Chapter 9

Reconciling Justice and Efficiency: Integrating Environmental Justice into Domestic Cap-and-Trade Programs for Controlling Greenhouse Gases

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Forthcoming: ETHICS, ENERGY, AND CLIMATE CHANGE (Denis G. Arnold, ed.)

Introduction

In the international climate change debate, issues of corrective, distributive, and participatory justice abound. Corrective and distributive justice principles are critical to determining the relative responsibility of developed and developing countries in light of their differing contributions to the accumulation of greenhouse gases and their relative differences in wealth. The anticipated differential impacts of climate change also raise distributive justice issues in light of the more severe impacts anticipated in developing countries, the relatively greater difficulty of poorer nations and communities to adapt to the impacts of climate change, and the more severe impacts predicted for future generations if current generations fail to control their emissions.[1]

The focus of this essay, however, is on the domestic distributive and participatory justice implications of adopting a cap-and-trade program to address greenhouse gas (GHG) emissions in the United States. While carbon dioxide emissions themselves are not harmful and do not create direct distributional concerns, they are invariably accompanied by hazardous co-pollutants. Policies that affect greenhouse gas emissions therefore indirectly impact co-pollutant emissions, raising distributive justice concerns for impacted communities. Greenhouse gas mitigation policies also raise issues of

participatory justice: Who participates in regulatory decisions about how and when industrial sectors should reduce emissions? At the facility specific level, who controls and participates in decisions about facility emissions?

The cap-and-trade programs that are emerging as a core strategy for addressing climate change at the state and federal level have long been considered antithetical to the environmental justice movement's distributional and participatory goals. Rather than concluding that the conflict is unbridgeable, however, I propose a reconciliation. I argue that a cap-and-trade program that is one component of a much larger climate change strategy, and that includes limitations to avoid adverse distributions of co-pollutants, could balance efficiency and distributive justice.

This chapter begins by describing the simultaneous development of two opposing trends: environmental justice and market-based environmental policies. It then identifies the fundamental tensions between them: the tension between distributive justice and economic efficiency and the tension between participatory justice and administrative efficiency. Turning to climate change cap-and-trade programs, this chapter details the particular distributional and participatory challenges they pose.

The chapter next addresses why reconciliation is important -- why efficiency and justice are both worthy goals. I then describe a number of proposals to balance efficiency with distributive and participatory justice goals. I first suggest that cap-and-trade programs should fill only a limited role within a broader regulatory strategy. I then

suggest a series of practical mechanisms to address a cap-and-trade program's distributional risks while acknowledging and addressing each mechanism's efficiency consequences. The chapter concludes that, rather than focusing solely on economic efficiency, cap-and-trade programs could be qualified to achieve equity and maximize overall social welfare.

I. Fundamental Conflicts in Environmental Policy Trends

A. The Rise of the American Environmental Justice Movement

The environmental justice movement emerged in the 1980s as communities of color began to challenge siting decisions that appeared to impose disproportionate burdens on them.[2] These sporadic grassroots initiatives prompted a wave of studies that confirmed what many had intuitively observed: that undesirable land uses, particularly environmentally hazardous land uses, were disproportionately located in poor areas, areas often populated by communities of color.[3] While the causes of these disproportionate burdens are complex and contested, there is little doubt that they exist.[4]

The pattern of disproportionate burdens is partly a result of the structure of the nation's existing environmental laws, which have, historically, been relatively indifferent to distributional consequences. Federal environmental laws do not control or consider the local zoning and siting decisions that have concentrated undesirable polluting facilities in poor and minority neighborhoods. And because pollution control regulations

do not take into consideration the local impacts of polluting facilities, facility permits do not prevent adverse local impacts, much less address the accumulation of disproportionate impacts from multiple facilities in the same area. Instead, the nation's environmental laws have focused primarily on improving generalized ambient air and water quality.[5] Regulators hope to meet general ambient goals by simply requiring industries to meet emission standards based on the general cost-effectiveness of the technology for the industry as a whole, not premised on the local health consequences of pollution from particular facilities.[6] Where regulators do impose stricter requirements, they are generally focused on the overall air or water district's compliance with the standards, not the facility's impact on its immediate environs.[7] As a consequence, the nation's environmental laws have failed to avoid significant inequities in the distribution of pollution.

As the adverse consequences of the nation's indifference to distribution emerged, environmental justice considerations began to influence environmental policy. In 1994 President Clinton issued an executive order on environmental justice.[8] Executive Order 12,898 requires all federal agencies to evaluate the distributional impact of their policies on poor and minority communities. In addition, the Executive Order requires all government agencies to ensure equal opportunities for participation. While not changing existing laws, the Executive Order and its accompanying presidential memorandum made clear that existing laws, like the National Environmental Policy Act, could be interpreted to require attention to distributional and participatory impacts.[9]

Environmental justice concerns were also reflected in new policies for enforcing Title VI of the federal Civil Rights Act, which prohibits state and local agencies that receive federal funds from discriminating.[10] EPA issued guidance documents that stated that Title VI could place constraints on an agency's ability to grant permits to facilities whose emissions would create a disparate impact.[11] At least in theory, if a facility's projected emissions would cause a disproportionate impact on a community of color due to the presence of a disproportionate number of other pollution sources, then Title VI could be used to impose additional permit restrictions that would mitigate the impact. Although the guidance does not appear to have resulted in a significant change in permitting decisions,[12] it represents a departure from past policies.

Executive Order 12,898 and EPA's Title VI guidance demonstrate that environmental justice principles have emerged as a new trend in environmental policy. While these principles do not currently play a dominant role in regulatory programs,[13] they mark a shift from the regulatory programs' earlier blindness to local distributional impacts.

B. The Rise of Market-Based Mechanisms

Since the 1970s, market-based mechanisms for environmental control have become a major trend in environmental policy. Market advocates have critiqued traditional regulatory approaches, which generally impose technology-based performance standards on facilities, as cumbersome and inefficient. They require government agencies

to determine the appropriate technology for an industry and translate it into an applicable performance standard, a time-consuming process that requires significant government resources and that requires government officials to develop technological expertise that is arguably already held by regulated industries. Moreover, traditional regulatory approaches require all facilities to install control technology, even if some facilities could reduce at a much lower cost than others.[14]

Market-based mechanisms emerged as a way to make pollution control more administratively and economically efficient. The Clean Air Act's Acid Rain Program provides a useful example of the efficiencies that market-based programs could achieve.[15] To address the acid rain impacts of sulfur and nitrogen oxide emissions, Congress established a national emissions cap for each pollutant. EPA distributes allowances to facilities within the program. To achieve the cap, the allowances distributed are less than existing emissions. Rather than following the traditional model and requiring each facility to adopt a particular control technology or meet a particular performance standard, each facility can choose whether to reduce emissions to meet its allowance allocation, reduce emissions by more than the allocation and sell the remainder, or maintain existing emissions and buy allowances to make up the difference between the number distributed and actual emissions.

At least in theory, market mechanisms like cap-and-trade programs are more administratively efficient because they do not require the agency to develop industry-wide standards or engage in extensive permit negotiations for individual facilities. The

agency need only determine the cap and make sure that facilities have enough allowances to match their emissions. The facilities themselves, with their internal knowledge of industry operations, make the critical decisions about whether and how to reduce emissions.

Cap-and-trade programs are also touted as more economically efficient than traditional technology-based regulation. Economic efficiency in this context is generally defined as reducing aggregate emissions at the lowest industry cost. Cap-and-trade programs achieve this version of economic efficiency by allowing those facilities that face high reduction costs to buy allowances rather than make expensive reductions. Meanwhile, facilities that have lower control costs have an incentive to over-comply and sell the excess allowances to facilities that would otherwise face high costs of control. As a consequence, more of the reductions are accomplished by low-cost reducers rather than high-cost reducers, lowering the overall cost of pollution control. For the participating firms, cap-and-trade programs reduce compliance costs. For society as a whole, fewer economic resources are devoted to achieving a given environmental goal.

Market mechanisms, and cap-and-trade programs in particular, have become a dominant trend in environmental policy. Many recent administrative initiatives for air and water pollution have incorporated pollutant trading.[16] The former administration of George W. Bush strongly supported market-based mechanisms as does the Obama Administration. As discussed further below, cap-and-trade programs are emerging as a core strategy for reducing greenhouse gas emissions.

C. The Conflict Between Environmental Justice and Market-Based Mechanisms

These two emerging trends, environmental justice and market mechanisms, do not co-exist harmoniously. Instead, they present fundamental conflicts. Although I ultimately argue that their competing aims can be partially accommodated, it is important to recognize the inherent tensions.[17] In this section I further define the claims for justice, and then focus on the inherent tensions between the goals of the environmental justice movement and market-based mechanisms. The particular issues raised by cap-and-trade programs for greenhouse gases are addressed in the following section.

1. Distributive Justice v. Economic Efficiency

Distributive justice is central to environmental justice.[18] In the realm of environmental justice, the key distributive justice issue is how fairly environmental burdens are distributed.[19] Rather than focusing on purely utilitarian metrics – such as achieving the highest overall level of pollution reduction or reducing pollution at the lowest overall cost to society,[20] -- the environmental justice movement is focused on preventing concentrations of pollution that disproportionately impact vulnerable populations. The goal of equality in distribution is often premised on the idea that all people are morally equal, and that, as Professor Steve Vanderheiden suggests, "*arbitrary* or undeserved inequality in outcomes is taken to be unjust."[21] The current unequal distribution of environmental burdens is, arguably, arbitrary. Nor can the impacted

populations be said to "deserve" their exposure. The potential justifications for differences in the distribution of benefits – differing levels of need, or differing levels of entitlement based on "desert"[22] – do not apply where the distribution of environmental burdens is concerned. One would be hard-pressed to argue that a community "needs" or "deserves" more pollution.

Some may say that those who are *not* exposed to pollution "deserve" that benefit: they have earned and deserve the wealth that entitles them to live in pollution-free areas. In response, I argue first that the wealthy's entitlement, such as it is, to be free of pollution does not mean that the poor "deserve" to be burdened. Second, I assume for the purposes of this chapter that an individual's wealth cannot be deemed fully "deserved" because the underlying distribution of wealth in the United States is so heavily determined by forces outside of individual control.

The foregoing defines equality in terms of the distribution of goods – or, in this case, "bads." I argue that the existing distribution is also unjust under a welfare-based theory of equality, a theory which defines equality in terms of relative preference satisfaction rather than the tangible distribution of goods (or bads).[23] One could argue that residents differ in their relative preferences, or not, for polluting facilities, and facilities that some might abhor could be welcomed by others. Some communities might conclude that pollution sources provide net benefits due to their employment or municipal tax consequences.[24] Differences in the distribution of polluting facilities would not be "unequal" if neighboring residents were equally satisfied.

As I have discussed elsewhere, however, it is highly unlikely that the existing inequalities in the distribution of environmental burdens correspond to differences in community preferences.[25] Residents are rarely influential in siting processes, particularly if they have traditionally lacked political power. Moreover, residents of poor communities and communities of color dissatisfied with a siting decision rarely have the means or opportunity to find homes in less hazardous environments.[26] Thus, whether one adopts a goods-based or a welfare-based theory of equality, the existing distribution of pollution is unjust and the environmental justice movement seeks to alleviate existing disparities.

In contrast to the environmental justice movement's focus on the distribution of pollution burdens, market-based systems are fundamentally utilitarian, and are designed to achieve an overall level of pollution reduction efficiently.[27] As noted above, economic efficiency in this context is generally defined as reducing aggregate emissions at the lowest cost. In theory, the result achieves "the greatest good for the greatest number" by allowing society to achieve a given level of pollution reduction at a lower cost.

To achieve economic efficiency, however, market-based systems ignore distributional consequences.[28] By allowing some facilities to reduce by less than others, or even to increase emissions, they create the possibility that pollution will become even more unequally distributed. For example, assume that Facility A, located in a heavily-polluted area, must spend $100 per ton to reduce a given pollutant. Assume that Facility

B, located in an unpolluted area, can reduce the same pollutant for only $50 per ton. If a cap-and-trade system set a cap below existing emissions, distributed allowances in proportion to existing emissions, but allowed firms to trade allowances, then it is likely that Facility B would reduce by an extra amount so as to generate allowances for sale. Facility A would likely purchase allowances rather than reducing emissions. Moreover, if Facility A wanted to increase its production, it would also probably purchase allowances rather than install expensive pollution controls. By having low-cost Facility B make the reductions rather than high-cost Facility A, society as a whole would have achieved its environmental goal more cheaply than if rigid reduction obligations had been imposed on both facilities. However, as a consequence of the trading, pollution levels are likely to be higher near Facility A, located in the more heavily polluted area, than near Facility B, located in the less polluted area. Thus, pursuing economic efficiency can come at a cost to distributive justice.

ii. Participatory Justice v. Administrative Efficiency

Participatory justice presents a second central goal of the environmental justice movement.[29] Environmental justice advocates are not only concerned about distributional equity, they are concerned about their ability to participate meaningfully in decision-making processes that affect their communities' well-being. At the government agency level, participation in setting industry-wide standards is essential to a democratic process for determining industrial regulation. At the facility-specific level, community input on facilities' actual impacts gives communities a voice in shaping their environment and

provides a check on possible agency capture by regulated industry. Ultimately, participatory goals are linked to a deeper aspiration: empowering disadvantaged groups who have historically had little political power within local, state, and national decision-making structures.[30]

The environmental justice movement's participatory goals run head-long into the market mechanism emphasis on private autonomy and administrative efficiency. Market-based mechanisms are designed to minimize the government's role. Instead of government agencies developing technologically-based standards, the government simply sets overall pollution-reduction goals and lets private industries decide what technologies or process changes will achieve them. In addition, facilities' choices about how to comply with environmental requirements would not be determined through public permitting procedures that impose regulatory requirements and allow opportunities for public participation. Instead, in market approaches, facilities make their emission reduction or allowance purchase decisions privately. The resulting market transactions, whether through trades or auction sales, are generally designed to happen instantaneously, without review or public participation. Public accountability comes only at the end of a designated "compliance period," when facilities must show that they have enough allowances to cover their actual emissions. Under pure market-based systems, there is no direct government control over the reduction, trading, or purchasing decisions that determine a facility's actual emissions.

Because they do not involve public standard-setting or facility-specific permitting processes, market mechanisms thus close off key channels of public involvement. There is no democratic public process for determining industry-wide pollution reduction standards. And there is no pubic process for reviewing facilities' decisions about their emissions, decisions with a significant impact on surrounding communities.

II. Climate Change Cap-and-Trade Programs' Potentially Adverse Impacts on Distributive and Participatory Justice

Federal climate change legislation is very likely to include a cap-and-trade program.[31] Many states have created regional greenhouse gas trading blocs in the Northeast, the Midwest, and the West.[32] Members of the environmental justice community, at least in California, have been strongly opposed to using a cap-and-trade program to reduce greenhouse gases.[33] The general tensions between market mechanisms and environmental justice that I described above suggest why. In this section, I will discuss the environmental justice risks posed by climate change policy in more detail.

A. Distributive Injustice: The Co-Pollutant Problem

Some market advocates have suggested that cap-and-trade programs for greenhouse gases do not present issues of distributive justice because, unlike most other pollutants, they do not have local consequences.[34] However, greenhouse gases, the

product of most forms of combustion, are almost never emitted in a vacuum. When a greenhouse gas is emitted, harmful co-pollutants, like particulates, sulfur oxides, nitrogen oxides, as well as hazardous pollutants like volatile organic compounds, benzene, mercury, and other toxics, follow. Every allowance a facility received for emitting greenhouse gases would be accompanied by co-pollutant emissions.

1. Co-Pollutant Reduction Benefits

Climate change regulation has its silver lining: decreases in greenhouse gas emissions are likely to decrease co-pollutant emissions. Co-pollutant reductions are a significant environmental "co-benefit" of climate change regulation. The distribution of that benefit implicates distributive justice. If facilities in disadvantaged neighborhoods were to buy carbon dioxide allowances that maintain existing emissions, the surrounding neighborhood would not receive a co-pollutant reduction benefit. Conceivably, older facilities concentrated in urban poor areas will face higher costs of control and buy allowances rather than reducing emissions, while newer facilities in less polluted areas will make reductions. The consequence of such trading patterns would be inequality in the distribution of the co-pollutant reduction co-benefits of climate change regulation and, potentially, an increasing disparity in the prevalence of air pollution. Ideally, climate change policy would spread the reduction obligation, and its associated benefits, more evenly or, better yet, target GHG emission reductions in those areas where emissions reductions would have the greatest overall benefits.

2. Co-Pollutant Hot Spots

It is also conceivable that trading in GHG allowances could lead to hot spots of the associated co-pollutants. The risk of such hot spots depends upon the Clean Air Act's (CAA's) adequacy in controlling co-pollutant emissions. A facility's ability to buy or sell greenhouse gas allowances would be constrained by existing permits for the relevant co-pollutants. Since the existing permitting system does not fully constrain co-pollutant increases, greenhouse gas allowance trading could lead to increases in co-pollutant emissions.

Most co-pollutant permits specify that a facility cannot exceed a certain *rate* of emissions, like a certain quantity of pollutant per amount of energy created.[35] Facilities can, therefore, increase their total absolute emissions, so long as they do not increase their emissions rate. For example, if the emissions rate were based upon the amount of energy generated, a facility could increase the amount of energy generated and the associated co-pollutant emissions so long as the ratio between the pollutants and the energy generated did not change.

Once absolute emissions increase beyond a certain threshold, however, additional co-pollutant controls could be required under the Clean Air Act's New Source Review (NSR) program and its stringent requirements for new and modified facilities. If the facility physically changes its plant and, as a consequence, increases its actual, absolute, emissions above a certain threshold amount, then it would be deemed to have been

"modified," and would be subject to the additional controls associated with new pollution sources.[36]

Nonetheless, the NSR program does not impose limitations on all absolute increases in emissions. If a facility increases emissions due to increases in the hours of operation, not due to a physical change in the facility, then NSR would not apply even if emissions increased beyond the level deemed "significant."[37] In addition, the federal threshold for what constitutes a "significant" increase is relatively high, and could lead to a substantial impact on a local community even if it did not meet the statutory threshold.[38] Moreover, the integrity of the system relies upon proper enforcement of existing pollution control requirements, enforcement that has not always been effective.[39]

Thus, a greenhouse gas trading system in which a facility purchased allowances that allowed it to exceed its current emissions could lead to increases in co-pollutants, until and unless controlled by the Clean Air Act's New Source Review provisions. Given the existing disparity in the distribution of polluting facilities, greenhouse gas trading could lead to indirect increases in co-pollutant emissions in the nation's most vulnerable communities. In comparison, a more traditional regulatory approach that required all facilities to reduce emissions at the outset would be much less likely to lead to such increases. Even if a cap-and-trade program is only indirectly responsible for increases in co-pollutants, increases that are ultimately attributable to weaknesses in the Clean Air Act, climate change policies must account for the risks and opportunities they set in motion.

3. Additional Design Parameters: Offsets and Program Linkage

Certain design features of cap-and-trade programs could create additional distributive justice issues. For example, the use of offsets implicates the distribution of co-pollutant reductions. Cap-and-trade programs generally cover particular sectors, like the electric utility sector, and allowance trading occurs among sources within the sector. Offsets are reductions achieved outside of the regulated sector. If facilities are allowed to meet their emission reduction obligations by buying offsets, then the reductions would not be made by facilities within the regulated sector.

If offsets were produced from reductions in emissions from polluting facilities that were not subject to a cap-and-trade program but that were located within polluted areas, then an offset program would contribute to co-pollutant reductions. However, some types of offsets, like biological sequestration, do not provide co-pollutant reductions. For example, an electric utility might buy offsets from a timber company based on its commitment not to harvest carbon-sequestering trees. Assuming that the forest conservation is a verifiable and legitimate mechanism for sequestering carbon (often a contested issue),[40] use of a timber-based offset would allow existing GHG emissions and their co-pollutants to continue while offsetting only the GHG emissions, not the co-pollutants. In contrast, if trading were limited to allowances within a sector, it would be more likely to generate co-pollutant reductions.[41] This is not to say that biological sequestration does not generate its own important benefits. Nonetheless, the

use of such offsets allows continued greenhouse gas and co-pollutant emissions that would have decreased absent the ability to use the offset.

Similarly, if a facility is permitted to buy offsets from outside of the regulated jurisdiction altogether, then the jurisdiction might obtain fewer co-pollutant reductions. Thus, if a facility in the United States purchased reductions from tree plantations in Brazil, then the U.S. facility would continue its emissions with no decrease in co-pollutants within the United States. If the trades occur among countries that all have GHG reduction requirements, like trades between the European Union and the United States (once it has a cap), then reciprocal trades could, conceivably, even out the difference. But if the outside jurisdiction does not have a greenhouse gas reduction program, as is generally the case with developing countries,[42] then all such offset transactions would maintain greenhouse gas and co-pollutant emissions in the regulated jurisdiction. This type of linkage would deprive the regulating jurisdiction of co-pollutant reduction benefits.

International trading clearly raises many profound questions of international justice. From a distributive justice perspective, there are many potential benefits and drawbacks to reducing emissions in developing countries rather than in the industrial world, including but not limited to the distribution of co-pollutant reduction benefits.[43] This chapter is, however, focused on the potential impact of a cap-and-trade program on the distribution of co-pollutants, and here simply highlights the impact of international trading on that distribution.

B. Participatory Injustice

As suggested above, the environmental justice movement's participatory justice goals are difficult to realize within a cap-and-trade program. In a cap-and-trade program, government entities would set the emissions cap, but they would not design a system of industry-specific requirements through a public rulemaking process. Moreover, trading generally occurs in the private market, with, at most, a requirement that trades be registered with a government agency. A trading program for greenhouse gases is unlikely to allow for the kind of public participation that currently accompanies individual facility permitting proceedings.

III. Reconciling Justice and Efficiency

A. The Case for Reconciliation

The adverse distributive and participatory consequences associated with cap-and-trade programs do not mean that efficiency is unimportant. The challenge for policymakers is to develop policies that maximize the available benefits while minimizing their potential detrimental consequences.

1. The Benefits of Efficiency

The administrative and economic efficiencies that market-based mechanisms seek to achieve have their inherent virtues. Lowering the cost of environmental regulation means that industry and consumer alike could have more resources to devote to other, more productive, uses. Lowering administrative costs leaves the government with additional resources to devote to enforcement or ultimately saves taxpayers from the financial burden of resource-intensive regulatory efforts. Greater economic efficiency also has certain indirect distributive benefits. Although the primary focus of this chapter is on distributive justice as it relates to the co-pollutant impacts of GHG mitigation strategies, economic efficiency indirectly implicates wealth distribution. The energy and other consumer cost increases that are likely to result from climate change mitigation policies are likely to have a regressive impact: to have a disproportionately greater impact on the poor.[44] Lowering the costs of regulation could, at least theoretically, help soften the impact of climate change controls on the most vulnerable.[45]

It is also possible that using an economically efficient regulatory strategy could lead to higher reduction goals that would better protect the planet from impending climate change. Industry and policymakers may seek to control the economic impact of climate change policies and resist reduction targets they fear will impose unacceptable economic costs. Assuming that the economic impact of the law is held constant, a economically efficient mitigation strategy could lead to a more stringent reduction target.[46] And, going beyond the co-pollutant distributive justice issues that are the primary focus of this chapter, stringency could have a separate distributional benefit: the

greater the global reductions in GHGs, the greater the benefit to the communities most vulnerable to the impacts of climate change. As the Intergovernmental Panel on Climate Change has noted, residents of developing countries are likely to be more adversely impacted by climate change's consequences than those in the industrialized world.[47] Within the United States, poor communities are also likely to be more vulnerable to the consequences of climate change.[48] They may live in more environmentally vulnerable areas, as the nation witnessed in the aftermath of Hurricane Katrina. The increased air pollution associated with higher temperatures is likely to disproportionately impact poor and of-color communities because they are more likely to be in areas that fail to meet national air quality standards. The poor are also more vulnerable to air pollution increases, as well as increased incidences of disease, because they are much less likely to have health insurance. In general, the more disadvantaged the community, the less able it is to adapt to the inevitable consequences of climate change. Thus, if economically-efficient policies lead to higher reduction goals, they could mitigate the climate change impacts on the globe's most vulnerable regions and communities.

2. The Benefits of Distributive Justice

Although economic efficiency provides collective benefits and may have certain indirect distributional virtues, the benefits of economic efficiency do not justify complete indifference to the co-pollutant impacts of GHG mitigation strategies. The United States continues to be plagued by serious air pollution, much of it concentrated in communities of color.[49] While the existing Clean Air Act has undoubtedly improved overall air

quality, it has failed to lead many areas into attainment of the nation's health-based standards.[50] The failure to attain air quality goals has serious consequences for residents of polluted communities, who experience high degrees of asthma, heart disease, and cancer that is often at least partly attributable to poor air quality. Since climate change regulation is likely to require major transformations in the same sectors and processes that cause air pollution, addressing both GHGs and co-pollutants provides a more holistic approach than narrowly considering GHGs alone.

Addressing adverse pollution impacts on the poor is justified not only by a moral commitment to equality, but by a broader vision of social welfare than that embodied in a narrow conception of industrial economic efficiency. "Efficiency" in market-based systems focuses on achieving a given overall level of pollution reduction at the lowest cost. But, in light of the public health consequences of pollution and its associated costs, that approach does not necessarily maximize social welfare. Concentrations of pollution also impose social costs: the public health and welfare costs associated with increased levels of asthma, heart disease, and cancer.[51] A system that more equally distributes pollution and reduces its public health and welfare costs could be more efficient from a social welfare perspective, even if it increases the cost of pollution control relative to a pure market-based mechanism. Ironically, the "greatest good for all" may be best served by attending to distributive justice.

3. What Balance Between Economic Efficiency and Distributive Justice?

As A. Dan Tarlock has stated: "A judgment that a certain allocation of resources is efficient but inequitable can constrain efficiency when the distributional impacts are deemed unacceptable."[52] Once one accepts the importance of reconciling the sometimes-conflicting aims of efficiency and a fair distribution of co-pollutants, one faces the question: how to balance the two? When is a given level of distributional impact "unacceptable?" As with most questions of public policy, there is no absolute answer; the appropriate balance rests on one's underlying values.

John Rawls' "Difference Principle" provides a potentially helpful conceptual guidepost for evaluating the tradeoff. While the Difference Principle does not apply directly, it provides a mechanism for balancing the collective advantages that can be obtained by allowing differences (such as the differences in emissions allowed by market-based mechanisms) with distributive justice concerns for the least advantaged (the communities most impacted by pollution). Rawls is willing to accept economic systems that lead to differences, like differences in wealth, if those systems do not make certain members of society worse off and if they benefit the poorest members of society. As he states, an economic system that leads to differences in wealth is justified if it provides "compensating benefits for everyone, and in particular for the least advantaged members of society."[53]

A rough analogy could be made to the tradeoff between efficiency and distributive justice in the cap-and-trade context. The analogy is imperfect, since it requires comparing "apples with oranges." Under Rawls' theory, the primary focus is on

the conditions in which an economic system leading to unequal wealth distribution might be justified. Here, the issue is not the distribution of a single good, like wealth, but the tradeoff between competing aims: achieving GHG reductions cheaply versus improving co-pollutant distributions. Nonetheless, the analogy is helpful because it juxtaposes a utilitarian goal that attempts to serve the greatest good with a distributive justice goal that focus on the distribution of costs and benefits.

Applying the Difference Principle in the cap-and-trade context, the justifiable "difference" would be differences in emissions reductions at different facilities, differences justified by the utilitarian goal of greater economic efficiency and its associated benefits. These differences would be justified, however, only where they would leave everyone better off, particularly those communities most burdened by pollution. If trading, and its resulting differences in emissions, resulted in greater pollution in the most-polluted communities, then pursuing the greater good of efficiency would impose an unacceptable burden on disadvantaged communities. Similarly, if pursuing efficiency failed to provide co-pollutant benefits to already-polluted communities, then trading would violate the Difference Principle. Stated differently, the differences in emissions likely under a trading system would be acceptable so long as they did not worsen air quality in heavily-polluted areas, and so long as they led to at least some improvements in the most polluted areas.

The analysis is complicated by the multiple consequences of climate change policies. As suggested above, the least-advantaged communities could also reap some

benefits from economic efficiency, since more efficient programs could lead to more stringent overall GHG reduction targets that ultimately protect vulnerable communities by reducing the impacts of climate change. Thus, while a system that allows differences in emissions could harm the least-advantaged by failing to address co-pollutants, it could help them if it provided greater protection from the ultimate specter of climate change.

The Difference Principle does not provide an automatic answer to the proper structure of a cap-and-trade program. It nonetheless suggests the general wisdom of qualifying utilitarian goals designed for the common good with protections for the least advantaged.

4. The Benefits of Participatory Justice

Participatory justice is another key attribute of environmental decisionmaking. As discussed above, a cap-and-trade program leaves key decisions to the regulated sector. Individual facilities decide how and when they will reduce emissions versus buying allowances. In a cap-and-trade program, the government's role, and the opportunity for public participation, would be limited to determining the appropriate cap (unless already specified by Congress) and designing the trading system. In contrast, traditional regulatory approaches involve a public rulemaking process for determining the appropriate reductions for each industry.[54] That process allows government decisionmakers, industry, and the public to provide their input on the full range of issues and impacts that particular standards, and the technologies needed to meet them, might

raise. Allowing industry to decide how and when to reduce might be more administratively efficient, but it privatizes a formerly democratic process.

For disadvantaged communities, participatory justice is particularly important at the facility-specific level. Most permitting proceedings include opportunities for public participation that allow community input into the process.[55] Even if communities do not have ultimate authority over permitting decisions, their ability to obtain information through public hearings and to voice their input creates a greater likelihood of industry accountability to impacted communities than is likely to exist absent that input. At least in some instances, environmental justice proponents' participation influences permit conditions.

5. What Balance Between Efficiency and Participatory Justice?

Participatory justice is the Achilles heel of cap-and-trade systems. Notwithstanding the critical importance of participatory justice, it is virtually impossible to balance with the essential characteristics of a trading system. Administrative efficiency is likely to be significantly impacted by public participation requirements in connection with individual allowance distributions, trades, or auction sales. While not inconceivable, and perhaps advisable for the most heavily-polluted areas, including public participation could create significant enough administrative constraints to undermine a cap-and-trade program. The administrative constraints could also so chill

trading that it could lead to significant economic efficiency impacts as well, as facilities forego economically efficient trades due to their associated administrative costs.

The proposals for reconciliation below therefore do not include any robust mechanisms for public involvement. Instead, as elaborated more fully below, they stress the importance of combining cap-and-trade with more participatory regulatory strategies and the importance of transparent public information to maximize public accountability.

6. Guiding Principles for GHG Policies: Efficiency, Equity, and Efficacy

Some scholars considering cap-and-trade programs to address climate change appear to focus primarily on what will maximize the market's efficiency.[56] Achieving aggregate environmental goals at less cost is a worthwhile attribute, and policymakers must design a functional market or the exercise is meaningless. But efficiency is not the only relevant issue to the design of environmental policies. Ultimately, market-based systems are a means to an end, and sound social policy requires the consideration of a much broader range of variables.[57] Incorporating additional goals, like improving the distribution of co-pollutants, would create a more equitable environmental policy, and one that more fully considers overall social welfare rather than a narrow conception of economic efficiency.

Before turning to specific proposals for reconciling efficiency and equity, I note that efficiency and equity, the foci of this chapter, are not the only issues to be considered

in determining how much to rely upon cap-and-trade programs and how to design them. A third critical issue is the likely efficacy of proposed regulatory choices. Cap-and-trade skeptics fear that cap-and-trade programs are unlikely to deliver the results that they promise in theory. Existing trading systems have often overallocated allowances, and have therefore failed to reduce emissions.[58] Another issue is the administrative ease and accuracy of verifying environmental results. Under a traditional permitting system, agencies establish permit requirements and enforce permit conditions. In a cap-and-trade program, in contrast, agencies must rely on monitoring and reporting data, and their ability to ensure that stated reductions are in fact occurring will depend upon the ease and accuracy of the monitoring and verification process. In addition, to accomplish the transformations necessary to cope with climate change, government policies will need to encourage both the adoption and development of alternative technologies. It is not clear that markets are always superior to direct regulation in creating these incentives.[59]

If a market's success is defined only by the quantity and fluidity of trades and the associated economic efficiencies that those trades likely represent, then other central goals could be sacrificed in the process. A system with fewer trades and less economic efficiency could be preferable if it is more equitable, more verifiable, and more likely to lead to the fundamental changes that the specter of climate change demands.

B. Mechanisms for Reconciling Justice and Efficiency

In the following discussion, I propose a number of practical mechanisms for alleviating the adverse distributional impacts of a cap-and-trade program. I then assess each proposal's impact on administrative and economic efficiency. In some instances, the impacts on efficiency may be less dramatic than cap-and-trade advocates fear, in part because cap-and-trade programs are not always as efficient in practice as they may be in theory, and in part because traditional regulatory approaches may not always be as inefficient in practice as they are sometimes portrayed. In some cases, however, minimizing a cap-and-trade program's distributive impacts could affect, but ideally not hobble, a trading program's efficiency. The extent of the impacts will depend upon how the particular mechanisms are implemented.

1. Combine a Cap-and-Trade Program with Direct Regulation

a. The Benefits of Combining Cap-and-Trade with Regulation

Fundamentally, a cap-and-trade program should be one component of a much larger and more comprehensive climate change agenda.[60] Some of the adverse distributional and participatory consequences of a cap-and-trade program could be mitigated if it were combined with direct regulations that require all facilities to adopt available cost-effective emission reduction mechanisms.[61] Existing cap-and-trade programs take a similar approach: virtually all of them supplement an existing regulatory system rather than replacing it. For example, in the Acid Rain Program, the trading program is designed to achieve reductions beyond those called for under existing Clean

Air Act requirements.[62] In a GHG emission reduction program, facilities could be required to adopt available and cost-effective energy efficiency or other GHG emission reduction measures. A cap-and-trade program could then be used to require facilities to make the further reductions necessary to address the threat of climate change.

Requiring facilities to adopt available mechanisms would distribute the co-pollutant reduction co-benefits of climate change regulation more equitably than a pure trading system. It would also reduce the risk of hot spots. As discussed above, if these regulations followed the traditional model, they would set allowable emission *rates* rather than absolute limits. Thus, traditional regulation could lead, ultimately, to increases in absolute emissions even if facilities complied with the new emission rate limitations. Nonetheless, across-the-board regulations would likely result in distributional improvements because any later emissions increases would begin from a lower baseline than they would have without direct regulations requiring all facilities to reduce their emission rates.

Another key benefit of a regulatory approach is the opportunity for pubic participation. The public could participate in the regulatory process for establishing initial regulatory standards and, at the facility-specific level, communities could participate in individual permitting processes.

Environmental justice benefits are not the only justification for some measure of direct regulation. Direct regulation is more effective at encouraging facilities to adopt

known and cost-effective technologies than the market's uncertain and sometimes-ignored price signals.[63] Moreover, the extensive reductions necessary to address the threat of climate change will likely require all facilities to reduce, not just the lowest-cost reducers. Those reductions should simply be required. Where government expertise ends, a cap-and-trade program could begin. Government regulators could set a cap below the level achievable by existing mechanisms and let the market create incentives for new technology innovation.

b. Administrative Efficiency Implications

Combining a cap-and-trade program with direct regulation would impact administrative efficiency. Under ideal circumstances, cap-and-trade programs promise administrative efficiency because government regulators just set a cap and allocate the initial allowances; they leave the decision about how to comply to the regulated community. Government agencies therefore do not have to develop initial industry- or facility-specific standards, and they do not have to engage in facility-specific permitting processes. Enforcement consists of ascertaining whether a facility has accumulated enough allowances to match its actual emissions. For example, the Acid Rain Program, which includes a limited number of sources, all of whom have been required to install continuous emissions monitoring that facilitates government enforcement, has been very administratively efficient.[64]

The relative administrative benefits of cap-and-trade should not, however, be overstated. Direct regulation is not always administratively complex and cap-and-trade programs are not always easy to administer. Developing industry standards for greenhouse gas reductions might not be as complex as it is for other pollutants since direct regulation to address GHGs would likely focus on energy efficiency improvements.

On the other hand, cap-and-trade programs could be more administratively complex than traditional regulation if the program includes multiple diverse sources of varying sizes, including smaller players who lack information about the market or are unaware of available implementation choices.[65] Such sources could require time and resource-intensive government assistance to take advantage of market benefits. Moreover, unless the participating facilities all have easily verifiable monitoring results, monitoring and enforcement can turn into a complex and time-consuming administrative process. In the RECLAIM program, a cap-and-trade program in Los Angeles, government officials concluded that the cap-and-trade program, which included a variety of types and sizes of sources and did not have an easily verifiable monitoring process for all sources, required more administrative resources than a traditional regulatory approach.[66] This is not to say that direct regulation is always more efficient than cap-and-trade programs, but that its administrative efficiency should not be presumed.

c. Economic Efficiency Implications

In theory, a program of direct regulation could impact economic efficiency by requiring some sources to adopt emissions-reducing measures that they could have avoided if cheaper allowances were available. The inefficiency of traditional regulation should not, however, be overstated: traditional environmental regulations typically take cost into consideration in setting industry-wide standards. The extent to which different firms within an industry would be expected to reduce is therefore likely to vary by each firm's costs of reduction, with those firms capable of making inexpensive reductions expected to do more and those facing high costs expected to do less. Admittedly, if costs vary *within* an industry, so that the required reductions are more expensive for some firms within the same industry than for others, then traditional regulation could be inefficient. But, to the extent that regulators create standards for industry groups with reasonably similar facilities, traditional regulation is not as inefficient as it is sometimes portrayed.

In addition, in light of the demanding reduction goals ahead, no business is likely to be able to continue as usual. Regulations requiring cost-effective emission reductions through, for example, energy efficiency improvements, would likely require steps that would have been economically rational under a market-based approach, assuming a sufficiently stringent cap. A regulatory program that simply required such reductions, rather than relying upon the market to inspire potentially irrational actors, would provide a more certain and direct mechanism to accomplish currently achievable reductions that are already economically feasible. In other words, regulations could simply replicate actions that the market would have incentivized in any case, but without the uncertainties

inherent in market approaches. If it achieves the same results as a market-based approach, it would not be less economically efficient.

2. Impose Limitations to Maximize Co-Pollutant Reductions

a. Types of Limitations

While some degree of direct GHG regulation could reduce co-pollutants widely, the reductions are not likely to be sufficient to solve the nation's air pollution problems. Even with a regulatory approach, GHG trades that increase co-pollutants or fail to provide co-pollutant reduction benefits could thus continue to impact disadvantaged communities. To address the impact, regulatory agencies could evaluate communities' relative exposure to co-pollutants and impose trading restrictions in proportion to the risk.[67]

The trading restrictions could take a variety of forms. Fewer allowances could be distributed to facilities in polluted areas. For example, in a system in which allowances are distributed in proportion to existing emissions, facilities in polluted areas could receive proportionately fewer allowances than facilities in less polluted areas.[68] If allowances were auctioned, facilities in polluted areas could be allowed to purchase only a certain percentage of their baseline emissions. Alternatively, more indirect reduction incentives could be developed. The regulatory agency could require facilities in polluted areas to submit more allowances per ton of emissions. For example, a facility might be

required to obtain 1.5 or 2 allowances per ton of emissions in a polluted area, with the ratio depending upon the extent of the pollution in the area.[69] This approach would be similar to the differing offset ratios required for new sources in areas that have not attained the nation's air pollution standards, known as nonattainment areas. In these areas, the number of offsets required depends upon the severity of the area's nonattainment status.[70] Alternatively, if allowances are auctioned, a higher rate could be charged for allowances to be used in disadvantaged areas.

Co-pollutant reduction benefits could also be enhanced by limiting the use of offsets that do not result in co-pollutant reductions and that are purchased from unregulated jurisdictions. Regulating the use of offsets would also prevent cheap offsets from reducing allowance prices too low to generate the price signal needed to prompt technology adoption and innovation.

Moreover, monitoring considerations may implicate the appropriate reach of a cap-and-trade program. Monitoring is critical to a program's integrity. Without a permitting process that establishes the ground rules for a facility's operation, agencies rely exclusively on the accuracy of a facility's contention that it has enough allowances to match its emissions. Accurate and easily verifiable monitoring is critical to ensuring that emissions in fact match allowances. A cap-and-trade program should therefore be strictly limited to those sectors and sources capable of providing accurate and verifiable emissions data.

b. Administrative Efficiency Implications

Geographically-based controls, like different allowance-to-emissions ratios, could impact administrative efficiency. The administrative efficiency impacts of such geographically-based controls would depend upon how the controls are designed. As an initial matter, an agency would have to assess exposure risks to determine the areas subject to limits. Agencies in some jurisdictions may have already collected the relevant information. If not, however, the information would be highly useful for a variety of purposes and its collection could be valuable on its own terms.

Once an agency determines the most-exposed areas, mechanisms that require a higher allowance ratio or charge more for allowances in polluted areas would be relatively straightforward to administer. However, mechanisms that turn upon a given facility's baseline emissions, like limiting a facility's allowance purchases to a certain percentage of its baseline, could be more administratively burdensome since they would require the agency to assess baseline emissions, an issue that is frequently contested. If the regulatory agency obtained baseline emissions data in any case, however, little additional administrative burden would be imposed.

Limiting offsets generally, as well as offset purchases from outside the jurisdiction, would not have adverse administrative efficiency consequences. Controlling offsets between regulated and unregulated entities could involve difficult monitoring and verification challenges, especially if the source of the offset is not under the jurisdiction

of the regulatory agency responsible for the purchasing entity. For example, if an electric utility were purchasing offsets from a farm's methane control program, the air pollution control agency is unlikely to have had traditional jurisdiction over the farm's unregulated methane emissions, and the agency will have to develop a new administrative system for monitoring and verifying the farm's reductions. The challenge is practical as well as institutional. Certain sources, like biological sequestration, are inherently difficult to verify and quantify. Agencies would likely face significant administrative challenges in determining how to keep track of such potentially variable reduction strategies. Geographic linkages also pose significant administrative challenges for agencies that seek to ensure that the promised reductions occurred in other jurisdictions. While the purchasing jurisdiction may have some confidence in the legitimacy of credits from selling jurisdictions with strong legal rules and enforcement, trades with countries that have less robust legal systems present administrative challenges for the purchasing jurisdiction. In general, trades within a jurisdiction are likely to be easier to administer than trades between jurisdictions.

Limiting the scope of a trading program to facilities that can be easily and accurately monitored would also be more administratively efficient. Distributing allowances will be more straightforward if regulators have confidence in information about existing baseline emissions. In addition, enforcement will be far easier if regulators have easily verifiable emissions data. If sectors that cannot be easily monitored are included in the trading system, then regulators will face a much greater

administrative burden in determining baseline emissions and verifying emissions associated with trades.

c. Economic Efficiency Implications

Limiting trading into polluted areas, limits on offsets from outside regulated sectors and other jurisdictions, and limiting the sectoral reach of the program would undoubtedly impact a cap-and-trade program's economic efficiency. If facilities in polluted areas have to spend more to cover their emissions than facilities in other areas, then they are more likely to invest in emissions reductions – even if other facilities could have reduced more cheaply. Limitations on offsets would also preclude the use of inexpensive reduction alternatives. Limiting the scope of the program to easily-monitored sources would deny the economic benefits of a cap-and-trade program to the omitted sectors. These restrictions thus pointedly raise the trade-off between economic efficiency and distributive justice. The extent of the conflict would depend upon the stringency of each restriction. While there is no objectively correct answer to the question of "how stringent?," some impact on efficiency is justified by the distributive justice benefits of alleviating concentrations of co-pollutants in disadvantaged areas and by the overall social welfare benefits that derive from addressing co-pollutants along with GHG emissions.

3. Use Auction Revenues to Further Distributive Justice

If allowances are auctioned, rather than given away for free, then facilities must pay for the right to pollute. The government receives revenue that it can use for a variety of purposes, including reducing co-pollutants that a GHG trading program might have failed to reduce. In other words, although a cap-and-trade program may fail to address the adverse distribution of co-pollutant emissions, auction revenue could be directed to impacted communities for alternative co-pollutant reduction activities.[71] Auction revenues could be used to subsidize industrial co-pollutant reductions, finance less-polluting public transportation, finance less-polluting private transportation, or finance any other pollution-reducing activities. Subject to overarching specifications, local communities could play a role in deciding how the funds should be used, creating a public participation opportunity.

This approach to the potential adverse distributional impacts of trading would have the least impact on the trading system's internal administrative and economic efficiency. Other co-pollutant reducing activities are not always easily available in all communities, however, so it may not suffice to address a trading system's co-pollutant impacts. And while it might make a trading system more efficient, it would create a separate administrative process that might not reduce overall governmental costs.

More generally, if it is impractical to use auction revenues to address the distribution of co-pollutants, auction revenues could at least address economic disparities. Auction revenues could be used to help low-income consumers improve energy efficiency to reduce the regressive impact of increasing energy costs. Funds could also be

used to provide green job training for disadvantaged communities, to create other green economic opportunities in historically disadvantaged communities, to finance necessary adaptation measures for poor communities, or for other purposes that assist those most vulnerable to climate change and its regulation.[72]

4. Public Accountability

The incompatibility of trading programs and public participation is a highly significant consequence of cap-and-trade programs. As discussed above, that incompatibility provides a justification for including direct regulation as an important component of climate change strategy to ensure a continuing role for the public in key regulatory decisions. Within the confines of a cap-and-trade system, the absence of direct public participation in permitting proceedings renders public access to trading information critical. If the public loses the ability to have input in facility decisions before they are made, then it is imperative for surrounding communities to be able to keep track of the consequences of trading for local facility emissions. Allowance purchases and their emissions consequences should be frequently and publicly recorded.[73] Although public accountability is not the same as public participation, it could provide an important check on potential abuse, and provide information that regulators could use to address adverse pollution concentrations if and when they emerge.

IV. Conclusion

Achieving greenhouse gas emissions reductions efficiently is an important and laudable goal that benefits society at large. In theory, pursuing efficiency could even serve some distributive justice goals if it accelerates reductions and lowers the economic costs of regulation, results that benefit the most vulnerable. But a single-minded pursuit of a narrow definition of economic efficiency, with efficiency defined solely in terms of lowering costs for industry and lowering the total cost of a given level of reduction, could sacrifice equity in the distribution of co-pollutants and fail the least-advantaged.

A single-minded pursuit of a narrow vision of efficiency would undermine the development of an effective and comprehensive environmental policy. Climate change legislation is likely to be a vehicle for fundamental industrial transformation. That transformation should be driven by a broader vision than the pursuit of economic efficiency. Holistically integrating principles of distributive and participatory justice into the design of regulatory policies will better serve an ethical commitment to equality and enhance overall social welfare.

[1] These profound questions about relative national obligations to address global climate change are addressed in Steve Vanderheiden, *Atmospheric Justice: A Political Theory of Climate Change* (New York: Oxford University Press, 2008) and in Eric A. Posner and Cass R. Sunstein, "Climate Change Justice," *Georgetown Law Journal* 96 (2008), 1565-1612.

[2] For an excellent history of the environmental justice movement, see Luke W. Cole & Sheila R. Foster, *From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement* (New York: New York University Press, 2001).

[3] James P. Lester et al., *Environmental Injustice in the United States: Myths and Realities* (Boulder, CO: Westview Press, 2001).

[4] *See* Alice Kaswan, "Distributive Justice and the Environment," *North Carolina Law Review* 81 (2003): 1031, 1048-50; Michael Ash, James K. Boyce, Grace Change, Manuel Pastor, Justin Scoggins, & Jennifer Tran, *Justice in the Air: Tracking Toxic Pollution from America's Industries and Companies to Our States, Cities, and Neighborhoods* (Los Angeles: University of Southern California Program for Environmental and Regional Equity, 2009); Robert D. Bullard, Paul Mohai, Robin Saha, & Beverly Wright, *Toxic Wastes and Race at Twenty: 1987-2007* (Cleveland: The United Church of Christ, 2007).

[5] Richard J. Lazarus, "Pursuing 'Environmental Justice': The Distributional Effects of Environmental Protection," *Northwestern University Law Review* 87 (1992), 787, 814-15. A. Dan Tarlock observes that environmentalism has been driven by a "utilitarian tradition which stresses *aggregate* welfare, often at the expense of identifiable communities within society." A. Dan Tarlock, "Environmental Protection: The Potential Misfit Between Equity and Efficiency," *University of Colorado Law Review* 63 (1992), 871, 874. E. Donald Elliott suggests that, since poor communities bear the brunt of pollution, they are likely to also reap disproportionate benefits from the nation's efforts to reduce aggregate pollution. E. Donald Elliott, Jr., Á Cabin on the Mountain: Reflections on the Distributional Consequences of Environmental Protection Programs," *The Kansas*

Journal of Law & Public Policy (Summer 1991), 5, 7. The fact that poor communities may disproportionately benefit from pollution control laws aimed at reducing aggregate pollution levels does not, however, resolve whether they would benefit *more* if the pollution control mechanisms focused directly on distributional impacts.

[6] See the New Source Performance Standards under the Clean Air Act, *U.S. Code* 42 (2006) § 7411.

[7] For example, the federal Clean Air Act gives states have the authority to impose requirements on existing air pollution sources in order to achieve district-wide air quality goals. *U.S. Code* 42 (2006), § 7410(a)(2)(A).

[8] Executive Order no. 12,898, *Code of Federal Regulations*, title 3, § 859 (____).

[9] "Memorandum for Heads of All Departments and Agencies" (White House, Feb. 11, 1994), http://www.epa.gov/compliance/resources/policies/ej/clinton_memo_12898.pdf. As a consequence, all federal agencies' environmental impact statements are required to analyze impacts not only in generalized terms, but with reference to the demographic characteristics of affected populations. Council on Environmental Quality, "Environmental Justice: Guidance under the National Environmental Policy Act," (Washington, D.C., 1997), http://ceq.eh.doe.gov/nepa/regs/ej/ej.pdf.

[10] *U.S. Code* 35 (2000), § 2000d.

[11] *See* Environmental Protection Agency, "Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs," *Federal Register* 65, (June 2000): 39,650. Most federal agencies have had long-standing regulations that prohibit state and local funding recipients from not only engaging in intentional discrimination, but from causing discriminatory impacts. See, e.g., *Code of Federal*

Regulations 40 (2008), § 7.35(b) (EPA Title VI regulations prohibiting disparate impacts). In the 1990s, environmental justice litigators recognized the potential environmental justice implications of these regulations, and began to initiate claims against state and local agencies alleging that environmental permits that resulted in emissions or discharges creating a disproportionate pollution impact in communities of color violated the federal disparate impact regulations. Since many of these claims were filed as complaints with the supervising federal agency, generally the Environmental Protection Agency (EPA), EPA then developed draft guidance on the applicability of Title VI to state and local environmental permits. The guidance made clear that Title VI could place constraints on an agency's ability to grant permits to facilities whose emissions would create a disparate impact. *See* Environmental Protection Agency, Draft Title VI Guidance.

[12] *See* Melissa A. Hoffer, "Closing the Door on Private Enforcement of Title VI and EPA's Discriminatory Effects Regulations: Strategies for Environmental Justice Stakeholders after *Sandoval* and *Gonzaga*," *New England Law Review* 38 (2004), 971-1008, 1004.

[13] *See* Ann E. Goode & Suellen Keiner, "Managing for Results to Enhance Government Accountability and Achieve Environmental Justice," *Pace Environmental Law Review* 21 (2004), 289-313.

[14] A classic article advocating market approaches is Bruce A. Ackerman & Richard B. Stewart, "Reforming Environmental Law," *Stanford Law Review* 37 (1985), 1333. For an overview of the history, principles, and assessment of trading systems, see T. H.

Tietenberg, *Emissions Trading: Principles and Practice* (Washington, D.C.: Resources for the Future, 2nd ed. 2006).

[15] *U.S. Code* 42 (2006), § 7651 *et seq.*

[16] *See, e.g.*, Environmental Protection Agency, "Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone," *Federal Register* 70 (May 2005): 25162; Environmental Protection Agency, Office of Water, "Water Quality Trading Policy," (January 2003), http://www.epa.gov/owow/watershed/trading/finalpolicy2003.pdf. In addition, some air districts, like the air district in Los Angeles, have used market-based mechanisms to meet local National Ambient Air Quality Standards for criteria pollutants. *See* Lesley K. McAllister, "Beyond Playing "Banker": The Role of the Regulatory Agency in Emissions Trading," *Administrative Law Review* 59 (2007). Some of the recent initiatives, like the above-mentioned rule to reduce particulate matter and ozone, were struck down because they failed to conform to the traditional regulatory structures established in underlying legislation. *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008).

[17] A number of the arguments discussed below are detailed more fully in Alice Kaswan, "Environmental Justice and Domestic Climate Change," *Environmental Law Reporter* 38 (2008): 10287, 10291–10312.

[18] Vicki Been, "What's Fairness Got To Do With It? Environmental Justice and the Siting of Locally Undesirable Land Uses," *Cornell Law Review* 78 (1993), 1001, 1029-55; Kaswan, "Distributive Justice and the Environment."

[19] Environmental programs raise an additional equity issue: the impact of pollution control obligations on regulated industry. This chapter focuses on the distributive justice

claims made by the environmental justice movement, which center on the distribution of pollution. For an article that focuses largely on the implications of considering fairness versus efficiency with respect to regulated industries, see Shi-Ling Hsu, "Fairness Versus Efficiency in Environmental Law," *Ecology Law Quarterly* 31 (2004), 303.

[20] Achieving the highest overall level of pollution reduction could be considered a utilitarian goal that achieves "the greatest good for the greatest number." *See* Nicholas Rescher, *Distributive Justice: A Constructive Critique of the Utilitarian Theory of Distribution* (Indianapolis: Bobbs-Merrill, 1966), 8.

[21] Vanderheiden, *Atmospheric Justice*, 49.

[22] Rescher, *Distributive Justice*, 73, 75-76 (discussing distribution on the basis of need), 53-55 (discussing distribution on the basis of "desert").

[23] Norman Daniels describes three potential egalitarian targets: of resources, of welfare, and of capabilities. Norman Daniels, "Equality of What: Welfare, Resources, or Capabilities?," *Philosophy and Phenomenological Research* 50 (Supplement 1990), 273-74. An approach that focused on a numerical distribution of polluting facilities embodies an "equality of resources" approach, while one that focused on relative degrees of preference satisfaction embodies an "equality of welfare" approach. The equality of capabilities approach is less relevant to the distribution of pollution. In this chapter, I do not evaluate the differing conceptions of equality, but simply indicate that unequal distributions of pollution are unlikely to be justified under any of the relevant theories.

[24] Professor Lynn Blais argues that the existing physically unequal distribution of polluting facilities is not necessarily unjust in light of potentially differing resident

preferences. Lynn E. Blais, "Environmental Racism Reconsidered," *North Carolina Law Review* 75 (1996), 75.

[25] Kaswan, "Distributive Justice and the Environment," 1090-1144. Arguably, even if different distributions meet differing preferences, the differing circumstances underlying those preferences undermine true equality in welfare. The disparity in preferences is ultimately traceable to underlying differences in economic equality, with the poor potentially "choosing" environmentally harmful facilities due to their economic need. According to Daniels, advocates of a welfare-based notion of equality have argued that the key issue is "equal opportunity for welfare," with welfare defined as preference satisfaction. Daniels, "Equality of What?," 287. Underlying economic inequalities create unequal opportunities for welfare by constraining choices for pollution-free environments. Where people do not have the opportunity "to gain welfare or advantage as a result of brute luck" – where their undeserved poverty prevents them from choosing pollution-free environments – "then we have a claim of justice on others." Daniels, "Equality of What?," 290.

[26] Kaswan, "Distributive Justice and the Environment," 1136–1144.

[27] Daniel J. Dudek & John Palmisano, "Emissions Trading: Why Is This Thoroughbred Hobbled?," *Columbia Journal of Environmental Law* 13 (1988), 217, 223, 231-34 (describing efficiency goals for market-based programs).

[28] For further elaborations of this tension, see Lily N. Chinn, "Can the Market Be Fair and Efficient? An Environmental Justice Critique of Emissions Trading," *Ecology Law Quarterly* 26 (1999), 80; Richard T. Drury et al., "Pollution Trading and Environmental Injustice: Los Angeles' Failed Experiment in Air Quality Policy," *Duke Environmental*

Law & Policy Forum 9 (1999), 231, 272; Stephen M. Johnson, "Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Injustice?," *Washington & Lee Law Review* 56 (1999), 111.

[29] Sheila Foster, "Justice from the Ground Up: Distributive Inequities, Grassroots Resistance, and the Transformative Politics of the Environmental Justice Movement, *California Law Review* 86 (1998), 775.

[30] Luke Cole, *Empowerment as the Key to Environmental Protection: The Need for Environmental Poverty Law,"* Ecology Law Quaterly 19 (1992), 641.

[31] Federal legislation introduced in 2009 included a cap-and-trade program to address stationary source emissions. *The American Clean Energy and Security Act of 2009*, HR 2454, 111th Cong., 1st sess. (June 26, 2009); David R. Baker, "Obama Seeks Immediate Action to Curb Emissions," *San Francisco Chronicle*, November 19, 2008 (discussing President-elect Obama's support for a cap-and-trade program for greenhouse gas emissions).

[32] Regional Greenhouse Gas Initiative, "Memorandum of Understanding," December 20, 2005, http://www.rggi.org/docs/mou_final_12_20_05.pdf; "Midwestern Greenhouse Gas Accord," November 15, 2007, http://www.midwesterngovernors.org/resolutions/GHGAccord.pdf; "Western Regional Climate Action Initiative," February 26, 2007, http://www.westernclimateinitiative.org/ewebeditpro/items/O104F12775.pdf.

[33] "The California Environmental Justice Movement's Declaration on Use of Carbon Trading Schemes to Address Climate Change" (2008), http://ejmatters.org/declaration.html The environmental justice movement's critiques of

cap-and-trade programs go beyond the concerns about distributive and participatory justice discussed in this article. Environmental justice advocates express a moral repugnance to cap-and-trade programs that could potentially allow companies to profit from selling pollution rights. Drury et al., "Pollution Trading and Environmental Injustice," 270-71; "California EJ Movement's Declaration" (findings 10 and 11); "Fact Sheet: The Cap and Trade Charade for Climate Change: 13 Reasons Why Trading and Offset Use are NOT a Solution to Climate Change," http://ejmatters.org/cap-Trade-FACTSHEET.pdf (reason #4). In addition, environmental justice advocates are deeply concerned that cap-and-trade programs will be less effective at reducing emissions and stimulating technological advancements than more tightly controlled regulatory programs that impose direct requirements on all facilities. "Cap and Trade Charade," (expressing skepticism regarding real reductions); David Dreisen, "Free Lunch or Cheap Fix?: The Emissions Trading Idea and the Climate Change Convention," *Boston College Environmental Affairs Law Review* 26 (1998), 1, 42–47 (questioning trading systems' ability to incentivize innovative technology).

[34] A. Denny Ellerman, Paul C. Joskow, and David Harrison, Jr., *Emissions Trading in the U.S.: Experience, Lessons, and Considerations for Greenhouse Gases* (Washington, D.C.: Pew Center on Global Climate Chate, 2003), 40–41, http://www.pewclimate.org/global-warming-in-deapth/all_reports/emissions_trading/.

[35] U.S. Environmental Protection Agency, *Tools of the Trade: A Guide to Designing and Operating a Cap-and-Trade Program for Pollution Control* (Washington D.C., 2003), 1-2, 2-5, and 2-9, http://www.epa.gov/airmarkets/resource/docs/tools.pdf,

[36] For example, see *U.S. Code* 42 (2006), § 7411(a)(4) (defining "modifications"), and *Code of Federal Regulations* 40 (2008), § 51.166(b)(3) (defining, under the Prevention of Significant Deterioration program, increase in emissions in terms of an increase in a facility's actual emissions).

[37] *Code of Federal Regulations* 40 (2008) § 51.166(b)(2)(iii)(f) (making clear that emissions increases resulting solely from increases in hours of operation or increased production would not trigger new source requirements, even if the net actual increases were significant).

[38] *See* David Wooley & Elizabeth Morss, *Clean Air Act Handbook* (2007) §1:113 (providing a table showing the threshold for determining a significant increase). The most common thresholds range from 15-40 tons per year of a given pollutant. *Id.* Significant increases could also occur because of new rules for determining the baseline from which to measure the emissions increase. Facilities can choose the emissions average from any two-year period within the preceding 10 years. *Code of Federal Regulations* 40 (2008), § 52.21(b)(48)(ii)(c). Facilities increasing emissions could choose a baseline year in which emissions were higher than at present. Using the higher emissions level as a baseline would make it less likely for current increases to cross the significance threshold, and make it less likely for a facility's emissions increases to trigger the controls required under NSR.

[39] *See, e.g.*, Tom Pelton, "State Gives Power Plants a Pass on Pollution," *Baltimore Sun*, May 28, 2006 (describing lax enforcement); Environmental Integrity Project, *Polluter Breathe Easier; EPA Environmental Court Actions Decline* (Washington, D.C., 2004),

http://www.environmentalintegrity.org/pubs/lawsuitoct041.doc (describing decrease in federal environmental enforcement actions).

[40] Kenneth R. Richards, R. Neil Sampson, & Sandra Brown, *Agricultural and Forestlands: U.S. Carbon Policy Strategies* (Washington, D.C.: Pew Center on Global Climate Change, 2006), 50-54, http://www.pewclimate.org/global-warming-in-depth/all_reports/ag_forestlands/.

[41] Requiring reductions to occur within the regulated sectors and limiting the use of offsets would also increase the incentive for facilities within the regulated sectors to adopt and develop sector-specific emission reduction techniques, rather than relying upon reductions in unregulated sectors.

[42] The Kyoto Protocol does not impose reduction targets on developing countries. While developing countries are adopting greenhouse gas emission control policies, few are likely to adopt actual *reduction* targets because it would be difficult to achieve economic goals if they were required to reduce from their already-low per capita emission levels.

[43] Critical issues include the economic and environmental benefits of offset-related investment in the developing world, developed country responsibility for financing developing country investments, and the degree to which the industrialized world should be expected to make actual reductions in its own emissions rather than relying on emissions reductions or sequestration elsewhere. In addition, assuming that industrialized countries should provide resources and energy-related benefits to developing countries, a key issue is whether trading that minimizes industrialized nations' actual reductions is the best mechanism for doing so. Direct aid for developing

country reductions that complements rather than replaces developed country reductions presents another option.

[44] *See* Terry Dinan, *Trade-Offs in Allocating Allowances for CO_2 Emissions* (Washington, D.C.: Congressional Budget Office, 2005), 1, 3, 6–8.

[45] A cap-and-trade program will not, however, eliminate the regressive economic impact of climate change regulation on the poor. The economic impact of climate change regulations could be directly addressed through government programs to increase energy efficiency for low-income residents or through compensation to low-income residents impacted by higher energy costs.

[46] *Tools of the Trade*, 1-4.

[47] "Summary for Policymakers," in *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. M.L. Parry et al. (Cambridge, England: Cambridge University Press, 2007).

[48] *See* Robert D. Bullard, "Climate Justice and People of Color" (2000), 3, http://www.ejrc.cau.edu/climatechgpoc.html (describing disproportionately adverse climate change impacts on the poor); Maxine Burkett, "Just Solutions to Climate Change: A Climate Justice Proposal for a Domestic Clean Development Mechanism," *Buffalo Law Review* 56 (2008): 169, 176–88; Rachel Morello Frosch, Manuel Pastor, Jim Sadd, & Seth Shonkoff, *The Climate Gap: Inequalities in How Climate Change Hurts Americans & How to Close the Gap* (Los Angeles: University of Southern California Program for Environmental and Regional Equity, 2009).

[49] "AP: Blacks Likely Breathe Most Unhealthy Air," *CNN.com*, December 14, 2005, http://www.cnn.com/2005/HEALTH/12/14/unhealthy.air.ap/index.html; "71 Percent of Hispanics Live in Areas Violating Federal Standards, Report Says," *Environment Reporter* 35 (2004): 1469.

[50] For lists of the nation's nonattainment areas, see Environmental Protection Agency, "The Green Book Nonattainment Areas for Criteria Pollutants," http://www.epa.gov/oar/oaqps/greenbk/index.html.

[51] J. Andrew Hoerner & Nia Robinson, *A Climate of Change: African Americans, Global Warming, and a Just Climate Policy for the U.S.* 11 (Oakland: Redefining Progress, 2008) 11, 13, http://www.ejcc.org/issues/us_policy/.

[52] A. Dan Tarlock, "Environmental Protection: The Potential Misfit Between Equity and Efficiency," *University of Colorado Law Review* 63 (1992), 882.

[53] John Rawls, *A Theory of Justice* (Cambridge, Massachusetts: Belknap Press, 1971).

[54] The Administrative Procedure Act dictates minimum public participation requirements for agency rulemaking. *U.S. Code* 5 (2000), § 553.

[55] *A Citizen's Guide to Using Federal Environmental Laws to Secure Environmental Justice,* (Washington, D.C.: Environmental Law Institute, 2002), 15-18.

[56] Ellerman, *Emissions Trading in the U.S.*

[57] Dietz, Hepburn, and Stern observe that "by its very nature climate change demands that a number of ethical perspectives be considered, of which standard welfare economics is just one." Simon Dietz, Cameron Hepburn, and Nicholas Stern, "Economics, Ethics, and Climate Change" (2008), http://ssrn.com/abstract=1090572. They are writing about the role of economic and ethical principles in determining the appropriate degree of

emissions reduction, rather than about the design of specific climate change policies. Their observation about the importance of moving beyond economic metrics is nonetheless applicable.

[58] Lesley K. McAllister, "The Over-Allocation Problem in Cap-and-Trade: Moving Toward Stringency," *Columbia Journal of Environmental Law* 34 (2009), 101-45.

[59] See, for example, David Dreisen, "Free Lunch or Cheap Fix? The Emissions Trading Idea and the Climate Change Convention," *Boston College Environmental Affairs Law Review* 26 (1998), 1-87.

[60] I focus on those components that relate to direct emission reductions, since they implicate the distribution of co-pollutants. Other key components of climate change policy include energy efficiency retrofits, land use planning to reduce sprawl, research and development of alternative technologies, adaptation planning and implementation, and other mechanisms.

[61] In the context of traditional pollutants, several scholars have advocated the maintenance of a regulatory safety net in conjunction with trading programs. Drury, "Pollution Trading and Environmental Injustice," 284-85; Johnson, "Economics v. Equity," 162, 165.

[62] *Tools of the Trade*, 3-21.

[63] For example, in Los Angeles' RECLAIM trading program, regulators decided to directly impose pollution control requirements on large electricity-generating facilities when the market-based system failed to create sufficient incentives for technology adoption. McAllister, "Beyond Playing 'Banker,'" 290.

[64] Ellerman, *Emissions Trading in the U.S.,* 16–17.

[65] McAllister, "Beyond Playing 'Banker.'"

[66] Ibid., 294–304.

[67] In the context of traditional pollutants, scholars have proposed trading limitations into overburdened areas, although some have expressed concern about the efficiency consequences of such limitations. Drury et al., "Pollution Trading and Environmental Injustice," 284, Johnson, "Economics v. Equity," 162; EPA, *Tools of the Trade*, 3-22. Jonathan Nash and Richard Revesz propose that all trades be pre-screened to determine their impacts on a given region's ambient air quality, and be rejected if they would lead to a violation of air quality standards. Jonathan Remy Nash and Richard L. Revesz, "Markets and Geography: Designing Marketable Permit Schemes to Control Local and Regional Pollutants," *Ecology Law Quarterly* 28 (2001), 569. Since truly localized impacts are unlikely to be fully detected by such a system, and since this approach is likely to result in greater transaction costs than its authors assume, this option is not discussed further in the text.

[68] This type of approach has been proposed for traditional pollutants. Chinn, "Can the Market Be Fair and Efficient?," 119.

[69] This approach could lead to reductions that exceed the targeted cap if facilities in polluted areas use more than one allowance for each ton of emissions. That result could be considered either an advantage or disadvantage to this approach, depending upon one's perspective.

[70] *U.S. Code* 42 (2006), § 7503(c) (establishing offset requirement).

[71] Market Advisory Committee to the California Air Resources Board, *Recommendations for Designing a Greenhouse Cap and Trade System for California* (2007), 57,

http://www.Climatechange.ca.gov/documents/2007-06-29_MAC_FINAL_REPORT.PDF.

[72] See Burkett, "Just Solutions to Climate Change," Van Jones, *The Green Collar Economy: How One Solution Can Fix Out Two Biggest Problems*, (New York: HarperCollins 2008).

[73] Similar proposals have been made in connection with trading programs for traditional pollutants. Johnson, "Economics v. Equity," 150.