Market Mechanisms for Greenhouse Gas Emission Reductions: Lessons for California

California is currently considering legislation that would establish state-wide caps on greenhouse gas emissions. The Pew Center on Global Climate Change recognizes that California's climate policies will serve as an important model as other states and the federal government address climate change. It is therefore critical that California's efforts be as efficient and effective as possible. Market mechanisms, including emissions trading, provide an important means of achieving this goal.

This paper is based on extensive research by the Pew Center and others on the use of market mechanisms to reduce greenhouse gas emissions. It begins with a summary of possible solutions for the state, and then provides more detailed background on market mechanisms, with particular attention to relevant lessons for California.[1] [2]

Summary of Possible Solutions for California

The fundamental goals of climate change policy should be:

- To achieve environmentally significant greenhouse gas emission reductions;
- To minimize costs; and
- To stimulate innovation to deliver further reductions over time.

The emission reductions required to adequately address climate change are large and long-term. Achieving these reductions at low cost will allow more reductions for a given level of expenditure. Any program must provide clear incentives for companies

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[2] This paper draws extensively from Ellerman, A. Denny, Joskow, Paul, and David Harrison Jr. (May 2003). *Emissions Trading in the U.S. Experience, Lessons, and Considerations for Greenhouse Gases.* Pew Center on Global Climate Change, Arlington, VA.

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and researchers to develop the innovative technologies and strategies that will be required to achieve the large reductions required. At present, market mechanisms—in particular cap-and-trade—best meet these programmatic objectives. In order to develop efficient and effective market mechanisms to address climate change, the Pew Center's assessment of existing trading programs and a large body of analytical research suggests the following:

Greenhouse gas reduction programs are likely to have co-benefits in the form of concomitant reductions in other environmental emissions. The market for sulfur dioxide analyzed below resulted in reductions of other toxic emissions. Furthermore, California's existing air quality rules will minimize the risks of localized increases in air toxics and criteria air pollutants as a result of a greenhouse gas program. There may be ways to further minimize the risks of localized increases. California could include anti-backsliding provisions to ensure that existing rules are not overridden by a new GHG trading program. However, any such provisions must avoid creating a requirement that regulatory agencies review individual trading transactions. As Ellerman et al conclude (see below), such trade-by-trade reviews significantly reduce the environmental and economic benefits of trading. Avoiding high transaction costs associated with trade-by-trade administrative certification is critical to the success of an emissions trading program. California could also consider:

- Using revenues from auctioning emissions allowances to fund job transition and economic development initiatives.
- Setting aside a percentage of allowances to encourage clean technology investment in low-income communities. These investments might be aimed at distributed generation, energy efficiency, or other beneficial technologies.
- Setting aside a percentage of allowances for public benefit uses such as clean energy technology research and development, job training, promoting residential energy efficiency, etc.
- Preventing facilities from participating in trading if they have committed major violations.
- Linking the development of the market-based GHG reduction program to increases in penalties for air quality violations, with generated funds used for abatement projects.

Large stationary sources should be covered by a cap-and-trade program. Broad coverage of these sources requires the involvement of many agencies with oversight over the various sectors of the economy that contribute to GHG emissions. Designing a cap-and-trade program for California will also require the expertise of agencies that are responsible for many facets of the state's economy. Several California agencies may also be helpful in ensuring that climate-friendly investment is targeted to low-income communities. Therefore GHG program design must involve state agencies other than the Air Resources Board and the Air Quality Management Districts, and could perhaps benefit from a new advisory group or governmental entity that brings cross-cutting expertise to bear on overarching program design issues.

Pew Center research also suggests that California:

- Analyze the benefits as well as the costs of particular policies, including market mechanisms, and account for non-GHG emissions in the analysis.
- Cover a broad scope of sources under any emissions trading programs. Broad coverage reduces compliance costs by offering greater opportunities for low-cost emission reductions.
- Carefully consider methods of allocating initial allowances because such decisions can affect cost savings and other overall impacts.
- Include emissions banking, as it has played an important role in improving the economic and environmental performance of emissions markets.
- Continue to support technological and strategic innovation, as it will serve as the foundation of a clean energy future.
- Consider developing a program that can be easily linked to the efforts of other states and regions, perhaps through trade of emission reduction credits.

Lessons Learned from Air Emissions Trading Programs from Ellerman et al.

Emissions trading has emerged over the last two decades as a popular policy tool for controlling air pollution. Indeed, most major air quality initiatives in the United States now include emissions trading and/or other market mechanisms as a component of pollution control programs. The primary attraction of emissions trading is that a properly designed program provides a framework to meet emissions reduction goals at the lowest possible cost. It does so by creating a market for emission credits, which gives firms with low-cost compliance options an incentive to reduce their emissions to a greater extent than would be required under a traditional command-and-control approach. These firms can then sell their surplus emission credits to firms with high compliance costs. As a result, compliance costs are reduced across the board as some firms profit from the sale of credits, while others save money by avoiding the costs of complying with individualized pollution limits. In practice, well-designed emissions trading programs have achieved environmental goals more quickly and with greater confidence than more costly command-and-control alternatives.

It is important to recognize, however, that while properly designed emissions trading programs can reduce the cost of meeting environmental goals, experience indicates that achieving significant emission reductions will not be free. Moreover, emissions trading programs must be designed properly in order to realize their potential cost-reduction and environmental compliance goals. As with any emissions control program, poor design is likely to lead to disappointing results.

The term “emissions trading” has been used, often loosely, to refer to three different types of market mechanisms: (1) reduction credit trading, in which credits for emission reductions must be pre-certified relative to an emission standard before they can be

traded; (2) emission rate averaging, in which credits and debits are certified automatically according to a set average emission rate; and (3) cap-and-trade programs, in which an overall cap is set, allowances (i.e., rights to emit) equal to the cap are distributed, and sources subject to the cap are required to surrender an allowance for every unit (e.g., ton) they emit.

The turnaround in perception of emissions trading over the last decade—from a reputation as a theoretically attractive but largely impractical approach to its acceptance as a practical framework for meeting air quality goals in a cost-effective manner—largely reflects the increased use of averaging and cap-and-trade type programs. The performance of the early EPA reduction credit programs was very poor and gave "emissions trading" a bad name. These early EPA programs emphasized case-by-case pre-certification of emission reductions and were characterized by burdensome and time-consuming administrative approval processes that made trading difficult. The averaging and cap-and-trade programs have been much more successful. While the use of cap-and-trade or averaging does not guarantee success, and the problems with the reduction credit-based approach can be reduced by good design, avoiding high transaction costs associated with trade-by-trade administrative certification is critical to the success of an emissions trading program. The success of any emissions trading program also requires several additional elements: emissions levels must be readily measured, legal emissions rates or caps must be clearly specified, and compliance must be verified and enforced aggressively. Third-party independent audits to verify emissions reduction and other compliance obligations can significantly increase confidence that a program is in fact robust.

U.S. and European Experience with Air Emissions Trading

Thompson examined the early experience in the European Union's Emissions Trading Scheme (ETS).[3] This trading program allows members of the European Union to trade greenhouse gas emissions in order to fulfill their obligations under the Kyoto Protocol. The EU ETS is still in a learning phase, as the participating countries prepare for the first compliance period beginning in 2007. Thompson's analysis found that the market is functioning robustly, with steadily increasing trading volumes. Recently, new emission data have given complying entities reason to believe that they will be able to meet their obligations, causing allowance prices to drop. Such behavior is a response based on new information and changing market conditions, rather than on assumptions about the difficulty of reaching targets. Internal Pew Center analysis suggests that while a number of factors could cause future changes in allowance price, the current price of approximately $20 seems to reflect a realistic price for what the European Climate Exchange has suggested is required to meet their emission reduction obligations.[4]

[3] Thompson, Vivian E. (April 2006). *Early Observations on the European Union's Greenhouse Gas Emission Trading Scheme: Insights for United States Policymakers*. Pew Center on Global Climate Change, Arlington, VA. Available at http://www.pewclimate.org/policy_center/reports/index.cfm

[4] ETS allowance price accessed 7/28/06 at http://www.pointcarbon.com/

Ellerman et al examined the experience of six U.S. emissions trading programs:

- The early Environmental Protection Agency (EPA) Emissions Trading programs that began in the late 1970s: These four emission trading programs provided mechanisms for compliance with the U.S. Clean Air Act air emissions standards for stationary sources. Overly burdensome regulations for certifying individual trades prevented the successful implementation of this program.
- The Lead Trading program for gasoline that was implemented in the 1980s: This program allowed trading of lead content allowances between refineries to comply with EPA lead content standards.
- The Acid Rain program for electric power plant sulfur dioxide (SO_2) emissions: The Acid Rain program was a product of the Clean Air Act Amendments of 1990. It set up a cap-and-trade system for power plant sulfur dioxide emissions, and is generally regarded as the most successful market-based emissions reduction program to date, with cost savings estimated at nearly 50 percent compared to achieving the same environmental goal through a command-and-control program.
- The Los Angeles air basin (RECLAIM) programs for both nitrogen oxides (NO_x) and SO_2 emissions, which went into operation in the mid-1990s: RECLAIM was a system developed to help the LA Basin comply with National Ambient Air Quality Standards. For a host of reasons, including not allowing banking of emission credits, RECLAIM has been less successful than other programs.
- The federal mobile source averaging, banking, and trading (ABT) programs that began in the early 1990s: These programs allowed the U.S. EPA to set a more stringent emission standard than would have been possible otherwise. Compliance has been achieved primarily through averaging and banking, in part because the small number of market participants reduces trading opportunities.
- The Northeast NO_x Budget trading program, which began operating in the late 1990s: The twelve participating states—along with the District of Columbia—instituted this program to address regional smog.

Based on this experience, Ellerman et al identify and discuss five general lessons concerning the design and implementation of emissions trading programs, and two considerations of particular relevance for GHG applications.

General Lessons from U.S. Experience with Emissions Trading

Market mechanisms have been successful in their primary objective of lowering the cost of meeting emission reduction goals. Experience shows that properly designed emissions trading programs can reduce compliance costs significantly compared to command-and-control alternatives. While it is impossible to provide precise measures of cost savings compared to hypothetical control approaches that might have been applied, the available evidence suggests that the increased compliance flexibility of emissions trading yields costs savings of as much as 50 percent.

The use of market mechanisms has enhanced—not compromised—the achievement of environmental goals. While some skeptics have suggested that emissions trading is a way of evading environmental requirements, experience to date with well-designed trading programs indicates that emissions trading helps achieve environmental goals in several ways.

First, the achievement of required emission reductions has been accelerated when covered entities are able to bank emission reduction credits—that is, to receive future credit for reducing emissions ahead of schedule. The Lead Trading program for gasoline, the Acid Rain program for electric powerplants, the federal mobile source ABT programs, and the Northeast NO_x Budget programs each achieved environmental goals more quickly through these program design features. Moreover, giving firms with high abatement costs the flexibility to meet their compliance obligations by buying emissions allowances eliminates the rationale underlying requests for special exemptions from emissions regulations based on "hardship" and "high cost." The compliance cost savings have also led to instances of setting tighter emissions targets, in keeping with efforts to balance the costs and benefits of emissions reductions. Finally, properly designed emissions trading programs appear to provide other efficiency gains, such as greater incentives for innovation and improved emissions monitoring, and simplified program implementation.

Market mechanisms have worked best when allowances or credits being traded are clearly defined and tradable without case-by-case pre-certification. Several different types of market mechanisms have been implemented. Their performance has varied widely, and these variations illuminate the key features of emissions trading programs that are most likely to lead to significant cost savings while maintaining (or outperforming) environmental goals.

Banking has played an important role in improving the economic and environmental performance of emissions markets. Early advocates of emissions trading tended to emphasize gains from trading among participants (i.e., sources with low compliance costs selling credits and allowances to sources with high compliance costs) in the same time period. The experience with the programs reviewed here indicates that inter-temporal trading also has been important. The form that inter-temporal trading most often takes is credit or allowance banking, i.e., reducing emissions early and accumulating credits or allowances that can be used for compliance in future periods. Banking improves environmental performance and reduces cumulative compliance costs. Moreover, it has been particularly important in providing flexibility to deal with many uncertainties associated with an emissions trading market—electricity and other product demand, compliance costs, and the many other factors that influence demand for credits or allowances. Indeed, the one major program without a substantial banking provision, the Los Angeles RECLAIM program, appears to have suffered because of its absence.

The performance of the RECLAIM program is of particular importance to the current debate in California about GHG reduction policies. Some constituencies view this program as a failure that raised emissions in low-income communities and allowed firms

to "buy" their way out of their obligations, delaying actual improvements. Such delays in installing emission reduction technologies were also a function of the level of RECLAIM's cap, which was set above actual emissions initially, pointing to the need to set the level of any cap appropriately. The buffer created by the cap, combined with a sudden spike in allowances prices due in part to the California electricity crisis, led to a temporary suspension in the program. Problems also arose with the Los Angeles basin's car scrapping rule, as well as brokers committing fraudulent trades. Many of the vehicles reported scrapped were not in fact destroyed, highlighting the need for robust monitoring and verification.[5] Acknowledging these criticisms, Profeta and Daniels draw a number of important lessons for California from the RECLAIM experience.[6] One of the key lessons is that cap-and-trade programs are better suited for emissions with non-localized impacts, and that such programs may consider including "anti-backsliding" provisions to address localized hot spot formation. Importantly, the authors also concluded that temporal flexibility in compliance, specifically the inclusion of banking, allows firms to best manage their emissions and avoid price spikes during allowance shortages. Banking provides an incentive for covered entities to reduce their emissions early in a program, even if entities are not initially constrained by their cap. Ellerman et al attach some of the perceived failures of the RECLAIM to the California electricity crisis, and conclude that a command and control program would have done no better, because such programs generally regulate the rate of emissions rather than total emissions. By regulating emission rates, an increase in generation will result in an increase in emissions, while under a cap total emissions cannot rise even if generation increases.

The initial allocation of allowances in cap-and-trade programs has shown that equity and political concerns can be addressed without impairing the cost savings from trading or the environmental performance of these programs. Because emissions allowances in cap-and-trade programs are valuable, their allocation has been perhaps the single most contentious issue in establishing the existing cap-and-trade programs. However, the ability to allocate this valuable commodity and thereby account for the economic impacts of new regulatory requirements has been an important means of attaining political support for more stringent emissions caps. Moreover, despite all the jockeying for allowance allotments through the political process, the allocations of allowances to firms in the major programs have not compromised environmental goals or cost savings. The three cap-and-trade programs reviewed here have relied upon "grandfathering," i.e., distributing allowances without charge to sources based upon historical emissions and emission rate information, which generally do not affect firms' choices regarding cost-effective emission reductions and thus the overall cost savings from emissions trading. There are other methods of allocating initial allowances—such as auctioning by the government, and distributing allowances on the basis of future behavior—that can affect cost savings and other overall impacts. No matter the method, the major effects of the

[5] Drury, Richard Toshiyuki, Michael E. Belliveau, J. Scott Kuhn;and Shipra Bansal 1999. *Pollution Trading And Environmental Injustice: Los Angeles' Failed Experiment In Air Quality Policy.* Duke Environmental Law and Policy Forum. Duke University.

[6] Profeta, Tim and Brigham Daniels 2006. *Design Principles of a Cap and Trade System for Greenhouse Gases*, Nicholas Institute for Environmental Policy Solutions, Duke University.

initial allocation are to distribute valuable assets in some manner and to provide effective compensation for the financial impacts of capping emissions on participating sources.

California's vehicle GHG standards are a home-grown example of a flexible market mechanism to address emissions. These standards would allow manufacturers to undertake the most cost-effective emission reductions across their respective new vehicle fleets, and trade emission reduction credits between manufacturers. California's vehicle GHG standards would operate in a manner similar to the well-tested EPA truck emission standards and the Corporate Average Fuel Economy standards.

Considerations for California Greenhouse Gas Control Programs

Market mechanisms seem especially well-suited to be part of California's policies to control greenhouse gas emissions. The emissions trading programs reviewed by Ellerman et al. generally have some spatial or temporal limitations because sources of the pollutants included in these programs—such as lead, SO_2, and NO_x—may have different environmental impacts depending on the sources' locations (e.g., upwind or downwind from population centers) and the time of the emissions (e.g., summer or winter). The concerns of market-based programs associated with climate change are different because greenhouse gases are both uniformly mixed in the earth's atmosphere and long-lived. The effects of GHG emissions thus are the same regardless of where the source is located and when the emissions occur. Emission markets can be global in scope as well as inter-temporal, creating an opportunity for the banking of emission credits, which allows emissions to vary from year-to-year as long as an aggregate inter-temporal cap is achieved.

Market mechanisms are also well suited to GHG emissions control because the costs of reducing emissions vary widely between individual greenhouse gases, sectors, and countries, and thus there are large potential gains from trade. While other market-based approaches, such as emissions taxes, also would provide for these cost savings, cap-and-trade programs have the further advantage of providing greater certainty that an emission target will be met. Moreover, most powerplants are already required to monitor their CO_2 emissions under the federal Clean Air Act, and GHG emissions generally can be measured using relatively inexpensive methods (e.g., fuel consumption and emission factors), rather than the continuous emissions monitoring required for some existing trading programs.

Furthermore, market mechanisms provide important incentives for sources with low compliance costs initially outside the program to find ways to participate, and thereby further reduce costs. Such "opt-in" or "offset" features are useful because an environmentally and cost-effective solution for reducing concentrations of greenhouse gases should be comprehensive and global, whereas initial controls on GHG emissions will—for political and practical reasons—likely be limited to certain sectors. Therefore, an important criterion for initial measures is that they be able to induce participation by sources not yet controlled. The markets created by cap-and-trade programs provide

incentives for sources outside the program to enter if they can provide reductions more cheaply than the market prices—a common feature of any market. Although, as discussed below, the voluntary nature of these incentives can create some problems, the ability to induce further participation is an important reason to use a market-based approach. Indeed, it is hard to imagine how command-and-control regulations or emissions taxes could provide similar incentives to non-participants to adopt new measures to reduce greenhouse gas emissions.

Offsets allow non-covered entities to participate in a trading program, without opting to become covered entities. Offsets are generally defined as out-of-system GHG reductions achieved by non-covered entities. Examples include carbon sequestration (e.g., in plants, soils or underground geological formations) projects or verifiable credits from the programs of other countries with capped emissions. In order to verify that these emission reductions are fungible with reductions made within the capped sectors, a robust system of measurement and verification is required. The Clean Development Mechanism under the Kyoto Protocol initially provided for a project-by-project review of proposed offsets that presented a significant burden and uncertainty for entities seeking offsets. The Pew Center has expressed a preference for the "standards" approach to offsets taken by the northeast Regional Greenhouse Gas Initiative (RGGI).[7] RGGI's standards approach seeks to balance reduction verification with regulatory burden. Rather than reviewing projects one at a time and making judgments as to whether the project baseline is appropriate, whether project reductions are additional and real, etc., standards are set for a specific category of offsets, and project applications are assessed against that standard. This approach has three benefits: it makes program administration easier, project approvals more predictable, and environmental benefits more certain, thus benefiting governments, environmental advocates and offset project developers by lowering the risk premium for such reductions.

Effective research, innovation, development, and deployment strategies will be critical to enabling a low-carbon energy future. In particular, achieving the very long-term, aggressive reduction targets that are necessary to stabilize the climate, such as Governor Schwarzenegger's 80 percent GHG reduction by 2050, depends on radical innovation. The private sector is generally a more efficient engine of technological innovation than the government. The private sector is particularly good at identifying and allocating resources to those technologies that have the best potential to become financially self sustaining, since private investment is almost uniquely profit-oriented and return-driven. Market mechanisms that include a strong price signal will stimulate innovation and cost-effectively reduce emissions. Such technological and strategic innovation will serve as the cornerstone of a clean energy future, and California companies will continue to lead in the development and export of clean energy technologies.

[7] Please see the Pew Center on Global Climate Change response to: "Design Elements of a Mandatory Market-Based Greenhouse Gas Regulatory System" issued by Sen. Pete V. Domenici and Sen. Jeff Bingaman, Senate Energy and Natural Resources Committee, February 2006. The full Pew Center response is available at http://www.pewclimate.org/policy_center/analyses/sec/index.cfm.

The Pew Center's assessment of experience from existing trading programs and a large body of analytical research suggest the following:

Allowance submission should be required "downstream" at the point of emission from large stationary sources, rather than "upstream" (e.g., on producers of coal, oil, and natural gas).[8] However, there are a wide variety of approaches to allocation, with proponents for each.[9] To many, a program that applies a cap-and-trade system to upstream producers functions for all practical purposes like a carbon tax, rather than a robust market. Moreover, some research suggests that carbon taxes must be very high and continuous to motivate a significant market response. It is more useful to apply regulation to those in a position to alter the behavior that results in emissions, rather than to apply a tax on firms that have no technology or process options to reduce emissions.

Large stationary sources should be addressed through a cap-and-trade program. A cap on emissions would send an economy-wide signal favoring reductions, and emissions trading would ensure that reductions are achieved at the lowest cost possible. Such a program should cover all GHGs in all major emitting sectors and include all measurable, verifiable reductions and offset measures, without restrictions on trading.

An absolute cap for the program should be set to achieve a moderate level of emission reductions and announced sufficiently far in advance to allow for planning. Further reductions should be phased in over time as new technologies come online and capital stock turns over. Because individual sectors have different sensitivities to the price of carbon and are growing at different rates, sector-specific emission limits or allowance allocations within the overall cap could be established.

In order to protect consumers and covered entities alike, there are a number of cost containment options available to the state. Many of these options are detailed in the Pew Center's February 2006 submission to the U.S. Senate Energy and Natural Resource Committee;[10] another option would be a process modeled after the state's other air quality programs to ensure that programs are technically feasible.

Some constituencies in California, especially those concerned with environmental justice, have expressed skepticism towards market mechanisms, in part due to the perceived failure of the RECLAIM program. As discussed earlier, these failures are attributable to significant design flaws, especially a lack of flexible mechanisms and poor oversight, in the RECLAIM program. The potential for increases in rates of non-GHG air emissions in particular communities due to GHG emissions trading is another key concern. Finally, some advocates worry that a cap-and-trade program will increase income disparities between communities.

[8] *Ibid*.
[9] In addition to the point of regulation, key issues include whether allowance allocations should be based on historic emissions or on benchmarks, whether allocations should be updated periodically, and whether allowances should be auctioned or distributed at no charge to emitters.
[10] *Ibid*.

It is important to keep in mind that there are environmental justice benefits of market mechanisms. A GHG emissions cap overall is likely to reduce non-GHG air emissions. An EPA staff analysis found that under the SO_2 emissions trading program, the biggest reductions occurred in areas with the highest emissions levels. This finding was true both regionally and at individual plants.[11] An Environmental Defense study of the program had similar findings.[12] The EPA staff analysis also found that there were no negative local air quality impacts because emission increases at specific plants were more than offset by reductions in sulfur dioxide entering the locality from elsewhere, and that the national ambient air quality standards have not been violated since at least 2000. The SO_2 trading program also had public health co-benefits due to the concurrent reduction in particulates. Similar health benefits were seen across all racial, ethnic, and income-levels. According to the EPA staff analysis, no population has seen adverse health or environmental impacts as a result of the Acid Rain Program. It is important that California analyze strategies—including market mechanisms—to understand the implications beyond GHG emissions in an integrated manner. In considering the use of market mechanisms, therefore, the state should examine the full suite of environmental implications, both positive and negative, in comparison to other policy options under consideration.

Any emissions cap would increase energy prices that may disproportionately and adversely affect low-income communities, because these communities spend a relatively high percentage of their income on electricity, transportation, and home heating. Market mechanisms reduce the cost of achieving any emissions cap, thereby minimizing such impacts on low income communities. Market mechanisms can also provide sources of funding for directly addressing any such economic impacts. Options for addressing these concerns include:

- Using revenues from auctioning emissions allowances to fund job transition and economic development initiatives.
- Setting aside a percentage of allowances to encourage clean technology investment in low-income communities. These investments might be aimed at distributed generation, energy efficiency, or other beneficial technologies.
- Setting aside a percentage of allowances for public benefit uses such as clean energy technology research and development, job training, promoting residential energy efficiency, etc.
- Preventing facilities from participating in trading if they have had major violations or significant penalties
- Linking the development of the market-based GHG reduction program to increases in penalties for air quality violations, with generated funds used for abatement projects.

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[11] "The Acid Rain Program and Environmental Justice: Staff Analysis" (September 2005) U.S. Environmental Protection Agency, Office of Air and Radiation, Clean Air Markets Program.
[12] Environmental Defense. (2000). *From Obstacle to Opportunity: How Acid Rain Emissions Trading is Delivering Cleaner Air*. http://www.environmentaldefense.org/documents/645_SO2.pdf

About the Pew Center on Global Climate Change

The Pew Center on Global Climate Change was established in 1998 as a non-profit, non-partisan and independent organization. The Center's mission is to provide credible information, straight answers, and innovative solutions in the effort to address global climate change.

Working on an issue that is often polarized and politicized, the Pew Center provides a forum for objective research and analysis and for the development of pragmatic policies and solutions. In its first seven years, the Pew Center has become a leading voice for sensible action to address the most pressing global environmental problem of the 21st century.

The Pew Center's Business Environmental Leadership Council (BELC) is the largest U.S. based association of corporations focused on advancing technology and policy solutions to climate change. Its 40 members are mostly Fortune 500 multinationals and large utilities, with combined market capitalization over $2 trillion and 3 million employees.

A nonprofit, tax-exempt organization under Internal Revenue Code section 501(c)(3), the Pew Center is supported by a range of individuals and charitable organizations. The Pew Center accepts no funding from any corporations or governments.

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