy-efficient and low-emitting combined heat and power (CHP) generators at manufacturing facilities.

Since the vast majority of North American chemical manufacturers belong to the ACC, its stances on climate change issues can be seen as representative of the industry as a whole. It should be noted that the industry's attitude toward climate change policy has evolved since the

⁶⁸ www.americanchemistry.com

⁶⁹ (American Chemistry Council, Statement for the Record: Subcommittee on Clean Air, Climate Change and Nuclear Safety, Committee on Environment and Public Works, Hearing on the Clear Skies Act, May, May 8, 2003.)

1990s. At that time, at least one industry group, the Chemical Manufacturers Association (CMA), belonged to the conservative Global Climate Coalition, an organization which had been formed to block ratification of the Kyoto Protocol in the U.S.

Currently, the industry's view toward Clear Skies is generally consistent with their approach toward climate change issues. As a whole, the industry supports voluntary initiatives for carbon reduction rather than legislative approaches. In fact, ACC has set up a plan for voluntary initiatives, and encourages its members to participate in another plan developed by the Business Roundtable. For example, Dow and DuPont, the two largest companies in the sector, are involved in the Green Power Development Group, a voluntary electricity buyers' consortium (described in more detail in Appendix 1). It is also worth noting, though, that some companies in the sector do not believe that voluntary measures are sufficient, and that there should be a regulatory backstop.

5.2 Case Study: DuPont

5.2.1 Background

Founded in 1802, DuPont is one of the oldest companies in the United States. With 94,000 employees worldwide, it has revenue of \$30 billion annually. DuPont is the number two chemical manufacturer in the United States, but it has also diversified its production into the areas of high performance materials (such as plastics and clothing), specialty chemicals, pharmaceuticals and biotechnology. (The company now markets over 2000 trademarks and brands.) In 1999, the company changed again, divesting itself of Conoco, its \$21 billion oil and gas interest, and acquiring Pioneer Hi-bred International, a leading seed producer.

The core business lines that DuPont operates are: agriculture and nutrition, coating and color technology, electronic and communications technologies, performance materials, and safety materials. In the area of sustainability, the company's corporate goal is to create shareholder value while reducing its environmental footprint. DuPont has tried to shape the company to fit this mold of environmental footprint reduction through strategic acquisitions and divestitures.

Conscious of its environmental footprint, DuPont's definition of societal value includes corporate social responsibility; the application of high global standards for manufacturing practices; and the impact of public policy issues. The company maintains a framework for identifying and utilizing the potential to reduce GHG reductions. DuPont believes that making GHG reductions enhances its overall value through greater energy efficiency, innovation and preparedness. The company believes that the positive image it creates based on leadership and action on environmental issues will itself lead to increased market competitiveness.

5.2.2 Climate Change Targets

DuPont has contributed to various efforts to study the issue of climate change and believes that there is a need for prudent action to address it. In fact, DuPont committed to the reduction of GHG emissions as far back as 1991.

During the 1990s, the company reduced carbon equivalent from operations by approximately 50% globally. In addition to these significant reductions in the 1990's, the company set ambitious goals for the current decade. DuPont intends to meet what they refer to as a "goal of zero," meaning a goal of zero injuries, illnesses, incidents, wastes and emissions. More specifically, in order to achieve its carbon reduction goals by 2010, DuPont intends to:

- Hold energy use flat using a 1990 baseline;
- Achieve a 65% reduction in CO₂-equivalent greenhouse gas emissions from global operations versus a 1990 base;
- Obtain 10 percent of energy from renewable resources by 2010 (at a cost competitive with fossil fuels); and
- Ensure that 25% of manufactured goods are produced from non-depletable feedstock.

The achievement of these goals can affect the bottom line. For example, a planned round of layoffs (the company intends to cut 3,500 jobs – or 6% of its workforce – by the end of 2004) due to a rise in costs associated with high natural gas prices demonstrates that DuPont has a huge financial stake in keeping energy use flat while the company continues to grow. To monitor progress toward its goals, the company's Vice President of Safety, Health and the Environment conducts reviews every two years with each business unit to compare that unit's progress with other business units within the company.

5.2.3 Specific Programs for Addressing Greenhouse Gas Emissions

DuPont has furthered its climate objectives through membership and activities in key groups and organizations. Until 2000, the company belonged to the now-disbanded Global Climate Coalition (GCC). Since 2000, however, DuPont has become more progressive in its outlook toward the reduction of carbon emissions. The following sections detail the groups that DuPont has joined.

5.2.3.1 Chicago Climate Exchange (CCX)

DuPont has engaged in emissions trading through the Chicago Climate Exchange (CCX). (Please refer to Appendix 1 for more information about CCX.)

Emissions trading is a financially attractive option for DuPont. In a hypothetical market for emissions credits, DuPont's GHG reductions as of 2000 had a potential market value of \$472 million per year (if one assumed that DuPont was awarded a tradable allocation amounting to 90% of its 1990 emissions, and that the average market price was \$10 per metric ton of CO₂). DuPont has already engaged in one major transaction -- selling some of its reductions to Entergy -- thereby reducing its own costs.

5.2.3.2 The Green Power Market Development Group (GPMDG)

DuPont also works with the Green Power Market Development Group. (For a more detailed description of this group, please refer to Appendix 1.) In September 2003 DuPont announced a deal to buy 97 megawatts (MW) of electricity from renewable energy sources through the

GPMDG. This purchase would bring the company's total to 112 MW from the beginning of the program two years ago. Other companies enrolled in the Green Power Development Group share DuPont's goal of obtaining 10% of their electricity from renewable energy sources. Charles O. Holiday Jr., DuPont Chairman, has expressed his confidence in GPMDG's utility by observing that "The group is beginning to make green power markets work for corporate buyers"⁷⁰.

5.2.3.3 The Pew Center: Business Environmental Leadership Council (BELC)

DuPont also belongs to the non-profit Pew Center for Climate Change's Business Environmental Leadership Council (BELC). (Again, please refer to section Appendix 1 for a more detailed description of BELC.) DuPont's climate change policies clearly demonstrate commitment to the Council's goals.

5.2.4 Achievements

Thus far, DuPont has displayed an impressive record of success toward its climate change goals:

- As of 2001, DuPont had exceeded its goal of a 65% reduction in greenhouse gas emissions nine years ahead of schedule. The reductions were done primarily through process change investments with low emissions technology designed at a new plant in Singapore to reduce nitrous oxide (NO_x) emissions;
- During the same time period, the company held energy use flat despite a 36% increase in production volume;
- Likewise, by 2002, energy efficiency measures led to 5 million metric tons of reduced carbon emissions. Energy efficiency gains were largely a result of product portfolio changes, cogeneration, yield improvements, capacity utilization, increases in the reliability of manufacturing processes, and conservation measures. Through these measures, DuPont avoided the consumption of the equivalent of 16.2 million barrels of oil in 2000 alone; and
- In Shanghai, environmental practices used during the construction of DuPont's Lycraa facility have since been adopted by Chinese authorities as a standard for further construction.

5.2.5 Economics of Cutting Emissions

As already noted, emissions trading promises to be a financially rewarding activity for DuPont. Profitability is insured within the company in the area of energy efficiency by a group called the Asset Productivity Team (APT). The APT is searching for emission reduction or energy efficiency projects whose internal rates of return (IRR) are high enough to warrant the investment. In 2002, seven DuPont business units submitted 16 major projects for review. Implementation of only the most efficient projects allows the company to achieve 80% of potential reductions for 20% of the cost of all of the proposed projects within the company.

⁷⁰ The Associated Press, "Some Companies Attracted to Green Power," *The New York Times*, September 13, 2003.

DuPont has set business-driven, internal goals for the current decade, which anticipate both market pressures and opportunities as economies respond to the long-term climate challenge. One key goal is the company's intention to send a market signal to producers of renewable energy that at least one major customer exists.

Like other major energy consumers, however, DuPont may soon feel the pressure to be more transparent about climate-associated risks with its shareholders. In April 2004, pension fund leaders from New York, Connecticut, Maine and other states called on companies to do a better job of reporting financial risks associated with climate change. International Paper and Alcoa (covered elsewhere in this report) have not mentioned climate change in their reports to shareholders regarding pension funds. In general, U.S. companies are required to report on conditions that pose financial hazards. According to the Coalition for Environmental Responsible Economies (CERES), mitigation costs associated with climate change-related weather events or the expenses resulting from compliance with greenhouse gas emissions reduction policies would qualify as reportable on corporate balance sheets.⁷¹

Furthermore as a cost-cutting measure, DuPont is trying to apply efficiency standards in its manufacturing complex to make up for costs associated with high gas prices. From a financial perspective, this is a "win-win" scenario for the company.⁷² Thus, DuPont's overall philosophy toward sustainability can be summed up with a quote from Paul Tebo, Vice President for Environment, Safety and Health. Tebo stated that "The adoption of sustainable growth as our central focus as we enter the 21st century is a critical step towards fundamental and lasting change across global DuPont."⁷³

5.2.6 Corporate View on Federal and State Policy Options

Consistent with the Kyoto Protocol's requirements, DuPont believes it is the government's responsibility to stimulate action to moderate greenhouse gas emissions and enable a gradual transition to a regulatory environment that is required for the long-term stabilization of greenhouse gases. Consequently, DuPont is committed to working with governments to help them fashion country-level strategies and programs, including interim steps that encourage and reward actions that advance these ends.⁷⁴ In the wake of the U.S. rejection of the Kyoto Protocol, DuPont will continue to work with the remaining participants in the UNFCCC international climate change processes to advance the causes of environmental sustainability and global economic vitality.

Reflecting this view on the national level, DuPont favors the concept of a renewable portfolio standard (RPS) and has implemented it as an internal corporate policy. The company currently obtains only 3% of its energy from renewable resources, still far short of its goal of 10% by 2010, and most of this comes from hydropower. DuPont is currently exploring landfill gas and direct thermal options to provide sufficient feedstock energy through cooperation with the GPMDG.

⁷¹ Arden Dale, "UPDATE: Pensions Ask SEC to Require Climate Risk Reports," The Wall Street Journal, April 15, 2004.

⁷² Interview with a DuPont Official, January 15, 2003.

⁷³ www.ecoscorporation.com/think/sustainbusiness/2000_hero_of_zero.htm

⁷⁴ www.dupont.com

While DuPont has favored voluntary measurers, the company's position on mandatory "cap and trade" climate change legislation is hard to discern. DuPont was unenthusiastic about the "McCain-Lieberman" bill, when it was first proposed in the U.S. Senate in 2003. The company later was cited in an article published in the Wall Street Journal that the legislation was going in the right direction, since it is market-based and the emissions caps are tailored to each industrial sector. Furthermore, if the United States begins living in a carbon-constrained environment, the company reasoned, the legislation would help force the development of new sustainable technologies. Thus, while DuPont expressed the view that the McCain-Lieberman measure was not likely to be passed into law, the company's leadership felt that it served as an extremely helpful marker in the ongoing climate change debate. Accordingly, seeking to get ahead of potential regulation, Dupont has retrofitted its manufacturing facilities with millions of dollars of cost-cutting technology and would like to see that its competitors are required to do the same.⁷⁵

5.2.7 Outlook

As noted in our description of the Climate VISION program, the overall goal of the Bush Administration is to reduce the intensity of annual greenhouse gas emissions per dollar of gross domestic product (GDP) by 18 percent by 2012, through a range of voluntary actions. However, DuPont is not counting on a continuation of the regulatory environment established by the Administration. As Tebo stated, "I think it is just a matter of time before tougher goals are set."⁷⁶

Thus, it is clear that DuPont expects a carbon-constrained future. In addition to saving energy through their own industrial processes, DuPont is producing goods, such as their Tyvek engineering polymers, that help customers conserve energy. The company is also performing research on new lighter weight materials for use in the manufacturing of fuel cells. Additionally, DuPont will introduce a new line of fuel cell scooters in Asia as a learning platform to develop better fuel cell technologies.

DuPont believes that a complete shift to the use of alternative energy is doable but also thinks that such a transition needs to be cost competitive to be sustainable. While the technologies and power sources are available for a clean energy future, the company also believes that sufficient public support for such technologies will be necessary to make the transition. Therefore, DuPont has identified increasing the country's renewable energy base as a major critical public sector need.

Overall, by 2025, Tebo predicts that DuPont will be providing products and services to a much greater percentage of the world while simultaneously leaving a much smaller environmental footprint; he suggests that the company will be well on its way toward a transition to completely renewable feedstocks and energy. According to Tebo, financial markets of the future will strongly reward those companies that have integrated all aspects of sustainable development into their business strategies and actions. He noted that, "I fully expect that we will no longer be

⁷⁵ Jeffery Ball and John Fialka, "Bush's Global Warming Plan Draws Heat From Business", *The Wall Street Journal*, February 11, 2003.

⁷⁶ www.ecoscorporation.com/think/sustainbusiness/2000_hero_of_zero.htm

talking about economic, environmental and societal values as being distinctly different. But see them as integral and interlocking aspects of every business process and activity.”⁷⁷

⁷⁷ www.ecoscorporation.com/think/sustainbusiness/2000_hero_of_zero.htm

6.0 THE ELECTRIC POWER INDUSTRY

6.1 Introduction

The power sector in the U.S. produces an estimated 40% of U.S. GHG emissions. Although utilities in the U.S. recognize the threat of climate change, many have taken comfort in the resolutely anti-regulatory stance of the Bush Administration on GHG emissions.⁷⁸ However, the emerging range of state, local, and shareholder activities which are pressuring utility companies to take steps to address their GHG emissions are indeed forcing these companies to implement a climate change strategy. The utilities surveyed in this section include a diverse mix of power companies: American Electric Power, which is heavily dependent on coal; Entergy, the second largest producer of nuclear energy in the U.S.; and the FPL which is increasingly reliant on renewables (especially wind) and nuclear. These utilities are all taking a variety of actions to respond to climate change.

These actions include:

- Performing a company-wide inventory of GHG emissions and identifying possible internal mitigation efforts;
- Setting GHG emission reduction goals and participating in voluntary programs to reduce these emissions;
- Committing to renewable energy and demand-side management programs; and
- Exploring domestic and international emissions trading.

Even while participating in voluntary programs at the state and local levels and while undertaking voluntary actions to report and reduce their carbon emissions, however, utilities acknowledge that a carbon-constrained future seems inevitable. By voluntarily committing to reduce emissions now, utilities are planning ahead for future national and international climate change policies.

Multiple and diverse regional, state and local climate programs could have significant implications for power companies. Given that electricity grids and markets are increasingly becoming regional, different state and regional GHG regulations could significantly hinder competition for those utilities doing business beyond a local service area. In addition, as noted in a recent *Public Utilities Fortnightly* article, “inconsistent state and regional policies related to emissions accounting and crediting systems could inhibit the development of cost-saving emissions trading markets.”⁷⁹

It seems clear, then, that from a utility’s perspective, continued uncertainty over when and how carbon regulations will be implemented by the government is not desirable. According to a September 2003 report by the Coalition for Environmentally Responsible Economies and the Investor Dialogue – “Electric Power, Investors, and Climate Change: A Call to Action” -- the most expensive regulatory approach for a majority of electric companies would be to reduce

⁷⁸ Danish, Kyle and Douglas W. Smith. “Climate Change: The Heat Is On,” *Public Utilities Fortnightly*, January 2004.

⁷⁹ *Ibid*

some pollutants (sulfur dioxide, nitrogen oxide and mercury) first -- and then face regulations to control CO₂ later.⁸⁰ **It may be more cost-effective if standards for all four emissions are established at the same time.**

Ultimately, utilities view climate change as a financial risk. Thus, efforts to address the issue are driven by both the necessity to mitigate this risk and the desire to take advantage of potential economic opportunities associated with climate change policies. This position has been shaped by shareholders' calls for utilities to report on the risks and opportunities associated with climate change mitigation strategies. The financial industry, therefore, plays a critical role in ensuring a lower-carbon power sector. For example, in its report titled "Power Switch: Impacts of Climate Policy on the Global Power Sector," the World Wildlife Fund (WWF) suggests that investors and financial institutions should develop more appropriate financing packages for renewable energy projects and technologies, as part of a strategy of switching their investments as a whole to a much lower carbon intensity portfolio.⁸¹

In the following sections, we first review measures that the electric power industry as a whole has taken to address climate change. Then, we provide case studies of how three specific power companies - AEP, Entergy and the FPL Group – address climate change. Each case study contains sections on each company's background, climate change targets, specific programs for addressing GHG emissions, achievements, view on federal and state climate change policy options, and economics of cutting GHG emissions. Finally, we briefly discuss what is likely to occur in the industry in the future.

6.2 Industry-Wide Climate Change Initiatives

Three voluntary industry-wide partnerships address climate change. (The three power companies examined in this report all participate -- or have participated -- in these partnerships.) **Climate Challenge** was launched in the early 1990s (and was terminated in 2000). Under this voluntary joint effort between DOE and the electric power industry, utilities committed to reduce, avoid, or sequester their GHG emissions through cost-effective activities identified in individual agreements with DOE.⁸² Additionally, a new public-private partnership initiative launched by the Bush Administration --the **Climate VISION** program -- includes all energy-intensive sectors in the U.S. (Please refer to Appendix 1 for a detailed description of this initiative). Finally, the **Power Partners program**, a joint DOE-Edison Electric Institute (EII) voluntary partnership to address climate change, succeeded the Climate Challenge initiative. All three of these initiatives -- and the commitments undertaken by the electric power industry as a participant in these partnerships -- are described in more detail in the following sections.

⁸⁰ The Coalition for Environmentally Responsible Economies (CERES) is a coalition of investors and environmental groups. CERES launched the Electric Sector/Investor Dialogue in 2002 with the objective of developing specific recommendations for government and private sector actions that could create the right financial signals for electric companies to take positive action on climate change.

⁸¹ http://www.panda.org/about_wwf/what_we_do/climate_change/news/news.cfm?uNewsID=9750

⁸² In addition, electric utility trade associations promote the program and develop industry-wide climate change mitigating initiatives. Under this program, each utility annually reports results to DOE's Energy Information Administration.

6.2.1 Climate Challenge

In this industry-wide initiative launched in 1994, power companies voluntarily agreed to promote actions to reduce, avoid or sequester GHG emissions by the year 2000. The power industry-government partnership, in which more than 650 electric companies have participated, managed to eliminate 237 millions tons of CO₂ in the year 2000 alone. In addition to programs undertaken by individual companies, Climate Challenge established 9 industry-wide initiatives which were primarily international in scope and focused on energy efficiency efforts. Some of these initiatives included:

- **The EnviroTech Investment Fund**, which invested in companies looking at emerging electric and renewable technologies;
- **International Utility Efficiency Partnerships, Inc (IUEP)**, which was launched to promote the development and implementation of international energy efficiency projects that will result in the reduction, mitigation or sequestration of CO₂;
- **UtiliTree Carbon Company/Utility Forest Carbon Management Program**, which committed to funding domestic and international reforestation projects;
- **EV America**, which promoted electric company-sponsored activities to introduce electric vehicles into the marketplace; and
- The **National Earth Comfort Program**, which was established to increase the annual sales of energy-efficient geothermal heat pumps.

As a pioneer in the use of voluntary climate change approaches that rely on flexible programs and a robust use of technology and good practices, the Climate Challenge Program managed to demonstrate the advantages of these efforts to reduce GHG emissions over mandatory targets and timetables.⁸³ As such, it served as a model for new voluntary approaches.

6.2.2 Climate VISION

The power sector participates in the Climate VISION program through the Electric Power Industry Climate Initiative (EPICI) and its Power Partners Program, which is described in section 6.2.3. EPICI consists of seven organizations: American Public Power Association (APPA), Edison Electric Institute (EEI), Electric Power Supply Association (EPSA), Large Public Power Council (LPPC), National Rural Electric Cooperative Association (NRECA), Nuclear Energy Institute (NEI) and the Tennessee Valley Authority (TVA). (The three utility companies surveyed in this report are members of EEI, and both Entergy and FPL are also members of NEI.)

In a January 2003 commitment letter to Secretary of Energy Spencer Abraham, EEI agreed to work with its EPICI counterparts and the government to **cut the power sector's carbon intensity by the equivalent of 3 to 5 % by 2010.**⁸⁴ The letter stated that a combination of power sector and demand-side actions will be necessary to achieve the aforementioned goal, including:

⁸³ Climate VISION Program. www.climatevision.gov

⁸⁴ EEI January 17, 2003 Letter of Commitment to Secretary Abraham. Climate VISION Program. www.climatevision.gov

- Individual company actions reflecting companies' particular circumstances (financial, operating and fuel mix);
- Government laws, regulations and policies favoring the full utilization or maintenance of nuclear and hydroelectric plant generating capacity;
- Adequate supplies and delivery infrastructure for natural gas;
- Economic incentives for renewables; and
- The full benefits of energy efficiency and demand-side management (DSM) projects.⁸⁵

NEI also submitted a letter to DOE outlining the nuclear energy industry's voluntary efforts in support of the Bush Administration's climate change strategy. In this December 2002 letter, NEI specifically stated that the nuclear energy industry could increase its capacity by the equivalent of 10,000 megawatts (MW) by 2012, which in turn would result in avoided emissions approximately equal to one-fifth of President Bush's 18% GHG intensity reduction goal. The industry stated that the following actions would help increase the production of nuclear electricity in the U.S.: power uprates; improved productivity of nuclear power sites; and plant restarts. This climate change strategy proposed by NEI would build upon the achievements of the industry during the 1990s. According to the industry, in 2000, improved performance at nuclear plants represented 23.3% of all carbon reductions and approximately 60% of the reductions reported by the U.S. power sector. Finally, the letter noted that beyond 2012, the ability of the nuclear energy industry to sustain the Bush Administration's commitment to reducing carbon intensity would depend on the construction of new plants.

6.2.3 Power Partners

Under this initiative, utilities undertake individual climate actions guided by the following principles: improved energy efficiency, increased investments in R&D, technological innovation, market-based initiatives, and cost-effective CO₂ emission reductions.⁸⁶ In addition, EEI member companies are participants in various industry-wide initiatives to reduce, avoid, and sequester GHGs:

- **PowerTree Carbon Company** - An initiative to implement forestry projects in the lower Mississippi River Valley. As much as 2 million metric tons of carbon dioxide (CO₂) are expected to be sequestered over the lifetime of the project;
- **Coal Combustion Products Partnership (C2P2)** - A project aimed at recycling coal combustion products (CCPs) for use as manufacturing materials (generating less GHGs as a result), rather than disposing them. CO₂ avoidances are projected at 16 million to 30 million tons per annum;
- **Harvesting the Wind** - A program that aims to accelerate the generation of electricity from wind sources by advancing wind turbine technology and more effectively integrating this renewable resource into the grid;

⁸⁵ EEI January 17, 2003 Letter of Commitment to Secretary Abraham. Climate VISION Program. www.climatevision.gov

⁸⁶ Power Partners Program. www.eei.org

- **Biomass for Electricity Generation** - A program to expand the use of biomass through the support of technology and to develop more efficient ways generate electricity from combining biomass and coal; and
- **International Power Partnerships (IPP)** - As part of these programs, power companies team up with U.S. and international investors to promote energy projects which reduce GHG emissions in other countries. It is expected that this program could achieve 1.8-18 million tons of carbon reductions or avoidances per year from 2002-2010.

EEI does not force companies to participate in their Power Partners initiative or set emission reductions. EEI spokesman Dan Reidinger explained, “Under Power Partners, there’s obviously greater flexibility, and it encourages companies to do what they can, recognizing that some can do more than others.”⁸⁷

The commitment letter also stressed that individual company activities will be the cornerstone in meeting the President’s goal. For example, **the Power Partners Resource Guide**, which includes numerous supply- and demand-side options for the power sector to address climate change, will guide individual companies regarding the options they might consider to reduce, avoid or sequester GHGs.⁸⁸ The companies’ actions will be of course supplemented by the industry initiatives headed by EEI and EPRI (the Electric Power Research Institute).

Finally, EEI’s commitment letter noted that EPICI planned to enter into a memorandum of understanding (MoU) with DOE by May 1, 2003. The MOU will outline the sector’s proposed implementation activities to curb GHG emissions intensity by 2012. Following the completion of this MoU, individual power companies would be able to sign agreements with DOE.

6.3 Case Study: AEP

6.3.1 Background

American Electric Power (AEP) is the largest generator of electricity in the United States and operates more than 80 generating stations in Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia, and West Virginia. The company manages more than 42,000 megawatts of generating capacity in the U.S. and abroad (the United Kingdom, Mexico, Australia, and the Pacific Region). In addition to generating, transmitting and distributing electricity, AEP manages an asset base which includes natural gas pipelines, gas storage fields, gas processing facilities, coal mines, barges, rail cars, transportation terminals, and more. AEP serves 5 million customers and has 20,000 employees in the U.S.

AEP is also the biggest consumer of coal in the U.S. (65% of its plants are coal-fired) and, consequently, the largest emitter of GHG emissions in the entire western hemisphere. However,

⁸⁷ Gugliotta, Guy and Eric Pianin. “Bush Plans On Global Warming Alter Little: Voluntary Programs Attract Few Firms.” *The Washington Post*, January 1, 2004.

⁸⁸ The Power Partners Resource Guide includes options such as: additional natural gas and clean coal technology generation; additional nuclear generation (through increased capacity utilization, uprating and plant restarts); additional renewables, energy efficiency and Demand Side Management (DSM) additional offset projects (e.g. tree planting and forest management, methane projects and international projects); and additional actions related to compliance with new air regulations. (Climate Vision and EEI Power Partners)

the company is also the leading diversified energy company in the U.S.: 25% of its plants run on natural gas, 7% are nuclear, and 3% primarily run on renewable sources such as hydro, wind, solar and biomass. AEP has significantly increased its use of natural gas and non-fossil fuels such as nuclear and renewables in the last few years. In 2002, for example, AEP became the second largest generator of wind power in the U.S.⁸⁹

AEP believes that enough is known about the potential environmental impacts of global warming for industry to take actions to address the issue today. The company advocates a global solution to the climate change problem, including GHG policies that are market-based and public and private efforts that develop and deploy low-to-zero emitting carbon technologies.

6.3.2 Climate Change Targets

A new report issued in April 2004 details that AEP and two other utilities - Southern Company and Tennessee Valley Authority - are responsible for 25% of the SO₂ emissions, 21% of the NO_x emissions, 18 % of the CO₂ emissions, and 24% of the mercury emissions from the electric power industry.⁹⁰ According to this report, AEP alone produced 217 million tons of carbon in 2002, which was 50% more than Southern Company, the second largest utility and polluter.

AEP committed to reduce its carbon emissions in 2003 when it became the first utility to become a founder and member of the **Chicago Climate Exchange**. AEP voluntarily agreed to cap its carbon dioxide emissions at the average of 1998-2001 levels and reduce or offset them by a cumulative 10 percent over the period 2003-2006 (an estimated 18 million tons of CO₂ emissions based on projected emission levels).⁹¹ Specifically, the company planned to reduce its emissions by 1% in 2003, 2% in 2004, 3% in 2005, and 4% in 2006, mainly by **using in-system reductions or carbon-equivalent offsets**.

At the March 2004 Carbon Finance Conference in Canada, AEP presented its **Greenhouse Gas Strategy**. Under this strategy, AEP is committed to implement short-term voluntary cost-effective actions to reduce GHGs and to invest in technologies (and the deployment of those technologies) in an effort to find long-term solutions to climate change. In the near-term, AEP supports advancements in generation efficiency, renewables (biomass and wind) and carbon sequestration. It also plans to explore the potential of low to zero carbon coal generation technologies, as well as CO₂ sequestration in geological formations as long-term solutions to climate change.

6.3.3 Specific Programs for Addressing Greenhouse Gas Emissions

AEP has participated in a number of voluntary initiatives to reduce, avoid, or sequester GHG emissions since the early 1990s. These actions include voluntary partnerships with DOE and the EPA, including the aforementioned Climate Challenge, Climate VISION and Power Partners Programs. The company is also a member of several domestic and international business and non-profit initiatives, and forums which focus on climate change solutions. In addition, AEP is a

⁸⁹ AEP Environmental Performance Report 2001-2002.

⁹⁰ "Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States – 2002." CERES, NRDC, PSEG. April 2004.

⁹¹ Pew Center on Global Climate Change. "AEP Summary." www.pewclimate.org

critical supporter of emissions trading, and believes that it could achieve its GHG emissions reductions cost-effectively. As already noted, AEP voluntarily participates in the first pilot carbon trading scheme set up in the U.S. (the CCX) and is a board member of the International Emissions Trading Association (IETA).⁹²

Although AEP has championed the use of voluntary initiatives to reduce GHG emissions, the company recognizes that a committed policy response will be required to effectively address climate change and provide greater certainty for business planning.⁹³ AEP lists the following principles as essential for the design of a successful climate change strategy:

- Comprehensiveness of emissions considered;
- Cost-effectiveness of instruments utilized, such as emissions trading and allowance banking;
- Realistic emission control objectives;
- Rigorous monitoring and verification of GHG emissions and reductions; and
- Technology development and deployment.

The following sections describe AEP's commitments and participation in various voluntary programs.

6.3.3.1 Climate Leaders

In November 2003, AEP joined Climate Leaders. (Please refer to Appendix 1 for a more detailed description of this program.) AEP announced that its commitment to reduce or offset its GHG emissions by **4% below an average 1998-2001 baseline by 2006** (under the CCX) would serve as its initial Climate Leaders target.

Through this commitment, AEP expects to reduce or offset approximately 16.5 million metric tons of greenhouse gas emissions (equal to a cumulative reduction of 10 percent over the four-year period 2003-2006). The company plans to develop a new emission control commitment for the post-2006 period with the support of EPA and CCX. Given AEP's recent transition into the program, AEP has not yet reported on the progress it has made toward meeting its goals.

AEP has developed a broad portfolio of actions to meet its carbon reduction target cost-effectively. These actions include: Power plant efficiency improvements and diversification of fuels; power generation, utilizing renewable sources such as wind and biomass; reforestation projects; off-system GHG reduction projects; and purchases of CO₂ through the CCX.⁹⁴

⁹² IETA is an independent, non-profit organization dedicated to the establishment of a functional international framework for trading GHG emission reductions. IETA is committed to the development of an active, global GHG market that is consistent across national boundaries and which involves all three flexibility mechanisms of the Kyoto Protocol (the Clean Development Mechanism, Joint Implementation and emissions trading). The organization is also committed to the creation of systems and instruments that will ensure effective business participation.

⁹³ AEP Position Paper on Climate Change. www.aep.com

⁹⁴ "AEP joins Climate Leaders program; sets initial GHG reduction goal of 4 percent by 2006." Nov 12, 2003. www.aep.com

Furthermore, as a Climate Leaders partner, AEP is also required to inventory its corporate GHG emissions and report them on annual basis to the EPA. To comply with these requirements, AEP will use the Climate Leaders GHG Inventory Guidance.

6.3.3.2 FutureGen & Geological Disposal of CO₂

In an effort to find long-term solutions to climate change, AEP supports the development of technologies that gasify coal to generate electricity and which sequester CO₂ in geological formations. To demonstrate the feasibility of coal gasification technologies, AEP joined an alliance of electric utilities and coal companies to support President Bush's \$1 billion **FutureGen** initiative. (That initiative seeks to create a near zero-emission power plant and hydrogen production facility with integrated carbon dioxide management.) In addition, AEP recently announced its plans to build the largest integrated gasification combined cycle (IGCC) plant to date, during the next five years.

AEP also hosts the nation's first major research project to prove the efficacy of geologic disposal of CO₂ emissions in its West Virginia Mountaineer coal plant.

6.3.3.3 Climate RESOLVE Initiative

As the leader of the Business Roundtable's Environment, Technology and the Economy Task Force, AEP has played a significant role in the launching of the Roundtable's **Climate RESOLVE** program. (Please refer to Appendix 1 for a description of Climate RESOLVE.) The principles behind Climate RESOLVE underlie AEP's philosophy – namely, support for voluntary actions over costly mandatory GHG regulations and for the development and deployment of clean energy and technologies to address climate change, without undermining the economy. In the December 2003 unveiling of the Initiative, AEP CEO Linn Draper stated that the "BRT's Climate RESOLVE initiative will show that voluntary actions can deliver solid results without government mandates and rigid compliance timetables."⁹⁵

As a Climate RESOLVE partner, AEP participates in GHG management workshops and learning sessions, and uses tools provided by the BRT (such as a Climate RESOLVE implementation workbook.)

6.3.3.4 Pew Business Environmental Leadership Council

AEP is also a founding member of Pew's **Business Environmental Leadership Council (BELC)**. AEP views the BELC as a vehicle to further address climate change concerns in a voluntary, proactive and cost-effective manner. Specifically, as illustrated by Dale Heydlauff, AEP's former Senior Vice-President for Government and Environmental Affairs, at the May 1998 launching of the BELC, this Pew group provides an opportunity for AEP to promote the use of market-based policy instruments and the inclusion of developing countries in a global

⁹⁵ "The Business Roundtable Announces Its Resolve To Voluntarily Control Greenhouse Gas Emissions." December 12, 2003. www.brtable.org

response to climate change.

6.3.3.5 International Efforts -- e7

AEP is also a member of e7, a group of leading international electricity companies which is working together to promote sustainable energy development through non-profit human capacity-building activities and capital projects.⁹⁶ The e7 implements concrete, sustainable energy projects (which offer the potential to reduce GHG emissions) in developing countries. As the U.S. representative in this initiative, AEP has served as the project leader in two initiatives: 1) A potential Clean Development Mechanism (CDM) wind generation project in San Cristobal Island, Galapagos, Ecuador and a 2) Micro-Solar Distance Learning Program in Bhutan and the Galapagos Islands.

The renewable energy project will provide affordable clean electricity to the residents of San Cristobal Island, while reducing the risks of oil spills associated with the delivery of fuel to the island. In addition, it will reduce greenhouse gases and other emissions associated with the burning of fossil fuels. Any certified emission reductions obtained from this project would be shared equally by e7 and the government of Ecuador.

In an effort to promote the Clean Development Mechanism, the e7 has published a guide to assist parties in developing projects under the CDM.

6.3.3.6 Emissions Trading

As already noted, AEP is a founding member of (and the only U.S. power company participating in) the Chicago Climate Exchange. It is also the largest single participant in the exchange. AEP was inspired to participate in the CCX by the success of the U.S. sulfur dioxide allowance trading scheme. According to Bruce Braine, Vice President of Strategy and Policy Analysis at AEP, the CCX serves as a vehicle for AEP to participate in the Bush administration's voluntary climate change program and to demonstrate the viability and cost-effectiveness of a multi-sector GHG trading program. AEP hopes that the lessons learned from this pilot project will inform the policy debate on climate change and positively influence the design of GHG regulations at the international, federal and state levels.⁹⁷ Various factors have influenced AEP's decision to participate in this mechanism:

- **AEP's voluntary GHG commitment.** AEP plans to use direct purchases of carbon emission reductions from other member companies to meet part of its commitment;
- **Low cost "insurance" and early mover advantages.** AEP views voluntary trading as an insurance policy, since under a mandatory system it would be at an institutional and economic advantage for taking early action;
- **Credit for early action.** This would ensure that AEP is not penalized under any future domestic control program; and

⁹⁶ Pew Center on Global Climate Change. www.pewclimate.org

⁹⁷ 2002 Greenhouse Gas Emissions Questionnaire. Carbon Disclosure Project. www.cdproject.net

- **Public policy precedents** (e.g. multi-sector, multiple GHG, and banking). These features provide opportunities for AEP to achieve its CO₂ reductions very cost-effectively.⁹⁸

Trading activities in CCX were officially launched in December 2003. AEP began trading in February 2004.

6.3.4 Achievements

As a participant in the **Climate Challenge** initiative, AEP managed to reduce, avoid or sequester 23.2 million tons of carbon emissions during the 1991-2002 period. The company did so by utilizing a mix of:

- Efficiency improvements in generation, transmission and distribution;
- Hydroelectric, solar, and wind generation;
- Demand side management (DSM) programs;
- Forest sequestration projects; and
- Ash utilization efforts.

Furthermore, during 2002, AEP reduced, avoided or sequestered 8.8 million tons of CO₂, which is greater than any previous year of the program.⁹⁹ Under the auspices of this program, AEP specifically pursued the following actions:

- Planted 21.8 million trees in 5 years¹⁰⁰;
- Improved generating and energy delivery efficiency;
- Increased its nuclear generation capacity; and
- Implemented energy conservation programs at its facilities and for its customers.

According to Diane Fitzgerald, Vice President of Government and Environmental Affairs at AEP, the company is also confident that it will meet its 2003 1% GHG emissions reduction goal (the commitment which is pledged under both the CCX and the Climate Leaders Program). Responding to an April 2004 questionnaire on behalf of AEP, Ms. Fitzgerald also noted that AEP's 2003 emissions are currently being audited by an outside entity. The performance results will be posted on the company's website after they have been validated.

6.3.4.1 Renewables

In the last few years, AEP has committed to increase its use of renewables in generating electricity. According to their GHG Strategy, AEP advocates a **Permanent Production Tax Credit (PTC)** for all renewables and the integration of renewables into state energy plans. Within renewables, AEP is primarily interested in wind. Specifically, the company has been exploring wind energy opportunities since 1995, when it completed its Fort Davis Wind Project (the first wind farm in Texas which utilized utility-scale wind turbines.) AEP currently owns

⁹⁸ Braine, Bruce. "Thoughts on GHG Trading and Allocation." AEP Presentation for GHG Workshop at International Energy Agency. September 24, 2003.

⁹⁹ AEP Environmental Performance Report 2001-2002. www.aep.com

¹⁰⁰ *Ibid*

two major wind farms-- Desert Sky and Trent Mesa in Texas--with a total wind generation of 310 MW. (This generation makes AEP the second largest wind generator in the U.S.) The company also owns 18 hydropower facilities and co-fires coal with biomass materials to lower emissions at some of its power plants.

6.3.4.2 Carbon Sequestration

For AEP and other utilities, the most obvious way to cut CO₂ emissions is to shift from coal-fired plants to natural gas, but the fact that natural gas is more expensive than coal, (particularly today in the midst of a natural gas crisis) makes such a transition less attractive. Consequently, in its search for “least-cost” solutions, AEP (and many other utilities) have focused their efforts on **carbon sequestration**. AEP has invested more than \$25 million to enhance carbon sinks such as forests and soils, and to develop technologies to capture CO₂ emissions and sequester carbon.

PowerTree Carbon Company

AEP is a founder of (and a participant in) the Power Partner’s **PowerTree Carbon Company**, a voluntary initiative launched in 2003. The partnership consists of 25 companies, which will invest \$3.4 million in reforestation projects in Arkansas, Mississippi, and Louisiana. These 3 southern states were chosen largely because of the relative abundance of inexpensive land, most of which has been previously farmed. In addition, the Agriculture Department announced it will give preference in approving forest replanting projects to initiatives in the Mississippi River Delta and will permit landowners to profit from selling carbon rights new trees generate in that region.¹⁰¹ AEP noted, however, that it is unclear whether the government would actually count these carbon rights as viable, tradable carbon credits if it were to impose a mandatory cap on carbon emissions. It is expected that the project will sequester 2 million tons of CO₂ over its 100-year term, a very modest level given the amounts of CO₂ these utilities produce.

Carbon Offsets from International Projects

AEP participates in various international climate action projects that attempt to sequester carbon in rainforests, and at the same time preserve the ecosystems of those areas and promote the sustainable development of the local populations. The CO₂ emissions avoided through these initiatives and credited to AEP are used by the company to offset its carbon releases in the U.S.

In 1997, for example, AEP joined the government of Bolivia, PacifiCorp, BP Amoco, Friends of Nature Foundation (FAN), and The Nature Conservancy, in the implementation of the **Noel Kempff Mercado Climate Action Project**—the largest forest based carbon project in the world. This \$11 million project aims to protect nearly four million acres of threatened tropical forests in Santa Cruz, Bolivia for a period of 30 years. The project’s carbon sequestration and storage capabilities have the potential of achieving a reduction of 7-10 million tons of carbon over the duration of the initiative. AEP, which is supporting activities to sequester carbon, protect the park from logging threats, protect the land’s biodiversity, and help the local villages develop sustainable economies, will receive (along with BP Amoco and PacifiCorp) **49% of the total**

¹⁰¹ “Despite Unclear Guidelines, Utilities Pursuing Climate Sinks.” *Greenwire*. December 10, 2003.

carbon offset credits attained by this project. In addition, as the lead investor, AEP will receive 2% more of the total offsets as a bonus.

AEP has also developed a Climate Action project in Brazil, which will sequester 1 million metric tons of carbon over 40 years.

6.3.5 Corporate View on Federal and State Policy Options

6.3.5.1 Federal Perspective

Although AEP supported the U.S. government's decision to reject Kyoto and advocates the use of voluntary measures to address climate change, it also believes that the U.S. will eventually be subject to a mandatory GHG reduction program. According to Diane Fitzgerald, Vice President of Government and Environmental Affairs at AEP, **"it is imperative that any mandatory program be fully flexible, take advantage of market mechanisms such as emissions trading, and have reasonable targets and timetables."**¹⁰² In addition, Ms. Fitzgerald noted that AEP believes all industry sectors should be included in a GHG mandatory program, and that energy efficiency should be a key component. AEP also holds that if the U.S. were to implement this type of initiative, it should do so in concert with a global GHG reduction strategy that includes countries which are currently non-Kyoto parties, but which are major carbon emitters (and trading partners with the U.S.) (countries such as China, Mexico, South Korea, Brazil and India).¹⁰³

AEP also believes that the U.S. government should provide public policy incentives for power companies to curb their production of GHG emissions, such as extending tax credits for renewable energy, streamlining hydroelectric and nuclear power plant permitting, and providing certainty about future environmental requirements.¹⁰⁴

6.3.5.2 State Perspective

AEP views the proposals developed by some states in the Northeast which require power plants to reduce their GHG emissions as "impractical," yet indicative of the pressure mounting in the United States to do more to cut GHGs. According to Susan Tomasky, financial officer at AEP, "the difficulty is where the emissions are and where the regulatory push is."¹⁰⁵ Most coal-fired plants are located in the Midwest where regulators generally oppose caps on CO₂ emissions and "don't want anything to do with Kyoto." According to Dale Heydlauff, AEP's former Senior Vice-President for Government and Environmental Affairs, none of the states that AEP serves (virtually all of which are fossil fuel producers) are inclined to mandate CO₂ emission reductions independent from an international or national program controlling greenhouse gas emissions. Not surprisingly, AEP is not subject to any state regulations on GHG emissions.

AEP does not support the patchwork of state and regional GHG regulations that is currently developing in the U.S. since it believes that the problem must be dealt with on a

¹⁰² Email Interview with Diane Fitzgerald, May 26, 2004. (Diane Fitzgerald responded on behalf of AEP).

¹⁰³ *Ibid.*

¹⁰⁴ *Ibid.*

¹⁰⁵ "U.S. likely to limit carbon emissions – AEP." February 16, 2004. Reuters News Service.

global scale. Mr. Heydlauff claims that “to be effective, any policy response to climate change must allow time for new technologies to be developed that are much more efficient and less carbon intensive than the existing technologies that power the economies of the world, and then ensure that these technologies are deployed globally.”¹⁰⁶ In addition, AEP believes that the states setting climate change regulations on an individual basis have positioned themselves at an economic disadvantage without providing any measurable environmental benefit.

6.3.6 Economics of Cutting Emissions

The aforementioned WWF-commissioned report -- “Power Switch: Impacts of Climate Policy on the Power Sector” -- concluded that AEP and other major international electric utilities “are facing a major financial threat and could face costs equivalent to over 10 percent of 2002 earnings if they fail to take steps to prepare for upcoming global warming regulation.”¹⁰⁷ The major findings of this report include:

- The general effect of policies, which vary from region to region, will be to force utilities to internalize the costs of curbing their carbon emissions;
- Climate change mitigation costs could be lower and even turned into profit for those firms which have shifted to the use of cleaner energy sources such as natural gas and renewables and implemented plans that maximize efficiency at their power plants, or plan to do so; and
- Cost-effectiveness can be ensured in the reduction of **large** quantities of CO₂ if firms take **early action** to plan a switch to cleaner fuels and increased efficiency. Delays in the implementation of such measures will only cost power companies more.

AEP would be the most affected utility in the United States by climate change regulations, and the report notes that the company could face additional costs equal to 5% of its 2002 earnings under certain scenarios.¹⁰⁸ However, the report also shows that AEP could save up to \$58 million annually from switching to cleaner energy sources. As one of the most coal-intensive companies, AEP also has the most to gain from maximizing the grandfathering of CO₂ emissions rights.¹⁰⁹

The findings of this report suggest that firms with **proactive and well thought-out carbon management strategies** will be the most likely winners in the new operating environment. This report then should serve as a “wake-up call” for these companies’ investors and shareholders to engage with utilities at the earliest opportunity to ensure the implementation of low-carbon investment strategies. In the case of AEP, this report will merely re-affirm the position taken by its shareholders back in early 2003.

¹⁰⁶ Truini, Joe. “Q&A with Dale Heydlauff.” *Waste News*. June 23, 2003.

¹⁰⁷ “Global Warming-Related Risk: Next Big Hurdle for Electricity Companies; Smart Planning Can Make CO₂ Emissions Reductions Cost-Effective, Says WWF.” *Business Wire*. Nov. 11, 2003.

¹⁰⁸ *Ibid*

¹⁰⁹ Grandfathering refers to the initial allocation of emission reduction permits (free of charge) based on current levels of pollution. Market trading begins only after this initial allocation. The fossil fuel industry prefers grandfathering over a system of auctioning.

In 2003, shareholder groups filed global warming resolutions for greater transparency on how AEP is planning for potential regulations on CO₂ and other emissions.¹¹⁰ The proposals specifically asked AEP to report on:

- The economic risks associated with the company's past, present, and future emissions of carbon dioxide, sulfur dioxide, nitrogen oxide and mercury emissions, and the public stance of the company regarding efforts to reduce these emissions; and
- The economic benefits of committing to a substantial reduction of those emissions related to its current business activities (i.e. potential improvement in competitiveness and profitability).

After AEP's management initially declined to respond to these resolutions, the company finally agreed to comply with these shareholders proposals in February 2004. AEP views this decision as consistent with the efforts the company has undertaken to make environmental improvements while keeping its power plants competitive.

On August 31, 2004, AEP released a report addressing the 2003 shareholder demands. This report specifically assesses the impacts of and potential responses to various policy scenarios, including President Bush's Clear Skies Initiative, the McCain-Lieberman cap and trade legislation, the multi-pollutant bill sponsored by Senator Tom Carper (D-Delaware), and existing state legislation to limit CO₂ and other emissions. The report indicates that such legislation would probably not strand AEP's planned investments of \$3.5 billion in emission control technologies by 2010, which is part of an overall \$5 billion planned investment by the year 2020. However, the report does note that this proposed legislation could materially alter the amount and manner of the anticipated \$1.5 billion in additional investments after 2010.

6.4 Case Study: Entergy

6.4.1 Background

Entergy Corporation is the fifth largest power generating company in the U.S., and operates over 30 power plants totaling more than 30,000 megawatts of electric generation. It is also the second largest nuclear generator in the U.S with 10 units; these nuclear plants produce approximately half of the company's electricity. In addition to electric power production, Entergy is engaged in distribution operations and gas transportation. The company serves approximately 2.6 million customers in Arkansas, Louisiana, Mississippi and Texas. With the exception of 5 of its nuclear plants (which are located in Massachusetts, New York and Vermont), all of Entergy's operating units are spread across those four southern states. Headquartered in New Orleans, this utility has more than 14,000 employees and generates over \$9 billion in annual revenues.

Entergy claims that it has a moral obligation to current and future generations to responsibly manage the risks and costs of climate change. Given its size, Entergy recognizes the leadership role that a company of its stature and resources has in taking early action to limit GHG emissions

¹¹⁰ The Interfaith Center on Corporate Responsibility (ICCR) is a coalition of 275 religious institutional investors.

and reduce the risks of climate change. Perhaps most significantly from its perspective, however, **Entergy believes that it can commit to addressing climate change while remaining competitive and profitable.**

Entergy owns one of the cleanest generating fleets in the U.S., with approximately 78% of its power coming from nuclear and natural gas generation, and only 18% from coal-firing plants. Entergy is committed to making its fleet even cleaner, primarily by strengthening its nuclear capacity. Don Hintz, Entergy Corporation's former President, claims that: "Nuclear energy is crucial to maintaining the nation's quality of life along with its energy independence, and vital efforts to reduce global warming."¹¹¹

6.4.2 Climate Change Targets

During the 1990s, Entergy's total production of CO₂ continued to rise despite the reductions successfully achieved during this decade. The growth in electricity demand throughout this period was the principal factor responsible for this increase in GHGs. In 2001, recognizing that there would be a need to address the challenge of accommodating future electricity growth while simultaneously beginning to slow the corresponding growth in emissions, Entergy launched its new **Five-Year Environmental Strategy and Plan**. Under this strategy, Entergy committed to:

- Stabilize its CO₂ emissions from its power plants at 2000 levels (which corresponded to 53.4 million tons of CO₂ in reductions) through 2005, becoming the first power company to set a target of this kind;
- Adopt a subsequent future target by the end of 2004;
- Establish a \$25 million Environmental Initiatives Fund (EIF) to be utilized for both internal *and* external GHG emission reductions in support of its target;
- Establish a new Executive Environmental Forum comprised of senior managers which would manage this fund and the target achievement program;
- Employ an independent third party-organization for verification of its CO₂ emissions reductions; and
- Work in cooperation with organizations such as **Environmental Defense**, the **Partnership for Climate Action**, and the **Pew Center on Global Climate Change** to implement the company's new climate change program.

Entergy has also developed a strategy to achieve its reduction target. With the assistance of Environmental Defense, Entergy plans to meet 80% of its reduction commitment through internal efficiency upgrades and performance improvements, and the remaining 20% of its commitment through external cost-effective opportunities that reduce carbon emissions or sequester carbon. In addition, Entergy has incorporated innovative market mechanisms such as emissions trading into this strategy as a way of further achieving its reductions in a cost-effective manner.

¹¹¹ "Entergy's President Recommends Increasing the Nation's Use of Nuclear Power." *Foster Electric Report*, March 3, 2004.

6.4.3 Specific Programs for Addressing Greenhouse Gas Emissions

6.4.3.1 Climate Challenge Program

As a participant in the Climate Challenge Program, Entergy committed in 1995 to a 27 million ton GHG reduction goal. Entergy has participated in this program's **Utility Forest Carbon Management Program**. (In 1999, the company had invested more than \$100,000 in this forestry program.) In addition, Entergy committed to building up its nuclear capacity as a way of reducing its CO₂ emissions. Through nuclear improvements in its existing power plants, Entergy estimated in 1996 that it would be able to achieve CO₂ reductions of more than 9.5 and 2.4 million tons respectively through the year 2000. It also committed to fossil station efficiency upgrades, renewable generation, energy efficiency services, and carbon sequestration.

6.4.3.2 Partnership for Climate Action (PCA)

In 2001, following the Bush Administration's rejection of the Kyoto Protocol and guided by the idea that many corporate leaders fear that U.S. isolation on global warming could hurt their competitiveness, Environmental Defense (ED) mobilized the business community in an effort to address the risks and opportunities associated with global warming.¹¹² Specifically, under ED's leadership, Entergy teamed up with Alcan, BP, DuPont, Ontario Power Generation, Pechiney, Shell International and Suncor Energy to launch the **Partnership for Climate Action (PCA)**. In addition to committing to goals for reductions of their GHG emissions and plans to achieve these targets, companies in the Partnership pledge to share information gained from their own experiences or developed through joint experimentation. It is also important to note that **PCA's participants view market mechanisms, in particular the ones evolving under the Kyoto Protocol (i.e. Joint Implementation, Clean Development Mechanism, and international emissions trading), as potentially the most cost-effective responses to climate change.**

As a participant in this initiative, Entergy committed to:

- Publicly announcing a global GHG emissions reductions goal and its plans to achieve such a target;
- Measuring, monitoring and reporting its carbon emissions;
- Employing innovative strategies to work with other members of the PCA, customers, and suppliers to maximize opportunities to reduce GHG emissions through demonstrations, products and services; and
- Leading by example, positive engagement, collaboration, public communication and sharing of experience-based knowledge and effective technologies.

PCA members will reduce their GHG emissions by using an integrated approach that includes direct action, market mechanisms, offset projects, and sequestration.¹¹³ **Cumulatively, they have pledged to eliminate 80 million tons of CO₂ by 2010.**

¹¹² Environmental Defense is a national advocacy group that links science, economics and law to create innovative, equitable and cost-effective solutions to society's most urgent environmental problems, including climate change.

¹¹³ Partnership for Climate Action. www.pca-online.org

6.4.3.3 Environmental Initiatives Fund

In 2001, Entergy established an **Environmental Initiatives Fund** (EIF) with the support of Environmental Defense. The EIF was set up to provide incentives for internal and external reduction projects designed to help the company meet its CO₂ target. The EIF provides up to \$5 million per year for potential internal and external GHG reduction projects. With the support of ED, Entergy also implemented a process for nominating, reviewing and approving CO₂ emission reduction projects to be funded by EIF. In addition, a set of policy guidelines and project selection criteria were established. Once identified, these potential projects are reviewed by an EIF Coordinating Committee, which then makes recommendations to an Executive Environmental Forum. **As of December 2003 Entergy had completed or initiated 44 internal emission-reducing projects and 12 external offset projects. The company expects that these projects will result in more than 1.2 million and 650,000 tons of CO₂ equivalent reductions respectively by 2005.** ED will also certify the GHG reductions achieved by these projects.

Internal Initiatives

Most of the authorized internal projects focus on energy efficiency improvements, which enable power plants to use less fossil fuel in generating electricity. Project types include:

- Power plant upgrades;
- Establishment of small hydro turbines and renewable energy use to generate lower-carbon content electricity;
- Replacement of equipment containing SF₆, a potent GHG; and
- Plant-site reforestation for future carbon sequestration benefits.

These projects are dedicated to improving the efficiency and capacity factor of Entergy's cleanest and lowest emitting fossil, nuclear, and renewable electric generating units.

External Initiatives

External GHG emissions reductions projects throughout the U.S. and internationally can help Entergy offset some of its GHG emissions and increase the cuts the company is able to achieve within its own system. To date, Entergy has initiated or completed 12 external projects in the following categories:

- Coal mine methane to energy;
- Agricultural carbon sequestration;
- Landfill gas to energy;
- Forest sequestration; and
- International CO₂ trades.

Entergy has partnered with other organizations to carry out some of these projects. For example, Entergy has initiated a carbon sequestration project with the **Pacific Northwest Direct Seed Association (PNDSA)**. This project will produce 30,000 tons of CO₂ offset credits, corresponding to GHG reductions that will be generated by the direct seed agricultural methods

farmers will use in this area for at least ten years. This project also helps Entergy fulfill its commitments under the PCA.

The company has also partnered with **Winrock International** and the **Central Resource Conservation Council** to acquire 5000 acres of marginal cropland for reforestation. The project is expected to sequester more than 200,000 tons of carbon within 80 years.

In terms of supporting the development of technology for CO₂ capture and storage, Entergy became the first utility to purchase carbon emission credits from geological sequestration projects. (These projects capture carbon and place them into oil-bearing geological formations, which in turn result in enhanced oil recovery.) In 2004, Entergy has already purchased 100,000 tons of CO₂ emission reduction credits.

Entergy has also funded a **coal mine methane initiative** which is expected to provide 400,000 metric tons of CO₂ reductions by the end of 2005. Specifically, Entergy plans to collect coal mine methane from abandoned mines and utilize it as a fuel to generate electricity or convert it to pipeline-quality gas.

6.4.3.4 Business Environmental Leadership Council

Entergy is also a member of **Pew's Business Environmental Leadership Council**. (Please refer to Appendix 1 for a description of the BELC.) Their membership in this organization clearly demonstrates Entergy's commitment to the Pew Center's founding principles.

6.4.3.5 Emissions Trading

Emissions trading is seen as an important component of Entergy's plan to reduce its GHG emissions cost-effectively. Entergy further believes that its early activities in emissions trading will be important in implementing an efficient and credible trading program in the future.¹¹⁴

In 2002, Entergy agreed to move forward with a demonstration GHG emissions trade with fellow PCA partner, **DuPont**. The trade was seen as an opportunity to:

- Take advantage of the surplus carbon reductions achieved by DuPont to meet its 1990 target in order to assist Entergy in accomplishing its 2000 stabilization goal; and
- Explore certain GHG emissions trading-related issues of interest to PCA and its members (issues such as the quantification and verification of reductions, GHG targets and baseline inconsistencies between the trading parties).

Through this pilot project, Entergy obtained from DuPont a total of 125,000 tons of 2001 vintage CO₂-equivalent Verified Emissions Reductions (VERs) achieved at a DuPont facility in Texas. In addition, Entergy and DuPont demonstrated that trades in emission reduction credits have a quantifiable business value and can be used to address climate change in an effective manner.

¹¹⁴ Carbon Disclosure Project- GHG Emissions Questionnaire, Nov. 30, 2002

Entergy has also engaged in international emissions trading. For example, Entergy has worked with the largest Danish electricity supplier, Elsam, to conduct the first international trade in CO₂ allowances under the Danish climate change program. Denmark and the United Kingdom are the only European countries which have established formal GHG trading programs to date. Entergy purchased 10,000 Danish CO₂ allowances which it will use to eliminate 10,000 tons of CO₂ emissions before 2005.¹¹⁵

In an effort to bolster its 2-year old environmental program, Entergy also agreed to purchase GHG-emission credits equal to 100,000 tons of carbon from Blue Source LLC (Blue Source LLC has an existing inventory of GHG emission reduction credits worth more than 200 million tons of carbon that will become available in 2012.)¹¹⁶

6.4.3.6 Emission Reductions Reporting & Verification: CH2M Hill & Environmental Resources Trust (ERT)

Entergy uses Continuous Emission Monitoring (CEM) data where available and estimates the carbon content of the fuels burned where CEMs are not installed to quantify its carbon emissions. The company treats emissions from external offset projects on a case by case basis. Entergy employs **CH2M Hill** for third party verification of its GHG emissions. Entergy also plans to work with the **Environmental Resources Trust (ERT)** to register its emissions data and to account for its in-house carbon emissions reductions and offsets. (ERT is a non-profit organization that pioneers the use of market forces to protect and improve the global environment.) These validated GHG emission reductions will be recorded in ERT's GHG Registry; the Registry provides:

- Transparent recordation and tracking of qualified emissions reductions;
- Credible third-party review, and quality assurance, of reductions recorded in the GHG Registry;
- Establishment of a long-term pedigree of the reductions claimed for early action and other public programs; and
- A credible mechanism for the retirement of GHG emissions reductions.¹¹⁷

Entergy also voluntarily reports its GHG emissions and emissions reductions to DOE's Registry of Greenhouse Gas Emissions and Emission Reductions.¹¹⁸

6.4.4 Achievements

During the 1990s, Entergy exceeded its goal of reducing its CO₂ emissions by 27 million tons by 10%, achieving one of the lowest CO₂ intensity rates compared with other electric companies. However, as noted earlier, its total production of carbon increased during this same period. Since 2001, Entergy has managed to reduce its CO₂ emissions by 18%: CO₂ emissions decreased

¹¹⁵ "Even without Kyoto, GHG trading in the US is set to soar." *Platts Energy & Technology Magazine*, April 2003.

¹¹⁶ "Utility Entergy Turn to Salt Lake City-Based Firm to Reduce Emissions," *The Salt Lake Tribune*, December 2003

¹¹⁷ GHG Registry Program www.ert.net

¹¹⁸ U.S. DOE, Office of Policy and International Affairs. www.pi.energy.gov/enhancingGHGregistry/index.html

from 53.2 million tons in 2000 to 49.5 million tons in 2001, to 44.2 million tons in 2002 and to 36.8 million tons in 2003. The company has managed to beat its GHG emissions reduction goal each year through a mix of internal and external GHG reduction projects in the areas of carbon sequestration, renewable energy development, energy efficiency, and others.¹¹⁹

Entergy has been committed to using natural, renewable energy sources for many years. Entergy owns and operate hydroelectric facilities in Arkansas and Louisiana as well as a facility in Texas that they operate but do not own. Entergy also owns and operates an 80 megawatts wind farm in Worth County, Iowa. Additionally, Entergy funded a project in Ohio and West Virginia that will collect coal mine methane vented from abandoned mines and convert it into either pipeline-quality natural gas or fuel to use in electricity generation.

Entergy was also named to the Dow Jones Sustainability Index (DJSI) for the second year in a row in September 2003. The company is one of only three U.S. electric utilities listed on this index. Companies listed under the DJSI must demonstrate both strong financial performance and outstanding leadership in environmental and social commitment. Entergy scored highest overall in the areas of environmental reporting and climate strategy. A September 2003 Entergy press release contended that, “Entergy’s commitments to addressing global warming, its investment in generation technologies, and its low income customer assistance initiatives all played significant roles in meeting the stringent criteria to be listed on this index.”¹²⁰

6.4.5 Economics of Cutting Emissions

Entergy recognizes that climate change presents both risks and opportunities. However, the company generally believes that it is very well positioned to both manage the risks and take advantage of the business opportunities that could result from assuming a proactive stance on the issue. Entergy’s responses to a 2002 Carbon Disclosure Project GHG Emissions Questionnaire signify that three factors determine this philosophy:

- Entergy’s leadership on climate change;
- Its investments in clean fuel assets such as nuclear and natural gas; and
- The strategic environmental initiatives the company has undertaken.

Entergy also recognizes that there might be a long-term business opportunity in generating electricity from low and non-emitting sources, since this can be an effective method for customers to reduce their direct GHG emissions.

6.4.6 Corporate View on Federal and State Policy Options

Entergy was one of the first energy companies to acknowledge the seeming inevitability of mandatory carbon caps. Thus, the company works for and supports federal multipollutant legislation to reduce air pollutant emissions, including emissions of CO₂.

¹¹⁹ “2003 Environmental, Social and Economic Performance.” Entergy Sustainability Report. This report can be found at: http://www.entergy.com/content/corp/environment/Entergy%20Sustainability_03.pdf

¹²⁰ “Entergy Names to Dow Jones Sustainability Index for the Second Year Running.” September 15, 2004. www.entergy.com

6.4.6.1 Federal Policies: Clear Skies Initiative and the Carper Legislation

Most power companies claim that Senator Tom Carper's (D-Delaware) multi-pollutant proposal, which would reduce emissions, including CO₂, to 2001 levels by 2013, could be 50% more costly than the Clear Skies Initiative to industry and consumers.¹²¹ However, Entergy's support for the Carper bill and opposition to Clear Skies are rooted in the company's commitment to address the problem of climate change *and* in the opportunities that a mandatory system may present for the company to strengthen its position in an increasingly competitive market.

The company is also involved in efforts addressing a multi-pollutant legislative proposal for the utilities industry. Entergy, along with other Clean Energy Group (CEG)¹²² members, has developed a legislative proposal that supports a hybrid approach for addressing future air regulatory challenges, including technology-forcing requirements and air quality-based emission reduction targets.¹²³ Under this proposed multi-pollutant legislation, affected plants would be mandated to operate under a cap-and-trade scheme for NO_x, SO₂, mercury and CO₂. In addition, this act would provide flexibility under the EPA's New Source Review (NSR) Program.

6.4.6.2 State Policies

Entergy operates plants in Arkansas, Louisiana, Mississippi, Texas, Massachusetts, New York and Vermont. In New York and Massachusetts, its nuclear units may be affected by the state-sponsored Regional Greenhouse Gas Initiative (RGGI). RGGI seeks to develop by April 2005 a cap-and-trade program that will initially control carbon emissions from power plants located in the Northeast. Entergy, along with other utilities operating nuclear plants in the Northeast, participate in RGGI, and recognize the important role nuclear energy could play in this initiative.¹²⁴ As Mary Quillian, Senior Project Manager for Environmental Policy at NEI, noted in April 2004, the continued operation of nuclear power plants in the Northeast is vital to any regional effort to reduce future GHG emissions, given that plant uprates in the Northeast could supply additional emission-free, baseload capacity.¹²⁵ However, while Entergy supports the efforts of RGGI and other states, the company believes that their work does not guarantee the implementation of such a GHG regulatory approach at the national level or internationally. Entergy hopes that state efforts like RGGI will serve as a model for a more universal approach.

6.5 Case Study: FPL Group

¹²¹ "Entergy Blasts Bush Climate Policies." *New Orleans Times-Picayune*. Sept. 11, 2003. "Bush gets heat on global warming: Entergy chief urges reducing emissions" *New Orleans Times-Picayune*. September 11, 2003.

¹²² CEG is a coalition of power companies that rely heavily on nuclear and are relatively light on fossil fuels, and which share a commitment to responsible environmental stewardship.

¹²³ Clean Energy Group. www.mjbradley.com/CEG_multip.htm

¹²⁴ The states that participate in RGGI include: Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. Pennsylvania, the Eastern Canadian Provinces and New Brunswick are observers in the process. Participating power companies include: Entergy, Constellation, Dominion, Pacific Gas & Electric (PG&E), Public Service Enterprise Group (PSEG).

¹²⁵ Nuclear Energy Overview. "Nuclear Energy Crucial to Meeting Climate Change Challenge." April 19, 2004.

6.5.1 Background

FPL Group (FPL) is one of the largest providers of electricity-related products and services in the U.S. with annual revenues of \$9 billion. FPL's subsidiaries include Florida Power & Light Company, FPL Energy and FPL FiberNet.

Florida Power & Light Company, FPL's principal subsidiary, serves 4 million customers in Florida. FPL Energy is one of the nation's leading providers of clean and renewable energy generated from power plants operating on natural gas, wind, solar, hydroelectric and nuclear energy. In 2003, FPL Energy's facilities, present in more than 20 states, totaled a generating capacity of more than 11,000 MW. In addition, FPL Energy manages the largest wind-power portfolio in the U.S., and produces more than 40% of the nation's wind-generated energy. In fact, FPL Energy is the largest developer of wind-generated electricity in the world and operates the world's largest solar fields as well.

FPL contends that its diversity of fuels and geography (its facilities are spread in the Northeastern, Mid-Atlantic, Central and Western regions of the U.S.) help the company manage its power generation business more efficiently and economically, even when energy markets are volatile.¹²⁶ FPL's third company, FPL FiberNet, is a leading provider of fiber-optic network in Florida.

FPL is committed to conducting business in an environmentally responsible manner. The company notes that growth in demand for electricity will continue across the markets that it serves, but adds that such demand can and must be met in a cost-effective manner while simultaneously sustaining, protecting and enhancing the environment.

6.5.2 Climate Change Targets

As a member of the EPA's Climate Leaders Program, FPL pledged to voluntarily cut its GHG emissions rate by 18% (from a 2001 baseline) between 2003 and 2008. This move came shortly after 12 U.S. states, including New York and California, filed a lawsuit against the EPA, petitioning the agency to enforce regulations to reduce GHGs under the Clean Air Act. FPL Chairman and CEO Lew Hay noted that while FPL prefers to work with the Bush Administration's voluntary programs (such as Climate Leaders), the company does believe that implementing these emission cuts will leave it well positioned if mandatory rules are eventually established.¹²⁷

According to an FPL October 2003 press release, the power company planned to achieve such reductions through a variety of efforts, including:

- Continuing to evaluate **fuel switching and efficiency improvement** opportunities at FPL's fossil-fuel plants;

¹²⁶ FPL Energy. www.fplenergy.com

¹²⁷ Reuters News Service. "FPL Group pledges to cut greenhouse gas emissions." October 29, 2003. www.planetark.com.

- **Expanding nuclear capacity** (Improving the operating efficiency of its nuclear power plants);
- **Expanding wind generation** (Continuing expansion of FPL Energy’s U.S. leading wind energy portfolio);
- **Expanding natural gas generation** (Building or buying power from clean natural gas-fired generation to offset older less efficient facilities); and
- **Increasing Demand Side Management (DSM) Programs** by introducing a **green power program** to FPL customers and increasing participation of FPL customers in energy management and conservation programs.¹²⁸

6.5.3 Specific Programs for Addressing Greenhouse Gas Emissions

FPL voluntarily participates in various programs to reduce, avoid or sequester GHG emissions. In a recent interview, Ray Butts, Manager of Environmental Services at FPL Group, noted that the voluntary programs implemented today are clearly important and will have an effect on reducing CO₂ emissions. In fact, contrary to the recent report released by CERES, NRDC and the Public Service Enterprise Group, FPL believes that the various voluntary programs active today will continue to raise the awareness of global climate change and will help industry plan for and implement reductions in CO₂ emissions.¹²⁹ Mr. Butts did acknowledge, however, that these reductions will not be achieved as fast as expected by the aforementioned report, and cited FPL’s experience as an example. Mr. Butts noted that FPL’s rate of emissions of CO₂, which refers to the amount of carbon emitted per unit of electricity produced, has continued to go down in recent years, yet the utility’s total tons of CO₂ have increased each year.

According to Mr. Butts, two factors have contributed to this scenario: 1) Florida’s population is growing (in 2003, customer accounts increased by 2.4%); and 2) The average customer is using more electricity on a daily basis. In 2003, for example, the average customer used 1.7% more electricity than the year before. Finally, Mr. Butts stated that “in an industry that depends primarily on electric generation from fossil fuels, even clean generation from new and efficient combined cycle natural gas-fired power plants will continue to result in increased CO₂ emissions when generation growth continues.”¹³⁰

6.5.3.1 Climate Challenge - FPL’s Commitments

In 1994, FPL committed to limit the rate of its GHG emissions to its 1990 level, which at the time was estimated would result in approximately 11 million tons of CO₂ reduction from the 2000 reference case. In a 1995 Participation Accord with DOE, FPL committed to continue the activities it had already initiated in 1990 and to undertake new ones in order to achieve this goal. These activities included:

- Increasing the use of natural gas;

¹²⁸ FPL Group. “FPL Group announces commitment to reduce emissions rate by 18 percent by end of 2008.” October 28, 2003. www.fplgroup.com

¹²⁹ “Benchmarking Air Emissions of the 100 Largest Electric Generation Owners in the U.S. – 2002”, which claims that power plants’ GHG emissions soared in 2002 and suggests that voluntary programs will not work for the electric utility industry.

¹³⁰ Email Interview with Ray Butts, May 5, 2004.

- Implementing heat rate efficiency improvements at its fossil power plant fleet;
- Improving the availability and reliability of its fossil plant fleet;
- Modifying oil-fired steam electric units to be dual fuel (oil and gas) capable;
- Improving the availability and reliability of its nuclear power plants; and
- Implementing Demand Side Management activities for energy savings by residential and commercial users.

FPL also participated in the Utility Forest Carbon Management Program of the Climate Challenge initiative.

Additionally, FPL has pursued other activities which were not part of their Climate Challenge commitment, including a reforestation program; recycling activities; and SF6 gas reclaiming and disposal activity.

6.5.3.2 Climate Leaders

FPL joined Climate Leaders in 2002. Subsequently, FPL has committed to reduce its greenhouse gas emissions rate 18% by 2008. One method of achieving these reductions has been the reduction of emissions from FPL's Fort Myers and Sanford Power Plants through “repowering.” (The repowering process converts “older, oil-fired units to natural gas-fired combustion turbines that generate electricity and then use waste heat from that process to generate more power through a traditional steam generator.”)¹³¹ As such, FPL claims to be the leading utility “in modifying existing plants in a way that not only expands capacity but also improves energy efficiency and reduces emissions.”¹³²

As mentioned earlier, FPL is also a leader in energy management and conservation programs. According to Mr. Butts, “FPL's DSM projects have assisted over 1.7 million residential, commercial and industrial customers to more efficiently meet their energy needs while also reducing the number of power plants and emissions.”¹³³ Specifically, Mr. Butts noted that in the past two decades FPL's DSM programs have enabled the company to avoid the construction of ten medium-sized power plants.

As a Climate Leaders participant, FPL has committed to introduce new or modified programs, including a green power program, which was launched in February 2004. Under this program – called Sunshine Energy - FPL will offer 3.6 million residential customers the opportunity to support electricity generation from clean and renewable sources such as solar, wind, biomass, landfill gas and hydro. Customers who choose to enroll in this program will pay \$9.75 extra each month. In addition, FPL has committed to provide 150 kilowatts of solar capacity in Florida for every 10,000 customers who enroll in the green energy program, which would in turn generate enough clean energy to avoid 160 tons of CO₂ a year.¹³⁴

¹³¹ FPL Group. www.fpl.com

¹³² FPL Group. www.fpl.com

¹³³ Email Interview with Ray Butts, May 5, 2004.

¹³⁴ “FPL to offer environmentally friendly Sunshine Energy program to residential customer.” FPL Group, www.fplgroup.com

Under the Climate Leaders initiative, FPL also continues to expand its wind-generating capacity. In 2003, FPL Energy generated 43 % of all the wind generated electricity in the U.S. By the end of 2003, it completed the construction of an additional 325 megawatts of wind-powered generating assets and it plans to add 400 megawatts of wind farms in 2004.

As noted earlier, FPL has also chosen to expand its nuclear capacity as a means of achieving GHG emissions reductions, at least at some of their plants. At their recently purchased Seabrook nuclear facility located in New Hampshire, for example, FPL is planning an uprate improvement that will increase its output by approximately 7 percent. This uprate will result in CO₂ emissions avoidance that will be applicable to the company's reduction of CO₂ emissions. FPL also owns two nuclear stations at Turkey Point and St. Lucie, in Florida. However, Mr. Butts mentioned that other than the proposed improvements to be made at Seabrook, FPL has no immediate plans for uprates to the corporations' other nuclear units. In addition, FPL currently has announced no plans for near-term acquisitions of nuclear generating facilities.

As part of the Climate Leaders program, FPL also participates in EPA's SF₆ gas reduction program to capture and sequester the greenhouse gas known as sulfur hexafluoride, which has a high CO₂ equivalent greenhouse gas potential.¹³⁵ According to Mr. Butts, FPL is currently meeting its target set with the EPA to reduce SF₆ gas leakage.

6.5.3.3 PowerSwitch!

In February 2004, FPL joined the World Wildlife Fund's PowerSwitch! program. This program challenges the power sector to become carbon-free by 2050 in developed countries, and to implement a major shift from coal to clean energy production in the developing world. FPL, along with Austin Energy, Burlington Electric Department, Sacramento Municipal Utility District, and Waverly Light and Power, are the first power companies in the U.S. to support this program's mandatory cap on CO₂ emissions and to commit to clean energy production.

Under this initiative, FPL called on the U.S. Congress to set binding limits on CO₂ emissions and committed to undertake one or more of the following action items to accelerate the shift from coal to clean energy:

- Use renewables as the source for 20 % of electricity sold by 2020;
- Increase energy efficiency by 15 % by 2020; or
- Retire the least efficient half of coal generation by 2020.¹³⁶

¹³⁵ One pound of SF₆ gas is equal to 11 metric tons of CO₂.

¹³⁶ Under commitments to WWF, renewable sources of energy may include solar, wind, sustainably harvested biomass, low-impact small-scale hydropower, geothermal, and methane recovery from landfills or farms. Energy efficiency efforts may include such innovative approaches as improving energy efficiency in power production, upgrading distribution technologies, transmission optimization efforts, and reducing overall demand from customers in a service territory as part of a strategy to diminish the need for new electricity generation capacity. PowerSwitch! www.panda.org

FPL opted to increase its energy efficiency by 15% by 2020 through its continued promotion of demand side management activities and improvements in its power generation facilities.

6.5.3.4 Fuel Cells and Other Technologies

FPL is also committed to other renewable technologies (such as fuel cells) which have the potential of becoming a next generation fuel source. Through demonstrations, FPL seeks to explore whether these technologies could be viable energy-related products that FPL could offer to local, state and federal agencies in the future. For example, in April 2004, FPL launched a fuel cell demonstration at a North Port High School in Florida. FPL plans to monitor the fuel cell at North Port and provide data to the state's Department of Environmental Protection for further study and analysis.

6.5.4 Achievements

In 2000, FPL met its goal of 11 million tons of CO₂ reductions goal that it had committed to achieve under the Climate Challenge program. Mr. Butts also noted that FPL is making good progress towards its Climate Leaders 18% emissions reduction target by 2008.

In April 2004, FPL ranked first among 26 utilities in the United States in Innovest's Strategic Value Advisors report on power companies' environmental performance.¹³⁷ The report noted that FPL had:

- A "below average" environmental risk;
- An "above average" environmental management capacity; and
- An "above average" engagement in environmentally-favorable businesses.

FPL's outstanding environmental performance will benefit the company's future stock price performance.

FPL has also received recognition for its "repowering" efforts at their Fort Myers and Sanford sites, and for its solid waste reduction initiatives. In addition, FPL:

- Leads the nation in wind generation and owns 42 wind farms in 15 states. Its focus on increasing its wind-generating capacity has earned the company the 2003 Platts Global Energy Award as the "Renewables Company of the Year;"
- Owns and operates the largest solar field in the world, located in the Mojave Desert;
- Owns 28 hydroelectric plants in the nation, housed in Maine and New Hampshire;
- Has developed successful energy conservation programs. More than 1.7 million customers have participated in these initiatives, helping to cut electricity demand by the equivalent of 10 medium-sized power plants; and

¹³⁷ Innovest Strategic Value Advisors is an internationally recognized investment research and advisory firm which specializes in analyzing companies' performance on environmental, social, and strategic governance issues, with a particular focus on their impact on competitiveness, profitability, and share price performance. The Innovest Strategic Value Advisors' utility report analyzes the performance of 26 power companies in the following areas: Corporate governance, environmental risk and management, environmental business performance, carbon profile, environmental strategy and air emissions improvement. More information about this firm can be found at: www.innovestgroup.com

- Has one of lowest rate of GHG emissions in Florida and in the U.S.¹³⁸

6.5.5 Economics of Cutting Emissions

Mr. Butts stated in our interview with him that FPL has historically been very well-positioned with regard to GHG emissions risks. He contended that the company has been very open about its operations and environmental performance, and has communicated GHG emissions information and goals to its shareholders and investment analysts through its 10-K and 10-Q financial reports, and its Annual Report.

6.5.6 Corporate View on Federal and State Policies

6.5.6.1 Federal Policies

FPL supports the implementation of a national cap-and-trade program for reducing CO₂ emissions. Under this system, FPL believes that CO₂ allowances should be allocated on an output-based methodology through a generation performance standard,¹³⁹ rather than on the standard input-based methodology (which is used in the EPA's Sulfur Dioxide (SO₂) Program). According to Mr. Butts, the latter program rewards inefficient old plants with more allowances and fails to adjust for periodic changes in market shifts in electric generation.

In addition, FPL believes that a mandatory CO₂ cap-and-trade scheme should be a component of a multipollutant (NO_x, SO₂, Hg and CO₂) reduction legislative plan. Mr. Butts noted that FPL supports the concept of a multipollutant reduction program since it provides the electric utility industry with the certainty it needs to make economic decisions about the future operations of its power plants and other generating assets. Interestingly, FPL does not support the McCain-Lieberman cap-and-trade bill or the Bush Administration's Clear Skies Act – the company argues that they fall short of providing full certainty for future power plant operations. (McCain-Lieberman sets up a mandatory market-based reduction program, but it doesn't address how the program would allocate allowances. For FPL, this component of the legislation is critical, given the company supports an output-based allocation system over a heat input method of allocation.)

6.5.6.2 State Policies

FPL does not support the emerging patchwork of mandatory, state CO₂ regulations. The company believes that this patchwork system affects economic competition between different electric transmission markets and may also result in GHG registry programs that are cumbersome in nature. Still, according to the company, FPL is not negatively affected by any existing state regulations on GHG emissions; although it operates facilities in Massachusetts and Oregon, where regulations mandating power plant cuts in GHG emissions have been implemented. (FPL operates gas-fired plants in Massachusetts and wind farms in Oregon.) FPL does not expect that these rules will have a negative impact on its affected units.

¹³⁸ "Building for a Sustainable Future." FPL Group Environmental Report. www.fplgroup.com

¹³⁹ Email Interview with Ray Butts, May 5, 2004.

FPL also anticipates compliance with the Regional Greenhouse Gas Initiative (RGGI), given that it operates power plants that run on coal, oil, and gas in Pennsylvania and New York. (FPL also owns non-emitting facilities in the Northeast, including wind farms, hydro-powered plants, and its Seabrook nuclear plant in New Hampshire.) Therefore, FPL could potentially be rewarded under the RGGI if allowances for CO₂ reductions were to be allocated using an output-based methodology. Under such a system, all plants, whether dirty or clean, would receive emission allowances. FPL's non-emitting units would receive allowances and FPL would be able to sell these permits to plants that do emit CO₂. For this reason, FPL and other utilities are trying to play a role in the design of this cap-and-trade system.

6.6 Outlook

The three power companies surveyed in this report generally view their current actions to address climate change as positive initial measures and in many cases treat them as pilot initiatives from which they will gain knowledge and experience for the future. For example, AEP believes that their early action movements to address climate change represent a common-sense approach that can jump-start their process of reducing GHG emissions along a gradual, cost-effective path. Entergy views its current environmental strategy as a "positive initial step" towards stabilizing its CO₂ emissions. The company also considers its current strategy valuable for acquiring experience in reduction techniques and costs, and in methodologies for structuring corporate internal and external GHG programs. Finally, FPL believes that as one of the most efficient power companies in the U.S., it is part of the solution to climate change.

Regarding new emissions reduction targets, AEP, Entergy and FPL have generally committed to reviewing their progress to meet their current goals on an annual basis and to evaluate the possibility of new targets at the end of their commitment period. Entergy, for example, has committed to establish a new emission reductions goal for the post-2005 period, and therefore plans to evaluate its progress and success achieved with the current plans, as well as the additional costs and savings associated with a new target, by the end of 2004.

Overall, the power companies surveyed in this report and the utility industry as a whole believe that voluntary actions to address climate change are effective. Nonetheless, the electric power sector also recognizes that mandatory requirements to reduce carbon emissions seem inevitable, particularly as more activities ranging from state climate change policies to shareholder proxy actions and the risk of climate change lawsuits emerge. This industry could be severely affected by the emerging patchwork of state climate regulations which: has implications for economic competition between different electric transmission markets; results in cumbersome GHG registry programs; and inhibits the development of cost-saving emissions trading programs.

This sector thus supports the development of a national market-based CO₂ emissions reduction program that is fully flexible, has reasonable timetables and targets, and is comprehensive in the inclusion of targeted pollutants. However, large differences exist between power companies regarding the allowance allocation method that should be implemented in a national CO₂ cap-and-trade emissions program. Cleaner utilities, which increasingly rely more on nuclear energy and renewables, and less on fossil fuels, prefer a system that allocates allowances on an output-based (or current production) methodology. On the other hand, those power companies which tend to be heavily reliant on fossil fuels prefer a "heat input-based" method of allocation.

Finally, the rise of a shareholder movement which advocates a more progressive response to climate change from corporations will become a larger factor in the decision-making processes utilities. In particular, the decisions of two power companies –AEP and Cinergy –to respond to their shareholders’ resolutions could serve as an incentive for more shareholder groups to demand similar actions from other companies in the electric power sector and in other industries as well.

7.0 THE PAPER PRODUCTS AND FORESTRY INDUSTRY

7.1 Introduction

The United States is the world's largest producer of paper and forest products. (For purposes of this survey, we include manufacturing pulp, paper, paperboard, wood and related products as a part of this industry.) The American Forest and Paper Association is the national trade association of the industry, and represents more than 240 member companies and related associations. The industry employs 1.5 million people and ranks among the top ten manufacturing employers in 42 states, with an estimated payroll of \$51 billion. Sales of U.S. forest and paper products exceed \$250 billion annually in the U.S. and export markets.¹⁴⁰ Products from America's forest and paper industry also represent more than eight percent of U.S. manufacturing output. The forest products industry is the nation's most capital-intensive manufacturing industry and one of the most energy-intensive.

Not surprisingly, energy conservation programs have taken on a high significance in this industry. Energy costs have traditionally been in the top five cost categories for this industry; additionally, energy costs as a proportion of operating costs have continued to increase dramatically. As is the case in the chemical sector, many of the mills that have recently closed have cited rising energy costs as a main or contributing factor in the decision to shut down. Although the industry is nearly 60 percent self-sufficient (using non-carbon generating biomass), it is forced to turn to natural gas, coal, fuel oil and purchased electricity to meet the balance of its energy needs, which in turn generates an increased amount of carbon emissions.¹⁴¹ Overall, the forest product industry's use of renewable fuels represents the equivalent of about 205 million barrels of oil per year - and offsets the carbon dioxide emissions of approximately 16 million automobiles annually.¹⁴² The industry is the nation's number one producer of co-generated electricity; it produces more than 41% of the nation's self-generated electricity through cogeneration. Approximately 85% of that onsite electricity is generated from renewable resources.

7.2 American Forest and Paper Association (AFPA)

In promoting the contributions of its members to fighting climate change, AFPA cites a study by the U.S. Forest Service which suggests that managed forests currently remove the equivalent of about 17% of total annual U.S. GHG emissions (the equivalent of removing the emissions from 235 million automobiles annually). In addition, the trade association highlights the impact of its commitment to recycling on reducing emissions. "Recycling paper that would otherwise be destined for landfills," the industry notes, "results in increased methane avoidance. Higher

¹⁴⁰ W. Henson Moore, President & Chief Executive Officer, American Forest & Paper Association, Testimony Submitted To the Committee On Energy And Commerce; Subcommittee On Energy And Air Quality, U.S. House of Representatives, Washington, D.C., June 8, 2001.

¹⁴¹ www.afandpa.org/Template.cfm?Section=Energy1&template=/ContentManagement/ContentDisplay.cfm&ContentID=32860

¹⁴² *Ibid*

recovery rates will lead to corresponding reductions in greenhouse gas emissions by facilitating sequestration and avoiding methane emissions from landfills.”¹⁴³

Since 1972, the industry states that it has reduced its fossil fuel and purchased energy consumption by 53 percent, and adds that its average total energy use per ton of pulp and paper has decreased by 30 percent over the past 27 years. The industry adds that, between 1990 and 1999, the paper manufacturing sector of the industry reduced GHG emissions 28% per ton of product through the use of more energy –efficient manufacturing processes, lower carbon-emitting fuels, and the increased use of biomass fuels.¹⁴⁴

The AFPA clearly prefers voluntary measures to address climate change, and also supports President Bush’s push for enhanced research in technology and science. In praising the President’s approach, AFPA states that “It recognizes that only a strong economy will allow the forest products industry to make needed investments in new and cleaner industrial equipment and energy supplies that will reduce its emissions in the long run.”¹⁴⁵

7.3 Programs and Priorities

7.3.1 Intensity Reduction Goal

AFPA’s members are currently involved in several programs which are intended to help the industry meet the President’s goal of reducing carbon intensity by 18% over the next 10 years. Those programs include: inventorying and reporting on greenhouse gases; actions to enhance sequestration in managed forests and products; the development and implementation of improved technologies; efforts to improve energy efficiency; use of cogeneration and increased use of renewable energy; and recycling. **Based on these programs, the industry hopes to reduce its GHG intensity by 12% by 2012 relative to 2000.** Furthermore, in a letter to senior Administration officials in January 2003, the industry made clear that, by 2005, it will evaluate progress that its members had made toward meeting that goal “and determine whether additional reductions or changes to our greenhouse gas programs are appropriate.” The industry vowed to develop a verification system as well.¹⁴⁶

In attempting to meet this goal, however, it is worth noting that the industry remains very wary of federal regulation. In that same January 2003 commitment letter, W. Henson Moore, the President and CEO of AFPA, highlighted these concerns:

As an organization, we believe that our success will depend in part on the Administration’s efforts to rationalize and manage the activities of all government

¹⁴³www.afandpa.org/Template.cfm?Section=Policy_Issues&template=/ContentManagement/ContentDisplay.cfm&ContentID=7322

¹⁴⁴www.afandpa.org/Template.cfm?Section=Policy_Issues&template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=6&OriginalID=2&InterestCategoryID=269&ExpList=2,265

¹⁴⁵www.afandpa.org/Template.cfm?Section=Policy_Issues&template=/ContentManagement/ContentDisplay.cfm&ContentID=7962

¹⁴⁶The January 2003 letter committed the industry to trying to meet President Bush’s intensity reduction goals. The text of the letter can be found at:

www.afandpa.org/Content/ContentGroups/Environment1/Climate_Change/Link1.pdf

agencies, especially with respect to the promulgation of regulatory requirements that may result in increases in greenhouse gas emissions. Our commitment will also naturally depend on the parameters of any implementation guidelines that may be developed. Specifically, we strongly encourage the Administration to address regulatory requirements where the negative climate impacts outweigh any environmental benefits.

7.3.2 Biomass Gasification Technologies and Agenda 2020 Program

In addition to its efforts to maximize energy efficiency by utilizing renewable energy or biofuels, the industry highlights its collaboration with DOE's **Agenda 2020** Program to develop **biomass gasification technologies**. AFPA notes that these technologies could make the industry totally energy self-reliant and generate a significant surplus of power to the electric grid.

Simultaneously, the carbon displacement from biomass gasification could transform the industry from emitting 24 million tons of carbon each year to displacing at least 18 million tons of GHG from fossil fuels. At the same time, the industry is very conscious of the potential economic risks of its R&D investment, contending that "the industry needs a consistent and committed partner to ensure successful commercialization." (Industry participants are putting up 50% of the investment capital for demonstration projects.)¹⁴⁷

7.3.3 Recycling

Recycling is also a key component of the industry's approach to reducing emissions. As of January 2003, companies have invested approximately \$10 billion in new recycling capacity to meet the demand for increased use of recycled paper. AFPA also noted that recovered paper accounts for approximately 37% of the domestic paper industry fiber supply¹⁴⁸. Specifically, AFPA has established a **new paper recovery goal of 55% of all paper consumed in the United States by 2012**. By reaching this recovery rate, and reducing potential emissions from landfills, AFPA expects that the industry would achieve a "corresponding level" of GHG reductions.

7.3.4 Carbon Sequestration

A third major element of the industry's approach to climate change concerns **carbon sequestration**. AFPA's **Sustainable Forestry Initiative** Program – with more than 114 million acres enrolled – is the largest sustainable forestry program in the world.¹⁴⁹ The industry believes that significant carbon sequestration will be one result of the enhanced forest productivity and improved forest management resulting from this initiative. In testimony submitted to the Senate Environment Committee's Subcommittee on Clean Air, Climate Change, and Nuclear Safety in July 2003, AFPA outlined its views on the subject. Among other recommendations, the industry group called for:

- A clear recognition that forest and product sequestration mitigate GHG emissions;

¹⁴⁷ www.afandpa.org/Content/ContentGroups/Environment1/Climate_Change/Link3.pdf

¹⁴⁸ Moore letter to Congress, January 21, 2003.

¹⁴⁹ www.afandpa.org/Content/NavigationMenu/Environment_and_Recycling/SFI/What_is_the_SFI_Program/_What_is_the_SFI_Program_.htm

- Increased funding for a data collection and analysis program which provides information on both carbon sequestration and forest resource trends in general;
- The development of a national accounting system;
- Increased funding for forest productivity research in tree physiology, biotechnology and soil productivity (on the theory that improved productivity increase carbon sequestration);
- Encouragement of cogeneration in order to extract “maximum usable energy from biomass, waste and fossil fuels...;” and
- The commercialization of biomass and black liquor gasification technologies to improve the efficiency and displacement of fossil fuels.¹⁵⁰

7.4 Case Study: International Paper

7.4.1 Background

International Paper is the world’s largest paper and forest products company. Its business includes paper, packaging and forest products. The company is also one of the world’s largest private landowners, and owns, manages or has harvesting rights to more than 19 million acres of forestlands worldwide. IP manages its forests under the principles of the Sustainable Forestry Initiative program, a system which helps ensure the continual planting, growing and harvesting of trees. The company has operations in almost 50 countries and exports its products to more than 130 nations.¹⁵¹

Regarding climate change specifically, IP has acknowledged that it is an important environmental issue. Thomas Jorling, the Vice President for Environmental Affairs, has stated,

As the largest forest owners in the U.S. with manufacturing interests, we can play an important role in climate change initiatives. We rely extensively on biomass produced energy and with some 10 million acres of U.S. farmland, our sustainable forestry practices have already positively contributed to mitigating climate change.¹⁵²

Furthermore, contending that industry should play a significant role in efforts to reduce emissions, IP argues that **“reductions can be effectively achieved if market-based approaches are integral to the efforts to counteract climate change.”**

7.4.2 Climate Change Targets

Like Alcoa, International Paper is also a charter member of EPA's **Climate Leaders Partnership**. As part of this program, **IP has established a goal of reducing absolute**

¹⁵⁰ Congressional Testimony, Senate Environment and Public Works Subcommittee on Clean Air, Climate Change, & Nuclear Safety, July 8, 2003. The testimony can be found at: www.afandpa.org/Template.cfm?Section=Policy_Issues&template=/ContentManagement/ContentDisplay.cfm&ContentID=7188

¹⁵¹ www.epa.gov/climateleaders/partners/intlpaper.html

¹⁵² *Ibid*

greenhouse gas emissions by 15% by the year 2010 from a year 2000 baseline. IP has also agreed to report its progress to EPA on achieving this goal.¹⁵³

Additionally, IP and other members of the **Chicago Climate Exchange** have made “a voluntary, legally binding commitment to reduce their emissions of greenhouse gases by four percent below the average of a 1998-2001 baseline by 2006, the last year of the pilot program.”¹⁵⁴

Finally, as part of the **Business Roundtable’s Climate RESOLVE Initiative**, IP reports on the development of climate change programs and participation in voluntary programs to support the President's objective of reducing U.S. greenhouse gas emissions by 18 percent intensity (per GDP) by 2012.

Both the Climate Leaders Program and the Climate RESOLVE initiative are discussed in more detail in Appendix 1.

7.4.3 Specific Programs for Addressing Greenhouse Gas Emissions

Overall, the company’s efforts to combat climate change generally fall under three categories: **tracking and reporting GHG emissions; developing voluntary goals to reduce emissions; and supporting greenhouse gas trading programs.** Each of these categories is discussed in more detail in the following sections.

7.4.3.1 GHG Inventory and Reporting

The company has developed a complete US inventory and nearly complete international inventory of greenhouse gas emissions.¹⁵⁵ Additionally, the associated **Pulp and Paper Sector Protocol**, which was developed by National Council for Air and Stream Improvement (NCASI), **is the first greenhouse gas accounting protocol developed specifically for the forest products industry.** International Paper was among the first companies to implement the process.

IP reports the results of this inventory in its annual Sustainability Report, and notes that future Sustainability Reports will incorporate the results from the completed international inventory. Additionally, the company reports GHG information to governments and third parties as part of its participation in several voluntary initiatives.

Additionally, in December 2002, AFPA and the International Council of Forest and Paper Associations, in association with the World Business Council for Sustainable Development and the World Resources Institute, unveiled a methodology for calculating GHG emissions from pulp and paper mills. In theory, as noted by the President of WBCSD, the new calculation device

¹⁵³ www.internationalpaper.com/our_world/environment/climatechange.asp

¹⁵⁴ www.chicagoclimateexchange.com/about/

¹⁵⁵ These inventories are based on the widely accepted standard GHG Protocol developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

should allow the forest and paper sector “to collect and report accurate data in a unified way, thus helping to achieve comparability worldwide.”¹⁵⁶

7.4.3.2 Voluntary Initiatives

As already noted, International Paper is a charter member of EPA's **Climate Leaders Partnership (the first forest products company to join the program)**, and also participates in **the Business Roundtable (BRT) Climate RESOLVE initiative**. Additionally, the company participates in **Canada's Climate Change Voluntary Challenge and Registry**, which is a private-public partnership promoting voluntary efforts to address climate change issues.

As a member of AFPA, IP also is associated with other federal programs, including DOE's **Industries of the Future**. Industries of the Future is a collaborative research and development partnership between DOE and several industries, including the forest products industry. The industry notes that through the program, AFPA “has participated in the development of a number of technologies aimed at cutting energy use, minimizing environmental impacts, and improving productivity in industry.” If the technologies were fully commercialized, AFPA contends that the industry could become totally energy self-reliant as well as generate surplus power.¹⁵⁷ (Please refer to Appendix 1 for a more detailed description of Industries of the Future.)

7.4.3.3 Agenda 2020

Agenda 2020 is a voluntary partnership between the forest products industry and DOE (and more specifically, DOE's **Forest Products Industry of the Future program**) which promotes cost-shared research and development projects. Industry participants put up 50% of the investment capital for the demonstration projects. DOE is currently cost-sharing 48 R&D projects with the industry.

AFPA states that

The sole purpose of Agenda 2020 is to deliver on the challenge to significantly improve industry competitiveness and environmental performance by using the tools of technology.... The ultimate goal is to commercialize processes which will significantly improve the global competitiveness of the forest products industry and thereby meet society's need for sustainable energy sources and renewable materials-based manufacturing.”

By increasing energy efficiency, the industry clearly hopes that it will be able to reduce its GHG emissions while simultaneously improving its economic competitiveness.

While DOE launched the partnership in 1994, other federal agencies which now fund Agenda 2020 projects include the National Science Foundation and the U.S. Department of Agriculture. Funding for the program has grown from a few millions dollars in its first year to approximately

¹⁵⁶ www.climate.wri.org/newsrelease_text.cfm?NewsReleaseID=195 More information about this new calculation device can be found at: http://www.climatevision.gov/sectors/forest/pdfs/estimating_ghgemissions.pdf

¹⁵⁷ www.afandpa.org/Template.cfm?Section=Climate_Change&Template=/ContentManagement/ContentDisplay.cfm&ContentID=7939&MicrositeID=0

\$50 million in 2002. The industry is particularly interested in a hydrogen producing biorefinery “in which pulp, electricity, liquid fuels and selected chemical products can be directly produced from renewable resources through gasification of black liquor and other biomass residues.”¹⁵⁸

7.4.3.4 Emissions Trading

International Paper is a founding member of the **Chicago Climate Exchange**. Beyond being active members in the CCX, International Paper helped form some of the guidelines for forestry management for the group. (IP was the first paper and forest products company to join CCX.)

7.4.4 Achievements

IP’s climate change achievements include:

- In 1996, IP’s subsidiary Weldwood of Canada, Ltd. pledged to voluntarily stabilize its greenhouse gas emissions at or below 1990 levels by 2000. By the end of 2000, Weldwood had reduced its total direct emissions of greenhouse gases by 4.1 percent, despite increased product output during the decade.
- IP’s 6 European mills are preparing to meet the Kyoto Protocol’s emission reduction goals. The company noted that it will “continue to actively support free market trading mechanisms in Europe;” and
- In 2001, IP joined DOE’s Combined Heat and Power Partnership, a voluntary group whose members are committed to reducing environmental effects of electricity and power generation. The company argues that by generating power from biorenewable resources, its “use of CHP technologies will eliminate waste, reduce fossil fuel carbon dioxide emissions and increase the economic value” of its natural resources.

Additionally, through its membership in the American Forest and Paper Association, IP can boast of achievements through programs such as the DOE’s Industries of the Future or Agenda 2020. For example, referring to an R&D project involving the utilization of non-condensable gases as reburn fuel in boilers, DOE notes that “The technology benefits include lower capital and maintenance costs, reduced natural gas use, reduced NO_x and CO₂ emissions, and less waste.” The Department cites the use of plasma technology as another method of reducing carbon emissions.¹⁵⁹

7.4.5 Economics of Cutting Emissions

As noted in IP’s 2002 / 2003 Sustainability Report, one essential part of the company’s business strategy is to continually improve its environmental performance. In order to do that, the company vows to comply with all applicable environmental regulations, as well as with AFPA’s Sustainable Forestry Initiative Programs and with AFPA’s environmental, health and safety principles. Among other measures, the company emphasizes prevention of pollution.

Overall, the company’s three environmental objectives are:

¹⁵⁸ www.afandpa.org/Content/ContentGroups/Forestry1/Forest_Research/Agenda_2020/Agenda_2020.htm

¹⁵⁹ *Forest Products Annual Report Fiscal Year 2003*, Department of Energy, Energy Efficiency and Renewable Energy, Industrial Technologies Program, p. 10.

- Control emissions and discharges from its facilities into the air, water and groundwater;
- Make continual improvements in environmental performance; and
- Maintain 100% compliance with applicable laws and regulations.

Unfortunately, however, given the state of the U.S. economy in 2003, and the fact that consumer demand and the strength of the national economy control this industry's production, IP had a difficult year. As the company noted in its 2003 Annual Report, "The business environment for International Paper in 2003 was difficult. Demand for paper and packaging products was down from 2002," average prices were mostly lower for various IP products, and operating profits were also down as higher energy and raw material costs and lower prices more than offset benefits from cost reduction initiatives and improved operating performance.

IP spent \$88 million in 2003 for capital projects to control environmental releases into the air and water (and to ensure sound management and disposal of waste), and expected to spend \$116 million in 2004 for similar capital projects. It should be noted, of course, that these environmental releases refer to much more than just GHG emissions. IP also informed its shareholders that "Amounts to be spent for environmental control projects in future years will depend on new laws and regulations and changes in legal requirements and environmental concerns."¹⁶⁰

With indications that the U.S. and world economies are strengthening, however, IP forecasts increased demand for its products as 2004 proceeds. **The energy efficiency improvements being pursued by both IP specifically and the industry as a whole should lead to not only reduced emissions, but also substantial costs savings.** And through its membership in AFPA, and AFPA's ties to programs such as Agenda 2020, IP will seek to increase emission reduction benefits while maximizing its economic competitiveness. Furthermore, waste recovery and recycling both help meet environmental goals, and increase profitability by broadening the industry's raw materials base.

7.4.6 Corporate View on Federal and State Policy Options

Karen Risse, a member of IP's corporate environment team, summarized the company's policies towards climate change and legislative efforts to address the issue. Specifically, she stated that

IP supports the development of international trading programs for greenhouse gas emissions and sequestration credits. Trading programs should use inventories based on verifiable accounting methods. Trading should allow for flexibility in trading within and across company and national boundaries and should allow for maximum use of carbon sequestration credits.

To that end, she stressed that "IP believes that companies, industries, and countries should partner with each other wherever possible to further develop low-emission, energy-efficient technologies and refine carbon sequestration strategies." Although asked, Ms. Risse did not

¹⁶⁰ International Paper 2003 Annual Report, pp.28-29. The text can be found at: www.media.corporate-ip.net/media_files/NYS/IP/reports/ip_ar03.pdf.

address more specific issues, such as the company's position on the McCain-Lieberman legislation.¹⁶¹

7.4.7 Outlook

It seems clear that the paper and forest products industry as a whole remains wary of mandatory federal regulations to reduce greenhouse gas emissions, and instead supports voluntary approaches (such as President Bush's drive to reduce greenhouse gas intensity). It is still unclear, however, just how productive voluntary programs such as EPA's Climate VISION and Climate Leaders programs will be. Thus, it should be noted that in addition to these programs and trading mechanisms such as the Chicago Climate Exchange, the paper and forest products industry is likely to aggressively pursue measures in the future to improve its energy efficiency, which would also serve to reduce its collective greenhouse gas emissions.

In fact, it is these industry efforts to improve energy efficiency which may ultimately prove to have the biggest impact on reducing GHG emissions. But, while companies such as IP like to highlight their commitment to environmentally-friendly policies and tout the progress they have made in reducing emissions, **the driving force behind this desire to boost energy efficiency is economic competitiveness. And that is precisely why these efforts may be the most effective in reducing emissions – because it is in the economic self-interest of member companies to do so.** A brief overview of recent industry trends reveals why this is the case.

Specifically, in recent years, the industry has increasingly been challenged by low-cost foreign producers in South America, Africa and the Pacific Rim (as well as from traditional rivals such as Canada and Scandinavia.) Additional pressures on the industry include:

- The decreased availability of land;
- Increased interest in recycling; and
- More demanding environmental requirements.

All of these measures result in higher energy use. Furthermore, as DOE describes, the industry is characterized by a concentrated asset base, high capital requirements, and volatile business cycles. Consumer demand and the strength of the national economy also affect the industry's production.

Costs for energy consumption and environmental compliance are significant – for example, from 1997-2000, the industry spent approximately \$6 billion per year on energy (4% of its net sales), and averaged over \$800 million per year on environmental protection capital (nearly 14% of the average annual capital invested on equipment). And, despite the fact the industry has improved its energy efficiency and productivity dramatically over the last few decades, the industry still remains one of the most energy-intensive in the United States, and the third largest user of fossil fuels in the U.S. industrial sector. Thus, from an economic perspective, the industry clearly needs to find ways to reduce its reliance on fossil fuels and to lower its environmental compliance costs.¹⁶²

¹⁶¹ Email Interview with Karen Risse, April 27, 2004.

¹⁶² *Forest Products Annual Report Fiscal Year 2003*, pp. iv, 6

Thus, programs such as DOE's Forest Products Industry of the Future Partnership potentially may play a significant role in making this transition. DOE predicts that current projects being pursued by the partnership would reduce the industry's energy use by 25 trillion Btus per year in 2010, and 135 trillion per year in 2020

8.0 THE PHARMACEUTICAL INDUSTRY

8.1 Introduction

U.S. companies lead the world in all aspects of the pharmaceutical industry including production, and investment in R&D. The pharmaceutical sector is one of America's most research-intensive industries, and employs more than 70,000 scientists in this area alone. The pharmaceutical industry is also a mainstay of the American economy, and is one of a few industries, which shows a clear trend of exponential growth nationally, as well as globally.

The value of the U.S. pharmaceutical marketplace currently exceeds \$379 billion with over \$178 billion in sales within the U.S. alone.¹⁶³ The sector is dominated by a handful of large fairly establish companies, including Eli Lilly and Co.; GlaxoSmithKline; Johnson & Johnson, Pfizer; and Merck and Co.

The Pharmaceutical Research and Manufacturers of America (PhRMA), the industry's main trade association, boasts a membership of approximately 90 companies. The companies belonging to PhRMA have adopted a variety of approaches to GHG emissions reductions, and the largest companies (such as Johnson& Johnson, Merck and Pfizer) have been the most progressive in their approach to the reduction of greenhouse gas emissions and ozone protection.

Overall, greenhouse gas emissions related to energy output are not a major issue for the U.S. pharmaceutical industry. Energy use constitutes a very small portion of the total expenses in this sector and the corresponding level of pollution is very low. (Specifically, energy use is approximately 1% of the expenses associated with production in one company while research and development expenses typically claim a much larger share.) It is worth noting that vehicles (from the operation of sales fleets and transportation of merchandise to various markets), rather than manufacturing, are the most significant source of GHG emissions in this sector. Another lesser-known source of greenhouse gas emissions produced by the pharmaceutical sector comes from propellants such as hydroflourocarbon 139 A. This compound, which releases greenhouse gases, is used as a propellant for metered dose inhalers (MDIs) for the treatment of respiratory diseases.¹⁶⁴

Still, given the industry's small proportion of costs linked to energy use, regulatory issues such as the protection of intellectual property generally take precedence over environment protection. Of course, greenhouse gas emissions related to climate change have a higher priority for the multinational corporations in this sector that maintain production facilities overseas, particularly in Europe.

It is interesting to note, then, that even though energy issues are relatively low on the industry's policy agenda, the pharmaceutical industry has nonetheless been promoting energy efficiency measures since the early 1990s. Johnson & Johnson Co, for example, was the first company to join EPA's **Climate Savers** program. Furthermore, within the sector, companies such as

¹⁶³ www.black-collegian.com/issues/1998-11/pharmacy11.shtml

¹⁶⁴ www.gsk.com/ehs/review/managing_ehs.4.html

Johnson & Johnson and Pfizer have taken the lead in promoting the use of renewable energy in both their facilities and manufacturing processes. Several companies in the industry are also part of the **Green Power Marketing Development Group (GPMDG)**.

8.2 Case Study: Pfizer

8.2.1 Background

Founded in 1849, Pfizer discovers, develops, manufactures, and markets leading prescription medicines for humans and animals. After having completed a recent expansion with Pharmacia Inc., Pfizer is now the world's largest research-based pharmaceutical company. It boasts 122,000 employees and 2003 revenues of \$45.2 billion worldwide. The company has three business components -- health care, animal health and consumer health care -- and its products are available in more than 150 countries.

8.2.2 Climate Change Targets

Despite the fact that energy is responsible for less than 1% of Pfizer's overall operating costs, the company has a long-standing commitment to implementing energy efficiency measures and reducing the environmental footprint of its operations. Since 1993, for example, Pfizer has implemented an overall Environment Health and Safety guideline that applies to all of the company's manufacturing, research and development, large offices, and distribution centers worldwide.¹⁶⁵ This document sets benchmarks and performance standards for reducing greenhouse gas emissions. Pfizer's overall corporate goal is an intensity target. **Pfizer plans to reduce greenhouse gas emissions by 35% per dollar of revenue from 2000-2007.**

The company believes that the entire economic impact of its greenhouse gas reduction strategies on the corporate bottom line will be minimal. It expects some cost increases associated with energy supply constraints, higher taxes, and environmental costs associated with fuel switching. However, the company prefers to view higher costs as demand side opportunities to advance efficiency measures such as cogeneration projects. The company's balance sheets reflect this philosophy.

Pfizer strives to conserve energy through the reduction of its waste stream. Local U.S. pharmacies return unused prescriptions to the manufacturer for incineration at EPA-licensed facilities. Pfizer does not measure greenhouse gas emissions associated with this type of waste disposal, however, when it participates in the carbon disclosure activities outlined below.

As a multinational corporation, it is worth noting that Pfizer has facilities in 20 countries that have adopted the Kyoto Protocol and that the company is committed to meet the emissions reductions for those jurisdictions as mandated by the respective national governments.

In the first quarter of 2003, Pfizer decided on its 35% intensity target for 2007. The goals will be achieved almost entirely by the reduction of CO₂, Pfizer's only significant greenhouse gas. Pfizer's emissions are associated with the direct and indirect combustion of fossil fuels

¹⁶⁵ The full EHS guidelines are available at <http://www.pfizer.com/ehs/performance4a.html>

worldwide. The most significant obstacles toward the achievement of its goals are: the size of the North American and European sales car fleet, which consist of over 25,000 cars; and the recent corporate acquisition of Pharmacia Inc., which owned many facilities that were not as energy efficient as Pfizer's. Energy audits are conducted at least ever two years by Pfizer's corporate energy officer to ensure that the company has reached its goals.

8.2.3 Specific Programs for Addressing Greenhouse Gas Emissions

In addition to being a participant in EPA's Climate Leaders program, Pfizer has recently signed on to the pilot **Carbon Management Program (CMP)**, which aims to reduce the firm's CO₂ emissions. By integrating the growing implications of climate change into the company's day-to-day business practices, the Carbon Management Program seeks to help companies develop practical solutions to significantly reduce their emissions. The CMP pilot program offers advice, guidance, and analytical tools designed to help its members reduce carbon emissions through increased energy efficiency and resource productivity.

This program builds upon the Carbon Trust's existing **Carbon Disclosure Project (CDP)**.¹⁶⁶ Under the CDP, letters were sent to the 500 largest companies in the world in both May 2002 and November 2003, asking for the disclosure of investment-relevant information concerning their greenhouse gas emissions.¹⁶⁷ Pfizer's participation in the CDP is one of the ways in which it has moved toward greater transparency in its greenhouse gas reduction policy.

8.2.4 Achievements

Eight of Pfizer's research and manufacturing sites have installed cogeneration facilities. Cogeneration, the process of generating electrical power and thermal energy at the same time while using only one source of energy, is not applicable at all facilities, however.

While Pfizer claims to have prevented 322,000 metric tons of emissions from 1999-2000, actual CO₂ emissions increased from 1,568,000 metric tons in 1999 to 1,711,000 metric tons in 2001. Simultaneously, though, the amount of CO₂ emissions avoided through the use of cogeneration increased from 87,000 metric tons in 1999 to 174,000 metric tons in 2001.¹⁶⁸

8.2.5 Economics of Cutting Emissions

In general, Pfizer supports market-based solutions to environmental issues, and is committed to supporting new market mechanisms, such as the trading of pollution credits. However, absent the establishment of a formal market, the company believes that it is premature to engage in emissions trading, and in fact, views trading as unnecessary. Pfizer's reduction strategy commits it to achieving its goal through "in-house" energy saving projects or through the purchase of green power. The company will purchase credits from other companies only as a last resort.¹⁶⁹

¹⁶⁶ The Carbon Trust is a private company based in the UK that helps business and the public sector cut carbon emissions and capture the commercial potential of low carbon technologies.

¹⁶⁷ The responses to CDP 2002 and a report based on them are available for download, free of charge, from this web site. The report is also available in Japanese.

¹⁶⁸ www.pfizer.com

¹⁶⁹ *Ibid*

8.2.6 Views on Federal and State Policy Options

Energy constitutes such a low percentage of pharmaceutical companies' overall costs that they feel they can adjust to whatever regulations they are likely to encounter. Thus, unlike the electric power sector, regulatory policy has little effect on operations or siting decisions in this industry. In fact, according to one company official, energy costs currently have no effect on capital project planning.¹⁷⁰ Pfizer, for example, has a carbon emissions level of only 2.8 million metric tons per year. If the emissions trading market valued carbon emissions at \$10 per metric ton (a high estimate), it would only take \$28 million dollars of its projected \$50 billion in annual revenue for Pfizer to buy its way out of its entire emissions problem.¹⁷¹ Consequently, because these issues do not have much effect on the bottom line, Pfizer, like other companies, has not shown a preference toward any particular regulatory approach. Likewise, PhRMA does not have an official position of any kind on greenhouse gas reductions in general and has therefore not indicated any preferences related to state versus federal policies.

8.2.7 Outlook

Like other companies in this sector, Pfizer believes in a carbon-constrained future. In the words of one official, pharmaceutical companies have taken a relatively progressive stance in the area of greenhouse gas reductions because improving people's health is the central idea of their industry. Taking the lead on climate change is one way that companies within this sector can promote this positive, health-related message. Therefore, pharmaceutical companies are likely to maintain their relatively progressive position on carbon emissions reductions without becoming overly active in the particulars of the regulatory debate. The industry hopes that the voluntary greenhouse gas emission targets its members establish will form a basis for any future mandatory regulations envisioned by policymakers. Pfizer, in particular, would like to see its voluntary targets incorporated into a potential cap-and-trade system with "soft" emissions limits enacted at the state or federal level.

¹⁷⁰ Interview with Al Forte, Assistant Director for Energy, Pfizer Co, June 2, 2004.

¹⁷¹ *Ibid*

9.0 CONCLUSIONS

While the approaches of the aluminum, chemical, electric power, paper products and forestry, and pharmaceutical sectors in addressing greenhouse gas emissions vary considerably, most of the companies surveyed have exhibited at least some leadership in emissions reductions. **It is noteworthy that while all of the companies preferred voluntary measures over mandatory measures, no companies rejected the need to reduce greenhouse gas emissions out of hand.**

From our survey, some trends emerged and some overall conclusions can be drawn:

- All of the companies surveyed believe that the future will be carbon-constrained;
- Companies prefer voluntary measures over regulation;
- Most companies are not supportive of the Kyoto Protocol due to factors such as its targets and timetables, and the non-inclusion of large emitters such as India and China, but they also feel that the U.S. will ultimately become part of an international solution to the problem;
- Companies have not let uncertainty surrounding the Kyoto Protocol and possible mandatory federal regulations prevent them from taking actions to reduce emissions independently or in conjunction with voluntary federal programs;
- Companies are finding that they must adjust their operations to satisfy an increasing number of state-level regulations. The economic implications of this trend vary considerably from sector to sector;
- Every company surveyed is measuring its net greenhouse gas emissions and establishing internal emissions reduction and/or efficiency targets;
- Many energy-consuming companies have not found reaching their voluntary emissions reductions goals to be financially burdensome. In fact, in most cases, these companies have found that increased energy efficiency and conservation measures have generated higher profits. Energy producing companies, on the other hand, describe a more mixed economic picture. These companies have identified both risk and economic opportunities in climate change mitigation, especially in a regulatory environment;
- Companies in the manufacturing sector are having a relatively easy time reaching their declared emissions reduction targets. Companies in the electric power sector, however, are still in the process of making reductions and thus have not yet identified results. In the 1990s, some utilities made relatively good progress in reducing the rate of GHG emissions, while net emissions continued to grow;
- All companies surveyed in this report participated in at least one major voluntary program such as Climate Leaders, Climate Vision, and Power Partners;
- Companies are generally concerned that a lack of regulatory certainty over a significant time horizon will begin to impact significantly on capital investment decisions;
- American-based multinational corporations are more concerned with reducing emissions than companies that operate exclusively in the U.S.;
- Emissions trading allocation systems are a problem in the utilities sector. Power companies disagree on the allowance allocation method that should be implemented as part of a national CO₂ cap-and-trade emissions program. Those utilities that rely heavily on coal support a system in which allowances would be allocated according to the companies' relative CO₂ emissions in a baseline year, while those companies using cleaner fuels such as natural gas, nuclear and renewables prefer a methodology in which

carbon allowances are distributed to all types of power plants based on total electric output, regardless of their historic emissions;

- Shareholder movements demanding a more progressive response to climate change have become a factor in the energy producing sector, especially in the oil industry; and
- The insurance industry is playing an increasingly critical role in managing and reducing environmental risks such as those related to climate change. The industry's techniques for understanding uncertainty, identifying and quantifying risk, and responding to risk are key tools for managing climate change. For example, the work of the insurance sector is crucial for the functioning of an efficient emissions trading system.

Finally, at this time, regulatory uncertainty is an issue in U.S. climate change politics. We have found that companies are apprehensive about the patchwork of regulations that is developing on the state level and hope that national or global level policy may present the solution. In the absence of federal regulations, at least 28 state governments have enacted or are pursuing carbon emissions reduction measures. We have also found that corporations have been slow to shift their policies in response to these regulations in general. Time will tell whether these state-level policies will prompt U.S. companies to adopt more aggressive GHG emission reduction programs. It is worth noting though, as mentioned earlier, that shareholder movements demanding a more progressive response to climate change have become a factor in the energy producing sector, especially in the oil industry. The insurance industry is also playing an increasingly critical role in the evolution of corporate climate change policies. Of course, the outcome of the upcoming Presidential election in November could have the most significant implications for possible new regulations.

APPENDIX 1 – Climate Change Programs and Coalitions

Pew Center on Global Climate Change – Business Environmental Leadership Council

Established by the Pew Center on Global Climate Change, the Business Environmental Leadership Council (BELC) “is a group of leading companies worldwide that are responding to the challenges posed by climate change.”

The 38 members of the Council believe that:

- Businesses can and should take concrete steps now in the U.S and abroad to assess opportunities for emission reductions, establish and meet emission reduction objectives, and invest in new, more efficient products, practices and technologies; and
- The Kyoto agreement represents a first step in the international process, but more must be done both to implement the market-based mechanisms that were adopted in principle in Kyoto and to more fully involve the rest of the world in the solution.

Among other activities, member companies “establish and meet emissions reduction objectives; invest in new, more efficient products, practices, and technologies; and support action to achieve cost-effective emissions reductions.”¹⁷²

World Business Council for Sustainable Development (WBCSD)

The World Business Council for Sustainable Development (WBCSD) is a coalition of 170 international companies from 20 major industrial sectors that are “united by a shared commitment to sustainable development via... economic growth, ecological balance and social progress.” Seeking to “provide business leadership as a catalyst for change toward sustainable development, and to promote the role of eco-efficiency, innovation and corporate social responsibility, the Group created an Energy and Climate project. That project has “worked to develop innovative ways for business to address global warming within a sustainable development framework.” The Council has worked with several governmental and nongovernmental international organizations. For example, in 1999, in collaboration with the United Nations Conference on Trade and Development, the WBCSD helped found the International Emissions Trading Association, which was intended to “work on establishing effective international market-based trading systems for greenhouse gas emissions.”

The Council predicts for the next decade, “business will operate within two sets of greenhouse gas schemes: a mandatory approach in some industrial countries that will implement the Kyoto Protocol – regardless of whether or not it enters into force – and voluntary or national schemes in other countries.” Accordingly, WBCSD suggests that business should:

- Focus on energy efficiency in the short term and sequestration in the medium term, and begin work on long-term solutions, cleaner fuels and alternative energy sources;
- Create a stronger business consensus (backed up by scientific evidence); and

¹⁷² www.pewclimate.org/companies_leading_the_way_belc/

- Find a way to connect with the Intergovernmental Panel on Climate Change.¹⁷³

The GHG Protocol: Corporate Accounting and Reporting Standard

The Protocol is designed:

to set the standard for accurate, complete, consistent, relevant and transparent accounting and reporting of GHG emissions by companies and organizations, including information on setting organizational and operational boundaries, tracking emissions over time, and reporting emissions. It also provides guidance on GHG accounting and reporting principles, business goals and inventory design, managing inventory quality, accounting for GHG reductions, verification of GHG emissions, and setting a GHG target.¹⁷⁴

Green Power Market Development Group

These companies involved in the GPMDG own 250 facilities in 22 states; the group offers a wide range of technologies from solar to landfill gas, wind farms and a green power credit system. The Group's goal is "to develop corporate markets for 1,000 MW of new, cost-competitive green power by 2010."

More specifically, GPMDG aims to:

- Develop strategies to reduce green power costs by using innovative purchasing options, by reducing transaction costs for companies, and by gaining economies of scale through working as a group;
- Reduce market barriers faced by green power suppliers and buyers by providing independent information to potential customers; and
- Define the business case for buying green energy products by recognizing the value of renewable energy to diversify energy portfolios.¹⁷⁵

The WRI newsletter discusses RECs in detail, stating that "when applying the reduced emissions against total corporate GHG emissions, the buyer has to retire the REC (i.e., the REC cannot be sold again.) Additionally,

To be in a position to fully utilize RECs as emissions offsets, companies that purchase RECs should ensure that a credible method has been used to quantify the associated CO₂ reductions and demonstrate additionality. The resulting information can then be included in the purchasing organization's GHG emissions inventory as a purchased project reduction or credit as recommended by the Greenhouse Gas Protocol Initiative.

¹⁷³ www.wbcsd.ch/templates/TemplateWBCSD1/layout.asp?type=p&MenuId=NjA&doOpen=1&ClickMenu=LeftMenu

¹⁷⁴ The revised edition of the standard can be found at:

www.ghgprotocol.org/standard/GHGProtocolCorporateStandard_RevisedEdition.pdf

¹⁷⁵ www.thegreenpowergroup.org/aboutus.html

Given the relatively early stage of development of the REC marketplace, WRI and its GPMDG partners noted several challenges that exist, and offered recommendations for addressing those challenges. For example, the group recommended establishing “clear rules regarding ownership of environmental attributes.” Addressing a concern that two or more market participants might claim ownership to the same avoided emissions, the partners recommended that,

As GHG emissions trading programs develop, designers should ensure that the market “rules” guarantee that the purchaser of a REC has sole title to the environmental attributes represented by the certificate and that generators cannot claim title to these attributes once they sell the REC.

The group also recommended developing a standard accounting protocol for calculating avoided emissions for RECs. Noting that REC suppliers are currently using widely different methodologies and data to calculate avoided emissions, which in turn leads to widely different avoided estimates, the group concluded that the lack of consistency could lead to uncertainty about the amount of reduced emissions represented by a REC. Consequently, WRI and its partners observed that companies that purchase RECs “may find it difficult to incorporate the offset in its emissions inventory, determine the cost of the offset, . . . and thus understand how the cost compares to other offset or reduction opportunities.” Accordingly, as already noted, the group called for a standard accounting protocol – “a commonly accepted methodology for estimating the amount of avoided emissions represented by each REC. . . . Such a methodology should be consistent with existing and emerging corporate emissions accounting approaches such as the GHG Protocol Initiative.”

Finally, the group discussed “opportunities” that policymakers and market participants could pursue to accelerate REC market development and further increase the attractiveness of RECs to corporate customers. One such opportunity is to “ensure a role for RECs in emissions markets.” As stated by the group,

The business case for corporations to buy RECs would be strengthened if regulatory agencies were to formally recognize the avoided emissions represented by certificates. Specifically, purchasers of RECs would realize additional value if they could use these avoided emissions as a credit against their emissions footprint.

The group specifically talks of the promise of future GHG emissions markets in this regard:

As GHG markets develop for the United States as a whole, for a region, or for selected states, **RECs purchased by companies should be formally recognized as a GHG emissions offset capable of helping buyers meet their GHG emissions targets. In a GHG emissions market, RECS could become an attractive mechanism to offset emissions, particularly by displacing CO₂ emissions at relatively low cost.**¹⁷⁶

¹⁷⁶ Hanson and Van Son, September 2003

Climate Leaders

Partners in the Climate Leaders program:

- Set an aggressive corporate wide-greenhouse gas emissions reduction goal to be achieved in ten years;
- Perform a complex-wide emissions inventory for (CO₂, CH₄, N₂O, HFCs, PFCs and SF₆); and
- Submit an annual report detailing progress toward its reduction goals to the EPA.

Each company will determine its inventory by using the program's GHG Emissions Inventory Guidance based on the World Resources Institute/World Business Council for Sustainable Development's GHG Protocol. The EPA independently verifies all data and evaluates a company's progress against its reduction target. In return, the EPA offers technical assistance to complete an inventory and develop an inventory management plan, and opportunities for positive publicity.¹⁷⁷

Climate VISION

Through this initiative, the Bush Administration is encouraging industries "to take voluntary action using available, cost-effective technologies and best practices to reduce GHG emissions intensity..." Additionally, the plan includes "a major joint effort by industry and government to develop advanced technologies, commercialize them and use them commercially across the economy to increase energy efficiency and reduce, avoid, or sequester GHG emissions." Industry sectors represented include: oil and gas production, transportation, and refining; electricity generation; coal and mineral production and mining; manufacturing (including aluminum); railroads and forestry products.¹⁷⁸

Chicago Climate Exchange (CCX)

CCX represents the first voluntary, legally-binding commitment by a cross-section of North American corporations, municipalities and other institutions to establish a rules-based market for reducing greenhouse gases.¹⁷⁹ CCX currently has 22 founding and charter members, including the City of Chicago, American Electric Power, Ford Motor Company and DuPont.

In particular, the Exchange seeks a market-based emission reduction program "that is flexible, has low transaction costs, is environmentally rigorous and rewards environmental innovation." Trading of allowances and offsets began in December 2003. The initial categories of eligible offset project categories are:

- Landfill methane destruction in the United States;
- Agricultural methane destruction in the United States;
- Carbon sequestration in U.S. forestry projects;

¹⁷⁷ www.epa.gov/climateleaders/overview.html

¹⁷⁸ www.climatevision.gov/mission.html

¹⁷⁹ www.chicagoclimateexchange.com/

- Carbon sequestration in U.S. agricultural soils; and
- Fuel switching, landfill methane destruction¹⁸⁰

Business Roundtable (BRT) Climate RESOLVE Initiative

In general, the Business Roundtable “focuses on issues it believes will have an affect on the economic well-being of the nation.”¹⁸¹ One of those issues if global climate change.

Accordingly, in February 2003, the BRT launched an initiative to voluntarily reduce the GHG emissions of its member companies. Dubbed Climate RESOLVE (Responsible Environmental Steps, Opportunities to Lead by Voluntary Efforts), the initiative is intended to encourage BRT members to report their GHG management efforts to DOE. Additionally, BRT provides its member companies with “support and tools to effectively manage greenhouse gas emissions. The BRT will assist companies through workshops, one-on-one consulting support, an implementation workbook and examples of cost-effective options to reduce, avoid, offset, and sequester greenhouse gas emissions.”

The key element of the initiative for these member companies, of course, is its voluntary measure. As the CEO of American Electric Power (and chairman of the BRT’s Environment, Technology and the Economy Task Force) stated during the unveiling of the Initiative, Climate RESOLVE “will show that voluntary actions can deliver solid results without government mandates and rigid compliance timetables.”¹⁸² Contending that “developing and deploying breakthrough technologies without undermining the competitiveness of our economy,” is the best way for addressing global climate change, The BRT believes that “voluntary programs represent the best approach for controlling GHG emissions. These programs will deliver results at less cost than mandatory approaches and will simultaneously foster innovation and investment in new technologies.” In fact, the BRT argues that “strong and sustained support for voluntary action **is the best way to avoid undesirable mandatory GHG controls**. Reflecting this voluntary nature and the fact that each member company is different, the Initiative does not set specific emission targets to be met.”¹⁸³

Significantly, in a letter to Senate leaders in June 2003, while promoting voluntary private sector initiatives (such as its own Climate RESOLVE), the BRT noted its **staunch opposition to mandatory measures**. Speaking of legislation that was pending at the time, the group wrote that it

...opposes amendments to the energy bill that would place emission caps or other mandatory controls on some or all sectors of the economy. These requirements could result in major dislocations in energy supply that reduce fuel diversity and increase

¹⁸⁰ www.chicagoclimateexchange.com/about/program.html

¹⁸¹ The Roundtable is “an association of chief executive officers of leading corporations with a combined workforce of more than 10 million employees in the United States.” Accordingly, the Roundtable “is committed to advocating public policies that ensure vigorous economic growth, a dynamic global economy,” and a well-trained and productive workforce. <http://www.brtable.org/aboutUs/index.html>

¹⁸² www.brtable.org/taskForces/taskforce/document.aspx?qs=6D15BF159FF49514481138A74EA1851159169FEB56E36B2

¹⁸³ www.brtable.org/pdf/ClimateRESOLVE/ClimateRESOLVETwo-PageSummary.pdf

energy costs. In this event, U.S. economic growth and the competitiveness of U.S. industry would be threatened. Unwarranted GHG controls could also limit flexibility and innovation, create bureaucracy and increase the costs of managing GHG emissions.¹⁸⁴

Industries of the Future

Industries of the Future is a R&D partnership program that DOE has launched with nine industries to maximize its technology investments. Operating within DOE's Office of Energy Efficiency and Renewable Energy, and more specifically under that Office's Industrial Technologies Program (ITP), Industries of the Future consists of collaborative R&D partnerships with nine industries: agriculture, aluminum, chemicals, forest products, glass, metal casting, mining, petroleum, and steel. Each of the nine industries uses a large amount of heat and energy "to physically or chemically transform materials." Combined, the nine industries supply 90% of the materials needed in the U.S. economy, produce \$1 trillion in annual shipments, employ more than 3 million people, and indirectly provide an additional 12 million jobs.

More than 500 R&D projects are currently being conducted. Cumulatively, it is estimated that ITP's projects have saved more than 1.6 quadrillion Btu – worth approximately \$6.5 billion.¹⁸⁵

¹⁸⁴ BRT Letter to Senate Majority Leader Frist and Senate Minority Leader Daschle, June 4, 2003. The text of the letter can be found at: <http://www.businessroundtable.org/pdf/940.pdf>

¹⁸⁵ www.oit.doe.gov/industries.shtml

**APPENDIX 2 – Actions of Profiled Companies to Address GHG Emissions,
and Perspectives on Policy**

Companies	Actions to Address GHG Emissions & Perspectives on Policy
<p>American Electric Power (AEP)</p>	<ul style="list-style-type: none"> ➤ Voluntary Climate Change Target <ul style="list-style-type: none"> ○ 10 % reduction in GHG emissions based on 1998-2001 levels from 2003-2006: 1% in 2003, 2% in 2004, 3% in 2005, and 4% in 2006. ○ Plans to commit to a new target for the post-2006 period. ➤ GHG Emissions Trading <ul style="list-style-type: none"> ○ Founding member and participant of the Chicago Climate Exchange (CCX). ➤ Achievements <ul style="list-style-type: none"> ○ GHG Reductions: 23.2 million tons of CO₂ emissions during the 1991-2002 period. ○ Renewables: AEP is the second largest generator of renewables. ○ CO₂ Sequestration: Invested more than \$25 million to enhance carbon sinks such as forests and soils, and to develop technologies to capture CO₂ emissions and sequester carbon. ○ Clean Coal Technology: AEP has planned to built the largest power plant using clean coal technology known as “integrated gasification combined cycle,” or IGCC, technology during the next five years. AEP also supports the Bush Administration’s FutureGen Initiative, which seeks to create a near zero-emission power plant and hydrogen production facility with integrated carbon dioxide management. ➤ Corporate Perspective on Policy <ul style="list-style-type: none"> ○ International Perspective: Do not support Kyoto Protocol ○ Federal Perspective: <ul style="list-style-type: none"> ▪ State and regional GHG regulations currently developing in the U.S. are impractical; the problem must be dealt with on a global scale. ▪ U.S. will eventually be subject to a mandatory GHG reduction program. ▪ Mandatory program should be flexible, include emissions trading and energy efficiency components, implement reasonable timetables and targets, include all industry sectors, and address all pollutants. ▪ U.S. should do this in concert with a global GHG reduction strategy that includes major carbon emitters and trading partners with the U.S. such as China, Mexico, South Korea, Brazil and India. ▪ U.S. should provide public policy incentives such as extending tax credits for renewable energy and streamlining hydroelectric and nuclear power plant permitting.

	<ul style="list-style-type: none"> ➤ Economics of Reducing GHG Emissions <ul style="list-style-type: none"> ○ AEP released a report on August 31, 2004 which assesses the impacts of and potential responses to various policy scenarios, including President Bush's Clear Skies Initiative, the McCain-Lieberman cap-and-trade legislation, and the multi-pollutant bill sponsored by Senator Tom Carper (D-Delaware), and existing state legislation to limit CO₂ and other emissions. ○ The report indicates that such legislation would probably not strand AEP's planned investments of \$3.5 billion in emission control technologies by 2010, which is part of an overall \$5 billion planned investment by the year 2020. However, the report does note, that this proposed legislation could materially alter the amount and manner of the anticipated \$1.5 billion in additional investments after 2010.
Alcoa	<ul style="list-style-type: none"> ➤ Voluntary Climate Change Target <ul style="list-style-type: none"> ○ 25% reduction in GHG emissions by 2010. ➤ GHG Emissions Trading <ul style="list-style-type: none"> ○ Supports an efficient, global, and comprehensive emissions trading regime that utilizes initial allocation procedures based on 1990 levels. ➤ Achievements <ul style="list-style-type: none"> ○ Achievement of 25% GHG reduction goal in 2003. ○ The company has reduced perfluorocarbon (PFC) gas emissions by 54% from 1990 to 2000. (The company has since adopted a new goal of reducing PFC emissions 27% from the levels achieved in 2000 by 2005). ○ Signed a framework agreement with the Quebec government which aimed to reduce, on a voluntary basis, greenhouse gas emissions from their Quebec-based facilities by approximately 200,000 tons by the end of 2007. ○ Improvements in energy efficiency. ○ International GHG reductions. ○ Development of efficient transportation. ➤ Corporate Perspective on Policy <ul style="list-style-type: none"> ○ International Perspective: Alcoa prefers a global approach to reducing GHG emissions rather than a national one. ○ National Perspective: <ul style="list-style-type: none"> ▪ Supported McCain-Lieberman cap-and-trade legislation to establish a cap-and-trade system for GHG emissions, including carbon. ▪ Alcoa prefers the following features for a cap-and-trade system that will be economically-viable: <ol style="list-style-type: none"> 1. Initial free allocation of emission credits to affected parties should be 85% of the total allowances that the source needs in given year; 2. Allocation levels should be modified to ensure that the goals of the cap-and-trade act are achieved in

	<p>the least economically disruptive manner possible;</p> <ol style="list-style-type: none"> 3. Early action should be incorporated into this system; 4. Inclusion of all six GHGs; and 5. Establishment of national GHG database and registry in support of the cap and trade system. <p>➤ Economics of Reducing GHG Emissions</p> <ul style="list-style-type: none"> ○ Through its Energy Efficiency Network, Alcoa has identified energy savings opportunities equivalent to more than \$59 million, and has captured over \$16 million per year in these energy savings to date. ○ Alcoa expects more than \$50 million in annual energy cost reductions by 2007 due to efficiency upgrades.
DuPont	<p>➤ Voluntary Climate Change Target</p> <ul style="list-style-type: none"> ○ DuPont intends to meet what they refer to as a “goal of zero;” meaning a goal of zero injuries, illnesses, incidents, wastes and emissions, by 2010. ○ Plans to achieve climate change goal by 2010: <ul style="list-style-type: none"> ▪ Achieve a 65% reduction in CO₂-equivalent greenhouse gas emissions from global operations versus a 1990 base by 2010; ▪ Hold energy use flat using a 1990 baseline; ▪ Obtain 10 percent of energy from renewable resources by 2010 (at a cost competitive with fossil fuels); and ▪ Ensure that 25% of manufactured goods are produced from non-depletable feedstock. <p>➤ GHG Emissions Trading</p> <ul style="list-style-type: none"> ○ DuPont supports emissions trading to reduce its carbon production. ○ DuPont has worked with Entergy and other companies in pilot emissions trading systems and has completed small trades in other countries, including the U.K. and Canada. <p>➤ Achievements</p> <ul style="list-style-type: none"> ○ 1990’s: DuPont held energy use flat despite a 36% increase in production volume. ○ 2001: DuPont had exceeded its goal of a 65% reduction in GHG emissions. ○ 2002: Energy efficiency measures led to a reduction of 5 million metric tons of carbon emissions, largely a result of product portfolio changes, cogeneration, yield improvements, capacity utilization, increases in the reliability of manufacturing processes, and conservation measures. ○ Chinese adopted environmental practices used by DuPont during the construction of the Lycra facility in Shanghai as standard procedures for further construction. <p>➤ Corporate Perspective on Policy</p> <ul style="list-style-type: none"> ○ International Perspective: Supports the Kyoto Protocol

	<ul style="list-style-type: none"> ○ National Perspective: <ul style="list-style-type: none"> ▪ No clear position on cap-and-trade, but viewed the McCain-Lieberman legislation as going in the right direction because it is market-based, the emissions caps are tailored to each industrial sector, and it would help force the development of new sustainable technologies if the U.S. became a carbon-constrained environment. ▪ DuPont favors a national RPS and has implemented this measure as an internal corporate policy. Currently, most of its renewable energy comes from hydropower. DuPont is also exploring landfill gas and direct thermal options. ➤ Economics of Reducing GHG Emission <ul style="list-style-type: none"> ○ DuPont believes emissions trading will be financially rewarding. ○ Asset Productivity Team (APT): Searches for emission reduction or energy efficiency projects whose internal rates of return (IRR) are high enough to warrant the investment. In 2002, seven DuPont business units submitted 16 major projects for review. Implementation of only the most efficient projects allows the company to achieve 80% of potential reductions for 20% of the cost of all of the proposed projects within the company. ○ One key goal is the company's intention to send a market signal to producers of renewable energy that at least one major customer exists. ○ DuPont is trying to apply efficiency standards in its manufacturing complex to make up for costs associated with high gas prices, which would be a win-win scenario for DuPont from a financial perspective.
Entergy	<ul style="list-style-type: none"> ➤ Voluntary Climate Change Target <ul style="list-style-type: none"> ○ Stabilization of CO₂ emissions at 2000 levels (equivalent to 53.4 million tons of CO₂ in reductions) through 2005. ○ Entergy committed to adopt a new target by the end of 2004. ➤ GHG Emissions Trading <ul style="list-style-type: none"> ○ Entergy uses emissions trading to achieve reductions in GHG emissions cost-effectively. ○ In 2002, Entergy agreed to move forward with a demonstration GHG emissions trade with fellow PCA partner, DuPont. The trade was seen as an opportunity to: <ul style="list-style-type: none"> ▪ Take advantage of the surplus carbon reductions achieved by DuPont to meet its 1990 target in order to assist Entergy in accomplishing its 2000 stabilization goal; and ▪ Explore certain GHG emissions trading-related issues of interest to PCA and its members (issues such as the quantification and verification of reductions, GHG targets and baseline inconsistencies between the trading parties). ○ Entergy has also engaged in international emissions trading. Entergy has worked with the largest Danish electricity supplier, Elsam, to conduct the first international trade in CO₂ allowances under the Danish climate change program.

	<ul style="list-style-type: none"> ➤ Achievements <ul style="list-style-type: none"> ○ During the 1990s, Entergy exceeded its Climate Challenge goal of reducing its CO₂ emissions by 27 million tons by 10%, achieving one of the lowest CO₂ intensity rates compared with other electric companies. ○ Since 2001, Entergy has managed to reduce its CO₂ emissions by 18%: CO₂ emissions decreased from 53.2 million tons in 2000 to 49.5 million tons in 2001, to 44.2 million tons in 2002 and to 36.8 million tons in 2003. ○ In September 2003, Entergy was named to the Dow Jones Sustainability Index (DJSI) for the second year in a row. Entergy scored highest overall in the areas of environmental reporting and climate strategy. ➤ Corporate Perspective on Policy <ul style="list-style-type: none"> ○ International Perspective: Entergy works for and supports federal multi-pollutant legislation to reduce air pollutant emissions, including emissions of CO₂. ○ As a participant in the Clean Energy Group (CEG), Entergy has supported Senator Tom Carper’s competing proposal to the Clear Skies Initiative. Senator Tom Carper’s proposal is a multi-pollutant bill which would reduce emissions, including CO₂, to 2001 levels by 2013. ➤ Economics of Reducing GHG Emissions <ul style="list-style-type: none"> ○ Entergy believes that it is very well positioned to both manage the risks and take advantage of the business opportunities that could result from assuming a proactive stance on climate change. Three factors determine this philosophy: Entergy’s leadership on climate change; its investments in clean fuel assets such as nuclear and natural gas; and the strategic environmental initiatives the company has undertaken. ○ Entergy has claimed that the nuclear industry’s operations have helped avoid substantial GHG emissions, worth \$7 billion in 1998. Entergy holds that as a primary nuclear generator it will be able to benefit economically from nuclear energy’s “zero-emissions” benefits if there is a mandatory GHG cap-and-trade system in place that distributes emission permits based on total power generation. ○ Entergy also recognizes that there might be a long-term business opportunity in generating electricity from low and non-emitting sources, since this can be an effective method for customers to reduce their direct GHG emissions.
<p>Florida Power & Light (FPL)</p>	<ul style="list-style-type: none"> ➤ Voluntary Climate Change Target <ul style="list-style-type: none"> ○ 18% reduction in GHG emissions based on 2001 levels between 2003 and 2008. ➤ GHG Emissions Trading <ul style="list-style-type: none"> ○ FPL has not participated thus far in existing carbon trading programs. ➤ Achievements <ul style="list-style-type: none"> ○ In 2000 FPL met its goal of 11 million tons of CO₂ reduction goal pledged under Climate Challenge, and is currently making good progress to 18% reduction target;

	<ul style="list-style-type: none"> ○ Has one of lowest rates of GHG emissions among utilities in Florida and in the U.S.; ○ Leads the nation in wind generation and owns and operates the largest solar field in the world; and ○ Development of successful energy conservation programs, which FPL claims have helped cut electricity demand by the equivalent of 10 medium-sized power plants. <p>➤ Corporate Perspective on Policy</p> <ul style="list-style-type: none"> ○ National Perspective: <ul style="list-style-type: none"> ▪ FPL supports the implementation of a national cap-and-trade program for reducing CO₂ emissions. ▪ FPL prefers an allowance allocation system based on electrical output rather than an emissions baseline. ▪ FPL holds that a mandatory CO₂ cap-and-trade scheme should be a component of a multi-pollutant (NO_x, SO₂, Hg and CO₂) reduction legislative plan. ▪ FPL does not support McCain-Lieberman cap-and-trade legislation or the Bush Administration's Clear Skies Act. FPL rejects the McCain-Lieberman act because it does not provide a plan for the allocation of allowances. <p>➤ Economics of Reducing GHG Emissions</p> <ul style="list-style-type: none"> ○ FPL has historically been very well-positioned with regard to GHG emissions risks. ○ FPL has communicated emissions data and goals to its shareholders and investment analysts through its 10-K and 10-Q financial reports, and its Annual Report.
<p>International Paper (IP)</p>	<p>➤ Voluntary Climate Change Target</p> <ul style="list-style-type: none"> ○ Reduction of absolute GHG emissions by 15% by the year 2010 from a year 2000 baseline. <p>➤ GHG Emissions Trading</p> <ul style="list-style-type: none"> ○ IP is the first paper and forest products company to be a founding member and participant in the CCX. ○ Supports using emissions trading to reduce its carbon production. <p>➤ Achievements</p> <ul style="list-style-type: none"> ○ By end of 2000, IP's subsidiary Weldwood of Canada, Ltd. had reduced its total direct emissions of greenhouse gases by 4.1 percent, despite increased product output during the decade; ○ IP's 6 European mills are preparing to meet the Kyoto Protocol's emission reduction goals; ○ In 2001, IP joined DOE's Combined Heat and Power Partnership, a voluntary group whose members are committed to reducing environmental effects of electricity and power generation. <p>➤ Corporate Perspective on Policy</p> <ul style="list-style-type: none"> ○ International Perspective: IP supports the development of international trading programs for GHG emissions and carbon sequestration credits. These trading programs should:

	<ul style="list-style-type: none"> - Use inventories based on verifiable accounting methods, - Allow for flexibility in trading within and across company and national boundaries, and - Allow for maximum use of carbon sequestration credits. <ul style="list-style-type: none"> ○ National Perspective: IP did not provide the company’s position on McCain-Lieberman or other legislation. <ul style="list-style-type: none"> ➤ Economics of Reducing GHG Emissions <ul style="list-style-type: none"> ○ The energy efficiency improvements being pursued by both IP specifically and the industry as a whole (represented by the American Forest and Paper Association (AFPA)) should lead to not only reduced emissions, but also substantial costs savings. ○ IP has also implemented waste recovery and recycling measures, which both help meet environmental goals and increase profitability by broadening the industry’s raw materials base.
Pfizer	<ul style="list-style-type: none"> ➤ Voluntary Climate Change Target <ul style="list-style-type: none"> ○ Reduction of GHG emissions by 35% per dollar of revenue from 2000-2007. ➤ GHG Emissions Trading <ul style="list-style-type: none"> ○ As low GHG emitters, Pfizer and the pharmaceutical industry view emissions trading as unnecessary: Although Pfizer favors emissions trading; absent the establishment of a formal market, the company believes that it is premature to engage in emissions trading. ○ Pfizer will only purchase credits from other companies as a last resort. ➤ Achievements <ul style="list-style-type: none"> ○ Eight of Pfizer’s research and manufacturing sites have installed cogeneration facilities. ○ Amount of CO₂ emissions avoided through the use of cogeneration increased from 87,000 metric tons in 1999 to 174,000 metric tons in 2001. ➤ Corporate Perspective on Policy <ul style="list-style-type: none"> ○ Pfizer, as well as PhRMA (Pharmaceutical Research and Manufacturers of America), has not shown a preference toward any particular regulatory approach: Regulatory policy has little effect on operations or siting decisions in the pharmaceutical industry.