



Should Big Polluters Own the Sky?

The Distribution of Emissions Permits under
a Federal Greenhouse Gas Cap-and-Trade Program

Clean Air Watch

With a foreword by Larry J. Schweiger,
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Foreword

Who owns my grandson's future?

That question has haunted me since Thadius was born almost three years ago.

Without urgent action, global warming will, in Thadius's lifetime, visit catastrophic damage upon human communities and unfathomable harm upon the natural world. Few political leaders fully understand that we have precious little time before the planet reaches a tipping point that will trigger untamable, runaway global warming. We need to reclaim our right, and our responsibility, to protect our children from the irreversible changes we stand poised to unleash.

America emits 25 million pounds of global warming pollution into the atmosphere every minute. About 85 percent of this pollution comes from power plants, industrial sources, and the transportation fuels produced by oil companies.

Major corporate carbon emitters could reduce their carbon footprint by improving their energy productivity and by relying more on renewable forms of energy like wind, solar, geothermal and biofuels. But they have little incentive to do so, because they are not required to pay for their carbon emissions or for global warming's effects. After all, when millions of acres of drought-plagued forests and grasslands burn, nobody sends them a bill. When storm surges from rising sea levels flood neighborhoods, nobody sends them a bill. When wildlife and the natural environment that sustains it perish because of shifting climate zones, nobody sends them a bill.

Instead, that bill goes to my grandson and to my children, who will see these effects in their lifetimes.

It's time these companies started getting the bill. We need a pragmatic, market-based plan that attaches a price to carbon emissions. The price must be one that compels corporate polluters promptly to start cutting global warming pollution by at least two percent every year, and by a total of 80% within 40 years, a rate of reduction that scientist predict would allow us to avoid the most catastrophic effects of climate change.

An aggressive, scientifically based cap-and-trade program could achieve such reductions. Fortunately, dozens of responsible companies are expressing support for such a program.

But a cap-and-trade program that does not require companies to pay for carbon permits, and instead gives them away for free in perpetuity, would be fundamentally unjust. No-cost licenses to pollute would deprive the public of the resources and revenues with which to aid the economic transition to a low-pollution world, and with which to address the impacts of global warming. Consider the following:

- Low income American families, which are the least responsible for generating global warming pollution, bear the brunt of climate change's effects. We need carbon credit revenues to help address their needs. For example, implementing a system of incentives for

home weatherization would lower families' heating and cooling bills while shrinking their carbon footprint, as could subsidies to offset the sometimes high costs of purchasing energy-efficient appliances.

- Hundreds of millions of the world's poor, who live in nations unable to respond adequately to a rapidly changing planet, are already suffering from the spread of disease, floods from rising sea levels, drought, and dwindling supplies of clean water. Even if we stopped polluting altogether tomorrow to head off the worst impacts of global warming, the pollution we have already pumped into the atmosphere would perpetuate these effects. We have a moral responsibility to financially aid developing nations contending with climate change.
- Building a clean energy economy will create thousands of new jobs and require American workers dependent on the fossil fuel economy to transition into different jobs. We need to be ready to support this transition through job training and other programs that bridge the divide.
- The survival of wildlife species, and the continuation of America's cherished conservation heritage, will depend on investing in a host of mitigation, restoration and management strategies to help wildlife survive a warming planet.

Any fair and effective federal carbon emissions reduction plan will consider all of these interests. The resources to address these needs will be held in public trust by Congress, on behalf of my grandson and all of us.

We are the stewards of our children's future. Let's make sure our voices are heard.

Larry J. Schweiger
President and CEO
National Wildlife Federation

Should Big Polluters Own the Sky?

Executive Summary

As Congress debates the issue of global warming, one key issue involves how emission credits or “allowances” should be distributed under a cap-and-trade system. Simply giving allowances away to polluting companies – as Congress did with the Clean Air Act’s acid rain program – could amount to a multi-billion dollar windfall for the nation’s biggest polluters, not to mention a virtual monopoly on the combustion of fossil fuels for incumbent utilities. At stake is billions of dollars – the 10 most polluting electric power companies could collectively be awarded \$9 billion in allowances annually. The largest emitter of global warming pollution, AEP, could receive ten times the value of its SO₂ allocations under the Acid Rain Program. At the same time, low-income residents could be harmed by a system that simply hands over these windfall profits to private companies.

It seems unconscionable to reward the biggest polluters in this fashion. Why should the polluters profit from the legacy of damage they have caused? Do we really want them to own the sky?

The emissions from the power companies advocating for an approach that would guarantee these windfall profits have released pollution in the past fifty years that still remains in the atmosphere. Giving allowances for free to these polluting companies does not require them to pay for any of the potential consequences caused by their legacy of pollution including sea level rise, increased natural disasters, increased competition for water resources, and adverse health impacts from higher temperatures.

A more thoughtful approach would embody the “polluter pays” principle used in other federal statutes, including the Superfund toxic dump cleanup law with the revenues used to benefit electricity consumers – those who ultimately pay the cost of reducing CO₂ emissions. Rather than giving away these emissions rights, companies should be obligated to purchase allowances. Revenues could be invested in energy efficiency and renewable energy, help for low-income residents, worker transition assistance, protecting wildlife and other socially desirable goals.

Those who pollute the most should pay the most.

Introduction

At least ten bills have been introduced to date in the 110th Congress aimed at cutting global warming pollutants from power plants and other large industrial sources. The majority of the proposals would rely on a “cap-and-trade” regulatory system much like the program established under the Clean Air Act to address acid rain pollution.

The most critical feature of any cap-and-trade program is the stringency of the emissions cap and the timetable for ratcheting down the cap. The cap determines the total quantity of pollution that can be released to the atmosphere by regulated facilities. In the current climate change debate, many stakeholders advocate significant emission reductions – up to 25 percent below current levels by 2020 and 60 to 80 percent below current levels by 2050.

Another critical feature is the method by which the cap – in the form of allowances (each allowance entitles the holder to release 1 ton of pollution to the atmosphere) – is distributed among the power plant operators that need them to run their facilities. The basic options are to sell the allowances to industry (through an auction) or to give them away for free. Not surprisingly, many within industry advocate free allocations. Economists, however, warn of the “windfall profits” that companies would enjoy if allowances are given away for free and strongly recommend an auction approach as a more equitable approach.¹ According to the Congressional Budget Office most of the costs associated with a cap-and-trade program would be borne by consumers, and the price increases, for electricity and gasoline, for example, would be regressive because lower-income households devote a larger fraction of their household income to purchasing energy.² By auctioning allowances, rather than simply giving them away, the government generates revenue that can be used to offset these costs and to serve a broader public purpose (e.g., offsetting taxes, consumer rebates, protecting wildlife or technology research and development).

To evaluate the implications of freely distributing allowances to industry, this paper estimates the projected value of a free CO₂ allowance allocation under an electric utility sector cap-and-trade program. For illustrative purposes, this paper focuses on the top ten highest emitting companies in the electric utility sector; companies that generally advocate a free allocation approach.³

The top ten highest emitting companies in the U.S. account for approximately 29 percent of total annual U.S. electricity generation, 35 percent of CO₂ emissions, 34 percent of total annual NO_x emissions, 44 percent of SO₂ emissions, and 39 percent of mercury emissions from the electricity sector in the U.S. (See Appendix A for a list of the top ten CO₂ emitting electric utility companies and their contribution to electric sector emissions.) Collectively, the top ten emitting

¹ See, e.g., Lawrence H. Goulder, *Mitigating the Adverse Impacts of CO₂ Abatement Policies on Energy-Intensive Industries*, Resources for the Future (March 2002), available at <http://www.rff.org/rff/documents/rff-dp-02-22.pdf>; Dallas Burtraw et al., *The Effect on Asset Values of the Allocation of Carbon Dioxide Emission Allowances*, Resources for the Future, (March 2002), available at <http://www.rff.org/Documents/RFF-DP-02-15.pdf>.

² Congressional Budget Office, *Trade-Offs in Allocating Allowances for CO₂ Emissions* (April 25, 2007), available at http://www.cbo.gov/ftpdocs/80xx/doc8027/04-25-Cap_Trade.pdf.

³ See, e.g., Response from Dennis Welch, American Electric Power, to Sens. Domenici and Bingaman’s White Paper on Design Elements of a Mandatory Market-Based Greenhouse Gas Regulatory System (February 2006). In its response, AEP explained that “AEP believes strongly that a high percentage of the allowances (e.g., 95%-100%) should be allocated without cost to electric generators based on their pro rata share of historical greenhouse gas emissions.”

electric utilities emit over 900 million tons of CO₂ per year. In fact, these ten companies collectively emit more CO₂ on an annual basis than the emissions included in the European Emissions Trading Scheme in the countries of Germany, United Kingdom, and Poland combined.

Overview of Allowance Allocation Issues

How emission allowances are initially distributed has a direct effect on consumer energy costs and on the relative profitability of different types of producers.⁴ Ultimately, however, the decision as to how to distribute allowances is political.

Allowance allocations are one of the most contentious decisions in designing a cap-and-trade program, and the issue is shaping up to be a significant point of debate in Congress given the sheer quantity and financial value associated with the allowances in a CO₂ cap-and-trade program. The question is contentious precisely because allowances represent a valuable financial asset.⁵ As Senators Pete Domenici and Jeff Bingaman, then Chairman and Ranking Member of the Senate Energy and Natural Resources Committee, explained in a joint letter summarizing the common themes that emerged from their Committee's April 2006 climate change conference: "Allowances should not be allocated solely to regulated entities because such entities do not solely bear the costs of the emissions trading program." The same point is made by the bi-partisan National Commission on Energy Policy: "The economic burden imposed on a particular firm or industry sector under a greenhouse gas trading program is not a direct function of its emissions or fossil-fuel throughput.... Available analyses suggest that consumers and businesses at the end of the energy supply chain will bear the largest share of costs under a trading program."⁶

The Financial Value of Allowances

The financial value of the allowances under a future CO₂ cap-and-trade program would very likely dwarf previous cap-and-trade programs – reaching many billions of dollars.

While the actual value of emission allowances in a CO₂ cap-and-trade program would depend on several factors, including, for example, the stringency of the cap and the possibility of offsets, the existing literature and range of CO₂ policies now being debated suggests that the value of emission allowances might total between \$50 billion and \$300 billion per year (in 2007 dollars) by 2020.⁷

⁴ Dallas Burtraw, et al., *CO₂ Allowance Allocation in the Regional Greenhouse Gas Initiative and the Effect on Electricity Investors*, Resource for the Future (Dec. 2005) available at <http://www.rff.org/Documents/RFF-DP-05-55.pdf>.

⁵ National Commission on Energy Policy, *Allocating Allowances in a Greenhouse Gas Trading System* (March 2007), available at http://www.energycommission.org/files/contentFiles/Allocating_Allowances_in_a_Greenhouse_Gas_Trading_System_45f71a5fb536b.pdf.

⁶ National Commission on Energy Policy, *Allocating Allowances in a Greenhouse Gas Trading System*.

⁷ Congressional Budget Office, *Trade-Offs in Allocating Allowances for CO₂ Emissions*. The sum value of allowances, however, is not a true measure of the program's cost to society because allowances are an asset of the allowance seller. Rather the cost is equal to the cost of the actual mitigation measures undertaken. (National Commission on Energy Policy, *Allocating Allowances in a Greenhouse Gas Trading System*). For example, under the original National Commission on Energy Policy (NCEP)

To provide context for these large values, consider that the Maryland General Assembly adopted a \$30.0 billion budget for fiscal 2008, the New Jersey 2008 proposed state budget is \$33.3 billion, and Texas's state budget for 2007 was approximately \$75 billion.

The Acid Rain Program - Is it a Model to Follow?

Many electric utility sector companies advocate giving virtually all of the allowances away free of charge to the highest emitting facilities, much like was done under the existing Acid Rain Program, a near 100-percent allocation based on emissions or fuel consumption – with a small percent reserved for annual auctions.⁸

This free allocation approach has proved to be very valuable for electric utilities, especially major emitters of SO₂. For example, in the first ten years of the Acid Rain program (1995-2005), the financial value of the SO₂ allowances allocated to American Electric Power (AEP) – the largest U.S. electricity generator (35,600 MW capacity), the largest consumer of coal in the Western Hemisphere, and the largest emitter of SO₂ in the electricity sector – totaled at least \$1.6 billion.⁹

This type of analysis demonstrating the financial contribution that the federal government made to industry under the Acid Rain Program is further supported by the recent experience under the European Union (EU) CO₂ trading program. Under the EU program, most of the countries in the EU opted to allocate all available allowances for free to affected industries. This approach has become extremely controversial within the EU as evidence has emerged that the electric power producers passed on the cost of compliance with the emission limits to the consumers and realized windfall profits as a result of the free allocations.¹⁰

The Potential for Windfall Profits

Public interest advocates and environmental groups also argue that regardless of whether allowances are provided for free or are sold through an auction, companies will charge customers the same based on the opportunity cost of the allowances.¹¹ In other words, in order to comply with the CO₂ emissions limit, companies will increase the price of electricity sold to consumers. This price increase generates revenues *and* under a free allocation system, the company would also receive a new asset, the allowances, that the company can then sell on the market. Thus, a

proposal, the market value of allowances in circulation in the early years of the program would total \$30 to \$40 billion annually, while the costs incurred by society to actually reduce emissions would be much less (on the order of \$4 billion per year).

⁸ The SO₂ cap and trade program under the Acid Rain Program initially distributed allowances free of charge to each affected power plant unit based on its heat input during a historical base period (1985–1987), multiplied by an emissions rate calculated such that aggregated emissions equal the target emissions cap. A small portion (2.8 percent) of allowances were withheld from the market and auctioned, with revenues from the auction returned to industry.

⁹ See Appendix B for the methodology utilized to estimate the financial value of the SO₂ allowances given to AEP for the first ten years of the Acid Rain Program.

¹⁰ Eric Heymann, *EU Emission Trading: Allocation Battles Intensifying*, Deutsche Bank Research (March 6, 2007), available at http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD000000000207573.pdf (“Power generation companies reap hefty windfall profits.”).

¹¹ See, e.g., Congressional Budget Office, *Trade-Offs in Allocating Allowances for CO₂ Emissions*; Environmental Defense, *Toward a Fair and Effective Climate Policy for the United States*, response to the U.S. House of Representatives Committee on Energy and Commerce and Subcommittee on Energy and Air Quality (March 19, 2007); Natural Resources Defense Council, *Response to the U.S. House of Representatives Committee on Energy and Commerce and Subcommittee on Energy and Air Quality* (March 19, 2007).

free allocation system can create two additional revenue sources – the higher priced electricity and the allowances.¹² This system creates a windfall for affected sources, and as discussed above, this situation has borne out in the European CO₂ trading program. Moreover, a recent Congressional Budget Office analysis explains that price increases would disproportionately affect people at the bottom of the income scale.¹³ According to the report, a free allocation would increase producers' profits without lessening consumers' costs. This damning assessment of the concept of free allocations should give our Congressional leaders pause before opting for this approach.

Electric power companies operating in traditional regulated power markets assert that they are required to return the value of any allocation to the ratepayer in full and, therefore, oppose the auctioning of allowances. However, these same companies sell power into competitive power markets earning windfall profits, and a perverse outcome can result from the treatment of these allowances. Price increases in regulated power markets may be smaller relative to the increases in unregulated markets. More significantly though, as described below, this argument by the regulated companies runs counter to our society's basic principle that a polluter should pay for any pollution it has released.

The Polluter Pays Principle

Public advocates and environmental groups advocate a larger role for auctioning allowances under a future CO₂ cap-and-trade program citing the precedents created by other environmental programs such as Superfund and the Resource Conservation and Recovery Act (RCRA) under which the polluter pays. For example, under the Superfund program, EPA has the legal authority to: (i) conduct the cleanup and seek recovery from responsible parties, (ii) enter into settlement agreements with the responsible parties, or (iii) compel the responsible parties to conduct a cleanup or pay for the cleanup. Regardless of EPA's use of its authority, the key underlying principle is that responsible parties are joint and severally liable for restitution of any response costs incurred by the government or a private party as a result of a release of hazardous substances. As a result, between 1980 and 2000, the estimated value of private party settlements with EPA is \$18 billion.¹⁴ In 2005, based on the polluter pays principle, EPA secured private party funding commitments of more than \$1.1 billion.¹⁵ Similarly, RCRA requires the generators, transporters, and treatment, storage, and disposal facilities to comply with RCRA, which can involve remedial action by those responsible for the pollution. Advocates of auctioning CO₂ allowances contend that a CO₂ program should be no different.

Allowances are a public good and should not be given away for free. Instead, polluting companies should be required to purchase the allowances. The revenue from the sale of the allowances could then be utilized for public benefits – including energy efficiency and renewable energy investments, worker transition, habitat preservation, and adaptation to the impacts of

¹² See, e.g., Congressional Budget Office, *Trade-Offs in Allocating Allowances for CO₂ Emissions*; Dallas Burtraw, et. al., *Lessons for a Cap-and-Trade Program in Managing Greenhouse Gas Emissions in California*, The California Climate Change Center at UC Berkeley (2006) available at http://calclimate.berkeley.edu/5_Cap_and_Trade.pdf.

¹³ Congressional Budget Office, *Trade-Offs in Allocating Allowances for CO₂ Emissions* (April 25, 2007).

¹⁴ Environmental Protection Agency, *Superfund: 20 Years of Protecting Human Health and the Environment* (December 11, 2000) available at <http://www.epa.gov/superfund/action/20years/20yrpt1.pdf>.

¹⁵ Environmental Protection Agency, *Superfund National Accomplishments Summary Fiscal Year 2005, as of November 22, 2005*, available at <http://www.epa.gov/superfund/action/process/numbers05.htm>.

climate change (e.g., constructing sea walls). In other words, the polluters would pay for the costs resulting from and made necessary by the CO₂ pollution.

The Acid Rain Allocation Approach Applied to CO₂

As noted above, most of the cost of a CO₂ cap would ultimately be borne by consumers. Giving away nearly all of the allowances to affected energy producers would mean that the value of the allowances received under a CO₂ cap would greatly exceed any cost the companies might bear.¹⁶

The financial give away would be enormous if the Acid Rain Program approach were used for the allowance allocation in a CO₂ cap-and-trade program. For example, the value of the allowances provided to the top ten emitting electric utility companies would conservatively range from at least \$4.5 billion to \$9 billion per year (assuming allowance prices ranging from \$5-\$10/ton). The table below summarizes this information using 2004 emissions and shows that a free allocation system would provide the greatest subsidy to the highest polluting companies.

Table 1: Top Ten CO₂ Emitting Utilities and Annual Value of a Free Allocation

Company ¹⁷	CO ₂ (tons/year)	\$5/ton	\$10/ton
AEP	163,934,554	\$819,672,772	\$1,639,345,543
Southern	148,647,755	\$743,238,776	\$1,486,477,553
Duke	113,602,312	\$568,011,562	\$1,136,023,125
Tennessee Valley Authority	103,602,929	\$518,014,644	\$1,036,029,288
Xcel	69,809,043	\$349,045,216	\$698,090,431
Ameren	69,029,540	\$345,147,698	\$690,295,396
Dominion	62,071,888	\$310,359,438	\$620,718,875
Edison International	61,810,500	\$309,052,499	\$618,104,997
Progress Energy	58,930,512	\$294,652,560	\$589,305,121
TXU	54,946,087	\$274,730,437	\$549,460,875
Totals	906,385,120	\$4,531,925,602	\$9,063,851,203

Source: Ceres, Natural Resource Defense Council, and Public Service Enterprise Group, *Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States – 2004*, (April 2006) (available at: <http://www.nrdc.org/air/pollution/benchmarking/2004/benchmark2004.pdf> and <http://www.nrdc.org/air/pollution/benchmarking/default.asp>).

Thus, over the first ten years of the program, the value of the allowances AEP would receive would range from \$8.2 billion to \$16 billion dollars – ten times the value of the SO₂ allowances it received during the first ten years of the Acid Rain Program.

Conclusion - A Different Approach

There is growing recognition that giving CO₂ allowances away for free leads to windfall profits for companies. As mentioned above, in contrast to a free allocation of CO₂ allowances, other major environmental programs are based on the *polluter pays principle* – those entities that

¹⁶ Congressional Budget Office, *Trade-Offs in Allocating Allowances for CO₂ Emissions*.

¹⁷ Additional information regarding each company is provided in Appendix C.

create the pollution must pay for any required cleanup. No other environmental program, allows a company to profit from releasing the most pollution.

Auctioning emission allowances could raise sizable revenues that lawmakers could use for various purposes, some of which could lower the cap's overall cost to the economy. For example, policymakers could require that proceeds from an auction be used to decrease the budget deficit, which would strengthen the economy. Proceeds could also be used to reduce taxes on labor, capital, or personal income that could be affected by a CO₂ cap.¹⁸ Depending on the stringency of the cap and the type of tax cut, such an approach could reduce the economy wide cost by roughly 50 percent, or perhaps substantially more, some researchers suggest.¹⁹ Revenues can also be used to achieve other aims such as research, development, and deployment of new low carbon technologies, which could help reduce the growth of CO₂ emissions and increase energy efficiency, or could support adaptation and transitional programs to help workers and low-income households transition into a carbon constrained economy.

Another option being debated as a means to avoid the potential windfalls is allocating allowances to state regulated electric distribution companies (and providing explicit guidance to state regulators about the proper treatment of those allowances), rather than allocating directly to electricity generators.²⁰ This method would cause all electric sector allocations to “come under the purview of economic regulators—state public utility commissions in the case of investor-owned utilities and local boards in the case of publicly owned utilities and cooperatives.”²¹ Distribution companies would sell the allowances they are allocated to regulated sources (e.g., power plants), and return the revenues to their customers. Advocates for this alternative explain that “these authorities are in the best position to sort out the equity implications of different allocation schemes, direct appropriate levels of compensation to adversely affected firms, and ensure that end-use customers, who bear the largest share of program costs, receive an equitable share of the asset value associated with free allowances.”²²

Regardless of how the revenues are allocated, any CO₂ cap-and-trade program should not perpetuate the system of effectively allowing the most polluting companies to significantly profit from the pollution they have generated. Other significant environmental statutes are based on the equitable principle that the polluter should pay for any cleanup for which it is responsible. Any climate change legislation should be no different. A CO₂ cap-and-trade program can create benefits for society. A CO₂ program must not create windfall profits for the polluting companies, and distributing allowances free of cost to industry would only ensure such an inequitable result.

¹⁸ Congressional Budget Office, *Trade-Offs in Allocating Allowances for CO₂ Emissions*.

¹⁹ National Commission on Energy Policy, *Allocating Allowances in a Greenhouse Gas Trading System*.

²⁰ National Commission on Energy Policy, *Allocating Allowances in a Greenhouse Gas Trading System*.

²¹ National Commission on Energy Policy, *Allocating Allowances in a Greenhouse Gas Trading System*.

²² National Commission on Energy Policy, *Allocating Allowances in a Greenhouse Gas Trading System*.

Appendix A – Top Ten CO₂ Emitting Electric Utilities in the U.S.

Top Ten CO₂ Emitting Electricity Sector Companies in the U.S. (2004 data)

Company	Total (MWh)	NO _x (tons)	SO ₂ (tons)	CO ₂ (tons)	Hg (lbs)
AEP	190,358,346	318,783	963,838	163,934,554	7,498
Southern	186,294,694	216,824	886,735	148,647,755	7,821
Duke	168,010,605	190,722	873,574	113,602,312	3,973
Tennessee Valley Authority	157,556,843	199,801	492,605	103,602,929	3,360
Xcel	81,283,493	124,237	157,324	69,809,043	2,183
Ameren	74,954,742	67,553	318,461	69,029,540	2,943
Dominion	105,971,331	107,670	225,452	62,071,888	2,062
Edison International	78,170,023	93,760	271,764	61,810,500	2,837
Progress Energy	93,252,779	105,052	351,276	58,930,512	1,907
TXU	67,922,206	43,812	241,010	54,946,087	4,607
TOTALS	1,203,775,062	1,468,214	4,782,039	906,385,120	39,191
ELECTRIC SECTOR TOTAL	3,810,555,000	4,143,000	10,309,000	2,456,934,000	96,000
PERCENTAGE SHARE	32%	35%	46%	37%	41%

Source: Ceres, Natural Resource Defense Council, and Public Service Enterprise Group, *Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States – 2004*, (April 2006) (available at: <http://www.nrdc.org/air/pollution/benchmarking/2004/benchmark2004.pdf> and <http://www.nrdc.org/air/pollution/benchmarking/default.asp#>).

Appendix B- AEP SO₂ Allowance Analysis

This write up provides the initial SO₂ allowance allocations and their financial value for American Electric Power Company (AEP).

Methodology

Step 1 – Identification of AEP Electric Generating Facilities

The 2006 Benchmarking Report (2004 data year) electric generation facility ownership breakdown was utilized to identify AEP wholly and jointly owned electric generating facilities.

Step 2 – Query the EPA Data and Maps Query Tool²³

Using the list of AEP facilities obtained from the Benchmarking Report, EPA's Allowance Query Wizard was used to determine the facility allocations for Phase 1 (1995-1999); Phase 2a (2000-2009) and Phase 2b (2010- and beyond).

Step 3 – Utilize Average SO₂ Allowance Values to Calculate Allowance Value

Using EPA data for historical average SO₂ allowance prices (1995-2004) and broker reported values for 2005, the financial value of the allowances allocated to AEP were then estimated.

²³ See <http://cfpub.epa.gov/gdm/index.cfm?fuseaction=iss.isshome>.

Appendix C – Corporate Information Regarding the Top Ten CO₂ Emitting Electricity Sector Companies in the U.S.

1. AEP

AEP owns and operates about 80 generating stations in the United States, with a capacity of more than 36,000 megawatts. AEP's utility units operate as AEP Ohio, AEP Texas, Appalachian Power (in Virginia, West Virginia), AEP Appalachian Power (in Tennessee), Indiana Michigan Power, Kentucky Power, Public Service Company of Oklahoma, and Southwestern Electric Power Company (in Arkansas, Louisiana and east Texas). AEP's headquarters are in Columbus, Ohio.

2. Southern

Southern owns and operates four electric utilities, with a generating capacity of more than 41,000 megawatts. Southern operates Alabama Power, Georgia Power, Gulf Power, and Mississippi Power. Other major subsidiaries and business units include Southern Nuclear.

3. Duke

Duke has a generating capacity of 37,000 megawatts and owns and operates regulated (franchised) and unregulated (wholesale) power plants in North America (North Carolina, South Carolina, Ohio, Indiana and Kentucky) and Latin America. Duke Energy Generation Services (formerly Cinergy Solutions) is the owner and operator of power generation solutions utilizing natural gas and various solid fuels, and currently owns and operates over 6,500 megawatts. Duke Energy's U.S. portfolio includes approximately 8,100 megawatts of wholesale electric generation primarily in the Midwest.

4. Tennessee Valley Authority

The Tennessee Valley Authority is a federal corporation and its system includes three nuclear, 11 fossil, 29 hydroelectric, six combustion-turbine, and one pumped-storage plant.

5. Xcel

Xcel has regulated operations in 8 Western and Midwestern states and its plants have a generating capacity of over 15,000 megawatts. Its principal non-regulated subsidiaries include, Eloigne Company and Quixx Corporation. Xcel's regulated operating companies include: Northern States Power Company Minnesota, Northern States Power Company Wisconsin, Public Service Company of Colorado, and Southwestern Public Service Company. Its service company is Xcel Energy Services Inc.

6. Ameren

Ameren Corporation is the parent of AmerenCILCO, based in Peoria, Ill; AmerenCIPS, based in Springfield, Ill.; AmerenIP, based in Decatur, Ill.; and AmerenUE, based in St. Louis, Mo. Additional subsidiaries also include: AmerenEnergy, AmerenEnergy Resources, the holding company for non-rate-regulated generation, development, marketing and fuels services companies (AmerenEnergy Generating Company, AmerenEnergy Development, AmerenEnergy Medina Valley Cogen, LLC, AmerenEnergy Marketing and AmerenEnergy Fuels & Services), AmerenEnergy Resource Generating, and Ameren Services.

7. Dominion

Dominion's asset portfolio consists of about 26,300 megawatts of power generation. Its electric generating companies include: Dominion North Carolina Power and Dominion Virginia Power. Other subsidiaries also include: Dominion East Ohio, Dominion Hope, Dominion Peoples, Dominion Cove Point LNG, LP, Dominion Clearinghouse, Dominion Exploration and Production, Dominion Gathering-Producer Services, Dominion Generation, Dominion Greenbrier, Dominion Retail, Dominion Technical Solutions, Inc., and Dominion Transmission.

8. Edison International

Edison International operates in regulated and non-regulated markets with a power generation portfolio of approximately 14,000 megawatts. Headquartered in Rosemead, California, Edison International is the parent company of a regulated electric utility, Southern California Edison (SCE) and Edison Mission Energy (EME).

9. Progress Energy

Progress Energy, headquartered in Raleigh, N.C., has more than 23,000 megawatts of generation capacity. Its subsidiaries include Progress Fuels Corporation and Progress Energy Ventures.

10. TXU

TXU Corp. manages a portfolio of energy businesses primarily in Texas. TXU Power has over 18,300 MW of generation in Texas and TXU's other businesses include TXU Energy, TXU Wholesale, and Oncor Electric Delivery.