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RECLAIMing Air, Redefining Democracy : : A History of the Regional Clean Air Incentives Market, Environmental Justice, and Risk, 1960 - present

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RECLAIMing Air, Redefining Democracy: A History of the Regional Clean Air  
Incentives Market, Environmental Justice, and Risk, 1960 – present

A dissertation submitted in partial satisfaction of the requirements for the degree of  
Doctor of Philosophy

in

History (Science Studies)

by

Krystal L. Tribbett

Committee in charge:

Professor Naomi Oreskes, Co-Chair  
Professor Cathy Gere, Co-Chair  
Professor Luis Alvarez  
Professor Nancy Kwak  
Professor David Serlin

2014

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University of California, San Diego

2014

## Dedication

To my parents, for their constant support and encouragement, and for keeping me going when I thought I had no more to give. I love you now and always.

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## ABSTRACT OF THE DISSERTATION

RECLAIMing Air, Redefining Democracy: A History of the Regional Clean Air  
Incentives Market, Environmental Justice, and Risk, 1960 – present

by

Krystal L. Tribbett

Doctor of Philosophy in History (Science Studies)

University of California, San Diego, 2014

Professor Naomi Oreskes, Co-Chair

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Depending on whom you ask, the Regional Clean Air Incentive Market (RECLAIM), the nation's first regional smog market, is either a revolutionary approach to cleaning the air of the South Coast Air Basin, the most polluted region in the country, or a failed social experiment that put the interests of business and the marketplace above public health. In its original iteration, RECLAIM rules were intended to produce emissions reductions consistent with the command-and-control approach to

compliance embodied in an Air Quality Management Plan, but with greater efficiency, effectiveness, and flexibility – a goal RECLAIM in large part met. In an ideal application of emissions trading, public welfare and economic growth should have been jointly protected, and previous studies of RECLAIM have focused on the normative implications of the program, condemning suspected environmental injustices or praising economic efficiency without exploring the significant historical roots of market-based solutions. A closer look at these historical roots reveals the ways in which RECLAIM actually succeeded in improving air quality through difficult compromises and negotiations by regulators, environmental activists, politicians, and businesses.

This dissertation recounts this fuller history. It is about the history of market-based mechanisms to control air pollution in Southern California, and, in a broader sense, the history of neoliberalism and the process of neoliberalising nature. It traces the history of American air pollution laws from the 1960s to the present and finds a symbiotic relationship between federal and state governing bodies that led to the establishment of RECLAIM. The history told here shows that the development of RECLAIM was not wholly neoliberal, imposed intentionally by policymakers, venture capitalists, or academics with a neoliberal agenda. What emerged out of the archives and newspapers was a story of the organic evolution of markets to address air pollution that was shaped both by political processes and academic/theoretical arguments intended to find a compromise between public demands for clean air, political concern about economic growth, and industry pushback against regulation. This dissertation thus argues that in the United States neoliberal policies to govern nature are outcomes of struggles to balance societal values (like clean air) with political, economic, and scientific realities.

## Introduction

*... markets are only a tool for achieving a goal efficiently. The desired outcome is achieved only if the market operates in a context that promotes that outcome. Remember why we have environmental regulations – to repair the failure of the marketplace to pursue the societal goal of a clean, healthy environment. We have pollution because the market chooses not to include the damage in the cost of producing goods and services.*  
– Joel Swartz, Staff Scientist, Coalition for Clean Air (Schwartz, 1993)

Can markets fix problems created by markets? In the early 1990s, scientists like Joel Swartz debated precisely this question during the public testimony period for the adoption of California's Regional Clean Air Incentives Market, a program his organization, the Coalition for Clean Air a Los Angeles based nonprofit organization, helped to develop. RECLAIM was the first regional cap-and-trade emissions trading program to reduce urban air pollution in the United States. Its goal was to reduce stationary source emissions of oxides of nitrogen (NO<sub>x</sub>) and oxides of sulfur (SO<sub>x</sub>) within the South Coast Air Basin, a region comprised of the urban parts of Los Angeles, San Bernardino, and Riverside Counties, and all of Orange County.

The South Coast Air Basin had (and continues to have) some of the dirtiest air in the nation. At the time of its implementation in January 1994, RECLAIM was the most ambitious of any state or federal government program; it later became an exemplar for emissions trading broadly. For the first time, the federal government reconsidered the command-and-control system that had worked to improve air quality within the South Coast Air Basin for decades prior. RECLAIM's market-based approach was intended to reduce air pollution from stationary sources to the same degree as command-and-control, the traditional approach to air pollution regulation, but at lower cost and with greater

flexibility. Under a command-and-control scheme, a government agency told polluting industries how they must meet air quality standards. All polluting sources in the same category had to adopt the same prescribed technology.

For years, command-and-control worked to improve air quality within the South Coast Air Basin. In fact, when the federal control of air pollution began with the implementation of the Clean Air Act in 1963 and its subsequent amendments, California's programs served as models. A common sentiment was that "If the air could be cleaned up here [in the South Coast Air Basin], it might be cleaned up anywhere" (Carle, 2006: 80). Shortly after the national adoption of command-and-control, and with the economic downturn following World War II, this dominant approach to cleaning the air began to run out of steam.

As I will show in the upcoming chapters, critics of command-and-control argued that it is inefficient and expensive. They especially pointed to the inequity created by this regulatory scheme because its uniform requirements did not take into account the differences in compliance costs across polluting facilities (Stewart, 1985). In an effort to resist the high costs of polluting, businesses often challenged the mandates established by regulators. Others worried that businesses would not have adequate incentives to develop or install new control technologies (Ackerman, 1985). Some argued that the process of developing and implementing command-and-control schemes was burdensome, relying on regulators to research control options, monitor technologies, and evaluate them for economic feasibility (Ackerman, 1985; Stewart, 1985). Furthermore, command-and-control schemes did not guarantee a facility would achieve air quality goals even if it installed the mandated control technology, since command-and-control limited the

amount of emissions but not the level of production. For example, if the level of production rose, the levels of emissions would likely increase as well (Polesetsky, 1995).

In California, the birthplace of command-and-control, the Clean Air Act undermined the legacy of Los Angeles air pollution abatement success. The Clean Air Act's national ambient air quality standards (NAAQS), requirement of state implementation plans (SIPs), technology-based standards, and challenging attainment dates, resulted in the Basin's nonattainment (failure to meet one or more national air standards by a designated date) for decades. In fact, Clean Air Act standards were not met in the Basin in 1975, 1977, 1982, 1987, and 1988. The Basin's failure to meet Clean Air Act objectives from the mid-70s through the '80s should have resulted in the embrace of the District's command-and-control-based 1989 and 1991 state implementation plans.

But like at the federal level, the stronghold approach of command-and-control proved inadequate in balancing cleaning the air and fostering economic growth. The passage of Title IV, the Acid Rain Program, in the 1990 amendments to the Clean Air Act, established the first large-scale, long-term United States environmental program to rely on tradable emission credits and a cap on total emissions, which would decline each year (Ellerman, 2000). These paved the way for RECLAIM. The new program promised to lower the costs of air pollution abatement in to the South Coast Air Quality Management District, the governing body responsible for air pollution abatement in the South Coast Air Basin, and to polluting facilities. Economic theory suggests that in an ideal application of emissions trading there is the best of both worlds – public welfare is protected, as is economic growth, at least in theory.



This dissertation is an effort to evaluate the efficacy of RECLAIM to protect public welfare and economic growth. I use a historical approach to reach beyond current conclusions about RECLAIM's alleged successes and failures into the history of modern American air pollution policy. By so doing, I aim to understand the evolution from a command-and-control approach to the incorporation of market-based approaches to clean the air. This dissertation explores this change – its reasons and results.

The use of the marketplace to fix problems created by the market is a central characteristic of what is currently understood as neoliberal regimes. This dissertation examines the history of cap-and-trade emissions trading in the United States as a study of the neoliberalisation of the air, and the production of neoliberal governance. By tracing the formulation, introduction, institutionalization, and evolution of the Clean Air Act, the federal acid rain emissions trading program, and California's Regional Clean Air Incentives Market (RECLAIM), this dissertation argues that the neoliberalisation of the air was not part of a calculated political project. I argue that it is best understood as emerging organically out of discursive, structural and programmatic problems of the Clean Air Act's command-and-control approach.

### **The Neoliberalisation of Air**

Neoliberalism in the United States is often traced to the Chicago school of economics, and the theories of Milton Friedman and Ronald Coase, which center around the reduction of government intervention in social welfare issues. Under a neoliberal regime, the market is central to the management of social issues. The role of the government is thus to create and protect markets. As the thinking goes, markets can

improve social welfare, and so is expanded into public sectors like education, healthcare, and environmental management (Harvey, 2005). The typical histories identify the practices and policies of the Reagan Administration in the 1980s as evidence of the proliferation of neoliberal governance in the United States. And, American neoliberalism emerges as an extension of the global turn to neoliberal ideology which had been underway since the 1970s when Augusto Pinochet, under the guidance of Milton Friedman, infused national policies with free market ideology in response to political and social strife associated with fiscal crises (Campbell and Pedersen, 2001; Blyth, 2002; Harvey, 2005; Amable, 2011).

The study of neoliberalism by various disciplines has identified principles central to neoliberalism. These are (Castree 2008a: 142-43):

- Privatization – the assignment of property rights to social or environmental phenomena
- Marketization – the assignment of prices to phenomena that were previously unpriced
- Deregulation – the ‘rollback’ of state ‘interference’ in social and environmental areas
- Reregulation – the deployment of state policies to facilitate privatization and marketization of social and environmental life
- Market proxies – the state-led attempt to run public services along private lines as ‘efficient’ and ‘competitive’ businesses
- Flanking mechanisms – the state-led encouragement of civil groups like non-profit organizations and communities, to address citizens concerns about neoliberalisation and neoliberalism

The history of emissions trading contains all these principles, suggesting that cap-and-trade emissions trading schemes are tools that support neoliberal regimes. This

dissertation goes beyond this observation by challenging the notion of a singular neoliberal project. To look back at history through neoliberal lenses, and classify the policies that have governed nature as manifestations of a neoliberal project risks coming to Whiggish conclusions about the significance of the circumstances around which decisions about the governance of nature are made. In the very least, such an approach to the dissection of environmental policies risks an opportunity to come to a fuller understanding of neoliberalism(s) and how they emerge. The goal of this dissertation is to add to discourse regarding the neoliberalisation of nature. By examining the discourse, development, and implementation of emissions trading to govern air pollution, this dissertation is about the neoliberalisation of the air.

For almost two decades, scholars have written about the natural, meaning the nonhuman world in relation to privatization, markets, commodification, structural adjustment, and free trade (Cronon, 1991; Daviron, 2002). In other words, scholars have examined the neoliberalisation of “first nature.” They observe that across the world for the past four decades, nature has been subjected to neoliberal thought and practice. Critical geographers James McCarthy and Scott Pruham (2004:7) have argued that “neoliberalism is... an environmental project and... it is necessarily so,” because the ownership and commodification of natural resources was important to classical liberalism, neoliberalism’s predecessor. Although provocative, McCarthy and Pruham’s claim falls into the trap of overgeneralizing the governance of the modern world, and other critical geographers have moved away from the singularity of a neoliberal project and towards

and understanding of neoliberal thought and practice as part of a process referred to as neoliberalisation (Barnett, 2005; Peck 2004; Castree, 2008a).<sup>1</sup>

What I take from this scholarship is that there are many pathways to the neoliberalisation of nature, thus the outcomes of neoliberalisation should be thought of as neoliberalisms, sums of actors, places, processes, and products. This dissertation lays out the process of air's neoliberalisation by taking on questions raised by critical geographer Noel Castree (2008a and 2008b). These questions are: Why are nonhuman phenomena "neoliberalized"? What are the ways in which nature is neoliberalized? What are the effects of nature's neoliberalisation? How should these effects be evaluated? Embedded in Castree's inquiry is his desire to understand why the neoliberal agenda is "rational and desirable."<sup>2</sup> This dissertation challenges the idea that neoliberalisms can be understood in terms of intentionality to push a particular agenda. I show that measures that the state uses to govern the nonhuman world in response to the functioning of a capitalist society evolve organically, and seeing them for what they were as opposed to what we now think them to be offers a clearer understanding of our dynamic relationship with the biophysical world, and the impact of nonhuman world on how we govern ourselves.<sup>3</sup> An inquiry such as this speaks to the call for science studies scholars to consider the ways in

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<sup>1</sup> Geographer Wendy Larner (2000) has identified neoliberalism with a set of changes in practices across state institutions, "private" economic and social life.

<sup>2</sup> Critical geographers Michael Haynen and Paul Robbins (2005:2) have described how nature is neoliberalised in terms of governance, the privatization of natural resources, enclosure of natural resources that would otherwise be linked to particular communities, and valuation, in other words the pricing of natural resources as commodities. Castree critiqued Haynen and Robbins arguing that their description failed to express why a neoliberal agenda is "rational and desirable" (Castree, 2008a).

<sup>3</sup> Neil Smith (1984) has observed that the natural world is being transformed in ways that allow it support the means to accumulate capital.

which neoliberal positions are cultivated in order to understand how neoliberal theories shape science (Lave et al., 2008).

### **Chapter Organization**

Chapter 1 of this dissertation presents the political and environmental circumstances around which policymakers developed early air pollution policies in the United States. It is foundational in establishing that the history of the neoliberalisation of the air was not grounded in neoliberal ideology. In the 1960s, the “urban crisis” and public health concerns were central motivations for cleaning the air. Influenced by Stewart Udall’s call for the federal government to take responsibility for the protection of the environment, Presidents Kennedy and Johnson envisioned air policy that would eliminate smog regardless of the economic costs. Los Angeles is presented as evidence of the urgency of the pollution problem that plagued the urban metropolis, as well as at the forefront of smog science and abatement. Civil rights concerns are briefly juxtaposed with Kennedy and Johnson’s air pollution agendas to establish civil rights and air pollution control’s common history. Issues associated with the “urban crisis,” like substandard housing, and inadequate public schools and health services are characterized in literature as markers of segregation by race and class, and unequal access to resources. When described as such, the environmental realities of postwar cities can get lost. But, environmentalism – in the form of pollution control – was in fact central to the “urban crisis,” and in that way, central to American minorities (Fishman, 1987; Sugrue, 2005). This will become pertinent to considering the effects and evaluation of air’s neoliberalism as exemplified by opposition to RECLAIM discussed in Chapter 4.

Chapter 1 also examines the discursive and structural conditions surrounding the production and implementation of air pollution policy at the federal level in order to bring into view why air was neoliberalised. The chapter charts the rise and reevaluation of the command-and-control approach embodied in the Clean Air Act. I show that in the mid-late '60s at the same time that policymakers and polluting industries began to recognize the early shortcomings of the Clean Air Act, theories of market-based environmental management were coalescing in economic communities.

Chapter 2 shows how the neoliberalisation of the air took place as a gradual process of trial and error. The gradual uptake of policy tools (namely offsets, bubbles, netting, and banking) which we now recognize as the building blocks of emissions trading are best understood, first and foremost as responses to the programmatic issues and poor management of the Clean Air Act. States failed to meet Clean Air Act goals, regulated industries pushback against the costs of compliance, and governing bodies tried to balance social and economic welfare. The building blocks of emissions trading were grounded in economic theories about pollution permits and markets, yet they were not in and of themselves neoliberal.

The chapter shows that well before the neoliberal ideology associated with the Reagan Administration was established in the White House, a reimagining of the governance of the air was underway. With the incorporation of market-based tools into the command-and-control framework, the philosophy of cleaning the air regardless of cost shifted to cleaning the air in the most cost efficient and effective way possible (Kamieniecki, Shafie, and Silvers, 1999; Portnoy, 1990; Savas, 1987). The building blocks of emissions trading thus opened a door for a more conscious neoliberalisation of

the air in the 1980s as evidenced in the adoption of the Emissions Trading Policy Statement, and the adoption in the 1990s of Title IV, the Acid Rain Program to mitigate sulfur oxides. Chapter 2 also introduces risk assessment and risk management as examples of the impact of neoliberal policy on the production and consumption of science (Lave et al, 2010).

The third chapter focuses in on the neoliberalisation of the air in California by examining the circumstances around which emissions trading was incorporated into the air quality management plan for the South Coast Air Basin. This chapter further confounds characterizations of neoliberal public policy that focus on neoliberalism as a singular project grounded in an ideological push that took place in the United States in the 1980s. In the chapter, the exploration of questions of why and how nature is neoliberalised reveal that the roots of market-based solutions are tangled in the situatedness of the environmental problems they are designed to address. I show Los Angeles as an air pollution policy laboratory influenced by political, social, economic and biophysical circumstances.

The chapter argues that the neoliberalisation of the air in Los Angeles was due to the Basin's fall from its smog control throne, as the Federal Clean Air Acts challenged the South Coast Air Quality Management District, not only to clean the air, but to clean the air to a prescribed degree by particular deadlines. The sanctioning of emissions trading at the federal level opened the door to this approach by California. Faced with the worst recession since the great depression of the 1930s and the label of a severe nonattainment area for ozone, the South Coast Air Quality Management District needed a

policy that would balance public health and economic growth (Lents, 1998).<sup>4</sup> RECLAIM, it was thought, would provide that balance.

The fourth chapter aims to better understand the products of nature's neoliberalisation by considering the effects of the neoliberalisation of the air and how these effects are evaluated. The chapter does this by examining arguments made by environmentalists against RECLAIM based on the program's violation of environmental justice principles. Previous studies on RECLAIM have focused on the normative implications of the program and/or raised concerns about the ability of market-based approaches to environmental regulation to promote equity and democracy. For example, Curtis A. Moore, a former member of the Republican Counsel to the Senate Environment and Public Works Committee, and Jim Caldwell, former technical director for the Center for Energy Efficiency and Renewable Technologies, have argued that RECLAIM is a failed experiment in pollution marketing. Among Moore's concerns is the fact that RECLAIM's design resulted in a retardation of air pollution reduction between 1999 and 2001. Among Caldwell's concerns is that the worst polluters are given the biggest rewards because of how initial credits were allocated. Bae (1997), Drury et al. (1999), Kamieniecki et al. (1999), Coburn (2001), Lejano and Hirose (2005) and Fowlie, Holland, and Mansur (2009), all discuss the shortcomings of RECLAIM in terms of environmental injustice - the disproportionate burdening of pollution on the poor and people of color, and the failure to include the most burdened populations in environmental decision making.

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<sup>4</sup> The 1990 Clean Air Act Amendments classified ozone nonattainment into five categories based on severity of nonattainment. The categories are: marginal, moderate, serious, severe, and extreme (Belden, 2001; Mazmanian, 2001).



Arguing on moral grounds, the Coalition for Clean Air and Communities for a Better Environment, two L.A. based nonprofits that advocate for clean air in California and environmental justice, claimed that RECLAIM would give businesses an unfair “right” to pollute and increase pollution in the short-term more than the state implement plan it would replace. Moreover, these organizations argued that environmental justice populations - namely the poor and people of color - would suffer most under RECLAIM rules. By looking at the claims made against RECLAIM in light of the evolution of environmental justice and its incorporation into federal policy, this chapter sheds light on how and why emissions trading and environmental justice principles collide within neoliberal frameworks. In addition, this chapter contributes to studies of the neoliberalisation of nature by evaluating the role of risk assessment as an imperfect tool to evaluate the efficacy of market-based tools in the governance of nature.

This dissertation adds to a growing body of literature concerned with the manifestation and proliferation of neoliberal regimes across spaces and disciplines. By dissecting emissions trading in the United States, I show the complexity of nature’s neoliberalisation. The neoliberalisation of the air in particular has a complicated political and intellectual history that goes beyond the intentionality of the construction of a “neoliberal” project. In other words, the history provided in these pages, moves away from the tendency to black box neoliberalism (Latour, 1999), and towards a better understanding of the management of externalities produced by human consumption, and the impact of the proliferation of the neoliberal governance of nature on marginalized people. With the United States and the world developing market-based solutions to

climate change this dissertation will be of interest to policymakers, social scientists, and environmentalists.

## **Chapter 1: Balancing Air and the Economy: Command-and-Control and Market Incentives at the Federal Level**

### **1.1 Introduction**

During the 1950s and '60s, the federal government did little more than support local and state air pollution abatement efforts. It offered financial and technical support, as well as research resources, but it generally eschewed enforcement. Although the Clean Air Act (CAA) of 1963 acknowledged that smog was a national problem, it did not change the role of the federal government. The CAA of 1970 however, was very different. According to Daniel Mazmanian and Michael Kraft (2001; Mazmanian and Kraft, 2008), the adoption of the Clean Air Act of 1970 marked the beginning of the first epoch of the modern environmental movement. This first epoch, known as green regulation, took place from 1970 to 1980, and was characterized by command-and-control approaches, which, at the time, took a strong-arm approach to cleaning the air.<sup>5</sup>

The typical historical account of the federal regulatory shift to command-and-control began with the democratic liberalism of the 1960s, which encouraged greater government involvement. The public, skeptical of industry's concern for the environment, called on the federal government to solve environmental problems without succumbing to industry pressure (Liroff, 1986: 31; Meidinger, 1985:451). The Clean Air Act of 1970s command-and-control approach, whereby the federal government determined the pollution standards and criteria and prescribed how the districts it governed met the standard, became the major framework for modern air pollution policy.

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<sup>5</sup> The three epochs of the environmental movement are, green regulation (1970-1980), market-based regulation (1980-1990), and sustainability (1990-present).

Under the Clean Air Act of 1970, the federal government guaranteed the protection of public health nationwide, without regard to economic and technical feasibility.

In conjunction with the passage of the National Environmental Policy Act and the creation of the Environmental Protection Agency, the Clean Air Act of 1970 represented institutional reform meant to produce results by keeping both the government and industry in check (Mazmanian and Kraft, 2001; Mazmanian and Kraft, 2008). However, within just a few years of its adoption, stakeholders inside and outside of Washington concerned with the efficacy and monetary cost of environmental regulation pushed back against direct regulation. The rationale for cleaning the air remained the protection of human health, but the “stagflation” (the combination of stagnant growth and high inflation) of the '70s compelled policymakers and industry to dispute how to clean the air. By mid-decade, regulations that did not regard costs and the interests of industry were doomed to fail politically even when potentially environmentally beneficial. The shift from command-and-control to market-based regulation, which characterizes the second epoch of the environmental movement from 1980-1990, Mazmanian and Kraft argue, is a testament to the political and economic challenges of the decade, which compelled policymakers to balance environmental goals with economic ones (Mazmanian and Kraft, 2001; Mazmanian and Kraft, 2008).

This chapter takes a closer look at the rise and fall of command-and-control and the subsequent adoption of emissions trading at the federal level, in an effort to consider the full complexity of trade-offs policymakers made in order to accomplish the goal of cleaning the air while still protecting the economy. The chapter argues that the shift to command-and-control began with efforts to address the shortcomings of the Air Quality

Act of 1967, and culminated with the enactment of the Clean Air Act of 1970.

Furthermore, the shift to emissions trading was a piecemeal process that began as policymakers tried to address the perceived shortcomings of the Clean Air Act. The ultimate adoption of the federal Emissions Trading Policy Statement was a compromise between the Reagan Administration's attempt to address economic concerns about the cost of regulation and the EPA's rejection of the application of cost-benefit analysis to the Clean Air Act.

## **1.2 The Advent of the Clean Air Act**

The unfolding of the "urban crisis" between the 1940s and the 1960s laid the foundation for the formulation and adoption of the Clean Air Act. The "urban crisis" refers to a set of interconnected consequences that arose because of the impact of federal and social policies implemented after World War II. These policies included: the interstate highway system; the Federal Housing Administration's low-down payment, long-term, fixed-rate mortgages for race-restricted housing on the suburban fringe; the urban renewal projects of the 1949 Housing Act; housing shortages; racial segregation and job discrimination in cities and suburbs; and the rise of the Sunbelt and Sunbelt-like sprawl which was the migration of northern and Midwestern metropolitan dwellers and industries out of the well-established cities to the southern states including Georgia, Florida, Texas, New Mexico, and southern California (Jacobs, 1970; Jacobs, 1989; Fishman, 1987; Sugrue, 2005; Nickerson and Dochuk, 2011). Among the consequences of these policies and practices was an increasing wealthy and affluent American society juxtaposed with a crumbling metropolis plagued by water, noise, and air pollution.

Stewart L. Udall, President John F. Kennedy's Secretary of the Interior, observed that while America stood, "poised on a pinnacle of wealth and power, yet we live in a land of vanishing beauty, of increasing ugliness, of shrinking open space and of an overall environment that is diminished daily by pollution and noise and blight. This in brief, is the quiet conservation crisis of the 1960s" (Udall, 1963b quoted in Melosi, 2012: 196). Udall believed that "no one has a 'right' to pollute the air or water" and argued that the answer to the problem of pollution,

...lies in a new land ethic, and new form of social control. We can have clean air, clean rivers and a green countryside the moment we decide our environment should have parity with payrolls and profits. Once by law we make pollution abatement, for example, part of the cost of doing business, men in laboratories will quickly devise machines and gadgets to control the things that cause contamination (Udall, 1963a).

Udall called for incorporating the cost of pollution into the costs of doing business. His talk of a new land ethic was consistent with most people's idea of 1960s environmentalism – namely the preservation of wilderness areas and the conservation of resources – yet it also reflected increasing awareness of the urban crisis, which required a different kind federal approach to environmental ills.

It was also during the 1960s that civil rights activists challenged the state of race relations in the United States, and called for an end to hundreds of years of oppression and segregation. By the '60s, the most marginalized individuals in America, namely people of color and the poor, who had fulfilled the roles of low-skill, low-wage workers during the war, remained a large portion of the urban population because of housing and employment discrimination, segregation, or lack of resources which prevented them from

moving elsewhere. All over the country, African American and other urban communities rallied for urban change (Hurley, 1995; Sugrue, 2005; Gioielli, 2008; Gioielli, 2014).

While not often emphasized, President Kennedy recognized that a connection existed between civil rights and environmental policy. In a *Life* magazine interview in 1960 during his run for president, Kennedy remarked:

Even in material terms, prosperity is not enough when there is no equal opportunity to share it; when economic progress means overcrowded cities, abandoned farms, technological unemployment, polluted air and water, and littered parks and countrysides; when those too young to learn, when those no longer earning live out their lives in lonely degradation” (Kennedy quoted in Rome, 2003:531).

Kennedy emphasized the national goal as finding a means to reconcile economic progress, equal opportunity, and environmental degradation. What Kennedy would not live to learn was that it would take civil leaders and concerned citizens decades to figure out exactly how to achieve these goals, -- if indeed, they have.

Kennedy famously supported his call for equal opportunity by urging Congress to pass civil rights laws.<sup>6</sup> Influenced by the environmental leanings of his party, and his own

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<sup>6</sup> Kennedy’s dedication to civil rights was verified by the overt support he provided to civil rights activists. Weeks before the presidential election of 1960, Martin Luther King, Jr. was arrested during a protest in Atlanta, Georgia. A presidential hopeful at the time, Kennedy and his brother Robert became personally involved in King’s predicament. Kennedy called King’s wife, Coretta, to express concern and Robert Kennedy worked to secure King’s safe release. When in 1961, freedom riders faced violent opposition, Attorney General Robert Kennedy sent federal marshals to their side. The following year, Kennedy provided federal marshals to accompany James H. Meredith, Jr., an African American Air Force veteran, who was denied admission to the University of Mississippi because of his race, to register for university classes, and when rioting ensued to protest Meredith’s entrance, President Kennedy sent the National Guard and federal troops to maintain order. The President’s support successfully ended segregation at the University. When Martin Luther King was jailed in May 1963 following a protest in Alabama, Kennedy sent troops to restore order. Kennedy urged the nation to support equal treatment of Americans regardless of race. Referring to the question of civil rights as a “moral crisis,” he declared that, “It ought to be possible for American consumers of any color to receive equal service in places of public accommodation, and it ought to be possible for American citizens of any color to register to vote in free elections without interference or reprisal” (Kennedy, 1963). Following King’s “I Have a Dream Speech” in August 1963, the Kennedy Administration urged Congress to respond with federal civil rights legislation.

belief in a traditional kind of conservation that encouraged wise-use but prevented the destruction of the environment, Kennedy also urged Congress to pass legislation for the creation of an effective federal air pollution program (Udall, 1963b; Kennedy, 1961). Until then, the federal government had little if anything to do with legislation to clean the air. But by the 1960s, the seriousness of air pollution was well known. Between the 1930s and 1950s, a string of fatal smog incidents in Meuse Valley, Germany, Donora, Pennsylvania, London, England, and Los Angeles California left thousands dead, compelling civic leaders to respond (Davis, 2002; Stradling, 2002). Furthermore, scientists had documented positive correlations between air pollution, asthma, bronchitis, emphysema, and lung cancer; they also knew that smog could damage infrastructure, crops, and livestock (Haagen-Smit, 1952; Haagen-Smit, 1954; Middleton and Haagen-Smit, 1961; Zimmerman, 1968).

On February 21, 1961, in a special message to Congress, President Kennedy referred to air pollution as a problem of “immediacy” worthy of “attention and money” (Kennedy, 1961). He argued that the air needed help, for “the atmosphere over our growing metropolitan area-where more than half the people live, has only limited capacity to dilute and disperse the contaminants now being increasingly discharged from homes, factories, vehicles and other sources” (Kennedy, 1961). The Kennedy Administration’s position on air pollution was clear: “[t]here is no reason to wait until every city’s problem is as critical as that of Los Angeles before admitting that the problem is increasing elsewhere. We must all intensify our efforts. The hour is late and with the



pace of change in today's technology, *tomorrow is already here*" (U.S. Public Health Service, 1962: 7-9).<sup>7</sup>

Kennedy's reference to Los Angeles was not coincidental; most Americans knew of the city's problematic aftermath due to the economic growth that resulted from World War II. During the war, the expansion of a military and industrial presence increased the number of jobs available in Los Angeles, the region's urban core. Thousands, including people of color and low-income and poor people, migrated to L.A. in search of economic opportunity. By 1940, the population of Los Angeles County grew to about 1 million; by 1960, California's population reached some 16 million people. Rapid industrialization and population growth took a toll on the region's environment (Fulton, 1997; Hise, 1997; Hise and Deverell, 2005). Alfred Heller and Samuel E. Wood, remarked in their 1962 booklet, "California, Going, Going: Our State's Struggle to Remain Beautiful and Productive" (Wood and Heller, 1962: 6),

In spite of all efforts to the contrary, California's unique bright land is increasingly defiled by badly located freeways and housing subdivisions and industries which needlessly destroy beautiful scenery and entomb agricultural land; by reservoirs and water courses which unwittingly encourage the growth of misallocated communities; by waste products, by cars and jeeps and cycles which pre-empt our very living and breathing space. Already, the state's nose is bloody. How long before its whole magnificent body is beaten to deformity? How long before bright lands are dead lands?

Others challenged California's growing problems, too. Raymond Dansman's (1965) booklet, "The Destruction of California," published in 1965 criticized the impact of population growth on the state's environment, and California Tomorrow's quarterly, "Cry

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<sup>7</sup> Speech given by Ivan Nestigen, the Assistant Secretary of the Department of Health, Education and Welfare under the Kennedy Administration.

California” published in the winter of 1965/66 emphasized the need for regional and state planning.

Contemporary California’s air pollution policy took shape in the 1940s, shortly after its first serious smog episode in September of 1943. The event, which the Los Angeles Times compared to a “gas attack” by a foreign enemy, spawned complaints of reduced visibility, sore throats, headaches, runny noses and smarting eyes by tormented Angelenos: “Everywhere the smog went that day, it left behind a group of irate citizens, each of whom demanded relief. Public complaints reverberated in the press. There was an outraged demand for action. Citizens committees were appointed. Elected officials petitioned” (quoted in Krier and Ursin, 1977: 51). Scientists examined the problem and began to explain it: research by Arie Haagen-Smit and his colleagues at California Institute of Technology in the early ’50s revealed that Los Angeles smog is tiny particles, carbon monoxide, nitrogen oxides, sulfur dioxide, lead, ozone, and other pollutants produced by industrial processes and automobiles, which are carried eastward by the ocean breeze, trapped by the mountains, and cooked by the sun into photochemical smog, the Basin’s predominant form of air pollution (Haagen-Smit, 1952). The discovery of the science behind L.A. smog helped to guide the actions to control it. The Los Angeles Air Pollution Control District took a command-and-control approach to cleaning the air. This approach would become the cornerstone of American air pollution policies.

Kennedy did not live to see the passage of the civil rights and air pollution laws he sought. Following the President’s assassination in November of 1963, Lyndon B. Johnson picked up where Kennedy left off. Only five days after Kennedy’s assassination, Johnson remarked that the passage of civil rights law would be the “most eloquent” way

to honor the late President. Johnson argued that the bill for which Kennedy had fought would be a way to “move forward” and “eliminate discrimination and oppression based on race or color” in the United States (Johnson, 1965).<sup>8</sup> Johnson went on to establish a strong civil rights legacy; he made some 232 public references to civil rights, and successfully saw through the passage of civil rights legislation (Billington, 1977).

Like Kennedy, President Johnson saw the issue of civil rights as a moral issue, in the sense that it challenged the “values and the purposes and the meaning” of the nation (quoted in Warren, 1973: 27). Upon signing the Civil Rights Act of 1964, he remarked that the law had a national purpose to “promote a more abiding commitment to freedom, a more constant pursuit of justice, and a deeper respect for human dignity” (Johnson, 1964). Officially the Civil Rights Act prohibited discrimination in employment, established an Equal Employment Opportunity Commission, and prohibited discrimination in public places. Title VI of the Act enacted Kennedy’s proposal to prohibit the distribution of public funds to discriminatory programs.<sup>9</sup> Johnson furthered demonstrated his position on equal rights when in 1965 he issued an executive order designed to coordinate the various agencies of the federal government involved in the

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<sup>8</sup> Johnson had a history of supporting civil rights prior to his appointments as Vice President and President. As a Senate majority leader, in 1957, Johnson sponsored and managed the Civil Rights Act of 1957, the first civil rights bill enacted by Congress since 1875. The Civil Rights Act of 1957 was meant to strengthen voting rights and establish an investigative Commission on Civil Rights (Warren, 1973).

<sup>9</sup> Title VI of the Civil Rights Act of 1964 states, “no person in the United States shall on the grounds of race, or color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal assistance.” Furthermore, Title VI requires “agencies that disperse federal funds to promulgate regulations implementing Title VI of the Civil Rights Act and to create an enforcement framework that details the manner in which discrimination claims will be processed” (Civil Rights Act of 1964).

elimination and promotion of equal opportunity (Billington, 1977).<sup>10</sup> The Johnson Administration legitimated civil rights by placing individual rights and equality on par with other major national concerns. For the first time, public institutions could no longer expect federal monetary support if they continued what Johnson referred to as a “the long crippling legacy of bigotry and injustice” (Billington, 1977: 72).

The Johnson Administration’s dedication to civil rights was matched by its concern for environmental matters. During his time in office, Johnson would sign almost three hundred environmental measures. The Clean Air Act (CAA) was among these. Johnson’s hope was for the Clean Air Act to control and even “Halt the trend toward greater contamination of our atmosphere” (Johnson, 1965). Like Kennedy, Johnson believed the issue required “immediate action” (Johnson, 1965). The first in a line of legislation bearing the title which captured the goal of the federal smog legislation, namely “clean air,” the CAA of 1963 was “an Act to improve, strengthen, and accelerate programs for the prevention and abatement of air pollution” (Clean Air Act of 1963).

The simultaneous battles over the conditions of the metropolis and civil rights are significant backdrops to the neoliberalisation of air. The two issues – civil rights and pollution control – became entangled in ways that Johnson did not foresee, and few scholars have examined. Civil rights laws, especially Title VI, would provide the theoretical legal basis for environmental justice cases. When non-profit organizations challenged the legality of RECLAIM in the 1990s, violation of Title VI was the cornerstone of their argument. Thus, the federal commitment to enforcing civil rights is

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<sup>10</sup> In the same year Johnson signed the Voting Rights Act of 1965 authorizing the Attorney General to appoint federal examiners to register voters in areas of marked discrimination and strengthen penalties for the denial of voter rights.

critical to the history of environmental justice. Yet, for three decades, at the federal level, they were parallel until their forced intersection. This is the topic of Chapter 4.

### **1.3 Prelude to Command-and-Control**

When the Clean Air Act of 1963 was enacted, it was common knowledge that the urban metropolis bred an environmental problem that literally choked its inhabitants. Environmentalists privy to public health concerns and sensitive to the detrimental impact of man on nature called for government assistance in addressing the causes and consequences of air pollution. On December 17, 1963, Lyndon B. Johnson signed the Clean Air Act, optimistically speaking of eliminating air pollution:

Ninety percent of the population of our cities, over 100 million people, already suffer from a degree of air pollution that demands immediate action... This act will permit expanded research, foster cooperative efforts among the States, provide better State and Federal control over pollution. The Federal Government will encourage industry to seek effective solutions to problems of pollution and organize cooperative projects with local, State, and Federal participation. Now, under this legislation, we can halt the trend toward greater contamination of our atmosphere. We can seek to control industrial wastes discharged into the air. We can find the ways to eliminate dangerous haze and smog (Johnson, 1963).

The Clean Air Act of 1963 had support. Yet as an effort to improve state and local air pollution abatement and programs, the Act failed to deliver. At least that was the view of Edmund Muskie, then a Democratic United States Senator from Maine and the Chairman of the Subcommittee on Air and Water Pollution of the Committee on Public Works. Muskie argued that the problem with the CAA was that it was modeled after the Federal Water Pollution Control Act (Muskie, 1968). Like the Federal Water Pollution Control Act, the Clean Air Act gave the federal program authority for additional research and technical assistance activities, matching grants to state, regional, and local agencies for

the creation and improvement of regulatory control programs, and support for a federal enforcement program for the abatement of air pollution. According to Muskie, Congress believed that such provisions would preserve the federal system by supporting effective and viable action at all three levels of government, as well as keeping the task of implementing and enforcing the clean air program manageable (Muskie, 1968).

The problem with adapting legislation to control water pollution to the air pollution control program is that air and water pollution are dispersed differently, and thus require different federal oversight. Unlike water pollution, which can be traced to a source in one state, and adversely affect the health and welfare of citizens in another state, the movement and effects of air contaminants are more complex. Multiple sources can contribute to air pollution. Furthermore, the release, mixing, and dispersion of pollutants make tracing the origin of smog to specific sources difficult. This is true for both pollutants originating from automobiles and those released from the smokestacks of industries.<sup>11</sup> For these reasons the Clean Air Act was amended, first in 1965 to establish standards for automobile emissions and promote research on transboundary air pollution, and again in 1966 to expand local air pollution control programs. These amendments left matters of health and welfare protection as they had always been, in the hands of local and state authorities, with the federal government stepping in as overseer for cases that crossed state boundaries. Yet, Muskie explained, "... community or state jurisdictions bear little or no relationship to the geographic spread of air pollution. Because metropolitan areas are not consistent with meteorological areas, the old institutional

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<sup>11</sup> And from products used every day by the average person.

arrangements for air pollution control were not really adequate to the task” (Muskie, 1968: 18).<sup>12</sup>

By 1967, policymakers were ready for a dramatically different approach to cleaning the air. During a hearing on the 1967 amendments to the Clean Air Act, collectively referred to as the Air Quality Act (AQA) of 1967, policymakers expressed the need to reassess the federal air pollution control program. Republican John W. Gardner, Secretary of the Department of Health, Education, and Welfare, explained that the Clean Air Act of 1963 had been “useful,” but the time had come for “a new era in the nation-wide struggle against air pollution... The scattered hit-or-miss, uncertain control efforts on the part of all levels of government which characterized the past must give way to a much more rational and scientifically valid effort” (Air Quality Act, 1967a). At the same time, Gardner argued, the legislation should be “fair for everyone, to all industries and to all communities” (Hearings on Air Pollution, 1967). Gardner captured the sentiments of the Administration on the matter of air pollution control. The Johnson Administration was ready to put the enforcement of smog regulation, based on science, in the hands of the federal government.<sup>13</sup> At the same time, the Administration wanted to avoid unfairly financially burdening polluting industries.

The House Committee agreed. It argued that “reasonable regulation should ... be based on an accurate measurement of health and welfare needs, technological feasibility

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<sup>12</sup> Muskie noted that this was especially true given the nature of automobiles, the mobility of which could not be contained. At first the Subcommittee on Air and Water Pollution and Congress agreed that a single statute or set of standards could not solve the issue of automobiles, and this was the impetus for amending the Clean Air Act of 1963 (Muskie, 1968).

<sup>13</sup> In 1964, Johnson convened a Task Force on Environmental Pollution, which proposed a program concerning "The Federal Responsibility for Pollution." The proposal included interstate compacts, regional plans; plans for international cooperation to abate pollution in river basins, air sheds, and water zones; economic incentives to reduce pollution implementation of technical expertise and improved monitoring systems (Melosi, 2012).

of abatement of pollution and economic factors involved” (S. Rep. No. 403; H.R. Rep. No. 728). Gardner argued that “experience has proven that most states and cities will not take the initiative in requiring control measures beyond those required in other places; nor will industries support local or state control action which may place them at a competitive disadvantage” (Air Quality Act, 1967b). John T. Middleton, Director of the National Center for Air Pollution Control, explained:

...the most important of the factors that tend to discourage standard setting at the State and local levels is that such action seems inevitable to bring one major function of State and local governments – the protection of public health and welfare- into direct conflict with another – that of insuring economic growth. No matter how often we remind ourselves that effective control of air pollution is not incompatible with economic progress, the history of air pollution control efforts in this country provides abundant evidence that State and local officials are unable to take decisive action to adopt and enforce effective standards for the control of sources unless the problems have become so obvious, so severe and obnoxious as a nuisance that they cannot be tolerated. (Air Quality Act, 1967c)

In other words, if the nation wanted clean air, the federal government would have to play a larger role. Furthermore, leaning more on science and technology, and less on political boundaries, would produce more effective policy. But economic factors had to be considered as well.

As chairman of the Subcommittee on Air and Water Pollution of the Senate Committee of Public Works, which had the responsibility on the Senate side for the Air Quality Act, Senator Muskie had a strong influence the direction of the Clean Air Act. He too recognized a need for the Air Quality Act to, in his words, “reflect an economic-technological-environmental relationship” (Senate Report No. 403). However, he disagreed with the Johnson Administration’s proposal for how to balance goals. In a



message to Congress submitted on January 30, 1967, Johnson proposed the federal air pollution control program set national standards that would establish controls specifically on “those industries that contribute heavily to air pollution” (quoted in Muskie 1968: 20). Johnson recommended the Air Quality Act authorize the Secretary of Health, Education, and Welfare gain oversight to work with industries engaged in interstate commerce to develop and issue maximum industry-wide emissions levels<sup>14</sup>. Each state could then choose to adopt the same or stricter standards (Zimmerman, 1968). Johnson proposed that if a state failed to adopt standards, the Secretary of the HEW would create regional air quality commissions, which could enforce pollution control measures in “regional airsheds” that cut across state and local boundaries (H.R. Doc. No. 47, 1967; Muskie, 1968; Zimmerman, 1968).<sup>15</sup>

From the Administration’s perspective, national standards could be a means of eliminating the economic disparities among industries that resulted from complying with pollution controls. The Administration especially feared that industries would leave or avoid areas where controls were necessary. The Administration also believed that some industries were a threat to health and welfare wherever they were located, and national standards on individual sources would take this into account (Muskie, 1968).

Muskie strongly disagreed with Johnson. He believed that “no one has the right to use the atmosphere as a garbage dump,” and argued that this was precisely what Johnson’s proposed Air Quality Act would do by precluding specific, stringent

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<sup>14</sup> Johnson also recommended that vehicle pollution control devices be inspected by states; the procedure for enforcement of air pollution laws be improved; fuel additives be registered with the Secretary of the HEW; and funds for air pollution abatement research be increased by fifty percent (Zimmerman, 1968).

<sup>15</sup> The commissions would consist of two members from each state and one federal official and would establish regional air quality levels based on the nationwide levels for major sources of air pollution (Zimmerman, 1968).

regulations on an as-needed basis in given regions and for given industries (Senate Report No. 403, 1967). The scientific issues raised by the adaption of the Federal Clean Water Act for the Clean Air Act suggested the federal government needed to take a different approach to cleaning the air, yet according to Muskie, the federal program should not have focused on national emission standards. Prior to Johnson's proposal in January of 1967, Muskie declared in a speech at the Third National Conference on Air Pollution in December 1966, that the federal government needed to develop "national ambient air quality criteria, applied as standards on a regional basis" (Public Health Service, 1967). Muskie recommended, "Those criteria take into account health, esthetics, conservation of natural resources and the protection of public and private property" (Public Health, 1967). Furthermore, the criteria must be modified as knowledge expanded, to provide added protection against unforeseen pollution hazards (Public Health Service, 1967). Criteria and standards are fundamentally different. In the words of John Middleton,

Air quality criteria are descriptive – that is, they describe the effects that can be expected to occur whenever and wherever the ambient air level of a pollutant reaches or exceeds a specific figure for a specific time period. Air quality standards are prescriptive – they prescribe pollutant levels that cannot legally be exceeded during a specific time period in a specific geographic area. Ideally, the area should be the entire region that shares a common air supply and thus shares the impact of pollution from all sources in the region (quoted in Muskie 1968: 22).

In other words, Muskie proposed that the Air Quality Act should set air quality criteria before setting standards, rather than following along with the Administration's perceived rush to establish standards. "Without criteria," explained Muskie, "any air quality

program would be without scientific basis or rationale” (Muskie, 1968: 22).<sup>16</sup>

Furthermore, Muskie argued that the Administration’s proposal would create minimal standards without real teeth and, by the nature of the variety of geography and of the myriad pollution creators extant in America; the standards would not in fact be uniform. The Subcommittee believed that national emissions standards could limit control options such as relocation of sources, substitute fuels, and the like, which could be necessary in some areas. Furthermore, national emission standards would give equal priority to areas with “critical” pollution issues and areas where no problem existed. This was problematic; according to Muskie, “the wise use of capital resources maintained that financial priority for pollution control go to areas where the problem was the most critical” (Muskie, 1968).

Thus while both men and the camps behind them saw clearly the need for regulation intended to curb air pollution, they saw the issues through decidedly different frames of reference. As occasionally happens, the viewpoints of both the President’s administration and those of an impassioned congressman would end up informing the regulations adopted.

#### **1.4 The Adoption of the Air Quality Act**

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<sup>16</sup> Both the Kennedy and Johnson administrations tried to take a scientific approach to environmental policy. The Office of Science and Technology had been created in 1962 during the Kennedy era to serve as scientific – not a political or philosophical – advisor to the president on issues of environmental quality and to coordinate the government’s science and technology departments (Atkinson and Blanpied, 2008). Johnson maintained the Office of Science and Technology. Johnson convened conferences to solicit reports from the President’s Science Advisory Committee on strategies to improve the quality of the environment. Advisor Udall was a proponent of the use of science as a tool to improve the quality of life.

Upon signing the 1967 amendments, President Johnson remarked that “It is not the first clean air bill – but it is, I think, the best” (Johnson<sup>17</sup> The legislation had bipartisan support; neither the Senate nor the House of Representatives dissented.

According to Martin and Symington (1968:243) the AQA,

...reflected the congressional determination concurred in the Administration, industry, and many state and local authorities that air pollution had to be dealt with on a more comprehensive, cooperative, and accelerated basis than theretofore, using the best available scientific and research tools and recognizing both the paramount demands of public health and the very limitations imposed both by the lag in technology and by economic considerations.

As enacted, the AQA reflected the consensus for a more scientifically based federal air pollution control program, and it represented a compromise between President Johnson’s proposed national standards and Muskie’s motion for criteria. The Air Quality Act outlined a standard setting procedure. It required the Secretary of Health, Education, and Welfare to define “atmospheric areas” based on “those conditions including, but not limited to, climate meteorology, and topography, which affect the interchange and diffusion of pollutants in the atmosphere” (Air Quality Act of 1967, sec 107 (a)(1)). The Secretary was then required, after consulting with state and local authorities, to designate “air quality control regions based on jurisdictional boundaries, urban-industrial concentrations, and other factors including atmospheric areas necessary to protect the public health and welfare” (Air Quality Act of 1967, sec. 107 (a)(2)).<sup>18</sup> The Secretary was

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<sup>17</sup> Public Papers of the Presidents of the United States: Lyndon B. Johnson, 1967. Volume II, entry 503, pp. 1067-1070. Washington, D.C.: Government Printing Office, 1968. Online at Lyndon B. Johnson Library and Museum: National Archives and Records Administration <http://www.lbjlib.utexas.edu/johnson/archives.hom/speeches.hom/671121.asp> (Last accessed Feb. 5, 2012).

<sup>18</sup> The Air Quality Act defined regional air quality control region as “a program for the prevention and control of air pollution, or the implementation of air quality standards program as authorized by the Act in

also authorized to establish and publish “air quality criteria based” on the “latest scientific knowledge” (Air Quality Act of 1967, sec. 107 (b)(2)(3)). After consultation with appropriate advisory committees and federal departments and agencies, the Secretary was to “issue to the states and appropriate air pollution control agencies information on the recommended control techniques...to achieve levels of air quality set forth in the criteria” (Air Quality Act of 1967 sec. 107(c)). Whereas the CAA of 1963 had failed to require states to establish ambient air quality standards or a means of achieving them, the Air Quality Act gave states the authority to set and enforce standards within designated air quality control regions (Air Quality Act of 1967 sec. 108 (b)) and to recommend how to meet these needs. The Air Quality Act also authorized an arguably redundant two-year study of the need for national emission standards (Air Quality Act of 1967).

For the first time, the federal government stepped into the realm of “command,” prescribing mandates that established acceptable air quality, a power they did not have in the federal water quality program. Yet, under the Air Quality Act, the federal program would not displace state and local authority; instead it would serve as supporter and overseer and enforcer of last resort. The Secretary of Health, Education, and Welfare was authorized to step in if states failed to establish or enforce reasonable standards (Air Quality Act of 1967, sec. 208 (b)(c)). The Air Quality Act also addressed the economic concerns raised by policymakers. It required the Secretary to publish “technical data relating to the technology and costs of emission control” including “such data as are

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an area that includes the air area of two or more municipalities whether in the same or different states (Air Quality Act of 1967 sec. 105(a)(1)).

available on the latest available technology and economic feasibility of alternative methods of prevention and control of air contamination including cost-effectiveness analyses” (Air Quality Act of 1967, sec. 107(c)).

Only a year after the passage of the Air Quality Act, an article in *Science* magazine called for a new appraisal of air pollution policy. The article declared that the nation “had moved toward the establishment and enforcement of criteria, evaluating the costs and benefits, and translating scientific and technical knowledge into social advantage,” however major issues remained (Wolman, 1968: 1438). The article’s author, Abel Wolman, a retired Johns Hopkins professor of engineering, hygiene, and public health, argued that establishing the origins of air pollution, measuring its effects, setting reasonable limits, assessing technological controls, determining cost and benefits, and understanding economic impacts, were all stumbling blocks compounded by trying to fit air pollution abatement into the ecology of the total environment and issues of agency coordination (Wolman, 1968). Wolman noted the Air Quality Act had lofty goals it could not fulfill, not because of the provisions of the Act, but because of the structure of the procedures to carry out the provisions. The article captured an issue that would later serve as motivation for a full embrace of command-and-control at the federal level. In trying to retain the power of state and local authorities, but guide them to action by establishing a process for the development of standards, the Air Quality Act set forth a procedure that was inclusive but time-consuming. The procedure from designating air regions to the development of specific ambient air quality standards was complex. According to some, it was so onerous that it proved almost impossible to clean the air efficiently (Krier and Ursin 1977; Reitz 1968). Once the Secretary of the HEW issued criteria, recommended

control techniques, and designated control regions, states were required to submit letters of intent within 90 days of receiving the criteria; 180 days later to hold public hearings and adopt quality standards for its control region; and 180 days after that to adopt a plan for implementation, maintenance, and enforcement of standards. This was all to be completed by specific deadlines or they would risk subjection to federally prescribed standards (Air Quality Act of 1967).<sup>19</sup>

The purpose of the state standard setting process was to assure that standards were met within a reasonable amount of time. Yet, the procedural requirements laid out by the Air Quality Act were time consuming, and would result in enforcement of standards two years after the Act's was passed. In addition each part of the process called for cooperation among the various levels of government, industry, and the general public, which could create numerous opportunities for delay. Moreover, the prescribed process did not address policymakers' noted concern that state and local authorities would be required to purchase expensive technological controls to mitigate emissions (Murphy, 1967). The Air Quality Act made polluters direct participants in air pollution policy development, putting them in a position to challenge measures that could reduce their profits.<sup>20</sup>

## **1.5 The Rise of Command-and-Control**

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<sup>19</sup> There are two types of standards. One specifies air pollution control objectives and the other prescribes what polluters must do. Air quality levels are specific quality levels of ambient air that are considered acceptable for any given air quality control region. Emission standards prescribe the nature and quantity of a pollutant to be allowed from any given source (Trumball, 1972).

<sup>20</sup> During public hearings, polluters were direct participants, required to present evidence in an adversarial setting. Polluters could be taken to court by the federal government, however enforcement suits rarely reached the courts (Trumball, 1972). Trumball (1972) claims that before 1970, enforcement suits rarely reached the courts because federal officials viewed them as publicity tools rather than effective enforcement techniques.

The Air Quality Act was a failure at both the state and federal levels: by 1970, the Secretary of Health, Education, and Welfare had designated less than a dozen air quality regions, and in addition, no state had fully met the mandates of the Act. Although scholars of environmental history tend to attribute the Clean Air Act of 1970 to an increase in public environmental concerns associated with the first Earth Day in 1970, Paul G. Rogers, Chair of the House Subcommittee on Health and the Environment during the 1970 Clean Air Act deliberations, contends that the two key provisions of the 1970 amendment – the establishment of national ambient air quality standards (NAAQS), and the imposition of statutory deadlines for compliance with the standards – were a “deliberate response aimed at correcting the demonstrated failures of previous regulatory efforts” (Rogers, 1990).

To be clear, the Air Quality Act did not establish mandatory national standards, which President Johnson had proposed, nor did it impose hard compliance deadlines for states and local authorities to meet. The Clean Air Act of 1970 did, however, base the management of air pollution on national ambient air quality standards established by the federal government, and carried out by state implementation plans (SIPs) by specific dates.<sup>21</sup> The 1970 Clean Air Act used a command-and-control approach, directly overseen by the federal Environmental Protection Agency, to regulate air pollution. In these ways, the 1970 Clean Air Act was a significant departure from previous legislation.

With the enactment of the 1970 amendments, Congress showcased its belief that economic growth and a clean environment are not mutually exclusive goals, and

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<sup>21</sup> There were two types of NAAQS; primary standards to protect public health and secondary standards to protect public welfare (CAA of 1970).



furthermore, experiences gleaned under the amendments indicate that “environmental protection and economic growth can, and must, be accomplished hand-in-hand” (Rogers, 1990). But industry did not see it that way. Although Congress may have believed the legislation reconciled the goals of growth with the need clean the air, the Clean Air Act of 1970 (as well as the National Environmental Policy Act, and the creation of the Environmental Protection Agency all established under the Nixon Administration) was strongly opposed by industry because, industry claimed, it did not balance environmental and economic goals.

The passage of the National Environmental Policy Act (NEPA), the creation of the Environmental Protection Agency (EPA) in December 1970, and the Clean Air Act of 1970, firmly established the federal government as the ultimate authority in matters of health and welfare.<sup>22</sup> However, the responsibility for implementing environmental laws was spread out among different departments and agencies in the executive branch.

Four months after his inauguration in January 1969, President Nixon proposed a Task Force on Environmental Policy to investigate ways to restructure the many branches of environmental policymaking. The Task Force, with Russell E. Train as its chair, recommended the creation of a cabinet-level interagency Council on Environmental Quality (CEQ). According to later comments from Train, the new CEQ made little progress in restructuring environmental policy development in Washington, but it did represent an environmental policy landscape in transition (Train, 1996).

Meanwhile, the National Environmental Policy Act (NEPA) represented a major change in how the federal government went about protecting public health and welfare

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<sup>22</sup> See Cook, 1988

from environmental ills. Enacted on January 1, 1970,<sup>23</sup> the goal of the NEPA was, “To declare national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to his environment; to... stimulate the health and welfare of man; to enrich the understanding of ecological systems and natural resources important to the Nation” (NEPA of 1969).<sup>24</sup>

The NEPA established provisions for federal agencies to enforce policies, and at the same time the Council on Environmental Quality was officially established in the Executive Office of the President to assist President Nixon in the preparation of an annual Environmental Quality Report to Congress, gather data, and advise on policy (Pub. L. 91-190).<sup>25</sup> One provision for the enforcement of policies is especially significant to the subsequent history of environmental regulation in the U.S. The NEPA required all federal agencies to prepare environmental impact statements (EIS) (NEPA 1970). The NEPA’s EIS requirement set a plan for reform that included the systematic institutionalization of environmental values throughout the federal government. The EIS forced federal agencies to consider the consequences of a proposed action; declare adverse environmental impacts that could not be avoided if the proposal was carried out; offer reasonable alternatives to a proposed action; discuss the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity; and acknowledge irreversible and irretrievable commitments of resources that would be involved if the proposed action should it be implemented.

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<sup>23</sup> Although enacted in 1970, the short title for the legislation is the National Environmental Policy Act of 1969.

<sup>24</sup> Pub. L. 91-190, Sec. 2, Jan. 1, 1970, 83 Stat. 852

<sup>25</sup> Then Undersecretary of the Interior, Russell E. Train served as the Council’s first chairman.

The decision-making process that the NEPA put into place directly affected how the provisions of the CAA of 1970 would be enforced and challenged. According to political scientists H. Paul Frieseman and Paul J. Culhane (1976), the NEPA represented a shift from an attempt to determine program expenditures on the basis of cost-benefit evaluation of programs and program alternatives very common in the 1960s, to a more holistic approach that employed science, evaluation, mitigation and coordination for more rational decision-making. But there were many contradictions in the NEPA. On the one hand, the NEPA aimed to account for intangible societal values, for which policy had poorly, if at all, accounted in the past. On the other hand, the EIS forced the challengers and supporters of projects with environmental impact to determine the monetary worth of basic rights like clean air and human health. Law professors Eva Hanks and John Hanks (1969) have explained that the courts interpreted environmental values in terms of their monetary worth; in this way the NEPA was a cost-benefit analysis tool that raised the question of how to quantify quality of life. They argued that the NEPA created a “judicially cognizable interest in environmental values, enforceable at the suit of representative groups of citizens” (Hanks and Hanks, 1969: 265). In other words, the legality of EIS could be directly challenged but challengers would need to prove the worth of their concerns.

Twenty-one days after the passage of the NEPA, Nixon declared in his State of the Union Address that the “great question of the seventies is, shall we surrender to our surroundings, or shall we make our peace with nature and begin to make reparation for the damage we have done to our air, to our land, and to our water?” Nixon saw the government’s role as “restoring nature to its natural state.” He clarified, clean air was not

“free” and a debt was finally called after years of “carelessness” (Nixon, 1970a). The following month, the President proposed what he considered “the most comprehensive and costly [pollution control] in American history,” the Clean Air Act of 1970 (Nixon, 1970b).

The organized federal oversight implied by provisions of the Clean Air Act of 1970 gave the Nixon Administration cause to act on the recommendation of its Advisory Council on Executive Organization. The Advisory Council on Executive Organization, also known as the Ash Council after the organization’s chair Roy L. Ash (founder of Litton Industries and appointed by President Nixon in April of 1969) recommended in April of 1970 that federal anti-pollution programs be merged into an Environmental Protection Administration (EPA).<sup>26</sup> The Council on Environmental Quality oversaw environmental impact statements, but could not address the problems of the overlapping jurisdictions of government departments or improve their effectiveness. According to the Advisory Council, the EPA would be the principal instrument to fulfill Nixon’s pledge to “repair the damage already done, and to establish new criteria to guide us in the future” (Ash Council Memo, 1970; Nixon, 1970c). Ash found that “The environment, despite its infinite complexity, must be perceived as a unified, interrelated system,” and the structure of the National Government needed to reflect that characteristic (Ash Council Memo, 1970). Believing that federal standard-setting to address pollution concerns should take place outside of agencies whose interest may affect those standards, the Ash Council

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<sup>26</sup> The Ash Council prepared fourteen memoranda between July 19, 1969 and November 19, 1970 and resigned on May 7, 1971.

hoped the EPA would simplify the coordination among state and local governments previously impeded by federal fragmentation (Ash Council Memo, 1970).

Having openly declared a need to pull together the research, monitoring, and standard setting of previously “piecemeal” efforts, Nixon declared his plans to accept the Ash Council’s recommendation and establish, through Reorganization Plan Number 3, the Environmental Protection Agency. Its mission would be:

The establishment and enforcement of environmental protection standards consistent with national environmental goals... The conduct of research on the adverse effects of pollution and on methods and equipment for controlling it; the gathering of information on pollution; and the use of this information in strengthening environmental protection programs and recommending policy changes... assisting others, through grants, technical assistance and other means, in arresting pollution of the environment... assisting the Council on Environmental Quality in developing and recommending to the President new policies for the protection of the environment. (Pub. L. 91-190, Sec. 2, Jan. 1, 1970, 83 Stat. 852).

During hearings on the EPA, Russell Train testified that the EPA would provide “unity and leadership necessary to protect the environment.” Roy Ash argued that fragmentation of pollution control continued to “limit our solving the problem” (EPA, 1992a).<sup>27</sup> Nixon’s Reorganization Plan passed the Senate and House of Representatives, and the EPA was formally established in December 1970.

William Ruckelshaus, the EPA’s first administrator, saw the EPA as an entity that would act as an overseer, helping state and local agencies in their efforts to abate

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<sup>27</sup> Congressman John Dingell of Michigan however, proposed that instead of an EPA, the House should consider a cabinet-level Department of Environmental quality that included water and sewer programs from the Departments of Agriculture and Housing and Urban Development, and environmental operations of the Defense and Transportation Departments. Dingell’s proposal was rejected, however Dingell later becomes prominent voice in debates concerning the reauthorization of the Clean Air Act in the 1980s.

pollution (Ruckelshaus, 1970; Ruckelshaus, 1971).<sup>28</sup> At the same time, he believed that the EPA needed “to take on the large institutions in society which hadn’t been paying attention to the environment” (EPA, 1992b:9). Meeting both of these goals would prove difficult, especially in regard to tackling the problems of air pollution vis-a-vis the Clean Air Act of 1970.

### **1.6 The Fall of Command-and-Control**

Support for the revolutionary command-and-control mechanisms of the CAA of 1970 and the EPA was short-lived. Almost immediately there was push-back, both inside and outside of Washington. The EPA directly oversaw the fulfillment of the CAA; it was responsible for establishing the ambient and emissions air quality standards and reviewed and approved state implementation plans. The EPA published its initial ambient air quality standards for sulfur dioxide, carbon monoxide, nitrogen dioxide, particulates, hydrocarbons, and photochemical oxidants in April 1971.<sup>29</sup> state institutions, “private” economic and social life

State governments were then required to devise state implementation plans prescribing how the state would meet these NAAQS. States had to develop and submit state implementation programs (SIPs) to the EPA within nine months of the circulation of

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<sup>28</sup>Ruckelshaus, a graduate of Harvard Law School and native Indianan entered the role of EPA administrator with experience in public health, pollution, and enforcement. Ruckelshaus had as Deputy Attorney General of Indiana from 1960 to 1965 served as counsel to the Indiana Board of Health, and helped stop municipalities and industries from polluting Indiana waterways. He also worked with the department’s Steam Pollution Board. In 196 he helped draft the 1961 Indiana Air Pollution Control Act. Prior to becoming EPA administrator, Ruckelshaus served as Nixon appointed Assistant Attorney General in charge of the Civil Division for the U.S. Department of Justice from 1969 to 1970.

<sup>29</sup> Later, standards were established for lead, and revised for photochemical oxidants to a standard for ozone – the principal component of smog. For some pollutants, two different standards are set: a primary, which protects public health, and a secondary standard to protect public welfare measured by the effects of pollution on vegetation, materials and visibility.

the NAAQS. The states had to include specific “emissions limitations, schedules, and timetables for compliance” (CAA of 1970). With the guidance of state plans, states were to meet the Clean Air Act deadline for attainment of most primary NAAQS by mid-1975.

Many states failed to meet these standards. As Liroff (1986: 21) explained:

In theory, to devise an ideal, cost-effective plan for each region, a state would have had perfect knowledge about all emission sources in the region, about the relationship between emissions from those sources and ambient air quality in the region, and about the costs of control and technologies available for reducing emissions...The reality was far from ideal.

With the exception of California, states had only limited technological and financial resources from which to create their plans. Most had to estimate the need for reductions in emissions from stationary sources to reduce ambient levels of pollutants (Liroff 1986:

21):

With limited capabilities to model the impact of sources' emissions on ambient air quality, and with only rough indications of existing air quality from monitoring stations of uncertain reliability, states had to employ crude, simplifying assumptions as they established limits on emissions and devised plans to achieve the national ambient air quality standards. As a result controls on individual sources may have been either tighter or looser than was necessary to achieve the ambient standards giving cause for both industry and environmental skepticism.

If a state failed to meet standards, the EPA had the power to enforce penalties such as denying construction permits and withholding federal funds, and if necessary promulgate its own regulations if a state failed to act (CAA of 1970).

Government officials found the policy tools of the CAA and the authority of the EPA costly. The economic branches of the federal government, especially the Office of Management and Budget (OMB), expressed concern about the cost of regulations on

industry and the federal government (Schultz, 1971). Fearful of the political and economic impact of the EPA and Clean Air Act, policy analysts and policymakers like Commerce Secretary Maurice Stans (later implicated in the Watergate Scandal) and OMB Director George Schultz helped to establish the “Quality of Life Review,” the first formal process for presidential staff review of social regulatory policy. The Quality of Life Review aimed to raise awareness about economic efficiency in decision-making processes. It required federal agencies to consider regulatory alternatives and the costs of regulation (Landy et al., 1994).

Although the Review was supposed to be for all social regulatory agencies, it singled out the EPA (Eads and Fix, 1984). Ruckelshaus was not deterred. He took on his position in the EPA with a commitment to beginning a “new American revolution” by tackling environmental degradation, which he believed was one of “America’s most challenging objectives” (Ruckelshaus, 1971: 14). The EPA oversight of the command-and-control based CAA of 1970 required preservation in order to end what Ruckelshaus referred to as “the measure of progress as a gross national product” (Ruckelshaus 1971: 13). He created a unit in the EPA staffed by economists and intended to produce information and analyses that could be used against attempts to block EPA regulatory decisions on the basis of cost (Cook, 1988).<sup>30</sup>

Industry also challenged what it perceived as the CAA’s costly blocks to expansion. The new source performance standards (NSPS) of the CAA of 1970s established national technology-based emissions standards that were stricter for new

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<sup>30</sup> The unit became the EPA’s Office of Planning and Evaluation (later the Office of Planning and Management).



sources of pollution and for the modification of existing sources than they were for existing sources of pollution not facing any form of modification. NSPS reflected the emission limit achievable through the use of the “best technological system of continuous emission reduction which...has been adequately demonstrated” (Clean Air Act of 1970). By doing so, the provision encouraged technology at new and modified sources in order to meet required standards.

### **1.7 The Political and Theoretical Roots of Emissions trading**

The smelting industry’s challenge to new source performance standards was influential in the shift from command-and-control to market incentives, in part because the industry was able to argue that the Clean Air Act needed to be adjusted to better meet the goal of cleaning the air without stifling economic growth. This argument was particularly resonant during the mid-’70s when the oil crisis, brought on by the Arab Oil Embargo, raised energy prices and slowed growth and increased competition from foreign industries. The EPA granted waivers and extensions for meeting emissions standards to automobile and other industries to lessen the blow (Bailey, 1998). However, waivers and extensions were a temporary solution to the problem. Market-based programs would be the first steps towards a federal emissions trading program, would become the mechanisms through which the EPA would try to create a win-win situation: cleaner air for the people and federal support of business.

The possible use of market mechanisms to address environmental problems had been in the regulatory pipeline for sometime before the economic stresses of the 1970s. As awareness and concerns grew about the relationship between the production and

consumption of goods and the creation of waste, policymakers faced questions about how much pollution can be tolerated and what was the most efficient way to reduce pollution. A common argument about the cause of environmental degradation is that the free market does not account for the social costs of the production of goods. As long as polluting is free, industries will pollute, and the social costs will not be reflected in the price of goods (Mazmanian and Kraft, 2001). These additional costs, not reflected in the market price, are generally referred to as “external costs” or externalities. The question then becomes how much is society willing to pay for economic expansion, in terms of expenditures, to reduce losses from pollution and losses that cannot be avoided. In 1932 A.C. Pigou, an economist, presented a possible solution, through the concept of the “polluter pays” in his “The Economics of Welfare.” Pigou argued that polluters should internalize the cost of externalities through an emissions charge (i.e. a tax, so sometimes now referred to as a Pigouvian tax). Pigou’s charge would be in the form of a tax equal to the social damage caused by business. For example, if a plant’s pollution causes \$50 of damage, the plant should be taxed \$50 until the pollution stops.

Approximately thirty years after Pigou proposed that the polluter pay, the question of what to do about pollution in a climate of economic stress and public support for government involvement in the prevention of pollution, academics began to revisit the issue of externalities. In 1960, Ronald Coase’s article, “The Problems of Social Costs,” challenged Pigou’s application of an emissions charge based on the fact that a Pigouvian tax would not be socially efficient. Coase’s thinking was that if A (for example, plant’s pollution, which is a negative externality) hurt B (for example, a surrounding community) then requiring the plant to pay the community could result in the community hurting the

plant (monetarily). Coase's critique of the Pigovian tax was that it did not take into account the costs imposed on the polluter, and tax equal to the pollution damage would cause unduly high costs.

According to Coase, a more socially efficient solution could result if parties are willing to negotiate. For example, if people in the community were willing to move for less than the \$100 tax, a renegotiation of property rights could take place thereby saving the plant money and the community an opportunity to choose how to address the pollution. In this scenario, it is beneficial for the polluting plant to bargain with the community and internalize the cost of polluting. The assumption that there are no transaction costs (the costs incurred in making an economic exchange, in other words the cost of participating in a market). Coase believed that if the property rights were clear, free bargaining would lead to the optimal solution for both parties. No government intervention would be needed thus, Coase argued, market mechanisms could be more effective than government mandated regulation.<sup>31</sup> In 1966, Thomas Crocker's "The Structuring of Atmospheric Pollution Control System" came to the same conclusion, and proposed air emission permits as a less bureaucratic way – compared to direct regulation – to combat air pollution. Perhaps the most provocative and comprehensive economic take on, and solution to, the issue of externalities was published in J.H. Dales 1968 book *Pollution, Property, and Prices*. Dales proposed the idea of tradeable permits. Dales wrote:

Specifically, the linkage is between prices – the stuff of economics – and the law of property, or more explicitly the law of property *rights*. Property

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<sup>31</sup> A no-transaction cost scenario is imperfect. If transaction costs exist, and Coase recognized that they did, then it matters who has property rights. As sides try to protect their property rights, transaction costs rise, and it becomes necessary to involve government entities to help deal with externalities.

rights constitute the set of social rules that on the one hand gives individuals the right to use their “property” in certain ways and on the other hand forbids them to use it in other ways (Dales, 1968: v).

In other words, the role of law, from Dales’ perspective, is to restrict private rights to use natural resources. Dales described three possible techniques for addressing the issue: regulation, subsidization, and pricing. For Dales, regulation and subsidies were inequitable, insufficient, and costly. With regulations it is difficult to relate the cost of suffering pollution damage to the cost of avoiding it. The issue with paying subsidies to polluters who refrain from polluting is verifying the identity of polluters. Property rights however, would allow the government to decide what level of pollution society was prepared to tolerate, and then offer for sale the right to pollute. Property rights could be issued by the government and sold for a limited time to the highest bidder. Since the government would issue a limited number of rights, the price of rights would increase over time.<sup>32</sup> This would have the effect of ensuring that the volume of pollution was controlled and compelling polluters to equate the marginal cost of avoiding pollution with the price of the right to pollute. This approach, Dales believed, would help achieve a balance between the three components of pollution costs: public expenditures to avoid pollution damage, private expenditures to avoid pollution damage, and the welfare

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<sup>32</sup> Dales explained:

“It is suggested that transferable property right be established for the disposal of wastes. The government can choose any level of pollution it wishes by setting the number of regional Pollution Rights it issues – the number to be subject to change at five-year or ten year intervals. Because transferable (or full) property rights always command an explicit price, the establishment of an explicit price for the right to discharge a ton of wastes into a water (or air) system results in a theoretically efficient allocation of “anti-pollution effort” as between different dischargers. In other words, the market automatically ensures that the required reduction in waste discharge will be achieved at the smallest possible total cost to society. Moreover, the rise in the price of the Pollution Rights over time will automatically solve the problem of economic growth; as the price rises, it will be economic for existing discharges to reduce their wastes, and thereby make room for newcomers. And, finally, it seems obvious that the Pollution Rights market will require very little administrative expense by comparison with alternative schemes” (Dales 1968: 108).

damage of pollution (i.e. the money equivalent of pollution damage that is suffered rather than prevented) (Dales 1968: 15).<sup>33</sup>

Dales thought that property rights allowed pollution control policy to maintain a range of choices in environments, from which individuals choose where they lived, worked, and enjoyed recreational activities. Dales proposed the government set up a pollution rights policy such that the price of rights in less polluted regions would be set higher than in the more polluted regions. This would encourage industry to remain in urban areas and leave other, less polluted areas, for residential communities. He argued “As long as areas are not equally polluted, moving away from heavily polluted areas is the simplest and usually the most effective way for individual families or firms to avoid pollution damage” (Dales 1968: 25). Granted, people would have to be willing and able to pay to relocate to and live in a less polluted place.

Others expanded on his ideas. In 1971, William J. Baumol and Wallace E. Oates, building on the work of Crocker and J.H. Dales, presented a description of market-based strategies to control “uniformly mixed” pollution, in their paper “The Use of Standards and Prices for the Protection of the Environment.”<sup>34</sup> Federal organizations conducted research of their own to consider market mechanisms. Between 1967 and 1973, Ellison Burton, a mathematician, and William Sanjour, a physicist by training working as an Operations Research Analyst and Policy Analyst before becoming Chief of Waste

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<sup>33</sup> Dales presented the following equation to describe waste disposal costs: waste disposal costs = pollution prevention costs (i.e. money spent to prevent some of the damage or effect of waste reduction costs before they are released) + pollution costs (i.e. money value of damage after they are released into the environment) (Dales 1968: 12).

<sup>34</sup> In his book *Pollution, Property and Prices* (1968) Dales described the use of marketable permits for water discharge. Dales noted that creating markets was synonymous with creating property rights. Coase (1960) had previously explained transferable property rights as a way to apply market incentives.

Reduction at the EPA in 1974, working for the National Air Pollution Control Administration of the Department of Health, Education, and Welfare, studied the economic impact of urban air pollution abatement. They used mathematical models of cities and their emission sources in order to compare the cost and effectiveness of the strategies that regulatory agencies use, and found that a “least cost” abatement strategy was less costly than the same amount of pollution reduction produced by conventional methods (Burton and Sanjour, 1967; Burton and Sanjour, 1968; Burton and Sanjour, 1969; Burton and Sanjour, 1970; Burton et al., 1973).<sup>35</sup> William Sanjour claims that the “least cost” strategy emerged thirty years later from the EPA Air Office as the “cap-and-trade” system (Sanjour, 2013).<sup>36</sup>

Early academic considerations of market mechanisms did not provide a recipe for how to put such schemes into practice, or describe how to operate them (Tietenberg, 2006), but this did not prevent formal proposals for their use. The first proposal for implementing economic approaches to pollution control came from the Johnson administration.<sup>37</sup> In 1966, Johnson’s Council of Economic Advisors suggested effluent charges as a way to address industrial pollution (Cook, 1988), but the Council’s suggestion did not go beyond the proposal stage. The same can be said of President Nixon’s 1971 proposal of a “Clean Air Emissions Charge” on emissions of sulfur oxides

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<sup>35</sup> Burton and Sanjour specifically evaluated the impact of strategies for controlling sulfur dioxide and particulate pollution. The purpose of their analyses was to find the most cost-effective strategy for achieving the same air quality level as a command-and-control.

<sup>36</sup>The story of William Sanjour and his role at the EPA is an interesting one. He saw himself as a whistleblower at the EPA and even gave a speech at the Warren County event often pinpointed as a pivotal event in environmental justice history. See: Sanjour, 2013.

<sup>37</sup> Uekoetter (2009: 245) notes that in 1959, the Rand Corporation developed the concept of a “smog tax” (see D.M. Forte et al., 1959). Rand Corporation’s study did not receive much if any attention. Other than Uekoetter, other histories of market-based approaches to environmental regulation do not mention the Rand report.

(Train, 1996). Nixon openly declared that new comprehensive regulations required that “the price of goods should be made to include the costs of producing and disposing of them without damage to the environment” (Nixon, 1970b.). The President suggested “the answer was not to abandon growth, but to redirect it” (Nixon, 1970b). Economic incentives would be one way to do this. From the beginning of the ‘70s onward, the harnessing of market mechanisms was gaining attention.

Nixon’s proposals were timely, and they came on the heels of a series of hearings regarding the incorporation of market approaches into law and growing support of environmentalists to the idea of taxing pollution. In 1971, economists Charles Schultze, Director of the U.S. Bureau of the Budget (and later head of the CEA under President Carter), and Allen Kneese (a well prominent economist at Resources for the Future), testified before the Joint Economic Committee that economic incentives were a better way to regulate pollution than command-and-control. William Ruckelshaus, EPA Administrator, had also testified before Congress that economic incentives could have enforcement advantages (Cook, 1988). Despite support from economic experts and the EPA, Nixon’s proposal failed to garner the approval of Congress (Train, 1996).

Wilson (1980) has explained the rationale behind the initial rejection of economic incentives. According to him, “In the precarious early months of the EPA, when environmentalists were expressing skepticism about the Nixon administration’s commitment to environmental programs, any sign that the EPA was even considering effluent charges would have immediately been interpreted as indication that the agency

proposed to “sell licenses to pollute.”<sup>38</sup> Opponents of emissions trading would make this argument against market mechanisms on moral grounds. The argument for selling the right to pollute was that, in the long run, you get the desired effect, and possibly get it faster and more cheaply, at least in theory. This was seen by many in the government and in industry as a bromide for any moral dissent against the categorical refutation of tolerating and even sanctioning a degree of pollution.

Environmental matters, including the dealings of the EPA, needed to be handled carefully. Nixon would be up for re-election in 1972, but one of the most outspoken environmental advocates was making a bid for the White House. Democratic Senator Muskie, having sponsored the Clean Air Act among other environmental legislation, was Nixon’s biggest threat in the presidential race. During the hearings on the Air Quality Act, Muskie had openly shared his belief that “no one has the right to use the atmosphere as a garbage dump” (Senate Report No. 403, 1967). In discussions regarding the adoption of effluent charges, Muskie had argued that they were not proven by accepted science, that they introduced bureaucratic agents in the regulatory structure, and that they gave industry the option of polluting for free (U.S. CRS 1970:675). Furthermore, unlike the technological-forcing approach of the Clean Air Act, which allowed the EPA to assure compliance by monitoring technology, the enforcement of effluent charges would be difficult given the limited data on emissions inventories.

Polls showed that a race between Nixon and Muskie would have been close, however Muskie lost the Democratic Primary to McGovern. Muskie had diminished

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<sup>38</sup> In 1972, Senator William Proxmire (D-WI) proposed during the Federal Water Pollution Control Act Amendments, to incorporate an effluent charge system (Cook, 1988).



political pull after the early '70s. So too did a stance of opposition to market mechanisms as a viable way to control pollution soon see diminished potency.

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## Chapter 2: The Coming of Cap-and-trade

### 2.1 Introduction

While The EPA would not fully adopt emissions trading for almost two more decades, the building blocks of emissions trading, which included a set of provisions or programs to account for the economic strain that the Clean Air Act put on industry and, by extension, the national economy, began to receive support from the agency by the mid-'70s. To understand the EPA's motivation for incorporating the building blocks, it is important to consider the impact of cost-benefit analysis of federal programs on environmental decisions.

Beginning in the 1930s, the federal government employed early forms of cost-benefit analysis to determine the economic efficiency of its programs.<sup>39</sup> Since then, economic analysis by federal agencies (including the EPA) evolved with each new presidency. The EPA's primary directives are to protect the nation's health and wellness and to the reduce damage to the environment caused by pollution.<sup>40</sup> To meet the requirements of these directives, the EPA has prepared analyses of environmental regulation since its inception. The EPA considers different factors when setting environmental regulations. Environmental statutes require the EPA to evaluate risk in terms of health effect thresholds, margins of safety, and technical feasibility. Following the establishment of the Quality of Life Review in 1971, the EPA has also been required to provide regulatory analyses for review by the Office of Management and Budget

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<sup>39</sup> Cost-benefit analysis was incorporated into the 1936 Flood Control Act (Smith, 1986).

<sup>40</sup> "Because the nation's resources are limited, EPA seeks to the extent legally permitted to direct the resources towards the actions that will produce the greatest reductions in environmental risk" (EPA, 1987).

(OMB).<sup>41</sup> Nixon's Quality of Life Review created a formal economic analysis of EPA regulation review procedures. It required that a "summary description" accompany any regulation indicating principle objectives of the regulation, alternatives considered, a comparison of cost and benefits associated with the alternatives, and reasons for selected proposed alternatives.

When Richard Nixon resigned as President after the Watergate scandal in the summer of 1974, inflation was rampant; Gerald Ford faced the challenge of cleaning the air in a way that did not add to rising inflation. Established in 1974, Executive Order 11821 mandated the OMB require each agency develop, "Inflationary Impact Statements."<sup>42</sup> Ford also established the Council of Wage and Price (which would supplant the Quality of Life Review) to monitor inflation, dissuade industry and labor from making costly decisions, and pressure executive branch agencies, like the EPA, to analyze the likely economic consequences of proposed regulation (Cook, 1988; Kraft and Vig, 1984).

The same year that Ford established Executive Order 11821, the EPA revisited the smelting industry's 1972 proposal to redefine a stationary source. Recall that under the Clean Air Act of 1970, each individual stationary source of pollution in a facility (also called a plant) was subject to evaluation under the new source performance

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<sup>41</sup> Prior to the Quality of Life Review, Lyndon Johnson instated a Planning-Program Budgeting System for federal agencies.

<sup>42</sup> Ford issued E.O. 11949 in December 1976 to extend E.O. 11821 another year. E.O. 11821 changed the title of Inflationary Impact Statements to "Environmental Impact Analyses (EPA, 1987: 5). The OMB specified three criteria for the statements: 1. review of alternatives to proposed actions including probable costs benefits, risks, and inflationary impacts; 2. costs associated with recommended alternatives and the inflationary effects of the action on markets, consumers, and businesses; 3. a comparison of the benefits to be derived from the proposed action with the estimated cost and inflationary impacts. In its own guidelines for Inflationary Impact Statements the EPA emphasized that benefits be expressed first in terms of environmental improvements and dollar terms. The EPA acknowledged that in most cases, dollar terms would not be "feasible or meaningful" (EPA, 1987).

standards (NSPS). A facility could be responsible for a number of individual point sources, and any new source or modification to an individual source under an industry's control would subject the facility to NSPS requirements, which included the purchase of best available technology (Liroff, 1986; Tietenberg, 1985). The smelting industry, with the support of the Department of Commerce, proposed changing the definition of a stationary source so that all individual points within a facility represented a single plant (Levin, 1982; Liroff, 1986).<sup>43</sup> In 1972, the EPA rejected the smelting industry's proposal not because it would worsen the pollution problem, but because it would undermine the technology-forcing approach of the Clean Air Act, which allowed regulators to assess compliance by verifying the presence of emission reducing technology.

However, in 1974, the EPA reversed its position and agreed to the smelting industry's proposal. The reinterpretation of a stationary source did not entail the adoption of emissions trading, but it did indicate a willingness by the EPA to meet the demands of industry and to consider the economic consequences of regulation.

The EPA's compromise did not go unchallenged. Both environmentalists and industry had opposing objections. Industry argued that the EPA's proposed rule was not extensive enough for new sources because it applied to modification of existing sources, but not for new ones (*ASARCO, Inc. v. Environmental Protection Agency*, 578 F. 2d 319). The Sierra Club argued that the new rule was illegal because it violated the CAA's goal of achieving clean air. Specifically, the Sierra Club maintained that section 111 of the Clean Air Act defined "source" in terms of any "building, structure, facility, or

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<sup>43</sup> According to Bailey (1998), the Nixon Administration supported industry concerns and created the Industrial Pollution Control Council (NIPCC) in the Department of Commerce. Industry had access to regulatory decision-making through the NIPCC, and when the smelting industry made the proposal of a "plant" it did so through the NIPCC to the EPA in 1972.

installation” all of which represented singular entities, therefore the legislation intended these point sources to remain separate. Furthermore, the Sierra Club argued, the purpose of the Clean Air Act was to “protect and enhance” air quality. The concept of a “plant” represented a loophole to “delay cleanup efforts and confound enhancement” (ASARCO Incorporated v. EPA (Sierra Club) v. EPA.). In response, the EPA argued that section 111(b)(2) of the Clean Air Act permitted it to “distinguish among classes, types and sizes within categories of new sources for the purpose of establishing new source performance standards (Clean Air Act of 1970). Judge Wright, of the District Court of Columbia, settled the industry suit against the EPA in 1978 when he struck down the EPA’s revision in 1975.<sup>44</sup> Siding with the Sierra Club, he argued that “source” referred to a single entity. Furthermore, Wright concluded that the redefinition of a source would only maintain air quality, which was not the congressional mandate of the Clean Air Act to “protect and enhance” (ASARCO Incorporated v. EPA (Sierra Club) v. EPA.).<sup>45</sup> At the same time that Wright objected to changing the Clean Air Act, he nevertheless noted that the EPA had the authority to define the components of “source” especially “facility”. A facility could refer to more than one entity and sometimes to whole plants. Judge Wright thus left open an opportunity for the EPA to revisit the matter (ASARCO, Inc. v. EPA, 578 F. 2d 319, 327 D.C. Cir 1978).

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<sup>44</sup> The regulation provided that "(a) modification shall not be deemed to occur" unless the change in an existing facility results in a net increase in the emission of a pollutant from the whole "source." ASARCO Incorporated v. EPA (Sierra Club) v. EPA. 578 F. 2d 319 11 ERC 1129, 188 U.S. App. D.C. 77, Environmental Law Report 20, 164, 8 Environmental Law Report 20,277 online at <http://ftp.resource.org/courts.gov/c/F2/578/578.F2d.319.76-1037.76-1030.html#fn19>

<sup>45</sup> Note that this mandate was actually presented in the Air Quality Act of 1967, Pub L No. 90-148 section 101(b)(1), 81 Stat. 485 (1967).

## 2.2 Offsetting and Banking

The Clean Air Act of 1970 set a deadline of May 1975 for states to achieve national ambient air quality standards (NAAQS), but most states had already missed the deadline to prepare their state implementation plans, and it was clear that many states would fail to achieve standards as well. Under the Clean Air Act, regions not in attainment (often urban areas, the locations of the majority of oil, gas, and steel industries) faced sanctions such as the denial of construction permits for new stationary sources. In the months leading up to the EPA's official adoption of the "offset rule," the Ford Administration proposed a Senate bill that would provide "an exception to allow greater flexibility in the administration of the [CAA] and opportunity for growth of national industrial capability" (U.S. Senate 1976: 42). The House provided a "variance" for industrial expansion and new economic growth and the Senate declared that "combined emissions from the existing and new facilities be sufficiently less than the previous total of all emissions from the site to represent reasonable further progress toward attainment" (U.S. Senate 1976:43). Around the same time that President Ford, the House, and the Senate tried to ease the pressure on industry to meet Clean Air Act Attainment goals, the Sierra Club sued the EPA on the grounds that its NAAQS did not prevent air cleaner than the standard from worsening (*ASARCO Incorporated v. EPA (Sierra Club) v. EPA*. 578 F. 2d 319 11 ERC 1129, 188). The EPA adopted a prevention of significant deterioration program in 1974, which specified the maximum allowable increases in pollution concentration beyond a historically defined baseline. Once a region designated as one in which significant deterioration should be prevented reached its maximum concentration of pollution, no more increase was allowed (Tietenberg, 1985).

The offset policy was the EPA's compromise. EPA Administrator Russell Train presented an early form of the offset rule in December 1976 to allow construction in nonattainment areas, given that a facility reduced emissions in order to offset the emissions from the new or modified source. The rule also prevented "banking"; the retention of offset credits for future use (Emissions Offset Interpretive Ruling, 1976; Levin, 1982). The EPA rejected the concept of "banking" emissions trading credits for fear that banking was in direct conflict with the goal to achieve ambient standards as quickly as possible. Lawsuits, like those pursued by the Sierra Club, put the EPA at the mercy of the courts when it failed to uphold the 1970 Clean Air Act objective to "protect and enhance the quality of the nation's air" (Tietenberg 1985, 6) and banking could allow an industry to avoid reducing emissions because it owned emissions credits. The Sierra Club had made this objection to banking, arguing that banking made emissions credits a property right (Cook, 1988); they objected to the notion of credits as commodities rather than maintaining them as a finite resource.

When the offset rule was officially incorporated into the Clean Air Act amendments of 1977, the legislation allowed major new and modified sources of emissions to site in nonattainment areas provided they used control equipment that produced the "lowest achievable emission rate" (LAER) for the type of industry involved, and offset any excess by acquiring greater emission reductions from other sources in the area. LAER was the most stringent standard adopted up to that time and required technology superior to advanced technology normally required by NSPS. The Clean Air Act of 1977 also required the adoption of Best Available Control Technology (BACT) for new or substantially modified sources. The legislation required existing

sources in nonattainment areas to apply a less stringent technology standard than LAER called Reasonably Available Control Technology (RACT).<sup>46</sup> Unlike in the earlier forms of the program, a facility could transfer an offset to another facility within the same non-attainment area. The 1977 Amendments made room for banking by protecting significant deterioration (PSD) of regions in attainment through control technology, and a cap on the maximum increases emissions allowed (Tietenberg, 1985).<sup>47</sup>

### 2.3 Netting and Bubbles

According to some, (Hahn and Hester, 1989; Liroff, 1986) the acceptance of a “plant” allowed an industrial facility consisting of multiple sources to increase emissions from one point as long as the emissions at the other points decreased so that no “net” increase in emissions occurred from the facility. Others (Hahn and Noll, 1982; Meidinger, 1985; Tietenberg, 1985) suggest that this was the earliest form of what would be known as the “bubble policy.” In their interpretation, when many point sources were recognized as one entity, an imaginary “bubble” was created over the plant, such that it was like a single hole existed over a facility. In this case, emissions that exited the bubble were subject to NSPS standards regardless of their individual origin. Both interpretations have the same significance. If a stationary source was defined as a plant (i.e. multiple point sources under the ownership of one industry), a plant would be permitted to conduct an internal *trade* by reducing emissions at one point so that emissions at another

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<sup>46</sup> The CAA of 1977 also required that the EPA set ceilings on allowable increments of particulate matter and sulfur dioxide in PSD areas, and pushed deadlines for compliance to December 1982 with some extensions to December 1987.

<sup>47</sup> Banking allows industries to store emission reduction credits for their own future use. Banking rules established regional accounting central clearing houses for emission reduction credits. Industries in search of emission reduction credits that they themselves cannot generate can find other sources with credits for the appropriate pollutant emission credit banks trade for or purchase the necessary credits.



source could increase. Politically, the notion of a “plant” allowed the EPA to promote new business by both saving industry money that it would otherwise have to spend to add control technology, and reducing risk of preventing the industries’ expansion because of nonattainment. Still, it is important to note that the EPA did not officially incorporate bubble and netting rules into the Clean Air Act until the late ‘70s under the Carter Administration.

The Carter Administration was devoted to bringing greater efficiency to the design and operation of government programs, especially through continued regulatory reform. Carter appointed a number of market-minded individuals during his presidency, and these individuals created a political atmosphere receptive to economically-based environmental regulation. Charles Schultze, recycled from the Johnson administration, Douglas Costle, and William Drayton, especially, fostered emissions trading policy. Douglas Costle, Carter’s chosen EPA Administrator, and William Drayton, the President’s choice for Assistant Administrator of the EPA Office of Planning and Management (OPM), had worked together in Connecticut to develop an economic incentive based system of emission enforcement known as the Connecticut Enforcement Program (Cook, 1988; Drayton, 2005).<sup>48</sup> Schultze served as Director of the Office of Management and Budget, and under Carter was Chair of the Council of Economic Advisors. Both groups reviewed social regulation agencies, like the EPA, for their cost effectiveness. These actors helped to push the EPA closer, through amendments to the Clean Air Act, towards a comprehensive federal market-based emissions policy.

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<sup>48</sup> Costle had served as Deputy Commissioner and Commissioner of the Connecticut Department of Environmental Protection in Connecticut. He also served as Assistant Director for the Natural Resources and Commerce at the Congressional Budget Office. In Connecticut, Drayton was a strategy and management consultant.

Whereas the notion of a “plant” allowed the EPA to increase flexibility for major new or modified sources to meet Clean Air Act standard, as the ’70s came to a close, existing sources of air pollution were at risk of being targeted for not meeting clean air standards as well. For example, the domestic steel industry faced low-priced foreign competition, aging and outmoded plants and equipment, and poor management. These factors contributed to the industry’s inability to comply with the Clean Air Act, and were part of the rationale for amending the Clean Air Act in 1977, and prompting the EPA to seek other means to increase regulatory flexibility.<sup>49</sup> Beginning in 1977, Drayton began to change the institutional structure of economic policy review.<sup>50</sup> In the OPM he created the Regulatory Reform Staff (RRS) to coordinate offices working on implementation market-based policies - the offset, bubble, banking, and netting policies (Levin, 1982; Tietenberg, 1985). The motivation for the EPA’s incorporation of the “bubble policy” into the Clean Air Act was the Carter Administration’s concerns for domestic steel production. Carter appointed Anthony Solomon, Undersecretary of the Treasury, to chair a task force to explore possible relief mechanisms to help industry achieve compliance with state implementation plans in non-attainment areas (Liroff, 1986). In December 1977, Solomon’s task force issued a report suggesting the bubble policy as a solution (Levin, 1982; Liroff, 1986). The bubble policy complemented the notion of a “plant.”

The EPA published the final Bubble Policy on November 29, 1979 (44 Fe. Reg. 71779, 1979). The bubble policy gave a facility flexibility to use methods of its choosing

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<sup>49</sup> During a 1975 hearing regarding the reauthorization of the Clean Air Act, Rep. Paul Rogers (D-FL) asked about the status steel companies and compliance and found that of the four in attendance (Interlake, Inc., Bethlehem Steel Corp., Inland Steel Co.; U.S. Steel Co. and National) none were in compliance.

<sup>50</sup> Drayton helped to secure provisions in the CAA of 1977 as well including penalties for noncompliance, funding for research on economic incentives, and fee for permits.

to comply with the Clean Air Act.<sup>51</sup> The agency argued its “alternative emission reduction option” would “promote greater economic efficiency and increased technological innovation” (Cook 74; U.S. EPA 1979b: 3741).<sup>52</sup>

However, in a letter from Jodie Bernstein, the EPA’s General Counsel, to William Nordhaus of the Council of Economic Advisors, Bernstein explained, “the EPA adopted the ‘bubble’ only in response to pressure from the smelting industry and the Department of Commerce... [T]here is nothing in the record beyond the most general statements to support the proposition that a ‘bubble’ is desirable on the merits” (quoted in Liroff 1986: 163). As often happens, policy had therefore been adjusted to accommodate the industry it was suppose to regulate.

Perhaps Bernstein was suggesting that the bubble policy was primarily a political tool; it did meet the Carter Administration’s push for government programs to seek regulation that was the least economically burdensome. In March 1978, President Carter had issued Executive Order 12044, which replaced Economic Impact Statements with Regulatory Analysis. Carter’s executive order increased the control that political executives could impose on federal bureaucracies and made policy analysis more explicit, but analytic and empirical requirements stretched administrative resources (Smith, 1986). Regulatory Analysis mandated federal agencies provide for each proposed regulation “a succinct statement of the problem, a description of the major alternative ways of dealing with the problem considered by the agency; an analysis of the economic consequences of

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<sup>51</sup> The policy was especially helpful to facilities with variety of point sources for which the cost of control was different (Hahn and Hester, 1989).

<sup>52</sup> In 1980, the EPA made it easier for states to incorporate a bubble program into state implementation plans. By approving a generic volatile organic compound rule in New Jersey, the EPA eliminated the need for states to obtain approval of state implementation program revisions for each bubble trade (Tietenberg, 1985).

each of these alternatives; and a detailed explanation of the reasons for choosing one alternative over another” (EPA, 1987). Although E.O. 12044 did not explicitly require agencies consider the benefits of proposed regulations, it made clear how agencies should choose regulation. It required them to consider “the direct and indirect effects of the regulation and choose the least burdensome” (EPA, 1987).<sup>53</sup>

In this way, the Regulatory Reform Staff’s work toward more market mechanism during the Carter Administration reflected continued efforts to keep the peace between government and industry by supporting economic growth. The adoption of netting the following year supports this claim. Netting was reintroduced out of concern for an intensive, complex new source process.<sup>54</sup> Netting increased flexibility to meet state implementation requirements by allowing emission reduction credits earned by a plant to offset the increases expected from new or modified sources in prevention of significant deterioration or nonattainment regions. As long as the net increase (counting the emission reduction credits) in plant emissions was insignificant, the plant could net out of review (Tietenberg 1985, 8). This meant that the facility could be exempt from having to obtain preconstruction permits or meeting associated requirements, like modeling or monitoring the impact of the new source on air quality, installing best available control technology (BACT), or least achievable emissions rate (LAER) control technology. The facility still had to meet emissions limits set by new source performance standards (NSPS) and could

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<sup>53</sup> Carter’s Regulatory Flexibility Act of 1980 required all federal agencies analyze the impacts of proposed regulations on small businesses, small non-profit organizations, and small government entities. The Regulatory Flexibility Analysis was required for all actions except those that “will not have a significant economic impact on small entities (EPA, 1987: 9).

<sup>54</sup> For example, states had to submit each facility bubble policy proposal as a revision to its SIP. The EPA had to review proposed transactions to ensure that they complied with the CAA (Dudek and Palmisiano, 1988; Hahn and Hester, 1989)

not use emission reduction credits to avoid a national standard (Tietenberg, 1985: 8). A year later, netting rules were modified to support uniform treatment of sources in attainment and nonattainment regions.<sup>55</sup> According to Michael Levin, who headed Drayton's Regulatory Reform Staff (RRS), with offset banking, bubble, and netting rules in place, (RRS) worked to describe how the many regulatory reforms would allow industries to "trade inexpensive reductions created at one point and time for expensive regulatory requirements on other points at different times, under controlled conditions to assure air quality and enforceability" (Levin 1982:78). The RRS proposed to consolidate the four policies under one program it referred to as "controlled trading."

## **2.4 The Reagan Years**

The Carter Administration subscribed to the idea of regulatory reform, but the Reagan Administration supported regulatory "relief" (Eads and Fix, 1984). Michael Levin has recalled that the Reagan Administration saw the Reform Staff's work as "... a Democratic smoke screen to divert attention from the 'real issues' of federal intrusion and overly stringent regulation" (Levin 1982:88). The EPA as a whole, and not just the RRS, was an item on Reagan's political agenda. The Reagan Administration's concerns about "controlled trading" were both philosophical and political. The Reagan Administration worried that "controlled trading" would undermine the President's objectives to revise the Clean Air Act towards deregulation the title of the program

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<sup>55</sup> In 1982, the Natural Resources Defense Council (NRDC), challenged netting. In *Natural Resources Defense Council, Inc v. Gorsuch*, the NRDC argued that exempting modified sources from review in nonattainment areas was inconsistent with the Clean Air Act statute for nonattainment regions to reach attainment as quickly as possible. The appeals court sided with the NRDC and voided the netting rules for sources in nonattainment areas. The Supreme Court overturned the ruling in the 1984 *Chevron U.S.A v. Natural resources Defense Council, Inc.* case, approving netting policy in nonattainment and PSD regions (Tietenberg 1985, 11).

implied more federal involvement (Levin, 1982; Liroff, 1986). Yet, it was during the Reagan Administration that the EPA adopted the Controlled Policy Statement and the Emissions Trading Policy Statement. The move to market mechanisms during the Reagan Administration was tied to:

- Widespread rejection of Reagan's support of cost-benefit analysis
- The reauthorization of the Clean Air Act
- The EPA's attempt to compromise to protect itself from takeover
- Demonstrated state support of the market-based policy already in place

#### *Executive Order 12291*

By the '80s, the private sector was powerfully challenging the EPA's allegedly anti-business policies and procedures. The private sector argued, and conservative factions in Washington agreed, that the EPA threatened to further weaken an already debilitated economy by restricting industrial growth. Market mechanisms supported both the public desire<sup>56</sup> for environmental protection and Reagan's support of deregulation.

Reagan took a deregulation approach to solving the problem of distrust of the institutions of government. This aimed to restore trust by rebuilding the economy through supporting individual states' power and the private sector. The Reagan administration turned to cost-benefit analysis to keep federal agencies and regulations in check.

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<sup>56</sup> Opinion Research Center, Cambridge Reports, and the Roper Organization showed that in the early '80s, the majority of the U.S. public favored increased efforts for environmental protection (Dunlap, 1991). The public saw the government as having primary responsibility for environmental protection, and believed that business and industry would not volunteer to insure such protection. Indeed environmental regulation itself was born of the fact that industry had displayed a general disregard for environmental issues. But the Reagan White House tipped its hand and showed where its true allegiances lay with its environmental policies sympathetic to business interests. The Reagan administration's policy did not improve public confidence in governmental oversight of environmental issues; instead it reignited public concern for the environment (Gilroy and Shapiro, 1986).

Proposed in 1981, Ronald Reagan's Executive Order 12291 continued the long legacy of evaluating federal regulatory efforts through economic analysis.<sup>57</sup> However, Executive Order 12291 was unlike other economic analyses of federal bureaucracy. Its Regulatory Impact Analyses (RIAs) made what had previously been an economic tool into an imperative of Federal decision making (Shabecoff, 1981). E.O. 12291 changed the emphasis of regulator development from the "least burdensome" alternative to identifying the alternative with the maximum "net benefits to society" (EPA, 1987: 10). Specifically, the E.O. required federal agencies base all "major" regulations on...<sup>58</sup>

the need for and consequences of proposed government action; not be undertaken unless the potential benefits to society from the regulation outweigh the potential costs to society; have objectives chosen to maximize the net benefits to society; the regulatory approach involving the least net cost to society; and provide the maximum net benefit to society, taking into account the condition of the particular industries affected by regulations, and other regulatory actions contemplated for the future (Executive Order 12291).

In addition, E.O. 12291 gave the OMB unprecedented authority to veto and rewrite regulation even before executive agencies officially proposed them. The OMB could approve or deny an agency's findings at any step of the rule-making process (Chemical Week, 1981).

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<sup>57</sup> Beginning in 1930s, the federal government employed early forms of cost-benefit analysis to determine the economic efficiency of its programs.<sup>57</sup> Since then, a series of efforts to budget federal programs and assess policy alternatives based on policy outputs ensued. Lyndon Johnson instated a Planning-Program Budgeting System. Nixon created the Quality of Life Review. Gerald Forde introduced Inflationary Impact Statements under Executive Orders 11821 and 11949. Carter's Executive Order 12044 "Improving Government Regulations" introduced zero-based budgeting. Program budgeting had mixed results. It increased the control that political executives could impose on federal bureaucracies and made policy analysis more explicit, but analytic and empirical requirements stretched administrative resources (Smith, 1986). In terms of environmental regulation, the NEPA furthered the push to analyze federal agencies by mandating environmental impact statements.

<sup>58</sup> "Major" regulation included rules with an annual an annual effect on the economy of \$100 million or greater, those causing significant increases in costs or prices, and those having important adverse effects on competition, investment, productivity, employment or the international competitive position of firms in the United States.

Supporters of cost-benefit analysis believed the mandate could prevent unnecessary and extensive regulations, which risked burdening an already stressed national economy. Murray L. Weidenbaum, chairman of the Council of Economic Advisers, contended that such analysis could help achieve better environmental protection because in-depth examination of the consequences of regulation could lead to better decision making (Shabecoff, 1981). As the thinking went, looking at each regulation with a cost-benefit test could eliminate costly proposals with limited benefits. When cost-benefit analysis had been a more informal tool, the Federal Government issued 100 to 200 major regulations costing more than \$1 million dollars each annually. A more rigorous cost-benefit analysis offered a rational basis for regulation that reduced regulatory burden (Shabecoff, 1981). Jerry J. Jasinowski, senior vice president and chief economist of the National Association of Manufactures (a notably conservative group which had even opposed the New Deal), argued that cost-benefit analysis could “[free] up economic resources for investment in plant and equipment and improve productivity and international competitiveness” (Shabecoff, 1981). To economists, cost-benefit analysis made “analytical common sense” because the reality of limited resources required making informed decisions (Shabecoff, 1981).

Cost-benefit analysis seemed an appropriate regulatory tool to industry given limited economic resources, but how effective and appropriate was it as an evaluator of environmental policies? This was a major point of contention between the opponents and supporters of E.O. 12291, the major legislative instrument of cost-benefit analysis. Decision makers lacked a way to calculate the value of health and human well-being, and this was both the advantage and disadvantage of cost-benefit analysis. It was



advantageous to businesses struggling to cut the costs of meeting environmental standards. It was a disadvantage to regulation meant to protect health and the environment because society's values, when incorporated into cost-benefit equations, became a matter of political debate.

Richard N.L. Andrews, an environmental scientist, believed that E.O. 12291 represented a redefinition of environmental policy that shifted it from pursuing the fundamental goal of protecting public air and water to granting private corporations the right to pollute the environment, with the level of impact measured by weighing the loss of social benefits against economic considerations (Smith, 1986). Opponents of Reagan's measure argued that the cost-benefit requirement was a justification for deregulating business and industry. Economic regulation could aid the decision-making process by providing criteria, yet cost-benefit analysis unavoidably placed a market value on quality of life issues (Whittington and Grubb, 1984), many of which could not readily be quantified. Environmentalists argued that E.O. 12291 required assigning dollar values to unquantifiable things such as human life and health (not to mention the beauty of the natural environment, and the intrinsic value of biodiversity). This, they feared, placed more weight on costs than on the benefits of regulation (Whittington and Grubb, 1984). According to Representative Henry A. Waxman, Democrat of California and chairman of the House Health and Environment Subcommittee, and Richard Ayres, senior economist for the National Resources Defense Council and director of the National Clean Air Coalition, the potential risks to the public and to the environment was too great to justify the cost-benefit analysis of the essentially improvable factors (e.g. human health and ecosystem viability).

Waxman also believed that the Reagan Administration would favor business and industry rather than the public interest. The Office of Management and Budget had authority to exempt major regulations from RIA review, and thus could make politically motivated exemptions. For example, the OMB could exempt from review regulations that weakened existing standards or reduced federal expenditures thereby slowing the development of stronger regulations.

Waxman further argued: “It is very dangerous to think we can quantify the way we make policy judgments. We don’t know how to measure the true cost of health or disease” (Shabecoff, 1984). Ayres agreed. He argued that cost-benefit analysis allowed “costs to flow to small groups and benefits to large groups and vice versa.” It was, Ayres believed, “concerned with efficiency but not with equity.” In this way, E.O. 12291 could improve the precision of choices but in so doing it could ignore aesthetic, ethical, and moral concerns (Shabecoff, 1984). It therefore addressed only some of the concerns related to modern environmental policy, and did so largely through a lens favorable to business and industry (Oreskes and Conway, 2011).

## **2.5 The Clean Air Act and Cost-Benefit Analysis**

The debate about the application of cost-benefit analysis to environmental regulations came to a head during discussions concerning the reauthorization of the Clean Air Act of 1970, which was scheduled for 1981. The question of what to do, if anything, with the CAA sparked a debate between politicians, industry, and environmentalists. Here was an opportunity for political advantage and economic relief, yet all possible courses of action presented potential health and environmental consequences. All

stakeholders agreed that the CAA needed some “fine-tuning,” but they disagreed on why the Act needed improvement, and what might be the appropriate modifications.

Industry claimed that the CAA hurt the economy. For example, in 1979 when the EPA set standards for smog, General Motors predicted the CAA would lead to “widespread inflation and employee layoffs” (Waxman, 1997). The American Petroleum Institute (API) predicted that the Act required “impossible controls” that would cause “extreme social and economic disruption” (Waxman, 1997). These complaints echoed the same concerns raised time and again throughout the history of the intersection of government regulation and corporate interest.

When the time came to discuss the reauthorization, industry called for a reduction in compliance costs and tried to repeal the CAA’s health-based standards, hoping to replace them with cost-based standards instead (Waxman, 1997). The API complained that the CAA “failed to carefully consider whether the benefits of proscribed environmental control would exceed the costs” (Oil and Gas Journal, 1981). It contended that EPA’s rigid guidelines for state implementation ignored the power the CAA gave to states to implement the Act which resulted in “unduly stringent, cumbersome, overlapping regulation, detached from the problem and entailing substantial costs without insuring commensurate progress toward the objective that initiated the effort” (Crow, 1981). In a guidance paper, API suggested:

- Air quality regulations should be directed at problems as determined by sound scientific evidence. Regulatory decisions should be reviewed on a regular basis to take account of new evidence. (This was a straw man argument – much legitimate science was already extant on which to base regulations.)
- Before regulation, consideration should be given to economic and social factors as well as environmental concerns, insuring that the benefits of regulation we We are

left with the question of how neoliberal policies perpetuate inequalities in society, and what adjustments, we should make if any, to how we govern nature. re commensurate with additional costs.

- Rules should take into account regional differences in geography, meteorology, economic base, and resource and use.
- Attainment schedules for regulatory programs should be developed by states and should take into account the nature and degree of the problem. As long as progress toward attainment was made, economic activity in a state or region should not be impeded.
- Procedures for acquiring necessary permits should be as specific and simple as possible.
- Flexibility should be built in the system so that the regulated parties can choose among alternative means of meeting a given objective.
- The major responsibility for implementing clean air quality should be left to the states.

Partisan politics, held Reagan's plan back. Reagan took industry's side, and democrats in Congress tended to applaud greater environmental protection. A political battle was brewing, and the EPA tried to stay out of the middle.

The environmentally-minded feared that cost-benefit analysis would overshadow the health-based standards of the CAA. The law required the EPA to base primary National Ambient Air Quality criteria on an "adequate margin of safety... requisite to protect the public health" (EPA, 1987 2). In setting regulation, CAA specified only that the EPA shall consider public health. EPA must establish the secondary NAAQS "to protect the public welfare from known or anticipated adverse effects" (EPA, 1987 3). Welfare refers to, but is not limited to, "effects on soil, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and climate, effects on economic values, and on personal comfort and well-being" (EPA, 1987: 4). National emissions

standards for air pollution must be set at the level that “provides an ample margin of safety to protect the public health” (EPA, 1987: 5). EPA considers cost and economic feasibility to a limited extent when setting these standards. In establishing the performance standards for new stationary sources of pollution, EPA is required to consider costs. It must choose a standard that reflects the “degree of emission reduction achievable through the application of the best system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction and any non-air quality health and environmental impact and energy requirements) has been adequately demonstrated” (EPA 1987: 6). This means that the EPA, despite industry implication to the contrary, was considering costs. But it was also following the law.

Representative John Dingell (Dem-Michigan), Chairman of the House of Energy and Commerce Committee, called for a fine-tuning of the CAA, particularly in regards to streamlining the process by which state and local government, and by extension industry, met the goals of the CAA.<sup>59</sup> Streamlining, he believed, could make the CAA more effective, workable, reasonable, and more in concert with the need to improve air and the economy (Crow, 1981). Yet, Dingell disagreed with proposals to apply cost-benefit criteria to the CAA, and to require experts to review the EPA’s pollution standards. Dingell thought that cost-benefit analysis should be distinguished from economic analysis, which he believed “can give us a perspective on priorities, stimulate thinking about available options, and uncover implementation problems (Crow, 1981). He argued that “[cost-benefit] analyses can be manipulated to show just about anything EPA or

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<sup>59</sup> Dingell walked a fine line between deregulation and fine-tuning. He supported a bill to ease the regulatory pressure on the automobile industry Michigan (Shabecoff, 1981).

anyone else wanted to prove” (Crow, 1981). Furthermore, he warned: “It is impossible to affix a rational dollar value to intangibles like discomfort, pain, or premature death” (Crow, 1981). He noted that costs and benefits usually accrued at different times, with costs arising immediately and benefits spreading over a long period of time” (Crow, 1981). Dingell dismissed the industry argument that a board of distinguished scientists could insure that only relevant and scientifically valid studies be considered in setting standards (Crow, 1981). He and his cohort made it clear that they were not opposed to industry per se , but rather were opposed to the imbalanced favor with which industry was being treated by the Administration.

Interestingly, some Republican members of the Senate Environment and Public Works Committee also opposed any substantial weakening of the CAA. One member of the Committee, Senator John Chafee (R-RI), acknowledged that the program had success in controlling air pollution; noting “total emissions of regulated substances dropped by 40% during the past decade” yet felt that that some provisions of the CAA were not working. For example, cost overruns were high – “between \$16 million and \$17 million from 1972 to 1978” (Crow, 1981). Cost aside, Chairman of the Senate Environment and Public Works Committee, Senator Robert T. Stafford of Vermont, commented: “Each law can be reduced to a single phrase. For the Internal Revenue Code, it is the collection of taxes. For the Clean Air Act, it is the protection of public health. Removing health from the Clean Air Act would be like removing taxes from the Internal Revenue Code. Yet, that is exactly what some groups want to do...” (Waxman, 1997).

Environmental organizations, like the National Clean Air Coalition and the National Wildlife Federation, urged Congress to reauthorize the CAA, leaving it basically

unchanged. The National Clean Air Coalition opposed sweeping changes, and insisted that national ambient air quality standards set by the CAA continued without being subjected to cost-benefit analysis. The National Clean Air Coalition, however, conceded that the Act needed small modifications to make it less complex and more flexible to administer (Shabecoff, 1981 Pollution Coalition). Believing the CAA necessary to protect human health and prevent significant deterioration of air, the National Wildlife Federation agreed with the Coalition that the CAA deserved reauthorization. At the same time, the Federation suggested ways to improve the CAA by expanding old provisions and incorporating new ones. The organization suggested Congress improve regulations for bringing toxic air pollutants under control; set a schedule for the prompt regulation of fine particulates and hazardous air pollutants; set an expeditious schedule for reducing emissions from uncontrolled existing stationary sources of pollution; and establish a strong program for eliminating acid rain and other interstate and transboundary air pollution, including retrofitting existing power plants for sulfur oxide controls (National Wildlife Federation, 1981).<sup>60</sup>

The pressure for Congress to make a decision regarding the CAA was heavy. Public polls showed strong support for environmental protection, which suggested that any member of Congress who voted to weaken the CAA did so at the risk of public discontent. Congress authorized the National Commission on Air Quality to reevaluate the CAA in light of impending reauthorization hearings. The Commission's report challenged industry's claims that the CAA contributed to inflation, challenged the

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<sup>60</sup> At the time, no federal or state program was in place to control acid rain, even though evidence of the damaging effects of acid rain produced by emissions of nitrogen and sulfur oxide existed. The acid program became the first national emissions trading program.

Wildlife Federations' call for CAA deadlines, and rejected cost-benefit analysis of clean air regulation. The Commission found that the CAA and its prevention of significant deterioration (PSD) provisions in particular, were not a serious detriment to energy development and would permit increases in U.S. energy production. According to the Commission's report, air pollution control cost \$11-17 billion in 1978 and added 0.2% to the annual inflation rate, which it argued was not an impediment to economic growth. The Commission determined, however, that based on the current trends, the cost of air pollution control under the CAA, in its then current form, would rise substantially to as much as \$37 billion/year by 1987 (Crow, 1981).

Projected overall increases in air pollution control costs aside, the National Commission on Air Quality rejected the idea of cost-benefit analysis. The Commission claimed: "It is fruitless to try to compare meaningfully the costs and benefits of air pollution control" because there are too many uncertainties on the calculation of both sides of the equation – especially the benefit side (Crow, 1981). The Commission's report acknowledged that the difficulty of comparing costs and benefits lay in the fact that they were expressed in different terms (costs represented expenditures of money for pollution control, while benefits represented improvements in health).

The National Commission on Air Quality found that the CAA was successful in some ways and cumbersome in others. Particulates dropped 32% and carbon monoxide 36% over the decade, but in urban areas, sulfur dioxide and nitrogen levels had increased. Furthermore, nearly every urban area in the country failed to reach the original 1977 deadline to meet air quality standards. As a result, the EPA extended deadlines until 1982 with extensions possible until 1987 for ozone and carbon monoxide. The Commission



studies showed most states did not adopt major new controls as part of their efforts to meet the 1982 and 1987 deadlines (Crow, 1981).<sup>61</sup> For this reason, the Commission suggested “the deadlines themselves have become an excuse for delay” and recommended the EPA eliminate deadlines, and require all new factories to install the best possible control equipment (Crow, 1981). On this point, Waxman disagreed. Waxman believed deadlines forced the development of “better technology” to control air pollution (Crow, 1981). John R. Quarles, former deputy administrator of the EPA, supported more flexibility for meeting CAA provisions. He argued that the diversity of circumstances that contributed to an area’s nonattainment made the establishment and enforcement of rigid deadlines difficult (Crow, 1981). The National Air Quality Commission proposed the EPA expand its market-based initiative, specifically the offset program, to increase industrial flexibility.<sup>62</sup> Increasingly it seemed there was no viable option other than a market-based approach to emissions control. The CAA had programmatic problems; it could reduce some emissions, but the pressure it put on industry to meet deadlines and pay for clean air technology made it seemingly anti-business. Furthermore, pushback by industry, those who carry out the CAA’s provisions had the power to stifle progress in cleaning the air. Opponents of what would come to be called “cap-and-trade” were beginning to read the tea leaves.

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<sup>61</sup> Instead, states tended to rely on low-polluting automobiles, better compliance with existing pollution rules, and retrofits on existing power plants.

<sup>62</sup> Under the offset program, new industries could relocate in polluted areas if they more than offset existing pollution –usually by buying pollution control equipment for existing plants. Industry was skeptical of the offset program, and declared it did not work because limited offsets existed. By that time only 20 were purchased nationwide. The Commission suggested that EPA revise the offset program to permit states to require new plants to pay fees instead of securing offsets (Crow, 1981).

## 2.6 The Controlled Trading Policy Statement

As the debates continued over cost-benefit analysis and its application to environmental policy, especially the Clean Air Act, both state governments and industry showed increased support for the offset and bubble policies. Then, in 1980, the EPA made it easier for states to incorporate a bubble program into state implementation plans: by approving a generic volatile organic compound rule in New Jersey, the EPA eliminated the need for states to obtain approval of state implementation program revisions for each bubble trade (46 Fed. Reg. 2055, 1981; Tietenberg, 1985). By June 1981, companies were actively pursuing bubble applications (31 involved hydrocarbon emissions, 26 involved particulates, and 17 involved sulfur dioxide) (EPA, 1981b). These averaged \$2 million savings per year, and some 1,000 offset trades had been made within companies (Hamilton, 1981). Despite lingering concerns among many Democrats and in the general public at large, once this new approach to emissions control came to the fore, it quickly became a viable approach. The EPA had already approved five bubbles (EPA, 1981b) and had sponsored a conference on brokering emission reduction credits so that by March 1, 1981, almost all states had incorporated offset provisions in their state implementation plans (SIPs), and 17 states or areas had incorporated general banking provisions in their SIPs.<sup>63</sup> Three full banking systems, Louisville, Kentucky Bank, San Francisco Bay Area Bank, and Puget Sound Bank, were in operation. At least six other areas including, Maryland, Wisconsin, Oregon, Chicago, and the South Coast Air

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<sup>63</sup> Narragansett Electric Co. of Providence Rhode Island for a sulfur dioxide bubble; Coors Packaging Facility in Boulder, Colorado for a volatile organic compound bubble; Armco Inc. in Middletown, Ohio for a particulates bubble; McDonnell Douglas in St. Louis Missouri for a volatile organic compound bubble; and Dupont Chambers Works in Deepwater, New Jersey for a volatile organic compound bubble (EPA, 1981b).

Management District in Southern California had drafted pro forma banking and trading rules (EPA, 1981a).

Michael Levin and his Regulatory Reform Staff continued their work to develop and promote a controlled trading program, a program that would offer generic rules for states and companies.<sup>64</sup> Even before the EPA's official adoption of controlled trading it was de facto apparent that "the EPA already [has] a market system that is cleaner, simpler, cheaper, and more certain for regulated firms than forced clean-ups through increased regulation" (Hamilton, 1981). In the long run, Levine believed, the market system should be "an incentive for innovation because it makes it profitable to look for new ways and cheaper ways to control air pollution" (Hamilton, 1981). From Levine's point of view, controlled trading was in accord with Reagan's deregulation goals to transfer environmental power back to the states and back off on federal regulations.<sup>65</sup>

A controlled policy statement was formally proposed in the summer of 1981. It described bubbles, offsets, netting, and banking of emissions reduction for future use as voluntary approaches to controlling pollution under the Clean Air Act. By simplifying and consolidating the programs, the EPA believed the controlled policy statement "should facilitate significant economic savings while simplifying and reducing the administrative complexity of compliance with the Clean Air Act and the Agency's Controlled Trading initiatives" (EPA, 1981c). In addition, the EPA intended the

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<sup>64</sup> In January 1981, the EPA sponsored a conference on brokering emissions reduction credits (Hamilton, 1981; Shabecoff, 1981).

<sup>65</sup> A one-page position paper declared "We should return to the states the primary responsibility for environmental regulation in order to increase responsiveness to local conditions" (quoted in Holden, 1980). Palmer and Sawmill, 1982: 145) argue that the Reagan Administration's goals for regulatory relief program can be grouped in three categories: "the programs must fulfill its assigned role in the economic "game plan"; it must advance the administration's commitment to reduce federal presence in the economy; and it must demonstrate the administration's desire to redefine the federal-state-local government relationship."

Controlled Policy Statement to reduce administrative complexity by reducing the number of transactions which must be approved by EPA and stimulate innovation in pollution control (EPA, 1981c). The Controlled Policy Statement named emission reduction credits (ERCs) as reductions in emissions beyond those that would otherwise be legally required. As such, ERCs would be the currency that industries could use in bubbles, offsets, and netting. While contradicting past policy by making emissions into a commodity, the acceptance of ERCs was predicated upon the belief that market practices would ultimately achieve the same goals as top-down regulation.

Upon its adoption, the Controlled Policy Statement replaced the bubble policy (44 FR 71779, 1979) and the banking policy (Offset ruling 40 CFR Part 51, Appendix S, Section I.V.c.5, 1979). The Controlled Policy Statement did not allow use of Controlled Trading to avoid meeting new source performance standards (NSPS) or other technology-based requirements specifically applicable to new major stationary sources (EPA, 1981c). As required by E.O. 12291, the regulation was submitted to the OMB for review (EPA, 1981c).<sup>66</sup> The Controlled Policy Statement offered four fundamental rules for emissions reductions to qualify for a reduction credit: reductions must be real – the credit must result from a reduction in actual emission levels; surplus - the emission reduction must be surplus to any reductions required under a State Implementation Plan under the Clean Air

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<sup>66</sup> A decade later Waxman recalled, “President Ronald Reagan, members of Congress, environmental groups, states and localities, even some industries ultimately chose to favor health-based standards,” when by the end of 1981 “any hope for a cost-based” approach faded” (Waxman, 1991). His memory was not quite right. E.O. 12291 was a reminder that cost-benefit analysis was not completely null or void. The federal turn to cost-benefit analysis left the EPA in a tough position. The EPA tried to follow E.O. 12291’s philosophy, which promised to at least assess the legitimacy of what was being done, thereby allowing informed decisions in light of scientific uncertainty. The EPA, however, had difficulty placing values on health effects and determining long-term impacts. Whittington and Grubb (1984) have argued that cost-benefit analysis of environmental regulations had “shortcomings in theory, and in practice, which suggested that cost-benefit analysis was not well suited to complex cases, like environmental problems, in which costs were uncertain, benefits difficult to evaluate, and government decisions interdependent.”

Act; enforceable - the agency issuing the permit and the EPA must be able to enforce the reduction; permanent - the emission reduction must last for the life of the new or modified source; and quantifiable - the emission reduction must be measurable or calculable using generally accepted procedures, and with an official emission baseline in order to qualify as emission reduction credits (51 Fed. Reg. 43, 1986). Furthermore, all trades of credits needed to be approved by the regulating agency (EPA, 1981c). The EPA intended these rules to ensure that controlled trading did not adversely affect air quality.

According to Levin (1982) and Liroff (1986), the Reagan Administration worried that “controlled trading” would undermine the President’s objectives to revise the Clean Air Act towards less regulation because the title of the program implied more federal involvement. In April 1982, an Emissions Trading Policy Statement (ETPS) and technical issues document, appeared in the Federal Register; the statement was formalized in December 1986 bearing all the elements of the Controlled Policy Statement, its predecessor (51 Fed. Reg. 43, 1986).

While the EPA promoted the new rules as a win-win situation, not everyone agreed. Recall that the Sierra Club had questioned the legality of such a move when the EPA first proposed redefining a stationary source. The National Resources Defense Council (NRDC) raised the same point when, in October 1981, EPA Administrator Anne Gorsuch expanded the bubble concept to permit bubbles to be used in areas that had not met the air quality criteria; in other words to include netting. The bubble policy adopted during the Carter Administration was intended for use in areas that already had attained air quality standards, such that a business could average emissions from single point sources within the plant and add new point sources by cutting pollutants somewhere else,

as long as the total pollution did not increase. With Gorsuch's new proposal, the EPA held that new sources in nonattainment areas could be exempted from new-source review, provided the net effect was "no significant" increase in overall plant emission (Chemical Week, 1982). The expanded concept also changed the definition of a new pollution source to be an entire plant, not just a new boiler or another unit at the existing site. The change was supported by industry, including the Chemical Manufacturer Association, the American Petroleum Institute, the American Iron and Steel Institute, and General Motors (Chemical Week, 1982).

Environmental groups protested the change, and the courts agreed with environmentalists. The NRDC filed a suit charging that the shift would thwart efforts to clean the air, estimating that Gorsuch's proposed change would make exempt about 90% of all existing industrial projects that would otherwise be under EPA control (Barash, 1984). The U.S. Court of Appeals for the District of Columbia agreed, and ruled that the expansion of the "bubble" concept made by the EPA was not permissible. The changes went against the intentions of the Clean Air Act as written by Congress because it made it possible for plant owners to get EPA approval to increase emissions in nonattainment areas – areas that included all major urban areas which amounted to a population of about 100 million people (Chemical and Engineering News, 1982; Chemical Week, 1982; Greenhouse, 1984). The Court argued that the "EPA changed its definition of source expressly to cut back substantially the coverage on nonattainment area new-source review." The EPA argued however, that the expanded concept would reduce the regulatory burden on industry (Chemical Week, 1982). The Court's ruling put as many as 100 bubble proposals, that the EPA argued could save industry as much as \$1

billion, on hold, and could harm the two dozen bubble plans the EPA had approved (Chemical Week, 1982 ).

Yet, despite EPA's taking a pro-industry stance, some business groups thought the EPA had not gone far enough. Harvey Alter, director of environment and land resources at the U.S. Chamber of Commerce, for example believed that the new policies were just a temporary fix.<sup>67</sup> Alter contended:

I don't know if it will survive as a national policy. Technology got us into this mess and only technology can get us out. If you just let industry install the best available control technology, you'll get cleaner air. But these new schemes won't. It's just a bandaid on the wound..." (Chemical Week, 1982:17-18).

The Reagan Administration, the American Iron and Steel Institute, the American Petroleum Institute, the Chemical Manufacturers Association, and the Rubber Manufacturers Association all filed appeals to the Supreme Court, asking it to reverse the Court of Appeals' decision against the expansion of the trading concept, as did the General Motors Corporation and Chevron U.S.A. Inc., a subsidiary of the Standard Oil Company of California (New York Times, 1983). On June 24, 1984, by a vote of 6 to 0, the Supreme Court overturned the Court of Appeals decision and ruled that the Clean Air Act permitted the Reagan Administration's extension of the bubble policy. According to an opinion filed by Associate Justice John Paul Stevens, the Supreme Court believed that the Court of Appeals had "misconceived the nature of its role" in the sense that the court should have deferred to the EPA interpretations of ambiguous statutes (Greenhouse,

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<sup>67</sup> According to Meidinger (1985) some industries opposed market mechanisms because they were afraid that it would lead to more burdensome regulation and expanded bureaucratic power. They were also concerned that it could mean greater costs to doing business because it could give regulators more knowledge of industrial practices.

1984). The ambiguous statute in question referred to the concept of a “source” and whether or not the EPA interpreted the term properly. On this point, Stevens argued, the Court of Appeals was right to point out the unclear intentions of Congress, however, EPA should interpret the ambiguity, not the Court of Appeals (Greenhouse, 1984). According to David Doniger, an attorney for the National Resources Defense Council, the decision “completely gut[ted]” the Clean Air Act’s program (Greenhouse, 1984). The Supreme Court disagreed. According to Stevens, the EPA’s proposed policy was “fully consistent” with one of the concerns that motivated the enactment of the 1977 amendments to the Clean Air Act, namely “the allowance of reasonable economic growth” (Barbash, Fred. 1984. “Court Backs Industry-Growth Policy” Washington Post. June 26, 1984).

## **2.7 Ruckelshaus and Risk Assessment**

The Reagan Administration’s support of cost-benefit analysis was only one cause of widespread criticism of Reagan’s environmental agenda. Following the enactment of E.O. 12291, Reagan nominated, and the Senate unanimously confirmed, Anne Gorsuch-Burford as Administrator of the EPA (Reagan, 1981). Burford was widely viewed as a pawn in Reagan’s deregulation plans. Under the Reagan-Burford plan, the EPA’s budget was cut by 22% (Sullivan, 2004). This suggests why the EPA under pressure, took pro-industry positions. In addition to budget cuts, the number of cases the EPA filed against polluters declined, the organization made an effort to relax portions of the CAA, and federal approval for spraying restricted pesticides accelerated (Sullivan, 2004). Republicans, Democrats, and environmentalists accused Burford virtually dismantling the agency, increasing attention to Reagan’s environmental program. Burford recalled, “When



congressional criticism about the EPA began to touch the presidency, Mr. Reagan solved his problem by jettisoning me and my people, people whose only ‘crime’ was loyal service following orders” (Burford and Greenya, 1986).<sup>68</sup> Burford resigned in 1983, forcing the Reagan Administration to find a replacement; it chose William Ruckelshaus.<sup>69</sup>

During the discussions about the reauthorization of the Clean Air Act, William Ruckelshaus maintained that overall the CAA improved air quality substantially and Congress should maintain the CAA’s basic structure.<sup>70</sup> At the same time, Ruckelshaus believed that Congress should act to “strike a proper balance” between the goals of clean air and other national goals such as economic growth and energy development (Shabecoff, 1993). It is not unlikely that Ruckelshaus’ admitting to the need for balance helped him win his way back into the EPA, after nearly a decade, to “restore public confidence in the agency” (Ruckelshaus, 1984: 157). The federal turn to cost-benefit analysis, the Clean Air Act reauthorization debates, and the Burford-Gorsuch debacle left the EPA in a tough position. Ruckelshaus was especially concerned with the abuse of science to meet the goals of the deregulation agenda. According to Ellen Silbergelb (1991), a scientist blacklisted by the Reagan-Burford EPA, an effort was made to get rid of technical and scientific staff and advisors that were not sympathetic to Reagan’s deregulatory goals. A “blacklist” was used to keep potentially adversarial academics and scientists off the EPA’s Science Advisory Board so they could not criticize the Reagan-

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<sup>68</sup> Burford claimed, “I was not the first to receive [Reagan’s] special brand of benevolent neglect, a form of conveniently looking the other way, while his staff continues to do some very dirty work” (Burford and Greenya, 1986). In 1985, Burford declared during an NBC Today show, “The uncomfortable conclusion that I arrived at was that he [President Reagan] really does not have a commitment to the environment. We don’t have an environmental policy in this Administration” (Sullivan, 2004).

<sup>69</sup> Burford resigned in the wake of a scandal over management of \$1.6 billion program to clean up hazardous waste dumps (Sullivan, 2004).

<sup>70</sup> Former EPA administrators Douglas M. Costle and Russell Train agreed with Ruckelshaus (Shabecoff, 1981).

Burford Scientific basis for policy making, which Silbergelb (1991) recalled was built on the notion of uncertainty of risk (Oreskes and Conway, 2011; Rosner and Markowitz, 2002).<sup>71</sup> Risk is essential to environmental policy making, the goal of which is to reduce risk by assessing and managing it. For Ruckelshaus, reinventing how the EPA dealt with risk was the answer to regaining trust, and meshing the EPA goals of protecting the health and welfare of people and the environment with the economic health of the nation.

Risk estimates were not new to the EPA, but the separation of risk assessment from risk management, which Ruckelshaus, inspired by a National Academy of Sciences' (NAS) 1983 report "Risk Assessment in the Federal Government: Managing the Process," also known as the "Red Book." This was a relatively new approach in the '80s.<sup>72</sup> The NAS report argued that federal agencies often confused the assessment of risk with risk management (NRC, 1983 Report). Ruckelshaus, influenced by the NAS, determined that risk management, the job of the EPA to decide what to do about the problems, should be separated for the process of determining the costs and benefits of various approaches to environmental ills. Ruckelshaus intended risk assessment at the EPA be based on "scientific evidence and scientific consensus *only*" (Ruckelshaus, 1983: 4). This, he argued, was the way to be objective (Ruckelshaus, 1983).

Ruckelshaus's focus on risk was due in part to lessons he had learned during his first term as EPA Administrator. He explained in a speech to the NAS that during his first

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<sup>71</sup> For example, Rita Lavelle, assistant administrator for solid waste adopted approaches to exposure assessment to avoid taking action at a Missouri dioxin site (Silbergelb, 1991).

<sup>72</sup> The EPA's first risk assessment document was published in Dec. 1975 "Quantitative Risk Assessment for Community Exposure to Vinyl Chloride (Kuzmack and McGaughy, 1975). The next appeared in 1976 "Interim Procedures and Guidelines for Health Risk and Economic Impact Assessments of Suspected Carcinogens (Tran, 1976). Tran wrote in the preamble of this report "The EPA's goal is rigorous assessments of risk and economic impact will be undertaken as part of the regulatory process." The first application of qualitative procedures developed by the EPA and first EPA document describing quantitative procedures used in assessment was in 1980 EPA water quality criteria documents (U.S. EPA, 1980).

term, the level of federal government involvement in environmental regulation was indeterminate at best. He thought that given enough monetary investment in abatement, the EPA could “virtually eliminate the risks we call pollution” (Ruckelshaus, 1983: 4). Upon discovering the actual volume of capital needed to achieve these ends, he envisioned a system that could be structured to force a balance between public desire to eliminate pollution and the costs of control. Under these circumstances, Ruckelshaus had believed the issue could be resolved by 1976 (Ruckelshaus, 1983). Ruckelshaus acknowledged that he was wrong; funding was scarce and risks associated with pollution remained. Science and technology were wrought with uncertainty. Yet, cost-benefit analysis was not the answer.

Ruckelshaus hoped to get away from the idea that quantitative analysis would lead to the “right” decision and sought to demonstrate that the reduction of risks was the EPA’s main concern and that they were not driven by cost-benefit considerations (Ruckelshaus, 1984: 161). But he also thought command-and-control was not the definitive answer; Ruckelshaus believed that it was impossible to explain proper managing risks in a statute book, as was the practice under command-and-control. Furthermore, he thought it impossible to eliminate all exposure to toxics, to the extent that technology allowed (Ruckelshaus, 1984). Ruckelshaus contended it was unrealistic to eliminate all substances for which certainties existed. He called for a statutory formula that allowed the EPA “to assess the risk and weigh that, not only against the benefits of the continued use of the substance under examination, but against the risks associated with substitute substances and the risks associate with the transfer of the substance from

one environmental medium to another via pollution control practices” (Ruckelshaus, 1983: 4).

All of this suggests that Ruckelshaus acknowledged that no single approach to environmental management was perfect. By separating risk assessment from risk management, what he hoped do was to address what he called the “shotgun wedding” between science and the law, and improve communication between policymakers and the public regarding the assumptions, uncertainties, and nature of decision making concerning risk. In his speech to the NAS, Ruckelshaus declared “science and the law were uneasy partners at the EPA” (Ruckelshaus, 1983: 3). Science thrived on uncertainty, but the public wanted EPA laws to reflect certitude. He explained, “The public thinks we know what all the bad pollutants are, *precisely* what adverse health or environmental effects they cause, how to measure them *exactly*, and control them *absolutely*” (Ruckelshaus, 1983: 3). On the one hand, Ruckelshaus believed that uncertainty, which is inherent in science-based decision-making, was a point of contention with political implications. Policymakers were charged with deciding the amount of reasonable uncertainty, which influenced their decisions on whether or not to act (Ruckelshaus, 1984). Ruckelshaus was keenly aware of another risk: that assessment data could serve as a sort of “captured spy, if tortured enough it would tell you anything you wanted to know” (Ruckelshaus, 1984: 158). When action has economic or social consequences, the person who must make a decision regarding what to do “may be surely tempted to ask for “reinterpretation” of the data” (Ruckelshaus, 1984: 157). On the other hand, Ruckelshaus believed the “objective” approach to risk assessment could reinstate public involvement

in decision-making, something that E.O. 12291 neglected. Ruckelshaus explained in his speech before the NAS:

I think we must do better in showing how different values lead rationally to different policy outcomes. And we can only do that if we are able to build up a reservoir of trust, if people believe that we presented what facts we have fairly, that we have exposed our values to their view and that we have respected their values, whether or not such values can be incorporated finally in our decisions. We have, I hope begun to build that sort of trust at the EPA. (Ruckelshaus, 1984:162)

Ruckelshaus acknowledged that while objective decision-making was a goal, complete objectivity was not possible. Risk assessment had the potential to improve ways to describe risk to the average citizen by exposing assumptions, admitting uncertainties, and revealing the nature of decision making, and thereby promote democracy (Ruckelshaus, 1983).

## **2.8 Acid Rain**

By the late 1970s, acid rain was a known problem, and one without distinctly political lines drawn across it. However, the proper way to address the problem presented policymakers with a political dilemma.<sup>73</sup> Acid rain is the transformation of sulfur dioxide emissions into sulfates in the atmosphere. Sulfates are acidic compounds and can, with the help of prevailing winds, travel far away from their point of origin and dissolve into rain or snow. The toxic precipitation damages aquatic ecosystems, corrodes both man-made and natural surfaces, and creates reduced visibility. Scientists found that emissions from sulfur-bearing coal, burned in the Midwest, were largely to blame for acid rain in

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<sup>73</sup> In 1977, the National Atmospheric Deposition Program (NADP) began to monitor precipitation chemistry. In August 1979, President Carter proposed a ten year research program to investigate acid precipitation (Galloway et al., 1978). The National Acidic Precipitation Assessment Program (NAPAP) was established in 1980 to investigate the causes and effects of acid deposition in the U.S.

eastern Canada and New England (Kronholm, 1984). There were two ways to address sulfur oxides and nitrogen oxides emissions, the precursors of acid rain: reduce these emissions by using lower sulfur content fuel, or by installing control technology known as scrubbers to remove the pollutants. The Clean Air Act established national ambient air quality standards for sulfur dioxide and nitrogen oxides, and accounted for control of the precursors from power plants built after 1970. Old power plants built before 1970 were the main producers of acid rain, but they were exempt from the 1970 Clean Air Act and its 1977 amendments. New power plants could use low-sulfur coal or install scrubbers to meet air quality requirements.<sup>74</sup> The “clean coal” technology program attempted to address the issue through the development of technology (i.e. scrubbers) to reduce the sulfur dioxide emitted from the burning of high-sulfur coals (Ackerman and Hassler, 1981).

Increased regulatory standards on the precursors of acid rain stood to impact the electric utility industry, in the sense that the absence of required emission limits on existing plants allowed for extended use of old and precursor emitting plants. In addition, if power plants decided to meet air quality standards by building taller smokestacks, they could increase the transport of sulfates and sulfur acid over a geographic region (Ackerman and Hassler, 1981). In these ways, the acid rain control put the interests of one region, the Midwest, as a source of much of the problem against the interests of New England and Canada, the region that bore the brunt of the problem.

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<sup>74</sup> For an in depth study of the political context of the 1970 Clean Air Act and high sulfur coal see Ackerman and Hassler, 1981.

Given the implication of acid rain regulations, a program to address the issues was widely contested, especially during the early '80s discussions about the reauthorization of the Clean Air Act. Representatives from the mining and coal states, who looked to protect their states' economic interests, blocked proposed legislation in the Senate and the House. For example, in 1982 the Senate Environment Committee had approved, as part of the reauthorization of the Clean Air Act, an acid rain control program that would reduce eight million tons of sulfur dioxide emissions within 12 years (Kronholm, 1984). Two years later, the Senate Committee voted 14-2 for a program that would require the 31 eastern states to reduce their emissions of sulfur dioxide by 10 million tons a year, over the next 10 years (Kronholm, 1984). The Senate did not vote on the bill. Having spent three years developing acid rain legislation, Senator George Mitchell (D-Maine) and Senator Gordon Humphrey (R- NH), sponsored a program; but representatives of the Midwest, namely Senator Steve Symms (R-Idaho) and Senator Jennings Randolph (D-WV), opposed it (Kronholm, 1984).<sup>75</sup> Similarly, John Dingell (D-MI) House of Energy and Commerce Committee Chairman, blocked acid rain legislation to protect the auto industry in Michigan, with the assumption that increased regulation on the utility industry would encourage increased regulation on other industries (Joskow and Schmalensee, 1998). Candidates seeking support for presidential nomination to run against Reagan used their positions for or against acid rain legislation to gain support (Shabecoff, 1984).

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<sup>75</sup> Randolph had sponsored a bill in 1982 called the Acid Deposition Study and Sulfur Emission Limitation Act of 1982 to direct the EPA to within five years report on the acid deposition. The bill prohibited the EPA from increasing the annual allowable emissions of sulfur dioxide from any existing major source within the five years of reporting. Yet, it exempted cases in which the conversion from burning petroleum products or natural gas to the use of coal, or coal mixed with any other fuel as the primary source (S. 2959--97th Congress: Acid Deposition Study and Sulfur Emission Limitation Act of 1982).

In the 1988 presidential election, acid rain became a political talking point. Environmental Defense Fund president Fred Krupp, by way of White House counsel Boyden Gray, advised then Vice President George H.W. Bush to make good on his promise to be an “environmental president” by finding a solution to acid rain (Conniff, 2009).<sup>76</sup> Bush turned to market mechanisms (Conniff, 2009). By this time, the bubble, offset, netting, and banking programs had saved more than \$4 billion in control costs without overt adverse effects on air quality (Hahn and Hessler, 1987). Reports on the use of economic incentives in policy drew attention to the application of market mechanisms to address acid rain.<sup>77</sup>

Project 88 was particularly influential. The project, a “nonpartisan effort” under the direction of Harvard professor, Robert Stavins, and chaired by Senators Timothy Wirth and John Heinz, emphasized “the practical employment of economic forces to achieve heightened protection of the environment at lower cost to society” (Stavins, 1988).<sup>78</sup> The study recommended that the EPA initiate an “Acid Rain Reduction Credit program.” Stavins and his collaborators intended the program to work with other emission control efforts. According to the proposal, the program would allow industries

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<sup>76</sup> In the 1980s, Gray was the Counsel to the Presidential Task Force on Regulatory Relief chaired by, then Vice President George Bush. In 1986, Krupp published an article in the Wall Street Journal about the Environmental Defense Fund’s support of the application of emissions trading to address acid rain (Krupp, Frederic D. 1986, “New Environmentalism Factors in Economic Need,” Wall Street Journal).

<sup>77</sup> Academics Bruce Ackerman and Richard Stewart claimed in a report that market mechanisms were more cost effective than technology-based standards and increased industry’s ability to meet Clean Air Act goals (Ackerman and Stewart, 1985).

<sup>78</sup> According to the introduction to the report, Stavins and his collaborators were not “proposing a free market in the environment-- far from it. This report is not about putting a price on our environment, assigning dollar values to environmental amenities or auctioning public lands to the highest bidder. What we are proposing is that once tough environmental goals are set, we should design mechanisms for achieving those goals, which take advantage of the forces of the market place in our economy. In order to concentrate on that design task, Project 88 steps away from ongoing debates over specific environmental goals, to focus instead on finding better mechanisms for achieving whatever standards are set” (Stavins, 1988: 9).



to claim excess reductions of emissions as transferable acid rain reduction credits (Stavins, 1988). It would result in higher acid rain reduction goals to meet legislatively mandated total emission reductions at a lower cost to both industry and the government. According to the proposal, the Acid Rain Program would save \$330 million dollars in costs for achieving a ten-million-ton reduction of sulfur oxides (Stavins, 1988, 37). Furthermore, the Acid Rain Program would be able to give individual sources the freedom to decide methods of control, and also provide, via auctioned permits, a cost-sharing arrangement to offset the cost of technology to reduce sulfur dioxide emissions. These advantages would help ensure the equitable protection for communities which were economically dependent upon the high-sulfur coal industry. At the same time, the program proposal acknowledged that trades on one side of the country would not necessarily benefit the other side of the country (Stavins, 1988).

Proposed by President George H.W. Bush on June 12, 1989, the acid rain trading program restricted trading to intrastate transfers. In the case of acid rain, much of the problem in the United States stemmed from coal plants in the Mid-west.<sup>79</sup> During hearings held before the Subcommittee on Environmental Protection of the Senate Committee on Environment and Public Works, in October 1989, regarding the structure of the proposed trading market, policymakers presented concerns about the distributional impact of trades. For example, Senator Joseph Lieberman (D-CT) voiced a concern that industries in the Midwest could buy permits to continue to pollute, thereby making acid rain in the Northeast worse. David Hawkins of the National Resources Defense Council voiced a similar concern. Speaking on behalf of the National Clean Air Coalition,

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<sup>79</sup> 1993. For an overview of the legislative history of the Acid Rain Program see Senate Committee, 1990.

Hawkins explained, “We think new sources of pollution in the western United States might be tempted if they were permitted to do so to purchase allowances from the eastern United States and build dirtier plants in the West” (Senate Hearings No. 101-331, p. 5 at 12 Oct. 3, 1989). In short, Hawkins worried that with a national trading program, reductions in one place could cause regional damage. For both local and regional pollutants, the geographic, topographic, and meteorological characteristics of location, as well as technological controls in place, impact the level and type of environmental consequences. For example, the higher the smokestacks from which pollutants are emitted, the greater the impact on ambient air quality levels farther from the source. Furthermore, the chemical mixing of emissions in one region may be different from that which occurs elsewhere.

The Senate and the House did not agree on how to address these concerns. In April 1990, the Senate proposed a bill for a single national market, but with geographic restrictions on trading. In May 1990 the House Committee on Energy and Commerce proposed (and the House passed) a bill that would prohibit trading between two EPA designated geographic regions, except in the case of new sources and intra-firm trades among units already in operation (Parker et al., 1991; H.R. 3030--101st Congress: Clean Air Act Amendments of 1990).

Referred to by President George H.W. Bush as the “most significant air pollution legislation in the nation’s history,” Title IV of the 1990 Amendments authorized a national cap-and-trade emissions trading program for sulfur dioxide emissions – the precursors of acid rain – and authorized states and regions to develop Economic Incentive Programs, including emissions trading as a strategy for combating urban smog (Clean Air

Act of 1990).<sup>80</sup> Based on a cap-and-trade framework, Title IV set a decreasing cap on the total sulfur dioxide emissions for each year in order to reduce emissions to 50% of 1980 levels. The new cap-and-trade program was different from the separate market-based programs under the Emissions Trading Policy Statement, in that tradable units would not be derived from source-specific limits, but from a total cap on emissions from sources defined within the policy. The total quantity of emissions allowed within a set time frame is distributed among sources subject to the cap in the form of “permits,” or “allowances.” Permits allow the polluting industries to emit a certain amount of specified pollutant until the end of the pre-determined time frame. If at the end of the time period a polluting industry emits more than the amount covered by its allowances, the industry must purchase permits from firms with excess permits. In this way, a trade is possible between firms that do not reach pollution cap limits and those firms that pollute more than allowed (EPA, 2003).

When President Bush signed the bill to create an acid rain program in November 1990, the bill followed the Senate model (58 Fed. Reg. 3590, 1993). The program did not restrict trades based on geography. This was favored because of the potential for the

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<sup>80</sup> The 1990 Amendments also authorized programs for Acid Deposition Control, to control 189 toxic pollutants, including those previously regulated by the National Emission Standards for Hazardous Air Pollutants, established permit program requirements, expanded and modified provisions concerning the attainment of National Ambient Air Quality Standards, expanded and modified enforcement authority, and established a program to phase out the use of chemicals that deplete the ozone layer. The Acid Rain Program was implemented in two stages. The goal of the phase I, January 1, 1995 to December 31, 1999, was to achieve a 3.5 million ton reduction in sulfur dioxide emissions. The program covered 261 sources at 110 electric utilities. Phase II of the program began January 1, 2000. During this phase, all fossil-fueled electric generating plants, including new sources were subjected to an annual nationwide cap on sulfur dioxide emissions. Once permits were allocated, the sulfur dioxide trading program authorizes the purchase and sale among both required sources of pollution and any other entity that chose to participate in the market. The trading market is national, without geographic restrictions on trading. Brokers maintain price information and match buyers and sellers. The program allows those participating in the market to bank their permits, also referred to as allowances, for future use.

program to reduce acid rain overall: “it was understood that the greater the overall size of the reduction [in emissions] the more indifferent society could be to the spatial impacts of trades...” (Kete, 1993: 83).<sup>81</sup> The bill passed in the House with a vote of 401-25 and in the Senate with a vote of 89-11 (S. 1630--101st Congress: Clean Air Act Amendments of 1990). Both Democrats and Republicans supported it.

## **2.9 Beyond Acid Rain**

The Acid Rain Program was the first national program to incorporate tradable permits and utilize a cap-and-trade structure. It was recognized as a successful program, having achieved reductions in sulfur dioxide, and at a lower cost than might otherwise have occurred (Stavins, 1998; Ellerman et al, 2003; Tietenberg, 2006). According to Ellerman et al (2003), the Acid Rain Program saved over \$20 billion and resulted in emissions reduction 3.4 million tons more than expected in the year after its implementation (Ellerman et al. 2003). This became the backdrop for the turn to emissions trading in California. From the history of emissions trading at the federal level it becomes clear there was not a black and white “shift,” as Mazamanian refers to it, from command-and-control to market mechanisms to address the issue of air pollution. Instead, programs that would serve as the foundation of an Emissions Trading Policy Statement were grafted onto the command-and-control structure of the Clean Air Act in an attempt to address the challenges of balancing economic progress with environmental health and to create political consensus. Command-and-control did not go away. It

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<sup>81</sup> In 1998, New York State voiced concerns about the impact of non-restricted trading under the Acid Rain Program because major polluters in the South and Midwest could buy the right to pollute thereby increasing the acid rain problem in New York. In response to the state’s concerns, the Long Island Lighting Company (Lilco) agreed to stop selling pollution credits to polluters in those regions (Hernandez, Raymond. 1998. “Lilco is to Stop Selling Credits to Upwind Polluters,” New York Times. April 30, 1998).

remained the foundation of clean air policy. On paper, market mechanisms worked with command-and-control. Even in the case of the Acid Rain Program, industries were still subject to national ambient air quality standards described in the Clean Air Act.

The rise in the use of emissions trading, however, had the effect of creating a situation in which policymakers needed to consider the distributional trade-offs (in other words the differential risks to different populations) of air quality management strategies. Economist John Dales noted that a private rights policy allowed government to monetarily differentiate the level of pollution in a region by costs and in this way supported keeping urban areas dirty in order to maximize the ability to choose to live away from polluted areas. Other distributional issues arose with emissions trading. In the case of the Acid Rain Program, those with stakes in the North East worried that industries in the Midwest could buy the right to make air in the East worse. Environmentalists worried that industries that could afford it would choose to buy the ability to pollute in regions like the West, increasing the level of dirty air. At the same time, natural factors like meteorology, geography, and chemical interactions made it difficult for policymakers to fully assess the risks of air pollution in regions directly and indirectly involved in emissions trades. In the case of the Acid Rain Program, policymakers decided that the overall benefits of unrestricted trades outweighed the potential costs.

The Acid Rain Program was a political success and inspired the development of other programs including the Regional Clean Air Incentive Market in California. The history of the development of the Regional Clean Air Incentive Market in California offers an opportunity to better understand the challenges of balancing economic and health concerns in environmental policy. In addition, it brings the issues of air pollution

distribution into better focus and raises questions about who, in terms of the public, pays for the benefits of the greater good. It is through the lenses of the California program that the disparate regional effects of emissions trading become clear.

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## **Chapter 3: The Path to Emissions Trading in the South Coast Air Basin**

### **3.1 Introduction**

For more than 40 years, smog agencies in the South Coast Air Basin worked to develop command-and-control strategies to clean the air of the dirtiest airshed in the nation. These strategies successfully improved the quality of the air, reducing toxic emissions significantly. Yet, rapid industrial, automobile, and population growth following World War II and lasting well into the '80s threatened to undermine these successes. The challenge of growth was but one contributing factor to the development of the Regional Clean Air Incentives Market (RECLAIM). From the establishment of the first control agency in the nation to deal with the air pollution in the growing Los Angeles metropolis in 1947, to the creation of the South Coast Air Quality Management District<sup>82</sup> in the mid-'70s, tension among polluters, the public, and air pollution control agencies in the Basin challenged how and why to clean the air. These tensions came to a head with the passage of the 1970 Federal Clean Air Act. Faced with a federal mandate to meet ambient air quality standards and deadlines, the governing body of the most smog afflicted region in the nation was pushed to make promises it could not keep, exacerbating suspicions that Los Angeles Air Pollution Control District (APCD) bent to the will of Basin industries. This accusation against the L.A. APCD dogged its successors, including the South Coast Air Quality Management District, as the Basin failed to meet both air quality standards and deadlines. Recognizing a need to clean the air and protect the regional economy, the District underwent organizational and

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<sup>82</sup> The South Coast Air Quality Management District is also referred to as the District throughout this manuscript.

regulatory reform. Under the guidance of James Lents, its Executive Officer of the District from 1986-1997, the District proposed the 1989 air quality management plan (AQMP), which began a new era of commitment to clean the air of the South Coast Air Basin. The 1988 (AQMP) required sweeping changes across all sectors of the region. Industry outrage over the provisions of the 1988 AQMP inspired Lents to seek an alternative scheme for large stationary source polluters that would increase compliance flexibility, and clean the air as effectively as command-and-control, thereby meeting both the requirements of the Clean Air Act and the expectations of the public. Emissions trading was the chosen route. The District's Regional Clean Air Incentive Market was believed to be a win-win solution for all.

### **3.2 Los Angeles Smog**

Los Angeles' tendency to harbor smoke has been known for centuries. Juan Rodriquez Cabrillo, sailing into what is present day San Pedro Bay on the Los Angeles coast in 1542, was so taken aback by a dark haze created by native Indian fires that hovered about the mountains that he called the area the "Bahia de los Fumos," the Bay of Smokes (Caughey and Caughey, 1977: 43-45).<sup>83</sup> Cabrillo had observed a phenomenon that would burden the region for centuries to come. The South Coast Air Basin, as the region would later be known, and of which San Pedro Bay is a part, covers an area of 6,745 square miles nestled between the Pacific Ocean on the west and the San Gabriel, San Bernardino, San Jacinto, and Santa Ana Mountains to the north and east. This region has a bowl-like morphology and is dominated by inversion and marine layer weather.

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<sup>83</sup> Juan Rodriquez Cabrillo was a Portuguese explorer in the service of Spain.



Warm air caps the cooler marine layer, inverting the usual temperature gradient from warm at the ground to cool above, preventing convection and dispersal of pollutants. As westerly winds move beyond the coasts, and inland over the plains and valleys, pollution is trapped against the mountains in the eastern half of the Basin in places like Pomona, Riverside and San Bernardino. The Basin has the most polluted air in the United States. Even today its residents are exposed to unhealthy levels of air pollutants from factories, cars, and other sources on a daily basis. Toxic pollutants include ozone, volatile organic compounds, nitrogen oxides and sulfur dioxide; these threaten the health and quality of life of Basin residents by causing asthma, headaches, cancer and other chronic diseases (Ospital, 2006).

As noted earlier, contemporary California's air pollution policy took shape in the 1940s shortly after its first major smog episode in September of 1943. The event, which the Los Angeles Times compared to a "gas attack" by a foreign enemy, spawned complaints of reduced visibility, sore throats, headaches, runny noses and smarting eyes by tormented Angelenos (Carle, 2006). "Everywhere the smog went that day, it left behind a group of irate citizens, each of whom demanded relief. Public complaints reverberated in the press. There was an outraged demand for action. Citizens committees were appointed. Elected officials petitioned" (quoted in Krier and Ursin, 1977: 51).

Fletcher E. Brown, then mayor of L.A., promised that he would eliminate his city's problem in four years; in 1945, the City of Los Angeles began its air pollution control program when it established the Bureau of Smoke Control in its health department (SCAQMD, 1997). At the time, the cause of the brown haze that often lingered in the L.A. sky was poorly understood. In the early years, smog abatement

focused on reducing the physical effects that it had on the human body by restricting recognizable contributors to the urban air nuisance. Across industrialized world, scientists connected smoke from various sources, including industrial plants, backyard incinerators, and fog with dirty urban air. The Ringelmann System, a measure of the opacity of smoke from industrial plants and other sources was a standard means of determining the level of control. Scientists believed that reducing or eliminating smoke would eliminate smog and the health concerns it produced. Restrictions on smoke helped in some cases, but not in Los Angeles. For example, when the L.A. 1943 smog attack was attributed to Southern California Gas Company's manufacture of butadiene and the plant shut down, the smog problem persisted. L.A. smog was different.

From 1943 into the 1950s, county officials, scientists, industry, and community organizations made a concerted effort to understand the origins, chemistry and health effects of the region's air woes. The *Los Angeles Times* was among the first to investigate the movement to clean the air. The paper, which had frequent editorials demanding a solution to the smog problem, commissioned Raymond R. Tucker to identify the major sources of air pollution and recommend a course of action. Tucker, a former smoke regulation commissioner of St. Louis, Missouri, made over twenty recommendations for controlling smog in the Southland. He found that rapid growth due to industrial development, which had increased some 85% between 1941 and 1946, and a population explosion that brought an additional million people to the region in these five years, in addition to L.A.'s unique meteorology and topography, contributed to the problem. Tucker suggested that the Bureau of Smoke Control lacked the necessary legislative clout to control smog effectively. A variety of uncontrolled sources including industries, motor

vehicles, and backyard incinerators contributed to the problem, Tucker argued that, “the separate, disjointed efforts of L.A., 45 other cities, and the county were ineffective against the regional spread of smog,” and he recommended “creating a powerful, county-wide air quality agency with broad powers to adopt and enforce air pollution regulation” (SCAQMD, 1997).

Los Angeles was already sprawling after WWII. Manufacturing such as the automobile, aerospace, and electric power industries grew rapidly. The city’s business and civic elite encouraged suburbanization and downtown redevelopment. Auto dependency increased as the urban core expanded outward. Between 1950 and 1970, formerly agricultural areas like Orange, San Bernardino, and Riverside Counties experienced high population growth as more and more high paying industry moved out of the urban core and into the communities on the periphery. As Los Angeles County became an urban industrial zone and sprawled out over the land, so too sprawled the smog.

The Los Angeles County Board of Supervisors took Tucker’s report seriously, and supported the creation of a county-wide district. In June 1947, California Governor Earl Warren signed Assembly Bill 1, the Air Pollution Control Act, authorizing the creation air pollution control district in every county in California. Activated in October of 1947, the Los Angeles County Air Pollution Control District was the first local district in the nation, and Louis C. McCabe its first director (SCAQMD, 1997).

The passage of Assembly 1 was largely uncontested. The bill passed through the state Legislature 73-1 and 29-0 in the state Senate (SCAQMD, 1997). The Bill had the support of the California League of Cities, the County of Supervisors Association, the

L.A. Chamber of Commerce, the County Grand Jury, the California Fruit Growers Exchange, civic groups like the Citizens Smog Advisory Committee, and elected officials (Kennedy, 1954). The oil industry was the lone voice of opposition. In addition to creating county-wide districts, Assembly Bill 1 gave the districts the power to adopt and enforce air pollution regulation through a proposed a permit system to limit smoke based on the Ringelmann scale a month after its activation, the L.A. APCD required all major industries in its jurisdiction to have air pollution permits.

The oil industry worried about the impact of stronger regulation on business (Kennedy, 1954) and commissioned its own research. The research conducted by the Stanford Research Institute (SRI) and supported by the oil industry was one of the first systematic attempts to understand the science of Los Angeles smog<sup>84</sup>. SRI investigated the meteorological contributors of smog and found a natural inversion layer at work. Warm atmospheric air is usually rises, but off the coast of Los Angeles, cool ocean air often migrates inland underneath this warm air. Once blown inland, and inversion layer is created when cold dense air traps hot air close to the ground – the air that people breathe. The mountains then prevent pollutants from dispersing. This natural phenomenon, combined with materials like dust and pollen, and emissions from industries and automobiles, created LA smog. From its findings, SRI could predict when smog would occur 84% of the time (SRI, 1949). When SRI identified the natural contributors to L.A.

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<sup>84</sup> The oil industry actually sought to amend the AB 1's permit requirement, however A.I. Stewart, State Assemblyman of Pasadena and former president of the League of California Cities and Los Angeles County Counsel Harold Kennedy took the story of the industry's opposition to The Los Angeles Times. The paper's response was a article titles "Public Called on to Block Crippling of Anti-Smog Bill--- Powerful Groups Allied to Punch Holes in Measure" (Los Angeles Times May 18, 1947). The article was effective in dissuading the industry from publicly opposing the bill. At a meeting of oil executives, an agreement was reached to support the region's smog efforts. The agricultural community also opposed the bill, however before the Air Pollution Control Act was signed, amendments were made to make agricultural operations exempt (Kennedy, 1954).

smog as relating to the region's topography and meteorology, it revealed the geographical uniqueness of L.A., setting its smog problem apart from other urban areas.

The SRI report represented a turn to more scientifically-grounded smog legislation in California. As the thinking went, in order to better abate smog, regulators needed more information on what, exactly, to control. Following this trend, Arie J. Haagen-Smit, his colleagues at the California Institute of Technology, and SRI began in the early '50s to examine the chemistry of the atmosphere of Los Angeles. This collaborative effort was crucial in determining the mechanisms creating smog in the Southland. Haagen-Smit and the others found that particular chemicals, including hydrocarbons, volatile organic compounds, and carbon monoxide, when released into the atmosphere by automobiles and industry, react in the presence of sunlight to form secondary pollutants, including ozone, nitrogen dioxide, organic compounds, and acidic compounds. The smog was not merely smoke and fog, but rather a new cocktail of chemicals and compounds created by reactions catalyzed by L.A.'s strong sunlight.

Even as more information was gathered about the dynamics of L.A. smog, the calls for the L.A. Control District to do more came from different directions. Since its creation, the L.A. APCD had initiated a research and monitoring program with scientific advisors including scientists Francis Blacet, Arnold Beckman, and Haagen-Smit, instituted rules and regulations based on the permit system, and began a public education program (L.A. APCD, 1949). Outside of California, London's "killer" fog of 1952 raised concerns that a similar tragedy could happen in the States. The fog killed almost 3000

people, and made thousands of others sick.<sup>85</sup> In an effort to avoid such an event in Los Angeles, California Governor Goodwin J. Knight appointed a review committee to propose courses of regulatory action. The Beckman Committee, led by Arnold Beckman, delivered several recommendations. For the short-term the Committee recommended prohibiting hydrocarbon release from oil and gas industries, along with reducing, relocating or expanding air pollution industries in general, and controlling fumes from automobiles. In the long-term the Committee suggested the APCD undergo structural reform, increase industrial cooperation, and reconsider the zoning of industries. The Beckman Committee determined that no medical research was necessary because getting rid of smog would get rid of the health issues it produced (Beckman et al., 1953).

By the end of the fifties, scientists had gained a better understanding of the causes of L.A. smog, knowledge that proved invaluable to other urban centers. Yet, just a few months after Smith Griswold, the new L.A. Air Pollution Control District's control officer took his post in March of 1955, the region was plagued by a series of smog filled days, which were later determined to contribute to an extra 1200 deaths in L.A. over a period of ten days in August (Goldsmith and Bruslow, 1959). Griswold responded by strengthening the L.A. APCD. Griswold's appointment marked the beginning of the modern system for air pollution control. During his time as control officer, the agency's budget expanded (L.A. APCD, 1959).<sup>86</sup> Research was dedicated to controlling oxides of nitrogen and testing control of hydrocarbon from motor vehicles. A public information program was launched, consisting of a series of newspaper articles. A fifteen-station air

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<sup>85</sup> Epidemiological studies would later show that about 13,000 more deaths took place in the six-month period after the smog than would have occurred under normal circumstances (Davis, 2002: 46).

<sup>86</sup> Between 1957 and 1958, the budget expanded to over \$3, 800,000

monitoring network, the first continuous monitoring program in the nation, was completed in March of 1956.

Under Griswold's direction, the Los Angeles Air Pollution Control District became the leader in smog control, having adopted "more advanced control measures" than anywhere else in the world (Griswold, 1956: 2.).<sup>87</sup> The L.A. APCD's approach to smog was direct "maximum enforcement against business and industrial plants" the producers of smoke (quoted in Uekoetter, 2009: 204). In the opening letter to the 1954-1955 Annual Report of the Air Pollution Control District of Los Angeles (L.A. APCD, 1955), S. Smith Griswold reflected:

To most of us, the concept that air is no longer "free" and limitless is new and startling... Until now, everyone has believed his or her right to pollute is as inherent as his right to breathe it... Only by a mutual consent to control every source of pollution, can we again enjoy the untainted air.

As Griswold worked to expand the scope of L.A.'s control program the state of California began to increase its role in smog abatement. In 1958, the State's Department of Public Health's Advisory Committee on Air Sanitation recommended that the Department of Public Health undertake the task of setting air quality standards, which would serve as guides to for local control programs (Maga and Goldsmith, 1960). Prior to 1960 there were no state-wide air quality standards (Stern, 1982). The closest attempt at addressing specific emissions had been made by Los Angeles County Air Pollution Control District when in 1955 it adopted alert levels for ozone, oxides of nitrogen, sulfur dioxide, and carbon monoxide (Maga and Goldsmith, 1960). By February 1959, the Department of Public Health was to develop and publish standards "to reflect the

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<sup>87</sup> In 1947, the California State Legislature passed the California Air Pollution Control District Act authorizing counties to regulate air pollution, largely in response to the inability of Los Angeles County to control pollution sources from unincorporated areas (Bollen, 1947).

relationship between the intensity and composition of air pollution and the health, illness, including irritation to the senses, and death of human beings, as well as damage to vegetation and interference with visibility" (Maga and Goldsmith 1960: 453).<sup>88</sup> The Department took a systematic approach to developing standards with a process that included gathering and evaluating existing information, review of data and standards by scientists, and public hearings. In 1959, it adopted standards for the substances for which it felt it had the most information: ozone, carbon monoxide, nitrogen dioxide, hydrocarbons, sulfur dioxide, and particulates (Maga and Goldsmith, 1960). While the state distributed smog control between the local and state authorities and divided responsibility for stationary and motor vehicle emissions, scientists reported a strong connection between the motor vehicles and the production of L.A. smog (Maga and Goldsmith, 1960). By the '60s, the number of registered vehicles in California approached 8 million (Maga and Goldsmith, 1960). A Motor Vehicle Control Board was established to assume the primary function of testing and certifying emission control devices on motor vehicles. Traditionally the state had offered research and assistance to government agencies; the new legislation made the state government responsible for moving sources of pollution and local agencies responsible for the control of stationary and industrial polluters. The board's role was to grant approval for any motor vehicle pollution control device that kept the emission of contaminants from motor vehicles within the standards set and met the criteria adopted by the board for approval of devices (Brestel, 1962). The legislation that created the Motor Vehicle Control Board extended the state's role in

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<sup>88</sup> Assembly Bill No. 1386, enacted by the State Legislature in 1959 required the Public of Health create health-based standards (Maga and Goldsmith, 1960).



pollution abatement. Increased understanding of air pollution as a regional problem influenced by meteorological and geographical factors challenged the idea that control should fall in line with political boundaries. Giving the state authority over mobile sources followed this trajectory. Policymakers believed the state was the best entity to establish uniform requirements for polluters in motion (Clarkson and Middleton, 1961; Stevens, 1970).

In 1958, about 80% of the vehicles in California were registered in counties that had experienced photochemical smog. About 40% of these were registered in Los Angeles County (Maga and Hass, 1960). In L.A. motor vehicles and their fuel had contributed more than 80% of the total hydrocarbon emissions, 90% of the carbon monoxide, and over half of the oxides of nitrogen (Chambers, 1960; Maga and Hass, 1960). Without questioning the practical attainability or cost, the State set out to reduce emissions in a way that would achieve an acceptable level of air quality in Los Angeles County (Maga and Hass, 1960; Brestel, 1962).<sup>89</sup>

### **3.3 Towards a Regional Control District**

By the late '50s, California, and the L.A. APCD in particular, was a frontrunner in air pollution control. As L.A. was crowned “the most smog-controlled city” in the world, L.A. APCD was the first control agency to ban backyard incinerators, force refineries to

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<sup>89</sup> This could be done, it was thought, by automobile technology that could reduce the amount of hydrocarbons and carbon monoxide emissions. Although, knowledge of the chemistry of photochemical smog had improved, uncertainties still existed. When, for example the Motor Vehicle Control Board set hydrocarbon and carbon monoxide emission standards for automobile tailpipes, and exhaust control standards appeared on new cars in California, the amount of hydrocarbons and carbon monoxide from automobiles decreased, but nitrogen oxide emissions increased between 1965 and 1968. The reduction of hydrocarbons threw off the balance of smog precursors and products. Nitrogen dioxide, a toxic gas, reduces, visibility, can damage industrial hazards, is toxic to plants, destroys lung cells, enlarges lung blood vessels, causes the accumulation of fluid in the lungs, and can cause death.

invest in emissions control technologies (costing an estimated \$150 million), and require public utilities burn low-emissions fuels (Chernow, 1974). In 1960, it became the first control agency to target automobile emissions, which they had identified as one of the worst factors in L.A. pollution. The federal automobile emissions program followed California's lead, enacting a national program in 1966. These efforts improved the region's air quality even in the face of growth. Despite this, in the '50s and '60s, ground-level ozone reached high concentrations, often greater than 0.6 parts per million (Lloyd et al., 1989).<sup>90</sup> Furthermore, the air in areas on the outskirts of L.A. County became dirtier as ever more cars took to the roads, more factories took up production, and more residents settled into the area.

Scientific research showed that the meteorology, weather, topography, and location of industry affected the distribution of smog across a region (Stanford Research Institute, 1949). In time, it became increasingly clear that a mismatch existed between the structure of political institutions established to control air and the way air moved – weather patterns simply did not respect regulations established by governments. The inability of air pollution to follow political boundaries was a subject of concern for the Joint Subcommittee on Air Pollution. In 1955, the Subcommittee published a report on air pollution control in the San Francisco Bay area arguing, “The problem of the administrator and the legislator is also simplified when scientific aids can be brought to bear in determining the appropriate jurisdiction” (Berdahl, 1955). In other words, the

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<sup>90</sup> By the late 1960s, widespread control of emissions of oxides of sulfur (SO<sub>x</sub>) lowered the region's sulfur dioxide concentrations below the federal standard.

Subcommittee recommended a more scientifically based approach to air pollution regulation.<sup>91</sup> There would be no “one size fits all” bromide for the issue.

In the same year that the Subcommittee published its report, the League of California Cities adopted policy that recommended mandatory legislation creating multi-county or regional air pollution control district with legal authority to control air pollution (Berdahl, 1955). The passage of the Bay Area Pollution Control Law in 1955 formed the multi-county Bay Area Air Pollution Control District (BAAQCD), later renamed the Bay Area Air Quality Management District (BAAQMD). In the Bay Area, both urban and rural counties supported the creation of a regional air control district. San Mateo, Alameda, San Francisco, Contra Costa, Napa, Sonoma, Solano and Santa Clara Counties, where the smog originated, expressed a desire to reduce pollution at the source. In the rural areas of Santa Clara County, farmers sought relief for air pollution because smog from the north drifted downwind damaging crops (BAAQD, 1993; Simmons and Cutting, 1974).

In the Southland, however, political organization did not lend itself to thinking of the region as a whole. The Los Angeles Air Pollution Control District (APCD), the oldest and most seasoned air pollution agency, focused its attention and resources on air quality in the urban core. But regions on the periphery of the L.A. urban core were also growing as high-paying industries, like the defense industry, moved southeast to Orange County. The L.A. APCD maintained that it had no responsibility to clean up pollution outside of its jurisdiction. Such responsibility, it thought, would put financial strain on the County

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<sup>91</sup> California had experience with using science as a basis for environmental regulation. The state was divided into water pollution control regions based on watershed boundaries. A watershed is an area of land where surface water converges to a single point at a low elevation, and flows into a body of water like a river, lake, or the ocean.

of Los Angeles, which already struggled with a sluggish economy and dwindling resources. But resistance to cooperation cut both ways: air pollution control districts in areas downwind of the urban core, inhabited mostly by whites, sought to separate themselves from the ills of the city; this included having separate jurisdiction over air quality control in their areas (Soja et al., 1983).<sup>92</sup> Created in 1950, the Orange County APCD addressed the stress that extensive urbanization and growing population put on air quality. Between 1960 and 1970, the population of Orange County doubled from 703,925 to 1,420,386. The separation of urban from suburban was largely along color and class lines. According to Soja et al. (1983), it was known as “a haven for whites concerned about state-rights, property-rights, and ‘traditional values’ (Soja et al, 1983:12). Redlining and zoning reinforced racial and class barriers. With the expansion of Orange County, which included a rise in housing prices, Riverside and San Bernardino Counties also expanded. Riverside and San Bernardino previously rural areas focused on the few sources of stationary emissions within their borders. Between 1960 and 1980, they saw a nearly 100 percent increase in population (Soja et al, 1983: 12). The Riverside County APCD, activated in 1955, focused on agriculturally related dust emissions. The San Bernardino County APCD, activated in 1956, focused particularly on emissions from Kaiser Steel in Fontana and two cement plants in the region.

Despite these efforts at separation and segregation, beginning in the late 1960s, significant organizational and regulatory reform at the federal and state level, motivated at least in part by the scientific understanding of how air moves, began to force the

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<sup>92</sup> Soja et al. (1983) write about the impact of sprawl on the on the growth of the greater Los Angeles region.

intersection of the county control districts. As a result, both the relationship between the Los Angeles Air Pollution Control District (APCD) and the other control districts in the Southland, and between L.A. APCD's and the federal government began to change.

### **3.4 The Air Quality Act and the Mulford-Carrell Act**

Signed in 1967 by California Governor Ronald Reagan, the Mulford-Carrell Air Resources Act concentrated all state air resource activities into one state agency. Merging the California Motor Vehicle Pollution Control Board and the Bureau of Air Sanitation, it established the California Air Resources Board (CARB), giving the new agency authority over both mobile and stationary sources of air pollution. The Act intended CARB to serve as the “single state agency for administration, research, establishment of standards, and the coordination of air conservation activities carried on within the state” (quoted in Stevens, 1971:676-677). The Mulford-Carrell Act gave CARB the authority to promulgate the standards and plans required by the federal Air Quality Act, to support local control agencies, and hold secondary enforcement powers.<sup>93</sup> In addition, the Mulford-Carrell Act required CARB to divide the state into air basins on the basis of geographical, meteorological, and topographic factors (Cal. Health and Safety Code, 39011; CARB, 1969). The purpose of this was to “establish air quality standards that may vary from basin to basin; adopt emissions standards for air pollutants for each basin as found necessary; inventory all sources of emissions for each basin; and provide a mechanism for the establishment of regional air pollution control districts within the

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<sup>93</sup> California went beyond the federal program by setting ambient standards for areas throughout the state and for contaminants other than those designated by the Department of Health, Education and Welfare (CARB, 1970).

basins.”<sup>94</sup> According to CARB, California was “particularly suited to application of the concept of basins because of its large valleys, plains, and plateaus are in the most instances separated by mountain ranges. By November 1968, the ARB had established eleven basins (CARB, 1972). The Mulford-Carrell Act’s regional approach encouraged, but did not require, counties to form coordinated air pollution control programs by merging the effort of control districts within the same basin.

The passage of the Federal Air Quality Act and California’s Mulford-Carrell Act in 1967 show that federal and state air pollution control agendas were following a similar trajectory. In terms of authority, the Mulford-Carrell Act was a regulatory enforcer of the AQA. Both acts recognized the significance of science-based collaborative regional approaches to cleaning the air, but both acts failed to put in place policies to bestow authority on the regional organizations. Air basins and control regions were geographical areas, and even though they included more than one county, they did not create control agencies with enforcement power.<sup>95</sup> For example, the Mulford-Carrell Act created the South Coast Air Basin Coordinating Council, covering Los Angeles, Riverside, San Bernardino, Orange, and Ventura Counties, as well as parts of Santa Barbara County, but it could not enforce it. The Council was intended to develop a base-wide plan as required by the legislation. The plan the Council developed projected that the Basin would not

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<sup>94</sup> It did require regional and county districts to enforce state-wide regulations. CARB had the authority to ensure state regulations would help achieve federal air quality goals. It required local agencies seek approval for desired regulations and if the local agency fell short, CARB could impose stricter standards (Cal. Health and Safety Code 39052 and 39054).

<sup>95</sup> The air basins of the Mulford-Carrell Act and the control regions created by the federal Air Quality Act were not the same. The AQA jeopardized the strides that California made to clean up the air. California had already created eleven basins and was in the process of establishing air quality standards for six pollutants, when it had to turn its attention to two of its eleven air basins in order to address AQA criteria and control techniques for sulfur dioxide and particulates in each (Jacobs and Kelly, 2009).

attain state standards until 1990 (SCAB Coordinating Council, 1971).<sup>96</sup> Though well intentioned, the Council lacked political clout to address its findings in the form of regulatory action (Leong, 1974). Individual county control agencies still held the regulatory power over stationary source control. In California, legislature reinforced the power of county control agencies over regional agencies by granting power to county districts to implement permit systems; regional districts lacked that authority (Cal Health and Safety Code 24268-80).<sup>97</sup> This was particularly important for the L.A. APCD, which between 1947 and 1968 issued 141 emissions permits ranging in price from \$40 to \$800. During this time the L.A. APCD collected \$3,862, 464 in permit fees, which went towards the operation of the agency (APCD 1970: 11).

Although science supported regional control districts, before the '70s it was not politically advantageous for the counties of the South Coast Air Basin to formally merge their efforts. This remained the case for more than half a decade following the passage of the AQA and the Mulford-Carrell Act. However, the lack of authority for a regionally-based control agency in the South Coast Air Basin was eventually overshadowed by a pressing need to improve how air pollution in the Basin was managed.

Between the late '60s and mid-'70s, evidence suggested that the L.A. APCD was purposefully lenient when it came to enforcing air quality standards. In 1969, Stamp out Smog, a citizen's group in L.A., testified before the L.A. County Board of Supervisors that the L.A. APCD failed to adopt Rule 67, which would limit oxides of nitrogen from

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<sup>96</sup> The plan proposed, among other things, motor vehicle controls as well as 12% reduction in stationary organic emissions. The plan recommended limiting particulate emissions, and limiting organic solvents in L.A., Riverside, San Bernardino, and Ventura Counties. CARB rejected the plan.

<sup>97</sup> For regions outside the federal regions, state established county and regional agencies (as in the case of the Bay Area), possessed the primary responsibility for stationary source control (California Health and Safety Code 39012).

fuel burning equipment (Slade, 1969). The organization argued that the control district delayed adoption of the Rule 67 in order to allow the L.A. Department of Water and Power to expand an industrial plant (Slade, 1969). The following year, the Ecological Committee of the Los Angeles Grand Jury conducted a formal investigation of the L.A. APCD's hearing board and found that the control district had fallen short of its duty to clean the air in other ways, particularly enforcement. The Ecology Committee's Report made a number of recommendations for structural and operational changes to the L.A. APCD Hearing Board including: open meetings, improved public information, unannounced inspections at polluting facilities, use of injunctions and felony charges, and reducing sulfur dioxide emission standards (L.A. APCD, 1970). Testimony from Leonard Levine, an employee at a computer firm in El Segundo, motivated the Ecology Committee's recommendation for sulfur dioxide emission standards. Levine suffered from asthma caused by emissions from the facilities of Allied Chemical and Standard Oil. Levine asked for the L.A. APCD's help in addressing the matter but mired in bureaucracy, the control district never followed through on enforcement. Levine petitioned CARB to investigate the L.A. APCD for "the Los Angeles Air Pollution Control District's priorities, policies, and emission control regulations and enforcement record are inadequate with reference to what can and should be done to meet state and federal quality standards" (Levine, 1972). The Los Angeles County Board of Supervisors sponsored an investigation of its own; it appointed an Environmental Quality Committee to investigate the L.A. APCD. After a series of public hearings with testimonies from CARB, the EPA, the California Medical Association, and the California Department of Health, the Environmental Quality Committee criticized the recommendation that the



L.A. APCD restrict new and modified polluting industries, develop an annual permit and permit renewal system for polluting industries, audit the Hearing Board, increase fines for permit violations, develop a regional control mechanism using land use planning to improve air quality, develop a rapid transit system, enforce stronger vehicle emission standards, and institute mandatory automobile emission inspections (Krier and Ursin, 1977).<sup>98</sup>

Community groups and political officials campaigned for the unification of county control districts as a solution to concerns about the L.A. APCD's efficaciousness.<sup>99</sup> Senator Tom Carrell, who had sponsored the Mulford-Carrell Act and taken part in the creation of CARB, had proposed such a measure in 1969. Carrell received support from Louis Fuller, the L.A. Air Pollution Control Officer at the time. He also found allies in the Los Angeles County League of Women Voters, under the leadership of Gladys Meade, a housewife turned historian, who studied the state of air pollution in L.A. County and organized a conference in Pasadena to explore the relevance of a regional control district. Still, Carrell's proposal remained just that. The same can be said of the recommendations of the Legislative Analyst's Office, which issued a report calling for the reorganization of CARB suggesting all future legislative enactments support basin-wide approaches to air pollution control (Krier and Ursin, 1977).

### **3.5 Reagan and the Economics of Smog Control**

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<sup>98</sup> The Committee offered recommendations, but no one followed through and the Committee was dissolved.

<sup>99</sup> The California Health and Safety Code provides statutory mechanisms allowing the formation of multi-county districts can merge into a "unified district" or two or more counties in the same are basin an form a "regional district" (Trankley, 1974: 900-901 see footnote 34).

In 1972, a bill was introduced in the state legislature, but not passed, that would have created a regional planning agency with the power to formulate a regional plan and to review federal grant applications.<sup>100</sup> In 1973, Bob Moretti, Speaker of the Assembly, introduced AB 2283 to establish a regional district. It passed the State Legislature but was vetoed by Reagan. In 1974, Senator Craig Biddle (R-Riverside) proposed similar legislation. It too passed the State Legislature but was vetoed by Reagan. Reagan's opposition was tied to his political stance on the role of the state government in local affairs and the impact of allegedly costly regulation on the economic health of the region. He believed that "no effort to clean up the air should cause unreasonable economic hardships" (quoted in Jacob and Kelly, 2009:244). As governor, Reagan proposed Congress amend what he believed was an overly stringent and economically burdensome Clean Air Act.

The passage of the Clean Air Act presented seemingly insurmountable air quality goals for the Southland, and thus for California. In 1970, the annual California standard for oxidant (0.10 parts per million) was reached or exceeded in 241 days (Lees, Lester et al., 1972: 12). According to the Clean Air Act of 1970, air in the Southland was required by 1975 (1977 if granted an extension) not to exceed the federal oxidant standard of 0.08 parts per million.<sup>101</sup> Yet the South Coast Air Basin Coordinating Council projected the Basin would not meet standards until 1990. Reagan questioned if smog regulation was an

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<sup>100</sup> The bill did not grant the regional planning agency enforcement power (S.B. 776 1972 Regular Session 67635 and S.B. 776 1972 Regular Session 67620).

<sup>101</sup> The potential inability of the L.A. urban metropolis to comply with the CAA of 1970 was not a surprise. Ruckelshaus even acknowledged the impossibility of meeting standards but felt he had no choice but to implement them (Chernow, 1975).

issue of the “public good versus private rights” (quoted in Jacob and Kelly, 2009: 237). For him, it should at least be about both.

Reagan was opposed to coordination among counties. When in 1970 the California Council on Intergovernmental Relations presented county-based agencies as an alternative means of solving the area-wide smog problem, Reagan supported the proposition (California Council on Intergovernmental Relations, 1970). In a speech in 1972, Reagan announced the formation of “a major task group [which] will have the responsibility of looking at the geographic boundaries of California’s 58 counties to see if constructive changes might prove better government at less cost” (Remarks by Governor Ronald Reagan, County Supervisors Association of California 78<sup>th</sup> Annual Meeting, Palm Springs, Nov. 15, 1972 quoted in Mark and Taber, 1973: 133). Furthermore, Reagan believed that counties should have primary jurisdiction over matters of smog control. In the summer of the same year, Riverside experienced some of the worst air pollution of the era; even worse than L.A. (Lewis, 1972). Riverside Mayor Ben Lewis petitioned Governor Reagan to declare a state of emergency in the South Coast Air Basin. Reagan rejected the request suggesting that he believed that local powers, should have responsibility over themselves.

Reagan’s successor, however, took a different view. Elected in 1975, Governor Jerry Brown, signed AB 250 (also known as the Lewis Air Quality Management Act) to create the South Coast Air Quality Management District (SCAQMD) on July 2, 1976. Assembly Bill 250 had mixed reviews. The League of California Cities, Mayor Tom Bradley of Los Angeles City, and Supervisor of Los Angeles County Ed Edelman supported AB 250, but Los Angeles Supervisor Kenneth Hahn and Senator Nate Holden

opposed the bill, concerned that L.A. County would have to pay a significant portion of the operating budget yet only have limited voting ability on the board. In fact, the same year that AB 250 was up for review, the four counties tried to fend off a legislated merger by voluntarily associating as the Southern California Air Pollution Control District. L.A. County had the most pull; its members had veto power over decisions.<sup>102</sup>

AB 250 displaced the counties' voluntary cooperation.<sup>103</sup> The legislation moved forward in an effort to “successfully implement a comprehensive program for the achievement and maintenance of ambient air quality standards in the South Coast Air Basin” by integrating the responsibilities of local and regional authorities with respect to air pollution control in “the most critical” smog afflicted region in the United States (California Health and Safety Code 40402). Having missed the attainment deadline of 1975 under the Clean Air Act of 1970, there was work to do in the Basin, and for the first time, legislation required the counties in the South Coast Air Basin to work together to clean the air.

### **3.6 SOHIO and the California Environmental Quality Act (CEQA)**

Among the first tasks of the SCAQMD was to address a proposal made by Standard Oil of Ohio (SOHIO) in 1975 to construct an oil terminal at the Port of Long Beach. The permit process for the project was extensive, involving agencies at the local,

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<sup>102</sup> One scholar has noted that “It was doubted that the Los Angeles County Supervisors would be willing to support decisions which decreased emissions from the county at the real or imagined cost of economic growth, when the major beneficiaries of such reduced emissions would be residents downwind of San Bernardino and Riverside” (Trackley, 1978: 901 footnote 34 quoting Simmons and Cutting, 1974).

<sup>103</sup> When the law was signed by Brown, it called for a board of five supervisors: two from L.A. County, one each from Orange, Riverside and San Bernardino Counties, four city council members (two from L.A.), and a public member and resident of Los Angeles County appointed by the Governor.

state and federal level as well as providing for citizen participation.<sup>104</sup> In addition, the project included an application of the federal offset rule. Citizens' concerns with the SOHIO project and the projects market incentives provision marked the first time that such matters were reviewed under authority of the South Coast Air Quality Management District's review. It also represented the first time California considered a project with market incentive elements in order to address the need to balance economic growth and clean air quality in a nonattainment region. It was indeed also the first time that citizens turned to the California Environmental Quality Act to challenge market incentives as a component of cleaning the air. The SOHIO's proposal included the construction of 120 miles of new pipeline, the takeover of 910 miles of existing gas pipeline, and the construction of temporary storage tanks. The goal of the proposed project was to transfer half a million barrels of oil per day from Long Beach, CA to Midland, Texas 1000 miles away (NAS, 1980).<sup>105</sup> At the time, Long Beach was one of the busiest ports in the world, and after the South Coast Air Basin failed to meet the air quality standard 1975 deadline of the Clean Air Act, it was also an area in nonattainment.

The review process for the SOHIO project was fraught with controversy because of the environmental impact the project could have on the California Coast, the structure of the project review process, and the impact of the project on the National energy crisis policy. According to William Ahern, Energy Coordinator of the California Coastal

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<sup>104</sup> 703 total project permits total and 10 federal agencies and 22 from four states (California, Arizona, New Mexico, and Texas); 22 more agencies in 12 counties; and 52 agencies of separate units in 19 cities. There were also six special districts, four railroads, and four companies or individuals involved (NAS, 1980: 88)

<sup>105</sup> In 1973, Congress passed the Trans-Alaskan Oil Pipeline Act, which gave Alyeska, a consortium of oil companies' permission to build an 800 mile pipeline from Alaska to Panama. The Pipeline Act was responses to OPEC countries' increase to the price of oil from \$3.00 to \$12.00 a barrel, which had decreased the demand for oil. to It was first thought that the West Coast refineries could consume all of the 1.2 billion barrels per day of oil that flowed through the pipeline. When it discovered that this was not the case, an alternative was needed to accommodate an oversupply of oil (NAS, 1980).

Commission, the 10-12 tankers the project would bring to the area were not main cause of concern regarding the SOHIO project, the main concern was about *any* more tankers along the California coast in general, noting “there’s a heavy, symbolic, value-laden level to this kind of project” (NAS, 1980:93).<sup>106</sup> The Coastal Commission had unanimously approved the SOHIO project with a vote of 11 to 0 with one abstention. The Commission approved the project because it would replace the outmoded tanker facilities at the Port of Long Beach. In addition, it was the Commission’s policy that if an oil terminal was necessary, it would support its development in an existing industrial area as opposed to an underdeveloped part of the coast. Ahern said that this was nonetheless a land use issue, which raised the question of “dumping one thing after another on the City of Long Beach” (NAS, 1980:93). Yet air quality policies made it difficult to develop facilities in nonattainment industrial areas and easier to go to remote parts of the coast where requirements were less of an issue. Frank E. Mosier had done his postgraduate work with SOHIO and had been with the company for 25 years. At the time of the Forum he was responsible for supply, distribution and transportation, including the sale of Alaskan North Slope crude oil and the acquisition of crude oil for all of SOHIO’s refineries on a worldwide basis. According to Mosier, after two years of considering options from the Panama Canal to northern Canada, SOHIO decided to go with Long Beach in part because it was already a highly industrial area.<sup>107</sup>

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<sup>106</sup> The impact of the project on a region in nonattainment was a major concern in part because the air quality problems associated with emission created from the movement of oil was to well understood by the Environmental Protection Agency or CARB. For example, CARB had indicated the project would produce hydrocarbon emissions equivalent to those from six million cars, however this was incorrect. The key issue was not hydrocarbons, but nitrous oxides and sulfur dioxide (National Academy of Sciences, 1980).

<sup>107</sup> The project was to save SOHIO fifty cents to a dollar on every barrel moved through the proposed pipeline (NAS, 1980: 98).

While SOHIO's proposal was still at the review stage, federal and state regulators passed laws critical to development in nonattainment areas and the use of market mechanism to address air quality. According to some, the national offset policy was an adoption of California's program (Gorman and Solomon, 2002). Others argued that the national and state offset policies were independently developed (Cook, 1988). Either way, the EPA published an Emissions Offset Interpretative ruling in December 1976, to address "the issue of whether and to what extent the national air quality standards established under the Clean Air Act may restrict or prohibit growth of major new or expanded stationary air pollution sources (41 Fed. Reg. 55524-55525). The Ruling provided that "a major new source may locate in an area with air quality worse than the national standard only if stringent conditions can be met." The Clean Air Act Amendments of 1977 required further guidance in terms of nonattainment areas. The 1977 Amendments provided that each state in a nonattainment area prepare a state implementation plan. This required permits for the construction and operation of new or modified major stationary sources in accordance with section 173 and "the state agency to determine that there will be sufficient emissions reductions in the region to offset the emissions from the new source and also to allow for reasonable further progress toward attainment, or that the increased emissions will not exceed an allowance for growth..." Following the direction of the federal clean air legislation, in 1976 the California EPA passed the Offset Interpretive Ruling for California. The ruling required that new stationary sources of emissions in nonattainment areas meet the "lowest achievable emission rate" and offset their emission with a greater than one-to-one trade-off rate

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somewhere else in the nonattainment area (Gordon and Solomon, 2002; Hahn and Hester, 1989; Liroff, 1980). SOHIO proposed two trade-offs to offset the hydrogen emissions that would be caused by the tanker-unloading operations and by the storage tanks: the installation of a sulfur dioxide scrubber at the Southern California Edison Power Plant at Seal Beach and the installation of hydrocarbon vapor control at three large dry cleaning plants in Long Beach.

The environmental impact report for the project indicated that with the trade-offs, the SOHIO project would have negligible impact on air quality (National Academy of Sciences, 1980). Nevertheless, the environmental community voiced concerns about the impact of such a project in a nonattainment region. According to Jan Smutny-Jones, Chairman of the Citizens' Task Force, who openly opposed SOHIO, the SOHIO project directly impacted the air quality in the city of Long Beach by contributing to sulfur dioxide emissions. These would be produced by tanker operations and the trade-off proposals. He asked the basic question, "Who benefits from the trade-offs?" (NAS, 1980: 100). The Citizens' Task Force was also concerned that the proposed location of some of the tanks was inappropriate for seismic and planning reasons. It believed that the SOHIO project conflicted with the city's plans to develop a labor intensive recreational and tourist-oriented economy. Furthermore, the Citizens' Task Force believed the SOHIO Project would guarantee that Long Beach was the West Coast entry point for petroleum, thereby posing additional atmospheric and oceanic impacts. The Task Force did not see the project as a national interest; it called SOHIO the self-induced, private marketing problem of a foreign-owned oil company" (NAS, 1980:101). Local concerns in mind, the Citizens' task force believed the jurisdictional overlap of SOHIO project presented a



major concern. Who was in charge of assuring the air quality of Long Beach? The EPA? The South Coast Air Quality Management District? The Board of Harbor Commissioner of the Port of Long Beach? In 1977, the Citizens' Task Force sued the Board of Harbor Commissioners of the Port of Long Beach to challenge the project's organizational oversight of its compliance with the environmental impact report required by the California Environmental Quality Act (CEQA).<sup>108</sup>

In 1979, SOHIO abandoned its oil pipeline project proposal; the company found negotiating with the various stakeholders at the local, state, and national levels, and the public participation process in particular, burdensome (Liroff, 1980; Trankely, 1978). As one of the first projects under review by the newly formed South Coast Air Quality Management District, the troubles associated with the SOHIO project showed the impact of federal air pollution policy on decision making in the Basin. Under the pressure of federal law mandates, the District found itself battling standard deadlines and the public to pass legislation. Under the guidance of the Clean Air Act, the SOHIO project turned to offsets to address concerns about increasing emissions in a nonattainment area, but found itself challenged by environmentalists unconvinced that offsets could ensure the clean air of the local community. The SOHIO project foreshadowed the challenges the District would later face to pass RECLAIM, a comprehensive market-based program.

### **3.7 Poor Planning: An Air Quality Management Plan in the South Coast Basin**

The same year that SOHIO abandoned its pipeline project in Long Beach, the District published its first air quality management plan. According to the plan, the Basin

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<sup>108</sup> Citizens Task Force on SOHIO et al., v. Board of Harbor Commissioners of the Port of Long Beach, Docket no. L.A. 30922 and 23 Cal.3d 812 (1979) 591 P.2d 1236 153 Cal. Rptr. 584

would meet most national ambient air quality standards by the 1987 deadline. During its review of the Clean Air Act, which was up for reauthorization in 1980, the National Commission on Air Quality found the District's plan inadequate, with overly optimistic emissions reduction estimates. The Commission declared the attainment projections in the District's plan impossible, and argued that the District was in need of improved air quality data gathering and analysis techniques, especially in the form of standardization across its counties (NCAQ, 1981). In response, the Commission declared the Clean Air Act's deadlines a problem, motivating delayed attainment of air quality standards, as opposed to serving a motivation for cleaning the air in a timely manner. It proposed that Congress reform the Clean Air Act by eliminating the 1982 and 1987 air quality deadlines (NCAQ, 1981).

Although the National Commission on Air Quality's placed blame for the Basin's air quality management plan on the Clean Air Act, the District could not escape criticism for its part in failing to ensure that sources of pollution under the District's guidance attempted to meet mandates to clear the air. Following the findings of the National Commission on Air Quality's report, the Assembly Committee on Energy and National Resources held two days of hearings in September 1981 which were intended to determine if legislative action was necessary to improve enforcement activity in the Basin. The Assembly Committee examined air quality trends in the Basin, it studied the District's plan for reducing emissions, it evaluated research on the health effects of air pollution, and it considered the benefit of increased public accountability and citizen participation in District operations (NCAQ, 1981). Inside the hearings, testimony supported improving the effectiveness of the District. Los Angeles City Attorney Ira

Reiner requested increased penalties and legislative direction to allow city attorneys to prosecute air pollution violators. Judy Ortung, from the Riverside activist group Clean Air Now, testified that increased public input in the form of additional public members on the SCAQMD's board would improve policies.<sup>109</sup>

With many eyes focused on the South Coast Air Quality Management District, the District commissioned a study of its own to determine where its goals and those of its critics clashed. The District enlisted the RAND Corporation to consider the alternative perceptions of the problems of air pollution and its control; conceptual frameworks for comparing and evaluating those alternative perceptions; and the application of those frameworks for the development of alternative objectives and strategies for the control of air pollution (Builder and Graubard, 1982). While conducting research for its report, Rand reportedly,

... encountered few who regard the AQMP as a serious plan for the SCAQMD. The AQMP represents a plan for achieving something which, some if not most, people think is impossible: timely attainment of the federal air quality standards in the Basin. Others note that the AQMP is not really being implemented, for a variety of reasons. Several people in our discussion suggested that the principal purpose of the AQMD is to fulfill the administrative (paperwork) requirements imposed upon the SCAQMD by the SIP process, which is, in turn imposed on the states by the federal government. We do not argue here about what AQMP was intended to be or should be; rather we argue that it is, and has been, little more than a bureaucratic process used to set the agenda not the time line, for local rules development (Builder and Graubard, 1982).

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<sup>109</sup> Ortung testified that few of the District Board members lived in the most polluted parts of the Basin, and thus could not relate to public concerns. Ortung recommended the District establish a public advisor's office. Meade, the governor's appointee to the Board, concurred, and requested additional public members as a way to improve the District's policies.

RAND found that three perceptions of the problem of air pollution in the Basin contributed to debates about the Districts approach to the problem (Builder and Graubard, 1982):

1. Air pollution is a public nuisance that affects the human body and activities thereby reducing quality of life.
2. Air pollution is a hazard to health that adversely affects human development, capacity, and vitality by injuring and impairing proper bodily functions.
3. Air pollution is more a danger to human life, which has and will continue to result in human death.

The RAND report noted that each perception implied a different response from the District. If the threat of air pollution in the Basin was perceived as a nuisance, the response followed a pattern referred to by RAND as “regulator.” In this case, the District would seek a compromise or balance between inconveniences caused by air pollution and its control through the application of available technology. And in this case, the District was responsible for rule development, application, and enforcement. If air pollution was viewed as a hazard, the District would assume the role of “planner,” reducing the public exposure to air pollution that exceeds standards by advising community planning processes that affected Basin growth, land use, and transportation. In this case, the District was responsible for defining and communicating the air pollution consequences of specific community plans and actions. If air pollution was more than a nuisance or hazard, and instead a threat, the District should assume the role of “manager” with the objective to prevent lethal air pollution episodes through preventative actions. In this case, the District should manage air quality and meteorological data for forecasting and coordinating emergency actions through other government agencies.

Each role implied the need to work with different parts of the community – the regulator with industry and commerce, the planner with community planners and politicians, and the manager with governing agencies and emergency services (Builder and Graubard, 1982: vii-viii). RAND concluded that the District’s actions to date fit the “regulator” pattern best. Consistent with the citizens’ views that the district’s actions had been weak, RAND recommended the District embrace all three of the roles, which would require organizational changes and the creation of three programs – one for regulatory control, another for community planning, and a third for emergency management. More than anything, RAND argued, the District required major “intellectual redirection and philosophical commitment by the Board and the staff” (Builder and Graubard, 1982: 11).

The RAND report suggested that among the Districts’ problems with controlling air pollution was its need to meet the concerns of the many stakeholders in its jurisdiction. These included polluters and the polluted. This was the same challenge the L.A. APCD faced decades before: it was the challenge to do more.

### **3.8 Moderately Radical**

Seven years passed before the District embraced the recommendations of the RAND report. With its 1982 air quality management plan, the District divided goals into short-range and long-range control strategies. The short-range measures carried an expected implementation deadline of 1987, while the long-range strategies projected attainment by 2000. The District’s plan focused on a variety of strategies ranging from alternative fuels to high-speed rail and redirected growth (1982 AQMP). A Reagan appointee, the EPA administrator Lee Thomas approved the plan. In 1984, Mark

Abramowitz, then Executive Director of the Los Angeles Coalition for Clean Air, filed a suit against the EPA based on its acceptance of the District's long range plan.

Abramowitz was a UCLA graduate with a degree in analysis and conservation of ecosystems specializing in air quality. He had spent his time at the Coalition for Clean Air seeking District reform by challenging District Board members, such as Thomas Heimsheimer, the District Board representative for the cities of Los Angeles, who since his appointment on the Board the first year of the District's existence had challenged any air legislation that did not favor jobs, the economy, and industry (Russell, 1988).

Abramowitz argued that the EPA lacked authority to approve a plan that failed to show how cities and states would meet the health standards for ozone, carbon monoxide, particulates, and other pollutants by the 1987 deadline.<sup>110</sup> The Clean Air Act, however, required that in such cases, the EPA develop a federal strategy for cleaning the air. Over the ten months following Abramowitz's suit filing, the EPA worked with the Coalition for Clean Air to keep the matter out of court. They developed a "Reasonable Extra Efforts Program"; a comprehensive approach to address each area of emissions and require follow-through on the part of local agencies, a measure which industry opposed (Russell, 1988). However, their inability to come to a consensus led the suit to court anyway.<sup>111</sup>

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<sup>110</sup> The long-range approach was later embodied in the 1988 California Clean Air Act and the Clean Air Act Amendments of 1990.

<sup>111</sup> The U.S. Ninth Circuit Court of Appeals ruled that the EPA had to reject the AQMD's earlier plan, which the EPA did in January of 1988. The EPA set a moratorium on any new large-scale industrial construction in the Basin, and stronger sanctions including the cutoff of federal highway funds. At the same time, the EPA asked Congress to extend the deadlines for heavily polluted areas like the Basin for a third times – up to twenty-five years. The EPA reserved sanctions only for local agencies unwilling to take abate smog and demand a "reasonable effort" to reduce pollution by 3 percent a year. Abramowitz, joined by the Sierra Club," took the EPA back to court.

Abramowitz's suit was just one catalyst for what became a clear need for change at the District. As it turned out, change was just around the corner. The window of opportunity for District reform was opened widest when in March 1986, then District executive officer Jeb Stuart resigned from his post to become a private consultant representing clients in waste and energy projects that required operating permits from the District (Stammer, 1986; Chiton, 1989). Stuart had held the District job since its formation, but resigned during a time when the District faced tough decisions regarding its air pollution control strategies.

With little less than a year before the CAA 1987 attainment deadline, the District was on track to miss it. In addition to continuous concerns about its air quality management plan and nonattainment, the District faced a debate about the strategy for controlling ozone and nitrogen dioxide in the Basin. (Recall that ozone and nitrogen dioxide are products of the photochemical process involved in the creation of smog.) The District had major decisions to make regarding proposals for stricter, more expensive regulations governing the emissions of oxides of nitrogen. According to the RAND Study, the debate was centered on questions of who were the perpetrators and who were the victims of the air pollution. At the time, it was not clear how much the District was responsible for knowing and accounting for the variables at play; the sources of suspected emissions, the related health effects, atmospheric photochemistry, and the geographic distinctions of both those areas that contributed and those that suffered the effects of pollution (Boulder and Grausbard, 1982). Abramowitz had claimed that the District failed to fully enforce standards because it was, as many believed, "in the pockets of industry"

(Chiton, 1989:12) and by leaving the District for private interests, Stuart seemed to verify the suspected cozy relationship between industry and the District.

The District's continued fight against smog was not a battle of attrition, but it was a blow. According to a CARB/EPA 1986 audit of the District between 1981 and 1986, the agency had made some improvements, especially in the way of its toxics program. In 1983, the District's Engineering Division compiled the nation's first urban inventory, which inspired the California legislature to pass AB 1807. Also known as the Tanner Act, the measure established a statewide control program for toxic air contaminants (Health and Safety Code 39650 et. Seq). In addition, the Multiple Air Toxics Exposure study identified L.A. hot spots, concentrated areas of exposure to stationary and mobile emissions (MATES, 1986). The audit found the snail's pace of progress to be one of the District's major problems: almost a decade after its formation, the District still lacked a plan that could meet CAA deadlines.

By the mid-80s, the Basin was in attainment of the standards for sulfur dioxide and lead, and within two percent of meeting the nitrogen dioxide standards, but had twice the accepted standards for carbon monoxide and particulates, and nearly three times for ozone (Lloyd et al., 1989). Forecasts showed that future improvements in air quality would not come unless future growth was offset. Studies suggested that a reduction in emissions of most pollutants would continue until 2010, when emissions would rise nearly as high or higher than 1985 levels (Lloyd et al., 1989). The rules the District had in place would not keep up with population growth; air quality standards for ozone, particulates, and carbon monoxide would not be met. In addition to the problem of growth, computer modeling showed that by 2010, the distribution of emissions



throughout the District would have changed, with a decrease in emissions in the west and an increase in the east resulting in a decrease in ozone concentrations in Los Angeles and Orange counties, but an increase in the inland areas (Lloyd et al, 1989).

Urban airshed modeling for ozone and fine particulate modeling suggested that stringent controls on volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>) were necessary to meet all the federal air quality standards by the year 2010. VOC emissions would need to be reduced to 200 tons/day and NO<sub>x</sub> emissions to 195 tons/day from the 1080 and 1017 tons/day, respectively (Lloyd et al, 1989). Industry challenged the District's requirement for stringent control of VOCs and NO<sub>x</sub> because of the complexity of VOC/ NO<sub>x</sub> interaction in the formation of ozone and particulates, the uncertainties associated with models, and the different economic cost of controls. Southern California Edison and the Western States Petroleum Association proposed more emphasis on studying VOCs (Lloyd et al., 1989).

### **3.9 A New Sense of Urgency**

Waiting in the wings as the number two executive at the District, James Lents had been brought on by Stuart in 1986 as his deputy just two months before Stuart quit (Mathews, 1988; Chiton, 1989). Lents would become the strongest advocate for District reform that the Basin had ever seen. According to some, during his reign at the District the agency's sentiment towards industry shifted from "We are here to help you" to "Hey, we'll shut you down" (Chiton, 1989:12).<sup>112</sup> But others saw Lents as a fair and effective administrator. A trained physicist who had developed techniques to increase thrust in

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<sup>112</sup> Chiton reported that a smog lobbyist commented, "The AQMD staff has gone from saying, 'We're here to help you comply' to 'He y, I'll shut you down'" (Chiton, 1989:12).

rocket engine fuel while a student at the University of Tennessee, Lents had a personal interest against smog. While living in Knoxville, he experienced the problems of soot and dust that entered his apartment from a nearby coal-burning plant (Mathews, March 14, 1988). The plant's emissions left Lent's apartment covered in a film of dirt on a regular basis. In 1970, Lents turned his attention to air pollution when he failed to find a job in the aerospace industry. He designed an air pollution course at the University, which helped him win a position as technical director of the Chattanooga-Hamilton County Air Pollution Control Bureau. At the time, Chattanooga was among the country's top ten most polluted cities (Marini, 1990). From 1971 until his departure in 1979 Lents turned around an otherwise ineffective program. He started a regulatory program in the city that included a computerized permitting and enforcement program. He also convinced businesses that cleaning up their emissions was profitable.<sup>113</sup> The success of Lents' program was verified by its adoption by other local control agencies in the state. Following his success in Tennessee, Lents put his talent to work in Denver. At the time, Denver had the highest levels of carbon monoxide and particulates in the nation (James, 1986). Lents took over as the director of the Colorado's Health Department's air pollution control division, a position that experienced significant instability for some time (James, 1986). Among other things, Lents helped develop plans to meet air quality standards in five nonattainment regions in the state. He began one of the first automobile emissions testing programs outside of California (Marini, 1990). Bob Arnott, Director of the Colorado State Health Department, considered Lent's departure for dirtier pastures in

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<sup>113</sup> For example, a cement plant found that part of their emissions was caused by cement rerouted back to the production process. Another factory sold its captured fine particulates to industrial grinding industries (Marini, 1990).

California “a tremendous loss for the state.” As far as he was concerned Lents was “irreplaceable” (James, 1986).

During Lents’ first year in L.A., the air in Glendora exceeded federal ozone levels standards on 148 days, three times more than in any other U.S. city (Mathews, 1988). Glendora’s experience was representative of the ozone tendencies of the entire Basin. Ozone levels exceeded federal CAA standard on an average 161 days in any year, and reached concentrations as high as three times the 0.12 parts per million standard (Lents, 1988).

Studies showed that the ozone and the other toxic elements of smog threatened human health. The EPA’s Health Effects Research Laboratory indicated Basin residents were at risk, as ozone caused permanent lung damage. A University of Southern California test of lung function found that L.A. County children 15% below those of children in Houston Texas (Mathews, 1988). A study at California State University, Fullerton, estimated that each year exposure to ozone alone caused 120 million person-days of coughing, 100 million person-days of headaches, and 18 million person-days of restricted activity (Marini, 1990). The Statewide Air Pollution Research Center in Riverside found losses up to 20% in the state’s three principal crops (cotton, grapes, and oranges) because of the aging effects of ozone (Mathews, 1988). Studies showed that carbon monoxide causes angina and heart attacks among coronary-disease patients. Fine particulate matter reportedly caused premature death among those with chronic respiratory disease and contributes to lung cancer. Studies indicated that smog damaged distant downwind ecosystems (Lents, 1990).

Continued public environmental awareness,<sup>114</sup> and the unexpected departure of Stuart were marked motivations for aggressive overhaul of the District. The Lewis-Presley Air Quality Management Act sponsored by State Senator Robert Presley (D-Riverside) mandated a reconstruction of the District Governing Board (Mathews, 1988). Previously, although the inland areas were downwind receivers of the urban core's dirty emissions, they had limited representation, which gave players like Tom Heinsheimer a dominant voice at the District. The new board elected Norton Younglove, Riverside County Supervisor, as Chairman and Heinsheimer left (Chiton, 1989). The new board's commitment to tightening the District's effectiveness was affirmed when it chose energetic newcomer Lents over Mary Nichols, a long time smog advocate in the region who had even worked at CARB during Reagan's governorship.<sup>115</sup> Lents was seen as the man for the job largely because he was a political outsider (SCAQMD, 1997).

Lents once recalled that at the time there was a "new sense of urgency... In 1987 everyone woke out of their sleep. It came upon folks that we were talking about having clean air by the end of '87 and it was not going to happen" (Mathews, 1988). Under pressure from the U.S. EPA, Lents proposed sweeping changes to the district. He reinstated "smog patrols," an enforcement measure to catch automobiles emitting dirty emissions on area highways, which had been defunct since 1975. The measure put eight highway patrolman and five District inspectors on the road to ticket automobiles with black exhaust (Mathews, 1988). In December 1987, Lents pushed the District to adopt

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<sup>114</sup> At this time, other pollution related issues, namely the impact of emissions of chlorofluorocarbons and other chemicals on the layer of stratospheric ozone that shields life from ultraviolet rays, and evidence that emissions of carbon dioxide and other gases from burning fossil fuels causing a worldwide warming trend that could raise sea levels and damage ecosystems, commanded global attention.

<sup>115</sup> Nichols is now head of CARB.

Regulation 15, which required all companies with more than 100 employees (8000 firms representing 1.5 million workers) to offer incentives for ride sharing, including preferential parking, cash bonuses, or subsidized bus passes, by the summer of 1991 (Mathews, 1988; Marini, 1990). Business faced up to \$25,000 a day in fines for non-compliance. Lents proposed the District require rental and bus companies to buy vehicles that burned “clean” fuels such as methanol. The Board approved a five-year, \$30.4 million clean fuels demonstration program that required rental firms and bus companies to buy clean-fueled vehicles when they replaced current fleets and initiated a task force to promote the development of electric automobiles (Mathews, 1988).

The District now concluded that efforts to attain clean air standards in the Basin would have to “cut across the fabric of how we live, work and play” (Mathews, 1988). Lents and the District devised a 1989 air quality management plan. In January of 1988 the District Board, for the first time, voted to establish specific deadlines as part of a twenty year plan for reaching state and federal air quality standards: the end of 1996 for nitrogen dioxide, 1997 for carbon monoxide and 2007 for ozone (Mathews, 1988). In all, the measures would amount to a 4-percent-per-year emission reduction goal and would result in EPA compliance. The District held hearings to get input on rulemaking, but as David Cahn, vice-chairman of the Southern California Air Quality Alliance, a lobbying arm of the California Manufacturers Association reported, efforts to “rally the troops” failed because, “for the most part, the rules came out before businesses knew there was a problem” (Cook, 1990).

Lents’ approach was considered a “breath of fresh air.” Yet, as Speaker of the Assembly Appointee Board member Larry Berg reported, the District was hesitant. Berg

commented, “I still find a sense of timidity lingering among the staff and even among some Board members. I find some evidence of pressure put on by major polluters, and it is intense...” Although pressure to consider the interests of business loomed over the heads of District, Berg noted, “We’re still not as aggressive as many of us would like” (Daily Breeze, 1988). This quickly changed.

### **3.10 The 1989 Air Quality Management Plan<sup>116</sup>**

Lents argued that without “moderately radical” measures, L.A. smog would continue and worsen, impeding the region’s economic growth (Beaucamp, 1989: 148). Lents planned to leave no stone unturned. No emissions source was too big or too small for regulation. Aware that the effect of automobiles in the Basin was compounded by the region’s economic geography, Lents urged the District Governing Board to consider proposals to grant incentives to factories that located in the east (Mathews, 1988). With jobs concentrated in central and western Los Angeles and affordable housing in places like Riverside County, extensive commutes were common but could be reduced if more facilities were located to the east. By June of 1988, the District unveiled short-term control measures to reduce organic gas emissions from smaller sources including small businesses and users of consumer products. For example, the District sought an overhaul of the formulation, application, cleanup of paints and coatings. These solvents were responsible for 31 percent of reactive organic gas emissions, or 382 tons per day (Lents, 1988). House paints alone emitted 19 times more reactive organic gases than all the basin’s oil refineries and gasoline stations which combined emitted 55 tons a day (Lents,

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<sup>116</sup> The 1989 Air Quality Management Plan was proposed in 1988 and enacted in March of 1989. It is also referred to as the 1988 air quality management plan.

1988; Marini, 1990). Other everyday consumer product targets for emissions reform included printer's ink, spray deodorants, dry cleaners, and backyard charcoal barbecues, bakery exhaust, and fast food drive-through windows.

These early measures became the foundation of the first of three tiers of the toughest air quality management plan the Basin had ever seen. Some forty-five volumes and 5,500 pages in length, Lent's plan stood a reported three feet tall and included 123 control measures (Chiton, 1989; Marini, 1990). Tier I measures were regulatory, aimed at reducing emissions from stationary sources, as well as imposing growth management, controlling traffic flow by carpooling, alternative work weeks and flex-times and retrofitting public transportation vehicles with clean fuel capabilities. Tier I measures involved full implementation of known technologies and management practices with five years, and full implementation of new efforts like vehicle controls and transportation facility construction by 2007. By adopting the first tier measures, the plan called for the reduction of nitrogen oxides, sulfur oxides, and carbon monoxide, as well as a reduction of 617 tons a day of reactive vapors through improved vapor containment systems on cars and at gas stations. The estimated cost for Tier I measures was \$7.2 million per day, about 60 cents per day for each resident in the Basin, but this hefty price came with a high estimated air quality benefit of \$1.60 per day per capita in long-term healthcare costs (Chiton, 1989:12).

Tier I focused on controlling the damage done by existing high polluting technologies. Tier II encouraged switching over to low- or non-polluting alternative technologies. Actions involved advancement of then current technologies, but also regulatory intervention to encourage the development of future technologies by the turn

of the century which would contribute to emission reductions. The plan included the use of electrostatic spray guns that relied on electric charge to coat a surface, ultra-efficient robotic painting, and ultraviolet or catalytic curable paints that did not use organic solvents. The 1989 plan also called for the conversion of 40 percent of passenger vehicles, 70 percent of trucks, and all buses to run on “low-emitting” clean fuels like methanol and compressed natural gas (1989 Air Quality Management Plan). Methanol reduced emissions of hydrocarbons, nitrogen oxides, and carbon monoxide. Compressed gas could do the same for fleet use.<sup>117</sup> Tier II programs required the District invest in research, development, and commercial application of technologies not yet in existence. It proposed technological advances such as water-based, non-polluting, non-reactive solvents and coatings, and electric vehicles powered by fuel cells, solar energy or batteries within 20 years.<sup>118</sup>

Lents believed that the 1989 plan needed “to create the atmosphere that will make technology happen” (Marini, 1990). To do so and further support the Plan, Lents invested part of the District’s research budget into research and development of new products, for which the District could then create a market via strong regulation. For example, he allocated part of the research and development budget for clean fuels. While he couldn’t force consumers to buy clean vehicles, he could require business and governmental vehicle fleets to switch to clean-energy automobiles, thereby created a market for cleaner cars, saying “Once we get a flow of low-emission vehicles into the area, and create a marketplace with some of our rules, the car manufacturers have got to compete” (Lents

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<sup>117</sup> The District did not provide cost/benefit estimates for Tier II technologies because they were at least in part theoretical.

<sup>118</sup> The District did not provide cost/benefit estimates for Tier III because the technologies proposed were theoretical.



quoted in Chiton, 1989:14). The 1989 plan was more than a proposal for technological prowess; it was a plan that looked to change virtually every aspect of life in the Basin. Business big and small would have to change their operations and their materials. Citizens would have to change their habits at home and on the road.

The plan drew criticism from those inside and outside the District who believed it unreasonable and unattainable. District Board member and Orange County Supervisor Harriet Weider captured a core issue regarding the 1989 plan when she commented on the matter for a L.A. Business article, “The District has the luxury of taking a purist point-of-view. That is important, you need that – keep your eye on the target. But then there’s the real world and you have to say. What is the downside” (Chiton, 1989: 13-14)? The real world contained a number of public issues, and smog was only one of them. Critics of the plan believed that Lents and the District had ignored the social and economic side-effects of the Plan.

### **3.11 The 20-year Plan Under Fire**

A 1987 survey released by the District and the University of Southern California showed 73% of the state’s citizens willing to pay dramatically increased consumer cost for better air quality; other studies indicated more than 90 percent of the public willing to separate trash and give up polluting products (Lents, 1990). Eighty-six percent said they would try to drive less and give up auto air conditioning and drive-through restaurants and banking (Lents, 1990). Perhaps for this reason, most of the Board supported the 1989 Plan; only two board members voted against it. Yorba Linda Mayor Henry Wedaa, representative for Orange County was asked by his Orange County city officials to

oppose the plan, even though he personally favored the Plan (Chiton, 1989). L.A. County Supervisor and District Board member Michael Antonovich strongly opposed the Plan. He charged Lents with proposing “arbitrary” regulations.<sup>119</sup> Antonovich believed the 1989 Plan would cripple the local economy by causing an exodus of industry, thereby turning it into a “wasteland” (Chiton, 1989:14). Orange County likely had the same concern.

The economic community ostensibly agreed with Antonovich. The California Council for Environmental and Economic Balance (CEEB) claimed the plan would put people out of work. The District said the plan would cost \$2.6 billion per year, but CEEB claimed Lents had underestimated the cost by leaving out the likely cost of the anti-pollution technologies that had not been developed. With those costs added in, CEEB estimated the 1989 Plan cost to be about \$12.8 billion, almost six times the District’s estimate. Lents did not deny that the 1989 plan’s restrictions could limit the number of jobs created, but he and the District maintained the difference would be insignificant; without the plan the economy was estimated to grow about 140 percent, compared to the estimated 137 percent with the plan implemented (Marini, 1990). According to a District sponsored health-benefits study, reducing ozone and fine particles to the plan’s Tier III levels could save the region \$9.4 billion dollars otherwise caused by absences from work due to health issues and expensive medical bills (Lents, 1990; Marini, 1990).

If Los Angeles could not meet all the federal standards by 2007, it could lose tens of billions in state and federal funding for transportation and sewage purposes. After

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<sup>119</sup> In regards to restrictions on backyard barbecues, he harped, “Use a barbecue, go to jail!” In fact, the District had not banned barbecues. It outlawed liquid lighter fluid because it contributed to smog when it vaporized (Marini, 1990).

hundreds of hearings, public forums, workshops and meetings with business and community groups, city councils, editorial boards, and environmentalists, on March 17, 1989, the District Governing Board approved the 1989 air quality management plan for the Basin by a vote of 10-2. By the end of the summer, CARB had approved the plan unanimously (Lents, 1990).

### **3.12 The Thin Line of Compromise**

In response to industry concerns, Lents lent a sympathetic ear, sometimes backed by sympathetic action. Lents saw himself as “an advocate for clean air,” not the “economic director for the area” (Matthews March 1988), yet he looked to work with industry, not to oppose it. Lents firmly believed that the solution to cleaning up the dirtiest air in the nation lay “in empowering the polluters –from large industries to individuals in their cars and homes – to participate in the cleanup effort (Lents, 1990: 43). The District eased up on its command-and-control approach and supported giving industries flexibility to meet standards. For example in 1989, the District allowed Southern California Edison, the Los Angeles Department of Water and Power, and three municipal utilities to use alternatives to the boiler controls required for utilities. Southern California Edison’s proposal cut emissions below the levels that would have been reached under the District’s rules, and the total cost of the utilities’ alternative plans was also reduced (Cook, 1990). An article in California Business in October 1990 argued that the District was showing that it was ready to “accommodate, rather than just regulate, business” (Cook, 1990).

Lents hoped to work with the paint and coatings industry to find extremely low-solvent coatings. Recognizing that the proposed measures would be “technology forcing,” the District looked to fund research to assist the solvent industry much like it had done with its million-dollar clean fuels research program (Lents, 1988). When utility companies opposed a proposed rule requiring retrofitting of power plants with catalytic converters to reduce emissions, Lents accepted an offer by the utilities to rebuild older plants to modern specifications. This action doubled plant efficiency from 30 percent to 60 percent (Marini, 1990). The District further supported technological advancement by providing matching grants to research laboratories, universities, and industries to develop and demonstrate clean air technologies (Lents, 1990). Through its grants program, the District helped to create clean-air advocates within companies who could put environmental issues on corporate agenda at Hughes Aircraft Co, for example, research backed by the District at the company studied the potential to eliminate use of ozone-depleting chlorofluorocarbons in the electronics industry (Lents, 1990). A positive outcome like this one validated Lents’ belief that “technological and personal behavior changes [should] become the cornerstone of air pollution control programs in the 1990s and beyond” and seemed to make good on the District’s promise to clean up the air but remain “flexible and sensitive to economic concerns” (Lents, 1990: 43-44). Moreover they proved Lents’ assertion that fostering cooperation between industry and government was needed to “get the job done” (Lents, 1990).

But despite Lents’ assertion that he wanted to work with industry, not against it, District actions suggested otherwise to the Basin’s businesses. In 1990, the District began a surprise inspection program that targeted larger industries. The plan, called “Operation

Blue Sky” sent enforcement officers to local oil refineries, aerospace contractors and chemical manufactures to ensure that they complied with District regulations (Jacobs, July 1990). That same year, the District voted to tighten air pollution control rules for house paints and printing shops. Lents claimed that the actions would bring significant reductions (an elimination of 5.5 tons a day of smog-forming reactive hydrocarbons) in smog-forming reactive hydrocarbons (Lents, 1990). But the costly regulations of the 1989 prompted several major and minor industries to make idle threats about leaving the Basin. For example, after Chevron had spent \$2.5 billion during the eighties developing Point Arguello oil field off the coast of Santa Barbara, the District denied them the right to exploit it when regulators revoked the company’s permit to transport the oil by tanker to its terminals (Cook, 1990). Oil and aerospace companies, like Lockheed, General Dynamics, and Chevron, had planted their roots in Southern California threatened to reconsider expanding or building new facilities in the Basin (Cook, 1990). In another example, a profitable furniture business considered closing its doors. Fair Line Furniture, a company based in L.A. which sold \$5.5 million dollars’ worth of furniture annually had spent millions of dollars to reduce emissions from the plant to meet air quality standards yet still contemplated closing up shop (Cook, 1990).

While businesses large and small seemed to spending more and more money to meet the Districts mandates, the District hoped to take more money in to support its efforts. The District unanimously approved a record \$101.4 million annual budget. The budget represented a 19% spending increase, including \$21 million increased fees charged to polluters, and an increase in the number of workers to 1, 138 up from 117.

Lents told the District Board that the budget would keep the District on track toward attainment of their clean air goals (Stammer, 1990).

Lents walked a fine line. On the one hand he wanted to do whatever it would take to clean the air; on the other hand he acknowledged the need to be sensitive to economic concerns. The District's proposed amendments to the 1989 Plan, Lents suggested, leaned more toward the side of cleaning the air even though the revised plan was reportedly an effort to create a "clean air blueprint" that would reflect the social and economic situation in the Basin (SCAQMD, 1997). The District considered 34 new regulations for 1991 that varied in scope from special equipment for gasoline storage tanks and deep-fat fryers, to wind-reducing nose cones for trucks, a limit on "cold-starts" by car dealerships, elimination of gas-powered leaf blowers, and a greater number of businesses forced to car pool (Jacobs, 1990: 3). In support of the District, the Los Angeles County Board of Supervisors approved in September 1990 a plan for complying with carpooling regulations that drew attention from Service Employees International Union Local 660. The County's proposed a plan to charge a majority of workers \$120 a month for a parking spot, but subsidizing it with a \$70 monthly payment. The Service Union argued that the measure was a de facto reduction in salary. The Service Union allied with the Natural Resources Defense Council and pushed the development of a new plan forward. In order to reduce concentrated air pollution due gridlock during high commute times, the new plan offered a "traffic mitigation allowance" to offer employees options for parking including saving their money and parking farther away from their jobs in county-owned lots or paying to park closer. The Coalition of County Unions, 10 unions representing the other half of the county's employees approved the plan. The District

stepped in as mediator between the County Supervisors, implemented the new plan and held workshops to encourage union input (Government Employee Relations Report, 1990; Government Relations Report, 1990). L.A. County had experienced difficulty trying to comply with the District's mandate for employers to establish incentives for worker to carpool. Lents sought to fine the L.A. County for delaying its ride-share program even after four deadline extensions (SCAQMD, 1997).

This episode reflects the complex role the District played in the Basin to meet the needs of all those with stakes in the Basin's air. Staying committed to cleaning the air was a matter of knowing the tradeoffs of implementing its plans. Lents recognized the need to equally distribute the responsibility for cleaning the air. In another, the District ordered 175 of Southern California's biggest corporations, including Disneyland to oil and aerospace companies, to assess their potential risk to the public of the smog-forming or toxic air pollutants they emitted. The assessments represented an effort to by the District to make the potential risks of area companies transparent. Lents claimed, "We don't know if any of the facilities pose a significant risk and won't know until the health risk assessments are complete. Any suggestion otherwise would be speculation" (Stammer, Dec. 1990). Lents did not point a disapproving finger at the polluting facilities; instead he opted to foster a public-private partnership that tried to put polluters and regulators on the same side.

### **3.13 The Advent of RECLAIM**

By 1990, the Southland was almost 50 years deep to air pollution control. Stringent standards and control of known sources of pollution eventually improved the

region's air, but the path to effective policy was not a simple one. The process of cleaning the air of Los Angeles was wrought by decades of policy experimentation that was geared towards protecting the public health and welfare, and informed by science, but also limited by politics and economics. Command-and-control, relying on technology, had worked to improve the air of the South Coast Air Basin, yet the scheme had seemed to run out of steam. The 1989 Plan was a change for regulators, but also for the regulated. Basin businesses pushed back against the stringent control measures featured in Districts air quality management plans because of the cost of pollution control, and a decrease in manufacturing jobs (Armstrong, 1992; The Economist, 1993), but the District still moved forward with broad public support.

However, despite public support for clean air initiatives in the Southland, the industry backlash to stringency and costs of the 1989 Air Quality Management Plan, its successor, the 1991 Plan, and an economic downturn, left the South Coast Air Quality Management District, in need of a compromise that could balance the needs of its stakeholders. These circumstances could not void the federal requirement set forth by the 1990 Clean Air Act, that Los Angeles, an area of extreme nonattainment, meet the air quality standards by 2010.

The Federal CAA now encouraged the use of market-based mechanisms to achieve future improvements. William Reilly, Administrator of the EPA, speaking about the Clean Air Act of 1990, explained it this way:

“The cost-effective, market-based approach to environmental protection embodied in the statute will serve as a model for other Administration proposals –in the future. The lesson of the Clean Air Act is clear: The nation need not give up its aspirations for a cleaner, healthier environment,



or for other worthwhile social goals, even at a time of limited economic resources (Reilly, 1991).”

The Clean Air Act of 1990 required states with regions of extreme nonattainment to adopt economic incentive programs (EIPs) if they failed to meet emissions mandates.<sup>120</sup> The options for economic incentive programs included emissions fees, marketable permits, product fees, and transportation measures. The implementation of such approaches needed to comply with federal regulatory requirements.<sup>121</sup>

This was the backdrop for what would become the Regional Clean Air Incentives Market (RECLAIM). In November 1990, the National Economic Research Associates for the California Council for Environmental and Economic Balance (CCEEB), and the Regulatory Flexibility Group,<sup>122</sup> published a report supporting the development of an emissions trading program in the Basin (Harrison and Nichols, 1990). The proposed program described in this report included NO<sub>x</sub> and SO<sub>x</sub> as well as motor vehicles and VOCs. In December 1990, Roger Noll of Stanford University prepared a report on a potential Basin marketable permits program for the SCAQMD and the CCEEB (Noll, 1990). Noll suggested four potential mechanisms to reduce both compliance costs and emissions. The first mechanism was trading within source categories (i.e. utilities and refineries). In this case, cost savings result from trading between high and low cost of

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<sup>120</sup> Although the Clean Air Act of 1990 required EIPs, the EPA did not issue a final rule and guidance on EIPs until 1994.

<sup>121</sup> These included among others: reasonably available control technology (RACT), best available control technology (BACT), prevention of significant deterioration (PSD), new source review (NSR), lowest achievable emissions rate (LAER), new source performance standards (NSPS), and Title IV.

<sup>122</sup> The Regulatory Flexibility Group was a coalition of 20 companies. Its goal was to seek out opportunities to reduce the cost of complying with the Clean Air Act. The coalition included ARCO, Chevron, Mobil, Shell, Texaco, Unocal, Allied Signal, Hughes Aircraft, Lockheed, Northrop, Rockwell, TRW, Southern California Edison, Southern California Gas Company, Los Angeles Department of Water and Power, Pacific Energy, Toyota, General Motors, Association of International Automotive Manufacturers, Los Angeles Times, Maguire Thomas Partners, and the Walt Disney Company (Polesetsky, 1995).

control equipment. The second mechanism was trading between source categories. In this case trading takes place between utilities and refineries. The third proposed mechanism promoted technological innovation. Because facilities had an incentive to reduce emissions below the required level, they had an incentive to develop control technology. The fourth mechanism supported flexibility. In a market-based program, facilities have flexibility to choose how they will reduce emission and when to implement various control measures.

Lents and the District were receptive of a smog market program in the basin. In speaking about the change needed:

For regulators, this will mean providing incentives and information that will empower individuals and organizations to become active participants in solving the air pollution problem. The new approach will require environmental agencies to break with their comfortable 20-year tradition of command-and-control under the Clean Air Act and enter uncharted territory... (Lents, 1990).

In February 1991, the District Governing Board accepted the District's request to conduct a feasibility study of a smog market in the Basin (SCAQMD, 1993). Following the Board's decision, it commenced the rule-making process which included committees representing public agencies, business, labor, and, among others, environmental groups. The process tried to avoid leaving out any one with stakes in having clean air.

The Lents era at the District and the proposed 1989 Plan and its 1991 revisions reflected a major break from the old way of doing things. No longer could critics claim that the District was in the pockets of industry, willing to jeopardize enforcement to protect economic interests. Instead, the District showed willingness to compromise on

how to clean the air, without wavering on why to clean the air - for the sake of health and welfare. The move to markets was a new approach to bring everyone to the table.

## Chapter 4: RECLAIMing Air, Redefining Democracy

### 4.1 Introduction

In October of 1990, *California Business* published an article reflecting on the relationship between industries in the South Coast Air Basin and the South Coast Air Quality Management District. In the article, James Lents spoke of his willingness to work toward a “common ground” in order to clean the air and meanwhile support economic growth in the region (Cook, 1990). Lents acknowledged that while he could not compromise on the forecasted 4% annual reduction of emissions needed for the Basin to meet federal air quality standards, the adversarial relationship between the District and industry needed to change. Throughout the fifty-year history of smog control in the Southland, industry and the regional control authority had regularly been at odds. Lents argued that the time had come to support businesses by allowing them flexibility in their pursuit to attain clean air goals. Lents declared, “It’s always been my belief that companies understand their operations and what the variables are better than we [the District] do. That’s why we’re interested in a market-based program, if we can design one, something that inspires them to make changes beyond the rules” (Trief, 1991).

A proponent of strict command-and-control legislation included in the 1989 and 1991 Air Quality Management Plans (AQMPs), Lents’ support of market-mechanisms seemed at first like backpedaling. However, the political climate surrounding the costs of controlling emissions, and growing support for emissions trading reveals a more nuanced story. Despite three decades of substantial progress in improving air quality in the Los Angeles Basin, for two decades the District struggled to meet national ambient air quality standards (NAAQS), and for just as long, industry had pushed for greater flexibility in

meeting NAAQS. It was apparent to SCAQMD officials that further progress toward attaining federal standards would be prohibitively expensive using traditional regulatory approaches. By 1990, the marginal costs of NO<sub>x</sub> control had reached \$25,000 per ton at some electric power plants in the District, versus \$500 to \$5,000 nationally. Proposed SO<sub>2</sub> controls on catalytic cracking units at refineries would have cost \$32,000 per ton, versus national costs of under \$500 per ton (Lents and Leyden, 1996; Selmi, 1994). The 1990 Clean Air Act's authorization of economic incentive programs at the state level presented an opportunity to increase compliance flexibility and lower the cost of cleaning the air. Furthermore, industry, government, and environmentalist support of the federal acid rain program established by the 1990 Clean Air Act presented an opportunity to please all those with stakes in cleaning the air, or at least forging an agreement among them.

Environmental support of market-based programs was fairly new. When emissions trading was introduced in the 1960s, environmentalists opposed it on moral and structural grounds. Environmentalists held four main positions about emissions trading (Dudek and Palmisano, 1988; Esterling, 2009; Hahn and Hester, 1989a and 1989b; Kelman, 1981; Tietenberg, 1985):

1. Breathing clean air is a fundamental right.
2. Industry should not have the ability to buy or sell that right; regulators should not give industry the right to pollute.
3. Polluters will protect their own interests and therefore should not have a say in how to clean the air.
4. The piecemeal addition of emissions trading tools to the Clean Air Act left opportunity for loopholes that industry could exploit leading to reduced compliance.

The moral aspects of these earlier concerns remained. But, by the '80s, the Environmental Defense Fund, a national environmental organization with political clout, backed a comprehensive emissions trading program that ironed out the structural concerns associated with piecemeal emissions trading tools. Fred Krupp, president of the Environmental Defense Fund, described market-based programs as indicative of a “third wave” of environmentalism in which government, industry, and environmentalists were allies. In an op-ed in the *Wall Street Journal*, Krupp explained that the new environmentalism did not “accept ‘either-or’ as inevitable” (Krupp quoted in Schulte, 2007). Environmentalists could no longer point fingers of blame, and instead enlisted others in finding solutions to issues. Krupp offered “market-oriented incentives” to achieve “greater environmental and economic benefits at lower social and economic cost” (Krupp, 2008). Impressed by Krupp’s vision, C. Boydon Gray, counsel to then Vice President George H.W. Bush, invited Krupp to the White House where Krupp began work on Project 88, and ultimately the Acid Rain Program (Krupp, 2008).

Unlike the early piecemeal emissions trading tools, the Acid Rain Program was comprehensive. It addressed important aspects of trading including baseline allocations and the transparency of exchanges that had previously concerned environmental groups. More important, the program included a “cap” representing a legal, yearly-declining limit on pollution that promised to clean the air. Following the structure of the Acid Rain Program, Lents and the District put forth a revolutionary pollution market it entitled the Regional Clean Air Incentives Market (RECLAIM).<sup>123</sup> The Acid Rain Program included

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<sup>123</sup> Emissions trading broke into the state regulatory realm in the 70s. In 1979, Jefferson County, Kentucky set up the nation’s first emissions bank, and in 1981 became the site for the initial purchase of pollution rights, when B.F. Goodrich Corp. (Akron, Ohio) sold credits to Borden Chemical Co. (Columbus, Ohio),

emissions trading among coal plants across the nation. RECLAIM was revolutionary in the sense that it was a regional program that would include a variety of polluting sources including public utilities, and private companies. RECLAIM was more than a coincidental acronym for an otherwise lengthy program title. It represented an opportunity for the District to reduce emissions, comply with the Clean Air Act, and through a government-industry partnership supported by environmentalists, reclaim its position as a leader in smog control.

In this moment, when environmentalists, industry, and regulators seemed to agree that emissions trading presented a win-win situation, an issue remained unaddressed: the social costs of emissions trading. In 1968, Dales had openly acknowledged that, under a market-based system in which pollution is a property right, some regions could end up more polluted than others. He argued that it is beneficial to encourage industry to remain in urban areas by setting the price of rights in less polluted regions higher than in the more polluted region (Dales, 1968). As the thinking went, polluting clean regions was undesirable and should be left for residential purposes. People could choose to live in cleaner areas if they had the money to do so. Dales failed to consider who lived in urban areas, and thus was at risk of getting more pollution than others. During the development of RECLAIM, environmentalists did not overlook the question of who would suffer the negative externalities of emissions trading. The Coalition for Clean Air and Communities for a Better Environment (CBE), two Los Angeles-based environmental organizations,

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and Ashland Oil, Inc. (Ashland, Kentucky) (Lents, 1993). By March 1982, *Chemical Engineering* magazine reported that Jefferson County, Kentucky was the leading locality in developing a framework for such trading (Lents, 1993). After the U.S. EPA initiated an emissions trading policy to offset new sources of pollution, a tradable permit system for existing sources of sulfur dioxide aimed at controlling acid rain became part of the 1990 amendment to the Clean Air Act.

participated in the development of RECLAIM, but ultimately opposed the program on the grounds that it would lead to environmental injustice – the disproportionate burdening on negative externalities on the poor and people of color, and the failure to include the most burdened in environmental decision making.<sup>124</sup>

Emissions trading and environmental justice rose to prominence at the same time, but their intersection was contentious. Even as RECLAIM was developed, the notion of what exactly constituted environmental justice was in flux. On the one hand, the EPA and the District had laws to protect the health and welfare of the public as a whole; on the other hand, there was little precedent to consider how best to address environmental justice. As a result, when environmentalists raised environmental justice concerns during the public comment and testimony periods of RECLAIM rules review, the District refuted the claims, arguing that RECLAIM would not result in significant harm, and would overall reduce air pollution as mandated by existing state and federal legislation.

The fact is, although currently working as intended, in the early years RECLAIM did increase emissions of NO<sub>x</sub> in the year 2000, and credits were costly. So the question must be raised: did RECLAIM result in environmental injustice? In other words, did the increase in NO<sub>x</sub> disproportionately occur in urban areas, areas predominantly populated by the poor and people of color? Furthermore, what does the answer to this question suggest about social movement philosophy at the government level, (un)due risk, utilitarianism, and the future of emissions trading and environmental justice?

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<sup>124</sup> Key environmental justice work includes: United Church of Christ Commission, 1987; Bryant and Mohai, 1992; Bryant, 1995; Bullard, 1999.



This chapter is divided into three sections: the first outlines the structure of RECLAIM and its intended purpose; the second considers the concerns raised by environmentalists regarding the risk of RECLAIM to cause environmental injustice. In order to understand the clash between environmental justice philosophy and emissions trading, this section includes an examination of environmental justice as both a social movement and a government principle. The chapter concludes with a discussion of the District's response to the environmentalists' claims, and the implication of its response on the notion of risk.

#### **4.2 RECLAIM**

When the District decided in March of 1992 to move forward with the development of an emissions trading program, the stakes were high. At the time of RECLAIM's development, the South Coast Air Basin was in nonattainment for both NO<sub>x</sub> and SO<sub>x</sub> (SCAQMD, 1993). Under the traditional command-and-control framework of the 1991 Air Quality Management Plan, stationary sources under the jurisdiction of the District could comply with NO<sub>x</sub> and SO<sub>x</sub> standards by reducing operations or installing control technology. RECLAIM was built atop this command-and-control framework, maintaining the discretion to push polluters into compliance, but giving them the discretion to decide how to comply. In committing to RECLAIM, the District implicitly decided to put other rule-making on hold for a year. If no market was put in place, the District would be behind its own schedule to clean the air by 2010 (Pasternak, 1992).

RECLAIM was designed to achieve the same air quality goals as the 1991 Air Quality Management Plan, but had the potential to accomplish more: it would clean the air with greater efficiency, it would cost less, and it would have fewer adverse effects on the public. Consider its stated goal:

... to achieve the emissions reduction objectives for the Basin by providing facility operators with flexibility to choose how to make emissions reductions, thereby lowering compliance costs and providing incentives for the development of air pollution control technologies. Implementation of RECLAIM will reduce emissions from sources in the program to the same extent they would be required to reduce emissions through implementation of existing regulations and the Air Quality Management Program. RECLAIM is designed to ensure that the program achieves equivalent emissions reduction, and equal or greater level of enforcement, lower implementation costs, fewer job impacts, and no adverse public health impacts compared to the existing program (SCAQMD, 1993:Ex-1)

When implemented, RECLAIM was to be the first regional emissions trading program to include a diversity of polluting facilities in the nation. Initially, the program included 431 stationary facilities that emitted four or more tons of NO<sub>x</sub> and SO<sub>2</sub> per year. The spectrum of sources was broad: facilities included refineries, industrial sources, and power generators. RECLAIM covered about 65 percent of NO<sub>x</sub> emissions and 85 percent of SO<sub>2</sub> emissions from permitted stationary sources, representing 17 percent of the total NO<sub>x</sub> emissions and 31 percent of total SO<sub>2</sub> emissions in the region (SCAQMD, 1994).<sup>125</sup> Between 1994 and 2003, RECLAIM was to reduce stationary source emissions of NO<sub>x</sub> and SO<sub>x</sub> by a rate of 8.3% and 6.8% yearly for overall reductions of NO<sub>x</sub> by 83% and SO<sub>x</sub> by 65% (SCAQMD, 1993:EX-5). This was a great success. As a marketable permit

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<sup>125</sup> Mobile sources actually contribute the most to NO<sub>2</sub> emissions in the region as well as SO<sub>2</sub> emissions (SCAQMD, 1994).

cap-and-trade emissions trading program, RECLAIM would allow stationary point sources to the buy and sell pollution reduction credits among stationary point sources on an open market program (SCAQMD, 1994). Instead of regulating each piece of equipment within a facility, RECLAIM would use the “bubble” concept, and thus regulate the total pollution from point sources within a facility. The bubble concept would streamline the permit process by allowing the District to issue a facility-wide permit indicating all emissions sources, annual reduction targets, quarterly emission limits, and compliance standards.

Actual trading consisted of a multi-step process. The District gave each facility a declining allocation of RECLAIM Trading Credits (RTC) for each year from 1994 to 2003.<sup>126</sup> Baseline 1994 emission allocations were based on its historic level of emissions. This was computed in the AQMP by taking reported 1987 emissions and deducting projected reductions mandated by air quality regulations.<sup>127</sup> According to RECLAIM rules, a facility could buy and sell credits to emit NO<sub>x</sub> and SO<sub>x</sub> in three ways: use all its credits and pollute up to the level the District allowed; reduce its pollution and sell the excess credits to other facilities; or actually *increase* emissions by buying credits from other facilities (SCAQMD, 1993). To discourage that last possibility, the District would each year decrease the number of credits allocated by the RECLAIM program. This, of course, is the “decline” part of the declining cap-and-trade. As the number of credits

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<sup>126</sup> The RTC are denominated in pounds: one RTC equals one pound of emissions.

<sup>127</sup> The District originally planned to have a single expiration date of December 31 each year for all allocations. Concerns about an influx of trading near the expiration date led District officials to randomly divide facilities into two categories of equal size: Cycle One sources with calendar year compliance dates, whose credits expired on December 31 of each year; and Cycle Two sources with a July 1 to June 30 compliance calendar, whose credits expired on June 30. This setup allowed sources in Cycle One to trade with those in Cycle Two, but the expiration dates on the credits do not change.

available decreases, the market price should increase, thus providing incentive to actually reduce emissions rather than just buy credits. In theory, therefore, the cap-and-trade framework encourages polluting facilities to seek the most cost-effective means to comply with air quality standards and deadlines, and safeguard communities from smog.

RECLAIM was an attractive solution to long-standing industry accusations regarding the unfair cost of compliance. Under the command-and-control regulatory system, each facility could be required to cut its emissions by certain amounts, regardless of costs. In an article for the Forum for Applied Research and Policy, Lents presented an example of how trading could save facilities thousands of dollars. In the example, a shipbuilder emits 10 tons a year of pollution but has the potential to eliminate up to 8 tons at a cost of \$2,000 a ton. An electronics firm emits six tons of the same pollutant but must spend \$20,000 to eliminate a single ton. If air pollution guidelines required that 16 tons a year of emissions from both plants be cut in half, under command-and-control, meeting standards would cost the shipbuilder \$10,000 but cost the electronics firm \$60,000. Under an emissions trading framework, the shipbuilder could make the total reduction of eight tons at a cost of \$16,000, and sell three tons of excess reduction credits to the electronics firm at \$10,000 a ton. In this scenario, the electronics company would save \$30,000 and the shipbuilder would profit \$14,000. The environment benefits because the emission reduction requirement is met (Lents, Summer 1993). District studies predicted RECLAIM would save businesses more than \$400 million in compliance costs. RECLAIM would do this by lowering annual compliance costs by 42 percent compared to a command-and-control approach: \$80.8 million versus \$138.7 million (SCAQMD, 1993).

### 4.3 Challenges to RECLAIM

According to Lents, RECLAIM constituted “the most extensive public participation process ever initiated by the [District] for the development of any environmental regulation” (SCAQMD, 1994: 6). Its development involved hundreds of organizations and thousands of individuals who contributed to Public, Business, Labor, Community, Research, and Financial Steering and Advisory Committees, and public comment and hearing periods. Yet, in August 1993, two months before the District Governing Board would vote on the adoption of RECLAIM in the public hearing process for the final review of RECLAIM, a District Board member declared in a newspaper article, that “If the vote [to adopt RECLAIM] were held today, I don’t think it could muster the votes necessary” (Cone, 1993c). Despite the District’s attempt to develop a program able to meet a wide-range of interests and goals, RECLAIM was met with mixed reviews.

Those seeking a business-friendly and economically-sensitive approach to air pollution control applauded RECLAIM. The Regulatory Flexibility Group, representing the biggest industries in the region, supported the program, believing it offered the best way to clean the air given the political and meteorological context (Cone, 1993a). Los Angeles Mayor Richard Riordan believed RECLAIM was “a brilliant idea whose time had come” (Cone, 1993a). Councilman Marvin Braude of the Los Angeles Area Chamber of Commerce, who was also a member of the District Governing Board, called RECLAIM, “a revolutionary, business-friendly way of achieving something we all want – cleaning the air we breathe” (Cone, 1993a).

Small businesses worried that RECLAIM would be costly. The Orange County Chamber of Commerce, the Greater Riverside Chamber of Commerce, the Gas Company, Anheuser-Bush Corporation, and the Economic Development Corporation of Los Angeles County opposed RECLAIM (Cone, 1993a). The division in the business community stemmed from the belief that RECLAIM would benefit oil, power, and other large polluting industries the most. Bruce Brown, Vice President of the Orange County Chamber of Commerce, explained that smaller companies feared they would not be able to participate in the RECLAIM market because they could not afford it (Cone, 1993a). The Southern California Gas Company objected to RECLAIM on the same grounds, arguing that the program would most benefit big business (Cone, 1993c). The rationale was that the biggest businesses were both the wealthiest and the largest polluters. Small businesses and environmentalists feared that, if given the opportunity, big businesses would opt to buy credits, pollute more, and continue to take in revenues from production. Small businesses could not afford to purchase credits to the same extent as big businesses. The Southern California Gas Company proposed an alternative to RECLAIM's participation criteria, suggesting that RECLAIM should be mandatory only for large stationary sources, those emitting 50 to 100 tons of NO<sub>x</sub> per year. Facilities that did not meet these criteria could remain under AQMP controls or volunteer to participate in RECLAIM (Southern California Gas Company, 1993). The District rejected the Gas Company's proposal on the grounds that it limited the scope of RECLAIM.

Environmentalists challenged RECLAIM on several goals. Arguing on familiar moral grounds raised by others in the past about market-based programs, environmentalists argued that polluting industries should not be granted the "right" to

pollute; moreover, RECLAIM would bestow this right on the largest polluters, it could risk jobs at smaller companies, and it could even make the air worse. Environmentalists raised a new argument as well; they maintained that RECLAIM would result in environmental injustice by exacerbating pollution in communities of people of color and the poor. In a comment letter to address proposed RECLAIM rules, Jim Jenal, then Clean Air Program Director for Communities for a Better Environment (CBE) wrote to the District to address the omission of environmental justice categories – income, education, and ethnicity – from the District’s analysis of ozone exposure. Jenal wrote: “the possible disparate impacts on communities of color have been a matter of great concern for CBE” (CBE, 1993). In failing to prioritize the welfare of the local communities, RECLAIM policymakers had simultaneously failed to prioritize the welfare of the Basin’s communities of color.<sup>128</sup>

### *Hot Spots*

The issue of toxic hot spots – concentrated areas of pollution – was directly connected to the issue of environmental injustice because people of color and the poor often reside or work in areas closest to polluting facilities. Studies conducted prior to the development of RECLAIM showed that in the South Coast Air Basin, toxic emissions caused approximately 700 cancer cases annually (SCAQMD, 1987). Studies showed that cancer risk in some areas of the Basin was greater than in others. A District Analysis of toxic hot spots found that overall “the south-coastal, west-central, and northern valley

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<sup>128</sup> According to Jenal’s letter, Henry Hugo who worked with Barry Wallerstein a member of the Socio-Economic Working Group informed him that “the information [about disparate impacts on communities of color] was simply forgotten in the rush to get the [Environmental Impact Report] out the door last week” (CBE, 1993).

regions of the Basin show risk levels ...that are approximately two times greater than the lowest risk levels in regions like Orange County and inland (SCAQMD, 1988). Emission inventories by facilities in Carson and Wilmington, areas populated mostly by minorities, reported releasing 60% of the air toxic benzene emissions to the region (SCAQMD, 1992).

Originally the District had proposed that RECLAIM would include emissions of volatile organic compounds (VOCs, also referred to as reactive organic compounds, or ROCs) in the trading program along with NO<sub>x</sub> and SO<sub>x</sub>. NO<sub>x</sub> and SO<sub>x</sub> emissions originated at combustion sources. Monitoring these would be based on gas measurements using continuous emission monitors (CEM). VOCs are more difficult to measure because they are not homogeneous; some react more readily to than others. In addition, many VOCs are classified as toxic pollutants. For these reasons, Communities for a Better Environment challenged RECLAIM, arguing that inclusion of a VOC market was proof the District sanctioned hot spots (CBE, 1992). The District conceded that RECLAIM had “the potential to create toxic hot spots if owners or operators of affected facilities elect[ed] to comply with requirement of the [RECLAIM] by purchasing emission reduction credits” (CBE, 1992). Yet contradicting this acknowledgement, the District insisted that facilities “will not be allowed to trade toxic air contaminants,” and that furthermore facilities, “will not be allowed to create a toxic health risk as a result of trading activity” (SCAQMD, 1992a). The District the California Environmental Quality Act and the California Air Toxics “Hot Spots” Information and Assessment Act which controlled toxic emissions, were safeguards. Another safeguard was the District’s proposed Rule 1401: New Source Review Carcinogenic Air Contaminants to prevent



toxics from new and modified facilities (SCAQMD, 1992). In order to further study the redistribution of emissions, the District ultimately decided to shelve a VOC market. However, at the time that environmentalists presented their concerns, a VOC program was planned for implementation in 1996.

VOC induced hot spots aside, the RECLAIM Draft Environmental Report acknowledged that NO<sub>x</sub> trading would result in localized ozone hot spots in southern Los Angeles and northern Orange County during a period referred to as the “cross-over” (Fowle, Holland, and Mansur, 2011). In order to facilitate an easy transition to the market-based system until the 2003 deadline, facilities participating in RECLAIM were not held to an emissions cap meaning emissions would have to meet the federal and state standards, but would not have to decline yearly. The District reported that in the years before the cap, it expected NO<sub>x</sub> emissions to slightly increase. Both the American Lung Association and Communities for a Better Environment challenged the District’s approach to the short-term NO<sub>x</sub> increases. The American Lung Association connected the impact to potential increases in ozone. Nitrogen oxides react with volatile organic compounds in the presence of sunlight to create ground-level ozone. Ozone can cause respiratory problems including triggering asthma, and aggravating pneumonia and bronchitis. The Association criticized the District’s failure to estimate the impact of delayed reductions or ambient concentrations on the health of people in areas of the Basin due to ozone exposure and compared them to the human health effects of the 1991 Air Quality management Plan (American Lung Association, 1993). Communities for a Better Environment (CBE) argued:

... localized impacts are impacts nonetheless. Because ground-level ozone is a known toxic chemical with serious health effects. For the people living in ozone hot spots, any ozone increase will be highly significant. In short, affected communities have the right to know that the District is willing to sacrifice their health so that other communities may have somewhat cleaner air, and so that industry may save money (CBE, 1993).

CBE accused the District of putting the interest of industry and those who could afford to live in cleaner places above those of people who could not. In developing RECLAIM, CBE believed the District had failed to pay adequate attention to those most impacted by the changes in local air quality due to trading patterns. In one comment letter addressing the proposed RECLAIM Rules, Jim Jenal, wrote about the omission of environmental justice categories – income, education, and ethnicity – from the District’s analysis of ozone exposure. Jenal wrote to the District, the “possible disparate impacts on communities of color has been a matter of great concern” for CBE (1993). In failing to prioritize the welfare of the local communities, RECLAIM policymakers had simultaneously failed to prioritize the welfare of the Basin’s communities of color.<sup>129</sup>

Ultimately, CBE wanted the District to reject RECLAIM completely in favor of command-and-control embodied in the 1991 Air Quality Management Plan (CBE, 1993; Drury et al., 1999). In the very least, CBE argued that RECLAIM should incorporate an offset requirement equivalent to the one required by the federal Clean Air Act for new and modified sources in nonattainment areas. According to the federal Clean Air Act, new and modified sources in extreme nonattainment areas were required to offset their

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<sup>129</sup> According to Jenal’s letter, Henry Hugo who worked with Barry Wallerstein a member of the Socio-Economic Working Group informed him that “the information [about disparate impacts on communities of color] was simply forgotten in the rush to get the [Environmental Impact Report] out the door last week” (CBE, 1993).

emissions at a ratio of 1.5:1 from other facilities and a ration of 1.3:1 when the offset is internally derived (42 U.S. C. 7511a(e)(1)(2) 1993). RECLAIM did adhere to the California Clean Air Act, which required that control agencies to ensure that new and modified sources would not contribute to an increase in emissions, but it did not offer an offset requirement equivalent to its federal counterpart (SCAQMD, 1993). CBE argued that the lack of an offset requirement identical to the federal one indicated that RECLAIM violated the federal Clean Air Act (CBE, 1993a).

Hot spots are not only caused by stationary elements. Vehicles that move around and cluster can also create hot spots. RECLAIM Rule 2008 allowed a person or facility to earn trading credits by scrapping old, polluting vehicles (SCAQMD, 1993). This rule, which built on the Rule 1610, proved a source of contention because automobile emissions are a large source of pollution in the Basin. CBE argued that a mobile source emissions credit program incorporated into RECLAIM would open “a Pandora’s box of air pollution programs,” by allowing RECLAIM facilities to obtain credits from car-scraping (CBE, 1993). They worried that automobile emissions previously distributed around the Basin, once traded on the RECLAIM market, could be used to allow increased emissions at individual stationary point sources. The District argued that to ensure that mobile source credits represented real emissions reductions, an individual should have to prove that the vehicle intended for scrapping was registered and used in the Basin. Furthermore, Rule 2008 limited the number of scrapped vehicles eligible for trading credits to 30,000 (SCAQMD, 1993).

*Delayed Equivalency*

The District intended RECLAIM to produce emission reduction results equivalent or better than those of the 1991 Air Quality Management Plan (AQMP). Yet, the RECLAIM Proposed Rule Report acknowledged that equivalency would be delayed. The District estimated that its equivalency would not be reached until 2000 for NO<sub>x</sub> and 2003 for SO<sub>x</sub> (SCAQMD, 1993). Environmentalists objected to this delay. The Coalition for Clean Air argued that RECLAIM “clearly backslides from the 1991 Air Quality Management Plan,” (Coalition for Clean Air, 1993). Furthermore, CBE argued that delayed equivalency made RECLAIM illegal because it violated the California Environmental Quality Act (CEQA) which clearly states that RECLAIM must not “in any manner, delay, postpone, or hinder district compliance with state ambient air quality standards” (CBE, 1993).

Communities for a Better Environment (CBE) linked RECLAIM’s delayed equivalency to the baseline allocations of emissions credits to polluting facilities. RECLAIM rules allowed businesses to choose their highest production year between 1989 and 1992 for initial allocations and between 1987 and 1992 for their 2000 allocation. The District proposed these baseline allocations to circumvent the problem of holding businesses to recessionary levels of production (SCAQMD, 1993). The Coalition for Clean Air rejected the District’s recession-based rationale (Coalition for Clean Air, 1993). CBE estimated that the District’s approach to baselines would increase emissions by 26,280 tons for nitrogen oxides and 16,790 tons for sulfur oxides for the first eight years of the program due to these initial allocations (CBE, 1993). Furthermore, by allowing businesses to choose peak production levels, the District was not taking into account fluctuations in production (Coalition for Clean Air, 1993). Both the Coalition for

Clean Air and the Natural Resources Defense Council recommended that the District base allocations on a facility's average production level, as opposed to peak levels (Coalition for Clean Air, 1993). The District believed the concerns about equivalency were unwarranted because the equivalency requirements in the Health and Safety Code of the California Environmental Quality Act mandated that RECLAIM endpoints be the same as emission inventory endpoints that would result from the full implementation of the 1991 AQMP" (CBE, 1993).

### *Monitoring and Enforcement*

Hot spots were just the tip of the iceberg. Both Communities for a Better Environment and the Coaliton for Clean Air, as well as the Southern California Gas Company, expressed concern about the District's ability to enforce RECLAIM rules. Under command-and-control, the District could ensure compliance with legislation by monitoring the installation and operation of control technology (Jenal, 1993). Under a market-based program like RECLAIM, enforcement by regulators required the ability to determine facilities emissons and allocation at any given time, with the overall goal being compliance with an emissions cap. Under RECLAIM, the District placed the burden of enforcement on regulated facilities, the buyers and sellers of credits. Facilities needed to ensure that claimed emissions reductions had actually occurred before and after all trading credit sales. Furthermore, the proof of reductions was not required until year-end audits (SCAQMD, 1992). The Coaliton for Clean Air believed that under RECLAIM, polluting facilities could cheat the system by overestimating emission reductions, and by

so doing pollute the air and increase their profits from selling credits or save money by not buying credits (Coalition for Clean Air, 1993b).

The Coalition had reason to worry. The risk of discovering violations was documented and facilities openly criticised the cost of enforcement (Southern California Environmental Digest, 1992). For example, the Southern California Gas Company argued RECLAIM imposed costly monitoring and enforcement. According to the District, monitoring, recording, and recordkeeping would cost about \$12.8 million per year more from 1994 to 1995 than command-and-control. Continuous emissions monitoring (CEM) would cost over \$10 million (SCAQMD, 1993). The District argued that the overall cost savings of RECLAIM justified these higher monitoring, recording, and recordkeeping costs. The District estimated that the total cost savings of RECLAIM as \$57.9 million per year between 1994 and 1999 (SCAQMD, 1993b).

Risk assessment put into quantitative form the various elements of RECLAIM's trading model. Specifically, risk assessment justified RECLAIM by assigning monetary values to the externalities of industrial production. Not all externalities are easily assigned a pricetag. Like environmentalists, who in the 1980s challenged the use of cost-benefit analysis in environmental policies on moral grounds, the Coalition for Clean Air, Communities for a Better Environment, and their allies challenged giving industries the right to pollute the air that people breathe. Furthermore, because of the potential concentrated nature of the pollution RECLAIM could create, the District was valuing the majority over minorities.

### *Public Participation*

Communities for a Better Environment also argued that RECLAIM prevented public participation in the regulatory process because it did not give the public an opportunity to review trades (Jenal, 1993). The organization argued the “community will be in the dark about a facility’s pollution plans” (Jenal, 1993:2). Under RECLAIM, the SCAQMD made decisions about the amount of emissions allowed, making total emissions a public decision (Polesetsky, 1995), but giving polluters authority over trades. Trades can take place without public input (SCAQMD, 1993). Already skeptical about the District’s ability to safeguard the public through designated trading zones and an annual cap on emissions, Communities for a Better Environment thought that trading transparency would give communities directly impacted by trades a say in their own exposure to emissions. But CBE did not get what it wanted. The District rejected this recommendation on the grounds that the public was too ill informed to comment on trading, and would slow the permitting process (CBE, 1993).<sup>130</sup>

#### **4.4 The District’s Position**

The District repeatedly maintained that RECLAIM would not create hot spots, noting that “toxic emissions will not be allowed to increase as a result of trading”

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<sup>130</sup> Rowe and Frewer (2005) have created a typology of participatory mechanism that emphasizes process. The authors suggest the term public engagement to replace the overused and ambiguous public participation. The new terminology emphasizes information flow and transfer between sponsors who raise the question, policy, etc under consideration and the public (relevant population). “Engagement” acknowledges that there are different patterns to describe the flow of information. Participation suggests that all parties involved have an equal say in decisions. This is not the case and it should not be (see (Moore 2006). In truth, someone frames sets the agenda in any decision making process. This, by virtue of circumstance starts of discussions on an uneven playing field. Local knowledge or expert knowledge, all stakeholders have their own storylines and some knowledge is more qualified than others. Maarten Hajer (1997) uses the concept of storylines to understand the differences in interpretations of problems. Storylines present an explanation of causes and effects. They allow actors to position themselves in the social world. There is no guarantee that the storylines of scientific experts, policymakers, and the lay public will be compatible. For other takes on science, citizenship and identity see (Jasanoff, 2004). For an example of the benefits of local knowledge on defining a societal concern see Epstein (1996) and Wynne (2007).

(SCAQMD, 1992a). The District asserted that RECLAIM rules and design would prevent adverse effects. Among the most notable of RECLAIM's provisions was an annually declining cap on emissions. Furthermore, the District insisted that RECLAIM complied with existing state and federal laws which required that the program decrease overall emissions to the same extent as the 1991 Air Quality Management Plan. The 1991 Air Quality Management Plan was the District's failsafe; there was no need for the District to abandon RECLAIM, for if it failed rules could be modified or replaced in favor of command-and-control (SCAQMD, 1993). This was one benefit of grafting market-based tools onto a command-and-control framework.

#### **4.5 Understanding the Clash**

The clash between environmental justice concerns and RECLAIM stem from two factors. During RECLAIM's development, both environmental justice and air toxics rules were in flux. The District lacked a precedent outlining how best to account for both in RECLAIM rules. In other words, the District developed RECLAIM rules based on laws in existence but not fully implemented. In lieu of definitive guidelines, the District adopted original RECLAIM rules based on the Clean Air Act National Ambient Air Quality Standards (NAAQS).

##### *Air Toxics*

Originally addressed in the 1970 Clean Air Act, National Emissions Standards for Hazardous Air Pollutants (NESHAPs are also referred to as "air toxics") are stationary source standards for hazardous air pollutants that may cause cancer, other serious health



effects, or death, but are not covered by NAAQS.<sup>131</sup> The EPA experienced difficulty developing NESHAP standards based on risk defined as “an ample margin of safety.” Faced with the challenge of finding the balance between margins of safety that were too strict or not strict enough, the EPA set standards for only seven NESHAPs between 1970 and 1990 (Title 40 of the Code of Federal Regulations Part 61). The 1990 Clean Air Act took a different approach to federal responsibility for air toxics by requiring the EPA to set standards for NESHAPs (at the time 1989 hazardous air pollutants) and regulate all sources of air toxics based on Maximum Achievable Control Technology (Pub. Law 91-604, 42 U.S. C. 7412).<sup>132</sup> The EPA would then assess risk of public health and environmental risks based on the performance of the technology (“Clean Air Act” 42 U.S.C. 7401-7671).<sup>133</sup> The EPA was still in the process of establishing and publishing NESHAP standards when RECLAIM was being developed.

The state of California had its own laws to address air toxics. In 1982, in response to the Clean Air Acts requirement that states enforce NESHAPs, California adopted legislation regarding the Emission of Toxic Air Contaminants. According to the legislation,

“No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons

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<sup>131</sup> It defines hazardous pollutants as: “an air pollutant to which no ambient air quality standard is applicable and which in judgment of the Administrator [of the EPA] causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness” (Pub. Law 91-604, 42 U.S. C. 7412)

<sup>132</sup> NESHAPs were technology-based. The EPA was to enforce them through maximum achievable control technology (MACT) requirements. According to these requirements, regulated facilities were required to control emissions as well as the best performer in the same industrial category (“Hazardous Air Pollutants.” Title 42 U.S.C 7412).

<sup>133</sup> Section 112(d)(6) of the Clean Air Act requires the EPA to review and revise MACT standards as necessary.

or the public, which cause, or have a natural tendency to cause, injury or damage to business or property” (Cal. Health and Safety Code 41700).

To build on this law, in 1983 the California legislature enacted AB 1807, authored by Assemblywoman Sally Tanner. It was intended to establish a statewide procedure for formally identifying airborne toxic substances and to provide for control over emissions. Declaring it necessary for the state to take action to protect public health despite lack of “absolute and undisputed scientific evidence” to determine the exact nature and extent of risk from toxic air contaminants, AB 1807 required that “the identification and regulation of toxic air contaminants should utilize the best available scientific evidence gathered from the public, private industry, the scientific community, and federal, state, and local agencies, and that the scientific research on which decisions related to health effects are based should be reviewed by a scientific review panel and members of the public” (Cal. Health and Safety Code 39650). Regulators based the identification and control of a toxic air contaminant, defined by AB 1807, as a pollutant which “may cause or contribute to an increase in mortality or an increase in serious illness or which may pose a present or potential hazard to human health” (Cal. Health and Safety Code 39655) on risk along the same lines as risk assessment and risk management adopted by Ruckelshaus and the EPA.<sup>134</sup>

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<sup>134</sup> In the Risk Assessment Phase, CARB informed by a scientific review panel, proposed candidates for designation as “Toxic Air Contaminants” Cal. Health and Safety Code 39660-39662. During the Risk Management Phase, CARB works with local districts to determine the control measures for local district adoption and implementation Cal. Health and Safety Code, 38655-67). In 1983, the report *Risk Assessment in the Federal Government: Managing the Process* was published (NRC, 1983).

Created in 1987 “in the wake of publicity surrounding the planned and unplanned releases of toxic chemicals into the atmosphere,” the California Air Toxics “Hot Spots” Information and Assessment Act (AB 2588) was intended to correct the inadequacies in implementation of the Federal Clean Air Act’s provision to establish NESHAPS and California’s toxic air contaminant identification and regulation program. It did this by establishing a process to evaluate and control the low level of emissions of hundreds of substances suspected of posing cancer or other health risks to citizens in communities located around industrial plants and other chemical-intensive businesses (Cal. Health and Safety Code 44300-44384). The Hot Spots Act went beyond the scope of AB 1807 by shifting the responsibility for risk assessment from the state to the emitting businesses. The Hot Spots Act required control districts to review the emissions inventory data provided by facilities and, after consultation with CARB and the Department of Health Services, prioritize and categorize facilities in high, medium, or low priority for risk assessments. Priorities were set based on potency, toxicity, quantity, and volume of hazardous materials released, and the proximity to sensitive receptors, like schools, daycare centers, and residences (Cal. Health and Safety Code 44360). However, at the time of RECLAIM’s development, the District was still in the process of outlining how to implement the Hot Spots Act.

The consequence of in-flux state and federal air toxic laws was this: at the time of RECLAIM’s development, no regulatory program existed at the state or federal level that could adequately address RECLAIM’s potential to create hot spots (Cohn, 1993).

*Environmental Justice*

RECLAIM was designed and implemented during a pivotal time in the history of the environmental justice (EJ) movement, and it shaped debate surrounding new policy development. The District admitted that the trading of volatile organic compounds could lead to hotspots in communities of color, yet maintained that RECLAIM was legal. In order to understand why the District and environmentalists disagreed on the significance of hotspot creation, it is necessary to understand environmental justice as both a social movement and as a government principle still poorly defined at the time of RECLAIM's development.

Environmental justice and market-based approaches to environmental regulation share a historical timeline. In 1967, the same year that policymakers discussed how to make the Air Quality Act fair to both industry and the public, an eight year old African American girl drowned at a garbage dump situated next to an elementary school and a city park in an a predominantly African American neighborhood (Bullard, 1994). This event triggered riots among African American students at Texas Southern University who, in turn, found allies among civil rights activists (Bullard, 1994). Drawing attention to the issue of hazardous waste in communities of color, the event came to mark the beginning of growing concern for race-based environmental injustice. At the time, the relationship between human health effects and environmental problems was well documented (Carson, 1962; Levine, 1982). But the Texas garbage dump drowning drew attention to people of color and the poor as disproportionately affected by pollution.

After the Texas incident, and around the same time as the adoption of the Clean Air Act of 1970 and the first publications of studies on emissions trading, scholars including Freeman (1972), Burch (1976), Berry (1977), and Asch and Seneca (1977)

reported correlations between socioeconomic status and air pollution in U.S. urban centers. These studies represent some of the earliest empirical evidence of environmental injustice, demonstrating that people of color and low-income communities had been disproportionately located in and around industrial facilities and bore the majority of the environmental burdens.

In the late 1970s and early 1980s, the EJ movement, riding on the back of the national and international attention of the Love Canal controversy, gained strength in communities of color and poor and working class white communities in the United States.<sup>135</sup> In the white working-class communities, the movement took the form of a “citizen-worker” or “anti-toxics” movement (Cable & Cable, 1995; Gould, Schnaiberg & Weinberg, 1996; Levine, 1982). In communities of color, the movement took the form of the “People of Color Environmental Movement.” Toxic waste pollution was a concern for early EJ groups, but in general they were responding to air, water, and soil pollution in their communities. In 1979, a group of middle-class African American residents in Houston, Texas, formed a community action group to block a hazardous waste facility from being built in their neighborhood. The community filed suit to prevent the siting in *Bean v. Southwestern Waste Management*. This lawsuit was the first ever to challenge the siting of a waste facility under civil rights law (Bullard, 1983). In the early days (circa 1970s and 1980s), a fight for environmental justice was a fight against environmental racism. In the words of Reverend Benjamin Chavis, executive director of the United Church of Christ Commission for Racial (CRJ),

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<sup>135</sup> In the mid-1970s, Love Canal, a neighborhood in Niagara Falls, New York gained attention after it was revealed that the area had formerly been a toxic waste dump, and as a result a high rate of birth defects, miscarriages, and various illnesses plagued Love Canal’s community (Levine, 1982; Blum, 2008).

“Environmental racism is racial discrimination in environmental policymaking. It is racial discrimination in the enforcement of regulations and laws. It is racial discrimination in the deliberative targeting of communities of color by pollution industries. It is racial discrimination in the official sanctioning of the life-threatening presence of poisons and pollutants in communities of color. And it is racial discrimination in the history of excluding people of color from the mainstream environmental groups, decisionmaking boards, commissions, and regulatory bodies (Bullard, 1999:3).”

In many respects, the environmental justice movement was the environmental racism movement. Environmental racism served as the early framing of what would become the EJ movement by explicitly identifying the problem and the cause for concern for activists and scholars. From Chavis’ perspective, environmental racism was *deliberate* environmental oppression of people of color by authority figures. This purposeful oppression comes in the form of disproportionate distribution of pollutants in communities of color and the exclusion of people of color from membership on decision-making boards. Robert Bullard, a leading activist and foremost scholar of environmental justice, broadened the definition of environmental racism by acknowledging that it is “any policy, practice, or directive that differentially affects or disadvantages (*whether intended or unintended*) individuals, groups, or communities based on race or color” (Bullard,1994).<sup>136</sup> Bullard’s definition captures the full complexity of the problem. It is not always the case that environmental racism is intended; those in positions of authority at the local, regional, state, and national levels can, by virtue of the political structures they maintain, unintentionally oppress the most vulnerable members of society. The

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<sup>136</sup> Emphasis added.

challenge for EJ scholars and activists is to uncover the policymaking structures that result in environmental racism and reform them.

In 1982, EJ drew national attention when an African American community in Warren County North Carolina organized to protest the siting of a polychlorinated biphenyl (PCB) landfill. Warren County was the poorest county in North Carolina, and its population was more than 50% Black (Russell, 1989; Szasz and Meuser, 1997). The African American community in Warren argued that the siting of the landfill in a poor black community was not coincidental. The Warren incident's visibility in news reports inspired two key studies, one by the U.S. General Accounting Office (GAO) and one by the United Church of Christ (UCC) Commission for Racial Justice. The GAO examined the demographics of the communities near four large commercial hazardous waste landfills in the southeastern United States. It found that three of four off-site commercial hazardous waste landfills in eight southeastern states were located in predominately African American communities (U.S. GAO, 1983). The study "Toxic Waste and Race in the United States," conducted by the United Church of Christ, found that "three out of every five Hispanics and African Americans lived in communities with uncontrolled toxic waste sites" (Chavis & Lee, 1987:14). The study concluded that "race has been a factor in the location of commercial hazardous waste facilities in the United States" (Chavis & Lee, 1987:15). In addition to these two landmark studies, Bullard's 1983 study of solid waste sites in a black Houston communities (Bullard, 1983) found that 21 of Houston's 25 solid waste facilities were located in African American neighborhoods.

While in many ways effective, the frame of environmental racism was also limiting in the way in which it boiled down unequal distribution of environmental

burdens to race alone. In truth, environmental inequalities are born out of a variety of complex social conditions and ideologies. By the early 1990s, environmental racism was a clear cause for concern, but it was not the only factor in environmental inequality. An extensive review of 15 case studies by Bryant and Mohai (Bryant and Mohai, 1992) showed that the distribution of pollution was inequitable by income *and* in all but one case inequitable by race. Bryant and Mohai presented their findings at the Conference on Race and Incidence of Environmental Hazards held at the University of Michigan. During this conference, researchers and activists came together to discuss various findings and to meet with state and federal officials to discuss strategies for change (Szasz and Meuser, 1997). Similar studies were published in the '90s by plural groups. These studies showed a broad range of issues of environmental racism outside of the siting of landfills and hazardous waste facilities. Issues included children's exposure to lead, farm worker exposure to pesticides, contaminated air and drinking water, and placement of transportation thoroughfares.

It was also in the 1990s that activists and scholars replaced the notion of environmental racism with environmental equity. Equity was thought to broaden the emerging movement by capturing racial inequalities as well as gender and social class environmental inequalities (Taylor, 2000). However, the idea of equity came and went quickly for movement activists who believed that equitable distribution was not at all their aim. For them, pollution prevention – not redistribution – was the goal.<sup>137</sup> Yet as the

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<sup>137</sup> Holifield (2001:80) has observed that some scholars still use environmental equity. These scholars who include Zimmerman (1993), Bullard (R. Bullard, *Dumping in Dixie: Race, Class, and Environmental Quality* 1990) and Cutter (1995) acknowledge that there are various types of equity relevant to the study of environmental inequalities, including geographic equity, social equity, distributional equity, outcome equity and procedural equity.



EJ movement gained momentum and legitimacy, largely because of its quantitative evidence, the EPA latched onto “equity” measured quantitatively as the basis for federal environmental justice guidelines. In the 1990 report *Environmental Equity: Reducing Risk for All Communities*, the EPA claimed that environmental equity lent itself to measurement using methods of scientific risk analysis (EPA,1990; Holifield 2001).

According to the report (EPA, 1990:10):

“The distribution of environmental risks is often measurable and quantifiable. The [EPA] can act on inequities based on scientific data. Evaluating the existence of injustices and racism is more difficult because they take into account socioeconomic factors in addition to the distribution of environmental benefits...Furthermore, environmental equity, in contrast to environmental racism, includes the disproportionate risk burden placed on any population group, as defined by gender, age, income, as well as race.”

With this EPA report, for the first time the federal government acknowledged evidence that the poor and people of color were the most adversely impacted by pollution. The EPA recommended that were it appropriate, it should “assess and consider the distribution of projected risk in major rulemakings and Agency initiatives” (EPA, 1990:28).

Following the EPA’s report, environmental justice went from a predominately grassroots social movement to a rubric employed by federal and state policymakers (Holifield, 2001). In the years following the report, bills were introduced to address environmental justice issues; for example, Senator Al Gore proposed the “Environmental Justice Act of 1992.” The bill required the EPA to evaluate human health in 100 counties containing the highest total weight of toxic chemicals, and, if health effects were found, to impose regulations for future siting. Representative Cardiss Collins proposed the

“Environmental Equal Rights Act of 1993.” This bill attempted to amend the Solid Waste Disposal Act in order to prevent certain waste facilities from being constructed in EJ communities.

Neither of these bills passed Congress (Liu, 2000), but environmental justice bills were enacted in Arkansas, Florida, Louisiana, Tennessee, and Virginia, and considered in Georgia, Carolina, New York, and California. Various environmental justice advisory committees became commonplace as well (Liu, 2000).

At the state level, environmental justice legislation was not enacted until October 1999 (Peter, 2010).<sup>138</sup> Prior to this, Governor Pete Wilson vetoed environmental justice bills. The first of these, AB 937, was introduced in March of 1991 and passed the State and Assembly. It proposed to require the submission of project site demographics, including race and income census data, for specified high-impact development projects. If such information was not submitted, projects would not be approved (Peter, 2010 ). Governor Wilson rejected the proposal, nodding to “low-income and minority communities” near industrial facilities, but believing waste facilities “are necessary to the quality of life in California and must be developed” (quoted in Peter, 2010 :544). Furthermore, Governor Wilson argued the California Environmental Quality Act and public hearing already considered the welfare of Californian communities (Peter, 2010). In September 1990, the District established a committee of its own called the Ethnic Community Advisory Council to serve as an advisory body to the Governing Board with

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<sup>138</sup> SB 115 was signed by Governor Gray Davis. It defined environmental Justice as “the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.” The legislation required the Governor’s Office of Planning and Research serve as the coordinating agency in state government for environmental justice programs (Cal. Govt. Code 65050.12; Cali. Pub. Res. Code 72000-01).

expertise on the impact of air quality issues on the ethnic communities in the South Coast Air Basin. Few records even acknowledge the group's existence, suggesting that it had little, if any, political clout (SCAQMD, 2014).

The Clinton Administration challenged perspectives like these when it legitimized the existence of the environmental justice movement by creating the EPA's National Environmental Justice Advisory Council in the Office of Environmental Justice. The National Environmental Justice Advisory Council (NEJAC), a federal advisory committee to the EPA, was established in September 1993, a mere month before the final vote to accept RECLAIM was cast. Consisting of members representing the business, nonprofit, and academic sectors, the Council did not provide definitive standards; it merely dispensed advice and recommendations to the EPA on how to integrate EJ into programs, policies, and activities (EPA, 2012).

The following year, Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (Clinton, 1994). The Order was intended to help address EJ within the framework of existing laws, and regulations addressed environmental injustices within federal laws and regulations by reinforcing the Civil Rights Act of 1964, Title VI. Whereas the 1990 EPA report on equity suggested that environmental programs and policies shied away from focusing on the any one group, Clinton's order explicitly identified the communities of concern, directing each federal agency to "make achieving environmental justice part of its mission" and to consider "disproportionately high and adverse human health or environmental effects of its programs, polices, and activities on minority populations and low-income populations" in the United States (Clinton, 1994). This Executive Order

called for improved methodologies for accessing and mitigating impacts, health effects from multiple and cumulative exposure, collection of data on low-income and minority populations who might be disproportionately at risk, and impacts on subsistence fishers and wildlife consumers. It also encouraged participation of the impacted populations in the various phases of assessing impacts, including scoping, data gathering, alternatives, analysis, mitigation, and monitoring (Bullard, 2004). In addition, it established an Interagency Working Group on Environmental Justice to help guide federal agencies. It also required each federal agency to develop an environmental justice strategy. The federal definition of environmental justice states:

“The goal of environmental justice is to ensure that all people, regardless of race, national origin or income, are protected from disproportionate impacts of environmental hazards. To be classified as an environmental justice community, residents must be a minority and/or low-income group excluded from the environmental policy setting and/or decision-making process; subject to a disproportionate impact from one or more environmental hazards; and experience a disparate implementation of environmental regulations, requirements, practices and activities in their communities (EPA, 2014).”

Clinton successfully made EJ a government concern. However, at the time that RECLAIM was being developed, clear definitions and guidelines for taking environmental justice concerns into account did not exist at a level that would encourage the District to do as environmentalists suggested and reject RECLAIM on environmental justice grounds. The State of California did not explicitly enact an environmental justice policy until 1999, when Governor Gray Davis signed SB 115 which defined “environmental justice” as “the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies” (Cal. Govt. Code 65040.12). Pressures

such as environmentalist complaints, reports proving environmental injustice was real, and rising public attention to the environmental justice movement, all of which were at their height in the 90s, likely stimulated the District to act. The District began to evaluate EJ's socioeconomic impacts, including job loss and health impacts on ethnic communities, as well as appoint "Community" steering and advisory committees to aid in RECLAIM's development and hold public hearings to discuss RECLAIM rules. Yet the Clean Air Act, California Environmental Quality Act, National Environmental Policy Act, the California Air Toxics Act, and the EPA's acceptance of environmental equity were most influential in the assessment of RECLAIM rules. These policies emphasized fairness and overall reductions by specific dates, but said nothing specifically about environmental injustice.

#### **4.6 RECLAIM Worked?**

From a narrow point of view, RECLAIM worked as intended; it has improved air quality. A little over a decade after its implementation, RECLAIM has resulted in an additional 68 percent (27,643 tons) and 59 percent (6,073 tons) decrease in allowable emission for NO<sub>x</sub> and SO<sub>x</sub> respectively; and a 62 percent (15,758 tons) and 50 percent (3,611 tons) reduction in actual emissions for NO<sub>x</sub> and SO<sub>x</sub> respectively (SCAQMD, 2007). A review of RECLAIM found that the program stimulated technological development, helped save or create more than 10,000 jobs, and reduced compliance costs below those projected at the time of the program's adoption (National Center for Environmental Economics, 2014). Analysis of the geographical distribution of emissions

during the first eight years of the program did not show any distinct shift in the geographical distribution of emissions.

Analysis of per capita exposure (the length of time each person is exposed) to ozone in 1998 and 2000 shows that the Basin achieved the December 2000 target for ozone well before the deadline. In fact, Los Angeles County, Orange County, and the South Coast Air Basin overall achieved attainment with the December 2000 target prior to 1994 and Riverside and San Bernardino Counties achieved attainment in 1996. Additionally, RECLAIM did not create adverse effects from air toxics (Loung, et al., 2003). When compared to emissions from California facilities located in nonattainment counties, operating the same industries with similar pre-RECLAIM emissions levels, emissions reported by facilities in the RECLAIM program fell by significantly more over a fifteen year period (1990-2005) (Fowlie, Holland, and Mansur, 2011). Evidence suggests that no significant increases in emissions on particular racial or income groups resulted from RECLAIM (Fowlie, Holland, and Mansur, 2011).

Although total NO<sub>x</sub> emission declined overall under RECLAIM, in the early years (2000 and 2001) when the cap in emissions was not binding, NO<sub>x</sub> emissions were exceeded and credit prices increased (Fowlie, Holland, and Mansur, 2011; Inside CAL/EPA, 2000; OECD, 2004).<sup>139</sup> When the District allowed individual facilities to choose baseline allocations facilities chose maximum production levels for the basis of their allocations. High initial allocations led to a ready supply of credits until the year 2000, reducing pressure for facilities to install controls (SCAQMD, 2007). As a result,

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<sup>139</sup> The OCED estimated that in 2000, NO<sub>x</sub> exceeded the RECLAIM cap by about 6 percent (OECD, 2004). After what was called the crossover point, the point at which the cap on emissions became binding, the average rate of emissions decrease among RECLAIM facilities exceeded that of non-RECLAIM facilities (Fowlie, Holland, and Mansur, 2011).

emissions were exceeded. At the same time, California's energy crisis, which began in 2000, caused RECLAIM credit prices to increase and some facilities in the market had difficulty meeting emission levels resulting in reported emissions exceeding emissions allowed under the program.<sup>140</sup> The operation of power producing facilities in response to energy demands caused aggregate emission in the RECLAIM program for Compliance Year 2001 to exceed allocation by 28 tons (less than one-quarter of one percent) (OECD, 2004). In response to the increases in NO<sub>x</sub> emissions, the District devised provisions that called for future trading credit allocations to reflect the excess emissions. In addition, the district passed changes to RECLAIM that suspended participation by electricity generators and returned the control of electricity generators' emissions temporarily to command-and-control (OECD, 2004).

Average NO<sub>x</sub> emissions at RECLAIM facilities decreased by 70 percent overall between 1990 and 2005, but some argue that under a focused microscope, this average masks increases in emissions exposure in certain neighborhoods (Fowlie, Holland, and Mansur, 2011). One study found that all groups experienced a reduction of emissions under RECLAIM, however variations of the extent of reduction varied by class and race. High-income whites saw the largest reductions; low-income blacks saw the smallest reductions. Over all races and ethnicities, high income households experienced the largest

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<sup>140</sup> In response to NO<sub>x</sub> credit price increases, the District amended rules to include bifurcating power producing facilities from the rest of the RECLAIM facilities, requiring power producing facilities and facilities with annual emissions greater than 50 tons to submit compliance plans, and setting up RECLAIM Reserve to provide emission reductions to reduce credit demand. During this time SO<sub>x</sub> emissions from RECLAIM facilities were below allocations, as were NO<sub>x</sub> emissions from non-power producing facilities (Luong et al., 2003).

reductions. Across all incomes, white residents experienced the largest reductions in emissions (Fowlie, Holland, and Mansur, 2011). What can be made of this?

Four years after the adoption of RECLAIM, CBE challenged emissions trading in the Basin, this time based on the claim that emissions trading had indeed violated Civil Rights Law. The detail at stake was something called Marine Tank Vessel Operations Rule 1412, which required all marine tank vessels to limit emissions of volatile organic compounds (VOCs), which are indeed toxic gases, to a predetermined level. CBE claimed that oil companies used Rule 1610 – the Old Vehicle Scrapping Rule 1610 – instead of the 1142 in order to evade its legal responsibility to control VOCs. These gases are released when VOC- laden oil is emitted into the air after oil is loaded into a tanker. To meet Rule 1142 standards, marine terminal facilities sometimes installed expensive vapor recovery systems. CBE argued that four oil companies, Unocal, Chevron, Ultramar, Tosco and GATX purchased credits obtained under Rule 1610 to meet the requirements of Rule 1142, saving money instead of lowering their emissions (CBE v. Chevron, 1997a, 1997b; CBE v. GATX, 1997 ; CBE v. Tosco, 1997 ; CBE v. Ultramar, 1997a, 1997b ; CBE v. Unocal, 1997a, 1997b ; CBE v. SCAQMD, 1997).

In doing so, CBE argued, the District and oil companies violated Title VI of the Civil Rights Act, as well as EPA implementing regulations and Executive Order 12898. According to the Civil Rights Act Title VI, recipients of government funds must not use their funding in a discriminatory manner. The Civil Rights Act (1964) states: “No person in the United States shall, on the ground of race, color, or national origin be exclude from participation in, be denied the benefit of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.”



The oil companies saved money by not installing vapor recovery equipment, but they did so at the expense of San Pedro and Wilmington residents, the majority of whom were Latinos, when increased VOC emissions were produced by their facilities. As a federally funded agency, the District could not support programs that impacted members of minority groups even if the harmful impact on a minority community was unintended (Civil Rights Act of 1964; Fisher, 1995).

CBE believed that the issues raised by Rule 1610 were characteristic of the problems with emissions trading programs in general. When CBE challenged RECLAIM in 1993, it used empirical evidence provided by its own experts to argue in letters and in public testimony that emissions trading jeopardized the health and welfare of communities (CBE v. SCAQMD, 1997). CBE called for the abandonment of RECLAIM and emissions trading in general. Still backed by its experts, but not arguing to eliminate emissions trading entirely, CBE's lawsuits specifically challenged loopholes created when command-and-control and market incentives are poorly integrated (Clifford, 1997a; Clifford 1997b).<sup>141</sup> In this case, continuing to pollute instead of installing vapor recovering technology resulted in environmental injustice.

This time CBE was heard. As a result of CBE's 1997 lawsuit, the California EPA put all District credit rules and trading programs on hold; the United States EPA made EJ concerns part of the approval of any new pollution trading schemes, and the District

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<sup>141</sup> For and in depth legal analysis of CBE's 1997 administrative and civil suits see Chinn (1999).

Board of Directors unanimously adopted four guiding principles and ten initiatives to ensure environmental justice (SCAQMD, 2007; SCAQMD, 2005).<sup>142</sup>

We are left with the question of how neoliberal policies perpetuate inequalities in society, and what adjustments, we should make if any, to how we govern nature.

Environmental justice scholar Ryan Holifield (2004) has argued that in order to address environmental justice concerns, the Clinton administration developed “neocommunitarian” programs to establish political empowerment and economic efficiency marginalized communities. The case of RECLAIM seems to suggest that outside of the grassroots realm, the efficacy of environmental justice depends heavily on the courts ability to evaluate evidence of harm. Without the evidence, the prevention of injustice seems undermined by the measurement of risks. It seems, the shift from grassroots activism to challenge authority, to government neocommunitarian programs, has forced environmental justice activists to trust in the system they once challenged, not because the system is better per se but because the structure of governance requires it.

#### **4.7 Risk**

This dissertation began with a question: Can markets fix problems created by markets? In the case of RECLAIM, the short answer is yes. The more nuanced answer is also yes, but potentially at the expense of the health of already disenfranchised populations. At the time of RECLAIM’s development, no one knew for sure what would be the outcome of the program. The District did know that during the cross-over years, before facilities would be held to a declining cap, NOx was expected to increase.

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<sup>142</sup> This incident ended with the oil companies settling with the EPA and CBE for supplemental environmental projects and monetary penalties because of their violation of Rule 1142. CBE withdrew its civil rights complaint (SCAQMD, 2002).

Furthermore, the District was well aware of the existence of hotspots in the Basin and the potential for NO<sub>x</sub> increases to exacerbate or create new hotspots in communities with residents of color and the poor. After public testimony reiterating these facts, RECLAIM was adopted more or less as originally proposed because the District believed that RECLAIM was worth the risks.

RECLAIM did create minor hot spots, but there was no evidence of substantive harm. Overall, RECLAIM reduced emissions in the South Coast Air Basin. From this perspective, market-mechanisms are an ideal utilitarian solution. Michael Shellenberger and Ted Nordhaus suggested this in their book, *The End of Environmentalism*, wherein they claim that environmental injustice is a myth. Furthermore, they state directly that markets can solve environmental problems (Shellenberger and Nordhaus, 2007). The case of RECLAIM raises flaws in their argument. Empirical evidence supports that environmental injustice is real and emissions trading runs the risk of making it worse. The complicating factor in all of this is how to properly measure just how much risk is acceptable given the uncertain effects of any exposure to toxins. Take for example the case of lead; lead is well known to cause neurological damage in children. In the 1960s, however, the acceptable level of lead exposure was higher than it is today because we now know that any level of lead exposure to has damaging effects (Markowitz and Rosner, 2013). What, then, can be said of the District's comfort with "acceptable" levels of risk?

*Risk Society*

Ulrich Beck first proposed the idea of a risk society in 1986 in his work *Risk Society: Towards a New Modernity*. According to Beck, overproduction associated with modernization produced a set of humanly induced risks, dangers, and hazards, and society became preoccupied with negotiating the uncertainty of risk. Broad uncertainty characterized environmental problems and the risks they posed. Born out of industrial processes, the risks associated with environmental problems were, in this frame of reference, not fully understood. Beck claimed that a risk society was one in which the production of risks threatened to overshadow the production of goods (Beck, 1992).

Environmental risk assessment and policy are meant to protect the wellbeing of society's citizens. Beck argued that risk assessments and risk policy have become tools to maintain the capitalist state within which the "treadmill" of consumption and production operates. Born out of industrial processes, environmental problems and the risks they produce are characterized by a wide range uncertainty. Their sources, underlying causes, and potential effects are like mysteries waiting to be revealed by environmental policymakers. He argued:

[Risks] induce systematic and often irreversible harm generally remain invisible, are based on casual interpretations, and thus initially only exist in terms of the (scientific or anti-scientific) knowledge about them. They can thus be changed, magnified, dramatized or minimized within knowledge, and to that extent they are particularly open to social definition and construction" (Beck, 1992:22-23).

In the case of RECLAIM, the District arguably saw potential for environmental injustice as a sort of absorbable risk that would ultimately leave the majority of those living in the Basin better off.

If risk is a matter of seeing, the District latched onto the uncertainty of significant harm. According to Beck (1992) and Murphy (2006,) risk will or will not exist depending on the measurement tools used and the identities of the individuals using the evaluation tools. Moreover, the more uncertain the risk of an environmental problem, the more likely policymakers will disregard the risk in question. To clarify, according to Beck (1992), the consciousness of risks is “theoretical, ” *hence* “scientized.” Their causality is always implied; always uncertain without “proof.” Murphy (2006) elaborates, stating that “without evidence risks are invisible and nothing *has* to be done about the invisible. As long as risks are not recognized scientifically, they do not exist – at least not legally, medically, technologically, or socially, and they are thus not prevented, treated or compensated for.”<sup>143</sup> In the case of RECLAIM, hot spots were recognized as real risks. Risks can be acknowledged, but until an actual problem emerges do not require attention. What can be taken from this is that the category of risk does not prevent the tendency allow environmental issues to continue until a significant problem occurs. It is thus possible for the risk inherent in market-based programs to contribute to maintain treadmills of oppression.

The basic principle of justice is that those who benefit from an activity should also be those who take on the associated risks – this is at the center of a capitalist society. But pollution is a special case in which we can all benefit from taking risks, but some face greater potential risk than others. This was entirely true of RECLAIM. What then can be said about the efficacy of environmental justice as a government principle? David

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<sup>143</sup> Douglas and Wildavsky (1983) and Jasanoff (1990) observe that when a problem gains legitimacy policy action is taken.

Pellow has suggested environmental inequality formation (EIF) as a framework for rethinking environmental justice in a way that captures the intersection between environmental justice and social hierarchies. EIF redefines environmental inequality as a sociohistorical process rather than an isolated event. This is to say that environmental inequities are embedded in a social system. EIF shows that environmental inequality involves multiple stakeholder groups with contradictory and shifting interests and allegiances. With EIF, stakeholders can be anyone; even marginalized groups of supposed victims stand to lose or gain from inequality (Pellow, 2000; Pellow, 2002).

The clash between environmental justice and emissions trading will continue to exist because emissions trading inherently goes against environmental justice philosophy that no one should disproportionately. Given this, we have set ourselves up to live in a risk society that subscribes to a politics of disposability in which racial, social, and economic differences are embedded in our structural system through or politics and policies. This dissertation suggest that the simultaneous rise of emissions trading and environmental justices brought the two into direct philosophical opposition as political pressures calling for economically efficient, anti-regulatory-ism and environmental equity forced their intersection. Formally, both regional and national governments accepted environmental justice as part of law; however, in practice, emissions trading undermined this acceptance.

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Schemes.” *Urban Areas and Global Climate Change*, 12: 135-167. The dissertation author was the only investigator and author of this material.

## Conclusion

This dissertation did not begin as an attempt to understand the history of neoliberalism. It began as a history of environmental justice, one that took at face value the claim made by environmental social justice groups, like the Coalition for Clean Air and Communities for a Better Environment (CBE), that emissions trading systems were unjust. I expected to find evidence that these groups' argument against RECLAIM was correct – that by creating pollution hotspots, RECLAIM caused undue environmental harm to people of color and the poor. I intended to present a story of the simultaneous rise of market-based environmental tools and environmental justice grounded in a long history of institutionalized racism in America and culminating with the adoption of emissions trading cap-and-trade programs including RECLAIM. I did not find what I expected. The fact is that RECLAIM has worked as it was intended; it has substantially reduced emission of NO<sub>x</sub> and SO<sub>x</sub>, and it has not created significant hotspots.

What emerged from the archives and newspapers was a story of the organic evolution of markets to address air pollution, a process shaped both by politics and processes, and by academic/theoretical arguments intended to find a compromise between public demands for clean air, political concern about economic growth, and industry pushback against regulation. The federal air pollution policy envisioned by Presidents John F. Kennedy and Lyndon B. Johnson in the early 1960s aimed to eliminate air pollution, and looked to smog abatement success in Southern California for guidance. The Clean Air Act of 1970 was built around a command-and-control framework that promised results but not without tradeoffs. The first tradeoff was the shift from a goal to eradicate smog regardless of cost to cleaning the air as cost efficiently as possible.



Shortly after its adoption, industry and the economic branches of the White House, pushed-back against the Clean Air Act's costly emission reduction technology requirements, stringent deadlines, and restrictions to expansion. States, including California, found themselves unable to meet standards. It was the economic, political, and implementation challenges of the Clean Air Act that motivated policymakers to look to economic theories of marketable permits for flexibility. Not everyone supported the move to markets. Democrats like Edmund Muskie and environmentalists opposed making the air (or emissions released into the air) a commodity; they did not believe that pollution was a right that could be bought and sold by the worst polluters.

Yet, through the 1970s and 1980s growing acceptance of market-based provisions to the Clean Air Act, namely offsets, netting, bubbles, and banking, gained acceptance because of their ability to both support economic growth and clean the air. With the formal adoption of the Emissions Trading Policy Statement and the emissions trading-based Acid Rain Program, the doors were opened for expanding market-based programs to clean the air, and the South Coast Air Management District welcomed the opportunity. RECLAIM offered an opportunity to meet both clean air goals, as well as interests of various constituents. Yet, the same concerns that were raised in early discussions about market-based tools were raised during the development of RECLAIM – no one should have the right to pollute the air. These concerns took on a new life during a time when environmental injustice was a burgeoning concern at both the state and local levels. It is in the arguments made against RECLAIM by Communities for a Better Environment and the Coalition for Clean Air that the impact of the limitations of emissions trading could

be seen. People of color and the poor *were* put at risk of suffering more from the emission trades than others.

In the United States, neoliberal policies to govern nature emerged from struggles to balance societal with political, economic, and scientific realities. They were in a sense, eminently practical. This did not mean they were just, however: concerns about emissions trading causing environmental injustice are justified, for environmental injustice is real, and the potential to exacerbate it through market mechanisms remain. Perhaps more important, the utilitarian philosophies that undergird market-based policy tools are grounded in the conviction that the right actions tend to result in the greatest good for the greatest number of people. Those who follow this line of reasoning argue that we must accept the injury of a minority in order to protect the majority. Environmental justice advocates rightly raise red flags at the quantifiers “significant” and “greatest number,” challenging us to rethink what counts as “significant” and who are amongst the “greatest number.” There is value in asking if imposing risk, at whatever scale, to some individuals over others is how we want to govern nature, and society.

Moreover, various environmental guidelines, including those used at the U.S. EPA, stipulate that environmental regulations must protect the vulnerable as well as the strong. And U.S. Civil Rights legislation is grounded in the 14<sup>th</sup> Amendment guarantee of equal protection under the law. A system that allows for unequal protection potentially violates this. Recognizing this, the courts are still mulling the question, suggesting that the debate is not over.

The efficacy of cap-and-trade programs is deeply rooted in local, regional, and national contexts, as well as the rigor of scientific models used to inform program

development. As Joel Schwartz stated so clearly, “The desired outcome [of a market] is achieved only if the market operates in the context that promotes that outcome” (Schwartz, 1993). When policymakers consider implementing a +market-based tool, each input or factor used to assess the cost-and-benefits of a market must take into account the rights that the market commodifies. Future scholarly work on the neoliberalisation of nature in the United States and elsewhere will benefit from a deep deconstruction of social, political, geographical and environmental rights. This history of RECLAIM will focus on how the schism between policy and environmental justice increased with the move away from direct government intervention to government-private sector partnerships, and the promotion of a neoliberal environmental project through a neo-communitarian strategy of building trust in environmental justice communities. It is only through the framework of trust (and distrust) that the risks of the commodification of rights can be better understood.

## References

1. "AQMD Chief Accused of Fostering Legal Battle." Los Angeles Times, Valley Edition. 11 Oct. 1990.
2. "Limit Curbs on NOx to Cut Ozone Levels, Official Says," Los Angeles Times, 6 Oct. 1981.
3. "Public Workshops Set on Updating 20-year Clean Air Plan," PR Newswire, El Monte, CA, 6 Aug. 1990.
4. Greenhouse, Linda. 24 June 1984. "Court Upholds Reagan on Air Standard." New York Times.
5. S.B. 776 1972 Regular Session 67620
6. "Clean Air Act" 42 U.S.C. 7401-7671
7. "Court Bursts EPA's Expanded Bubble Idea". 23 Aug. 1982. Chemical and Engineering News, 60(34): 6-7.
8. "Court Pricks EPA's Bubble." 25 Aug. 1982. Chemical Week, 131(8): 17-18.
9. "Hazardous Air Pollutants." Pub. Law 91-604, 42 U.S.C 7412.
10. "Public Called to Block Crippling of Anti-Smog Bill – Powerful Groups Allied to Punch Holes in the Measure. May 18, 1947. Los Angeles Times
11. "Right to Pollute: California's Smog Market." The Economist, 30 Oct. 1993.
12. "Supreme Court Roundup; Court Agrees to a Review of Air Rules." 1 June 1983. Special to the New York Times, New York Times.
13. 1976. Comment, California's Environmental Quality Act – A Significant Effect or Paper Pollution? Pacific Law Journal 5(26).
14. 41 Fed. Reg. 55524-55525
15. 42 U.S. C. 7511a(e)(1)(2) 1993
16. 44 Fe. Reg. 71779 November 29, 1979
17. 44 FR 71779, Dec. 11, 1979
18. 51 Fed. Reg. 43, pp. 814–860, 4 December 1986

19. Acid Rain Program: General Provisions and Permits, Allowance System, Continuous Emissions Monitoring, Excess Emissions and Administrative Appeals, 58 Fed. Reg. 3590, 1993.
20. Acid Rain Program: General Provisions and Permits, Allowance System, Continuous Emissions Monitoring, Excess Emissions and Administrative Appeals, 58 Fed. Reg. 3590, 1993.
21. Ackerman, B.A. and R.B. Stewart. 1985. Reforming Environmental Law. Stanford Law Review, 37:133-1346.
22. Ackerman, B.A. and W.T. Hassler. 1981. Clean Coal/Dirty Air. New Haven: Yale University Press.
23. Ackerman, Bruce A. 1985. Reforming Environmental Law. Stanford Law Review 37: 1333-1365.
24. Air Quality Act of 1967. 1967. Hearing Before the Subcommittee on Air and Water Pollution of the Senate Committee on Public Works 90th Congress, 1st Session, pt. 3, at 115.
25. Air Quality Act of 1967. 1967. Hearing before the Subcommittee on Air and Water Pollution of the Senate Committee on Public Works, 90th Congress, 1st Session, pt. 2 at 762.
26. Amable, Bruno. 2011. "Morals and Politics in the Ideology of Neo-liberalism." Socio-economic Review, 9(1): 3-30.
27. American Lung Association. 1993. Comment Letter #10. Comments on Draft RECLAIM Rules and Environmental Assessment.
28. Armstrong, Scott. 10 March 1992. "Reducing L.A. Smog with Market Forces." Christian Science Monitor.
29. ASARCO Incorporated v. EPA (Sierra Club) v. EPA. 578 F. 2d 319 11 ERC 1129, 188 U.S. App. D.C. 77, Environmental Law Report 20, 164, 8 Environmental Law Report 20,277 online at <http://ftp.resource.org/courts.gov/c/F2/578/578.F2d.319.76-1037.76-1030.html#fn19>
30. ASARCO Incorporated v. EPA (Sierra Club) v. EPA. 578 F. 2d 319 11 ERC 1129, 188 U.S. App. D.C. 77, Environmental Law Report 20, 164, 8 Environmental Law Report 20,277 online at <http://ftp.resource.org/courts.gov/c/F2/578/578.F2d.319.76-1037.76-1030.html#fn19>
31. ASARCO, Inc. v. Environmental Protection Agency, 578 F. 2d 319
32. ASARCO, Inc. v. EPA, 578 F. 2d 319, 327 D.C. Cir 1978

33. Asch, P. and J.J. Seneca. 1977. "Some Evidence of the Distribution of Air Quality." *Land Economics*, 54(3): 278-297.
34. Ash Council. 1970. Ash Council Memo, Executive Office of the President, President's Advisory Council on Executive Organization, Washington, D.C., Memorandum for the President, Federal Organization for Environmental Protection, April 29, 1970. Online at <http://www2.epa.gov/aboutepa/ash-council-memo>.
35. Atkinson, Richard C. and William A. Blanpied. 2008. "Research Universities: Core of the U.S. Science and Technology System." *Technology in Society*, 30:30-48.
36. Barnett, Clive. 2005. "The Consolations of Neoliberalism." *Geoforum*, 36:7-12.
37. Beaucamp, Marc. 1989. "Moderately Radical" *Forbes*, 143:148
38. Bae, C.H.C. "The Equity Impact of Los Angeles' Air Quality Policies." *Environment and Planning* 29, no. 9 (1997): 1563-1584.
39. Beck, Ulrich. 1992. *Risk Society: Towards a New Modernity*. London: Sage: 22-23
40. Beckman, Arnold O., Arie J. Haagen-Smit, Joseph Kaplan, Reed Brantley, and John W. Poole. 1953. Report of Special Committee on Air Pollution to Governor Goodwin Knight's Air Pollution Control Conference. Los Angeles, CA.
41. Belden, Roy S. 2001. *The Clean Air Act*. Chicago: American Bar Association.
42. Berry, B.L. 1977. *The Social Burden of Environmental Pollution: A Comparative Metropolitan Data Source*. Cambridge, MA: Ballinger Publishing Co.
43. Billington, Monroe. 1977. "Lyndon B. Johnson and Blacks: The Early Years." *Journal of Negro History*, 62: 26-42.
44. Blum, Elizabeth D. 2008. *Love Canal Revisited: Race, Class, and Gender in Environmental Activism*. Kansas: University Press of Kansas.
45. Blyth, Mark. 2002. *Great Transformations: Economic Ideas and Institutional Change in the Twentieth Century*. Cambridge: Cambridge University Press.
46. Bollen, John C. 1947. *Special District Governments in the United States*. Berkeley: University of California Press.
47. Bronson, William (ed.). 1965. *Cry California: The Journal of California Tomorrow* (1)1. Sacramento: California Tomorrow.
48. Bryant, B. (ed.). 1995. *Environmental Justice: Issues, Policies, and Solutions*. Washington, D.C: Island Press.

49. Bryant, Bunyan, and Paul Mohai. 1992. *Race and the Incidence of Environmental Hazards: A Time for Discourse*. Colorado: Westview Press
50. Builder, Carl H. and Morlie H. Graubard. 1982. *A Conceptual Approach to Strategies for the Control of Air Pollution in the South Coast Air Basin*. Santa Monica: Rand Corporation.
51. Bullard, Robert D. 1994. "Environmental Justice for All: It's the Right Thing to Do." *Journal of Environmental Law and Litigation* 9:281-284.
52. Bullard, Robert D. 2012. "The Legacy of American Apartheid and Environmental Racism." *Journal of Civil Right and Economic Development*, 9(2): 445-473.
53. Bullard, Robert. 1999. *Confronting Environmental Racism: Voices from the Grassroots*. Cambridge, MA: South End Press.
54. Bullard, Ronald D. (ed.). 1993. *Confronting Environmental Racism: Voices from the Grassroots*. Cambridge, MA: South End Press.
55. Bullard, Ronald D. 1999. "Leveling the Playing Field through Environmental Justice." *Vermont Law Review* 23:454-478.
56. Burch, W.R. 1976. "The Peregrine Falcon and the Urban Poor: Some Sociological Interrelations." In P. Richerson and J. McEvoy (eds.), *Human Ecology: An Environmental Approach*. North Scituate, MA: Duxbury Press.
57. Burford, Anne and John Greenya. 1986. *Are You Tough Enough? An Insider's View of Washington Power Politics*. New York: McGraw-Hill.
58. Burton, Ellison and William Sanjour. 1967. *An Economic Analysis of the Control of Sulphur Oxides Air Pollution*. DHEW Program Analysis Report No. 1967-69. Washington, DC: Ernst and Ernst.
59. Burton, Ellison and William Sanjour. 1968. *A Cost-Effectiveness Study of Particulate and SOx Emission Control in the New York Metropolitan Area*. NTIS: PB-227 121/1. Contract Number: PH-86-68-37. Washington, DC: Ernst and Ernst.
60. Burton, Ellison and Sanjour, William. 1969. "Multiple Source Analysis of Air Pollution Abatement Strategies." *Federal Accountant* XVIII (March): 48-69.
61. Burton, Ellison and William Sanjour. 1970. "A Simulation Approach to Air Pollution Abatement Program Planning." *Socio-Economic Planning Science*, 4: 147-150.
62. Burton, Ellison, Edward H. Pechan, and William Sanjour. 1973. "Solving the Air Pollution Control Puzzle." *Environmental Science and Technology*, 7(5):412-415.

63. Cable, S. and C. Cable. 1995. *Environmental Problems, Grassroots Solutions: The Politics of Grassroots Environmental Conflict*. New York: St. Martin's Press.
64. Cal Health and Safety Code 24268-80
65. Cal. Govt. Code 65050.12
66. Cal. Health and Safety Code 39052
67. Cal. Health and Safety Code 39054
68. Cal. Health and Safety Code 39650
69. Cal. Health and Safety Code 39660-39662
70. Cal. Health and Safety Code 41700
71. Cal. Health and Safety Code 44300-44384
72. Cal. Health and Safety Code, 38655-38667
73. Cal. Pub. Res Code 21002
74. Caldwell, Jim. 1993. "RECLAIMing LA - An Experiment in Pollution Marketing." Los Angeles: Coalition for Clean Air Archives.
75. Cal. Pub. Res. Code 72000-01
76. California Air Resources Board. 1972. *California Air Basins*. Sacramento: CARB.
77. Cal. Health and Safety Code 39012
78. Cal. Health and Safety Code 40402
79. California Supreme Court Decision *Friend of Mammoth v. Board of Supervisors*, (8 Cal. 3d 247, 104 Cal. Rptr. 761 (1972)).
80. Campbell, John L. and Ove K. Pedersen (eds.). 2001. *The Rise of Neoliberal and Institutional Analysis*. Princeton: Princeton University Press.
81. Carle, David. 2006. *Introduction to Air in California*. Berkeley: University of California Press
82. Carson, Rachel. 1962. *Silent Spring*. New York, NY: Houghton Mifflin Company.
83. Carter, Jimmy. 1979. "Crisis of Confidence." Televised speech delivered on July 15, 1979. Transcript available at



- <http://www.pbs.org/wgbh/americanexperience/features/primary-resources/carter-crisis/> (Last Accessed June 1, 2014).
84. Castree N, 2008a, "Neoliberalising Nature: The Logics of Deregulation and Reregulation" *Environment and Planning A* 40(1) 131 – 152.
  85. Castree, N. 2008b." Neoliberalising Nature: Processes, Effects, and Evaluations." *Environment and Planning A*, 40: 153-173.
  86. Caughey, John and LaRee Caughey (eds) 1977. *Los Angeles: Biography of a City*. Berkeley: University of California Press.
  87. Chavis, B.F. and C. Lee. 1987. *Toxic Waste and Race in the United States: A National Report on the Racial and Socio-economic Characteristics of Communities with Hazardous Waste Sites*. New York: Commission for Racial Justice, United Church of Christ.
  88. Chernow, Eli. 1975. "Implementing the Clean Air Act in Los Angeles: The Duty to Achieve the Impossible." *Ecology Law Quarterly*, 4(3): 537-581.
  89. Chinn, L.N. 1999. "Can the Market be Fair and Efficient? An Environmental Justice Critique of Emissions Trading." *Ecology Law Quarterly*, 26(1): 81-125.
  90. Chiton, William, 1989. "Mr. Clean," *California Buisness*. On file at SCAQMD Library, Diamond Bar, CA.
  91. Citizens for a Better Environment. 1992. Comment Letter # 1: Citizens for a Better Environment. In SCAQMD, *Final Environmental Impact Report for: Proposed 1991 AQMD Amendments*.
  92. Citizens Task Force on SOHIO v. Board of Harbor Commissioners of the Port of Long Beach Docket no. L.A. 30922 and 23 Cal.3d 812 (1979) 591 P.2d 1236 153 Cal. Rptr. 584
  93. Civil Rights Act of 1964. Pub. L. 88-352, 78 Stat. 241.
  94. Clean Air Act of 1963. (1963). Pub.L. 88-206, 77 Stat. 392.
  95. Clean Air Act of 1970. (1970). Pub. L. 91-604, 84 Stat. 1676.
  96. Clean Air Act of 1990. (1990). Pub.L. 101-549, 104 Stat. 2399.
  97. Clean Air Act, 42 USC 7411
  98. Clinton, William J.1994. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. *Federal Register*, 59(7629).

99. Coalition for Clean Air. 1993. Coalition Opposes RECLAIM. The RECLAIM Program: Hearings before the Subcommittee on Health and the Environment of the House Committee on Energy and Commerce, 103d Cong. 1st Session 44 Testimony of Veronica Kun, Staff Scientist, Natural Resources Defense Council.
100. Coalition for Clean Air. 1993. Comment Letter #16: Comments on Draft RECLAIM Rules and Environmental Assessment. RECLAIM: Volume III Socioeconomic and Environmental Assessments. Diamond Bar: SCAQMD.
101. Coalition for Clean Air. 1993. Comments on May 1993, RECLAIM Rules and Staff Report. On file at Coalition for Clean Air, Los Angeles, CA.
102. Cohn, Nancy J. 1993. "Emissions Trading and Air Toxics Emissions: RECLAIM and Toxics Regulation in the South Coast Air Basin." *UCLA Journal of Environmental Law and Policy* 11(2): 255-295
103. Cole, Luke W. and Sheila R. Foster. 2001. *From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement*. New York: New York University Press.
104. *Communities for a Better Environment v. Chevron Corporation*, Civ. No. 98-5173 DT (BQRx) (C.D. Cal. Filed July 23, 1997b).
105. *Communities for a Better Environment v. Chevron Corporation*, Complaint (No. 97-5412) (C.D. Cal. Filed July 23, 1997a).
106. *Communities for a Better Environment v. GATX Capital Corporation*, Complaint (No. 975410) C.D. Cal. Filed July 23, 1997).
107. *Communities for a Better Environment v. Tosco Corporation*, Complaint (No. 97-5411) (C.D. Cal. Filed July 23, 1997).
108. *Communities for a Better Environment v. Ultramar*, Civ. No. 98-5174 DT (BQRx) (C.D. Cal. Filed July 23, 1997b).
109. *Communities for a Better Environment v. Ultramar*, Complaint (No. 97-5413) (C.D. Cal. Filed July 23, 1997a).
110. *Communities for a Better Environment v. Unocal*, Civ. No. 98-5175 DT (BQRx) (C.D. Cal. Filed July 23, 1997b).
111. *Communities for a Better Environment v. Unocal*, Complaint (No. 97-5414) (C.D. Cal. Filed July 23, 1997a).
112. *Communities for a Better Environment*. Comment Letter #17. Comments on Draft RECLAIM Rules and Environmental Assessment, 1993

113. Cone, Marla. 1 Sept. 1993. "Mayor Backs AQMD Smog-Trading Plan." Los Angeles Times.
114. Cone, Marla. 21 Aug. 1993c. "AQMD Plan for Blue Skies Turns Hazy." Los Angeles Times.
115. Cone, Marla. 9 Sept. 1993b. "Activists Urge Rejection of Pollution Credit Plan." Los Angeles Times.
116. Conniff, Richard. 2009. "The Political History of Cap-and-trade." Smithsonian Magazine. Online at
117. Cook, B. J. 1988. Bureaucratic Politics and Regulatory Reform: The EPA and Emissions Trading. Westport, CT: Greenwood Press.
118. Cook, Dan. Oct. 1990. "Common Ground." California Business, 38-57. On file at SCAQMD Library, Diamond Bar, CA.
119. Corburn, Jason. 2001. "Emissions Trading and Environmental Justice: Distributive Fairness and the USA's Acid Rain Programme." Environmental Conservation, 28(4): 323-332.
120. Cronin, William. 1991. Nature's Metropolis: Chicago and the Great West. New York: W.W. Norton.
121. Crow, P. 1981. "Dingell Blasts Early Decontrol of Gas. Oil and Gas Journal, 79(12): 60-61.
122. Dales, John H. 1986. Pollution, Property & Prices. Toronto: University of Toronto Press.
123. Dansman, Raymond. 1965. "The Destruction of California."
124. Daviron, Benoit. 2002. "Small Farm Production and the Standardization of Tropical Products." Journal of Agrarian Change, 2(2): 162-184.
125. Davis, Devra. 1985. "The 'Shotgun Wedding' of Science and Law: Risk Assessment and Judicial Review. Columbia Journal of Environmental Law, 10(1):67-109.
126. Davis, Devra. 2002. When Smoke Ran like Water: Tales of Environmental Deception and the Battle Against Pollution. New York: Basic Books.
127. Douglas, Mary and Wildavsky, Aaron. 1983. Risk and Culture: An Essay on the Technical and Environmental Dangers. Berkeley: University of California Press; and Jasanoff, Sheila. 1990

128. Drury, Richard T., Michael B. Belliveau, J. Scott Kuhn, and Shipra Bansal. 1999. "Pollution Trading and Environmental Justice: Los Angeles' Failed Experiment in Air Quality Policy." *Duke Environmental Law and Policy Forum*, 9: 231-289.
129. Dudek, Daniel J. and John Palmisano. 1988. "Emissions Trading: Why is this Thoroughbred Hobbled", *Columbia Journal of Environmental Law* 13(2): 217-256
130. Dunlap, Riley E. 1991. "Polls, Pollution, and Politics Revisited: Public Opinion on the Environment in the Reagan Era." *Environment*, 29(July/August): 6-11. 32-37.
131. Eads, George C. and Michael Fix. 1984. *The Reagan Regulatory Strategy: An Assessment*. Washington, D.C.: Urban Institute Press.
132. Ellerman, A. Denny. 2000. *Markets for Clean Air*. Cambridge: Cambridge University Press.
133. Emissions Offset Interpretive Ruling, 41 FR 55254 Dec. 21, 1976
134. Environmental Protection Agency. 1992. "The Guardian: Origins of the EPA, EPA Historical Publication 1, Spring 1992.
135. Environmental Protection Agency. 1992., "William D. Ruckelshaus." EPA History Program, EPA Oral History Series. Washington, D.C.: Environmental Protection Agency, November 1992.
136. Epstein, Steven.1996. *Impure Science: AIDS, Activism, and the Politics of Knowledge*. Berkeley: University of California Press.
137. Esterling, Kevin. 2009. *The Political Economy of Expertise: Information and Efficiency in American National Politics*. Ann Arbor, MI: University of Michigan Press.
138. Executive Order 12291, 46 F.R. 13193, 3 C.F.R. 127 (1981)
139. Forte, D.M., W.A. Niskanen, A.H. Pascal, and W.F. Sharpe. 1959. Proposal for a "Smog Tax." Santa Monica: Rand Corporation.
140. Fowlie, Meredith; Stephen P. Holland, and Erin T. Mansur. 2011. "What do Emissions Markets Deliver and to Whom? Evidence from Southern California's NOx Trading Program. National Bureau of Economic Research Working Paper No. 15082
141. Freeman, A.M. 1972. "The Distribution of Environmental Quality." In A.V. Kneese and B.T. Bower (eds.), *Environmental Quality Analysis*. Baltimore, MA: Johns Hopkins University Press.
142. Friedman, Milton. 2002. *Capitalism and Freedom*. Chicago: University of Chicago Press.

143. Friend of Mammoth v. Board of Supervisors, 8 Cal. 3d 247, 104 Cal. Rptr. 761 , 1972.
144. Frieseman, H.Paul and Paul J. Culhane. 1976. "Social Impacts, Politics, and the Environmental Impact Statement Process." *Natural Resources Journal*, 16:339-56.
145. Fishman, Robert. 1987. *Bourgeois Utopias: The Rise and Fall of Suburbia*. New York: Basic Books.
146. Fulton, William. 1997. *The Reluctant Metropolis: The Politics of Urban Growth in Los Angeles*. Point Arena: Solano Press Books.
147. Galloway, James N., Ellis B. Cowling, Eville Gorham, and William W. McFee. 1978. *A National Program for Assessing the Problem of Atmospheric Deposition (Acid Rain) Report to the President's Council on Environmental Quality*. Fort Collins: Colorado State University, National Atmospheric Deposition Program.
148. Gilroy, J.M. and R.Y. Shapiro. 1986. "The Polls: Environmental Protection." *Public Opinion Quarterly*, 50: 270-79.
149. Gioielli, Robert R. 2008. "Hard Asphalt and Heavy Metals: Urban Environmentalism in Postwar America." PhD Dissertation, University of Cincinnati.
150. Gioielli, Robert. 2014. *Environmental Activism and the Urban Crisis: Baltimore, St. Louis, Chicago*. Philadelphia: Temple University Press.
151. Giroux, Henry A. 2006. *Stormy Weather: Katrina and the Politics of Disposability*. Boulder: Paradigm Publishers.
152. Goldsmith, John I. and Bruslow, Lester. 1959. "Epidemiological Aspects of Air Pollution," *Journal of Air Pollution Control Association*, 9: 129-132.
153. Gonzalez, George. 2005. *Urban Sprawl, Global Warming, and the Empire of Capital*. Albany: State University of New York Press.
154. Gorman, Hugh and Barry D. Solomon. 2002. "The Origins, Practice, and Limits of Emissions Trading." *Journal of Policy History*, 14(3):293-320.
155. Gould, K.A., A. Schnaiberg and A.S. Weinberg. 1996. *Local Environmental Struggles: Citizen Activism in the Treadmill of Production* (1st ed). Cambridge, MA: Cambridge University Press.
156. Government Employee Relations Report, State and Local News: Safety and Health. Sept. 24, 1990. "Southern California Airboard's Car Pool Regulations Sparks Labor Dispute".

157. Government Relations Report, State and Local News: Safety and Health. October 15, 1990, "L.A. County Ridesharing Plan Disapproved by Air Quality Board".
158. Govt. Code 65040.12
159. GovTrack.us. S. 1630--101st Congress: Clean Air Act Amendments of 1990." [www.GovTrack.us. http://www.govtrack.us/congress/bills/101/s1630](http://www.govtrack.us/congress/bills/101/s1630) (Last accessed June 22, 2013).
160. H.R. 3030--101st Congress: Clean Air Act Amendments of 1990.
161. H.R. Doc. No. 47 90th Congress 1st Session 3 1967.
162. Haagen-Smit, Arie, Ellis F. Darley, Milton Zaitlin, Herbert Hull, and Wilfred Noble. 1952. "Investigation on Injury to Plants from Air Pollution in the Los Angeles Area." *Plant Physiology*, 27(1):18-34.
163. Haagen-Smit, Arie J. 1952. "Chemistry and Physiology of Los Angeles Smog." *Industrial and Engineering Chemistry*, 44(6): 1342-1346.
164. Haagen-Smit, Arie J. and M.M. Fox. 1954. "Photochemical Ozone Formation with Hydrocarbons and Automobile Exhaust." *Air Repair*, 4(3): 105-136.
165. Hahn, R. and R. Noll. 1982. "Designing a Market for Tradeable Permits." In W. Magat (ed.) *Reform of Environmental Regulation*. Cambridge, MA: Ballinger Publishing Co.
166. Hahn, R.W. and G.L. Hester. 1989. "Marketable Permits: Lessons for Theory and Practice." *Ecology Law Quarterly*, 16:361-406.
167. Hahn, R.W. and G.L. Hester. 1989b. "Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program." *Yale Journal of Regulation*, 6:109-153.
168. Hahn, Robert H. and Robert N. Stavins. 1991. *Incentive Based Regulation: A New Era from and Old Idea?* *Ecology Law Quarterly*, 18(1).
169. Hahn, Robert W. and G.L. Hester. 1987. "The Market for Bads: EPA's Experience with Emissions Trading." *Regulation* 3(4):48-53.
170. Hajer, Maarten. 1997. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Cambridge: Oxford University Press.
171. Hamilton, Martha M. 27 Jan. 1981. "EPA Promotes Private Method of Air Cleanup." *Washington Post*.

172. Hanks, Eva H. and John L. Hanks. 1969. "Environmental Bill of Rights: The Citizen Suit and the National Environmental Policy Act of 1969." *Rutgers Law Review* 24:
173. Harrison, D. and A.L. Nichols, Nov. 1990. "Market-Based Approaches to Reduce the Cost of Clean Air in California's South Coast Basin," National Economic Research Associates.
174. Harvey, David. 2005. *A Short History of Neoliberalism*. Oxford: Oxford University Press.
175. Health and Safety Code 39650 et. Seq.
176. Hearings on Air Pollution -1967 (Air Quality Act) Before the Subcommittee on Air and Water Pollution of the Senate Committee on Public Works, 90th Congress, 1st Session, pt. 2, at 762 (1967).
177. Hernandez, Raymond. 30 April 1998. "Lilco is to Stop Selling Credits to Upwind Polluters," *New York Times*.
178. Heynen, Nik and Paul Robbins. 2005. "The Neoliberalization of Nature: Governance, Privatization, Enclosure and Valuation." *Capitalism, Nature, Socialism*, 16(1): 1-4.
179. Hise, Greg. 1997. *Magnetic Los Angeles: Planning the Twentieth Century Metropolis*. Baltimore: John Hopkins University Press.
180. Hise, Greg and William F. Deverell. 2005. *Land of Sunshine: An Environmental History of Metropolitan Los Angeles*. Pittsburgh: University of Pittsburgh Press.
181. Holden, Candace. 1980. "The Reagan Years: Environmentalists Tremble." *Science* 210(4473): 988-991
182. Holifield, Robert. 2001. "Defining Environmental Justice and Environmental Racism" *Urban Geography*, 22(1):78-90.
183. Holifield, Robert. 2004. "Neoliberalism and Environmental Justice in the US Environmental Protection Agency." *Geoforum*, 35:285-298.
184. Hurley, Andrew. 1995. *Environmental Inequalities: Class, Race, and Industrial Pollution in Gary, Indiana, 1945-1980*. Chapel Hill: University of North Carolina Press.
185. Inside Cal/EPA. May 19, 2000. "Dramatic Increase in NOx Credit Prices Reflects Pivotal RECLAIM Year." 11(20).
186. Jacobs, Jane. 1970. *The Economy of Cities*. New York: Random House.

187. Jacobs, Jane. 1989. *The Death and Life of Great American Cities*. New York: Random House, Inc.
188. Jacobs, Chip and William Kelly. 2009. *Smogtown: The Lung-Burning History of Pollution in Los Angeles*. New York: Overlook Press.
189. Jacobs, Chip. 2 July 1990. "New AQMD Surprise Inspection Program Targets Oil, Aerospace." *Business Dateline*, 12(27): 1
190. Jacobs, Chip. 27 Aug. 1990. "AQMD Takes Aim at Leafblowers, Deep-fat Fryers, Auto Salesman," *Business Dateline*, 15(35): 3
191. Jacobs, Chip. 8 Oct. 1990. "Touch Tailpipe Rules May Give Businesses a Break." *Los Angeles Business Journal*, 12(41): 5.
192. James, Daniel J. 1986. cap "Air Pollution Boss Hired to Lead L.A. Fight Against Smog." *Denver Post*.
193. Jasanoff, Sheila. 1990. *The Fifth Branch: Science Advisers as Policymakers*. Cambridge, MA: Harvard University Press.
194. Jasanoff, Sheila. 2004. "Science and Citizenship: A New Synergy." *Science and Public Policy*, 31(2):90-94.
195. Jasanoff, Sheila. 2004. *States of Knowledge: The Co-production of Science and Social Order*. New York, Routledge.
196. Jenal, J., A. Ramo, and R. Drury. 1993b. Comment Letter #17. RECLAIM: Volume III Socioeconomic and Environmental Assessments. Diamond Bar: SCAQMD.
197. Jenal, James P. 1993. Citizens for a Better Environment Stopping the RECLAIM Express: Why CBE Opposed the Marketing of Pollution "Rights" in the Los Angeles Basin 5-6.
198. Johnson, Lyndon B. 1964. "Radio and Television Remarks Upon Signing the Civil Rights Bill," July 2, 1964. In *Public Papers of the Presidents of the United States: Lyndon B. Johnson, 1963-64*. Vol. II, entry 446: 842-844. Washington, D.C.: Government Printing Office.
199. Johnson, Lyndon. 1967. *Pubic Papers of the Presidents of the United States: Lyndon B. Johnson, 1967*. Volume II, entry 503, pp. 1067-1070. Washington, D.C.: Government Printing Office, 1968. Online at Lyndon B. Johnson Library and Museum: National Archives and Records Administration <http://www.lbjlib.utexas.edu/johnson/archives.hom/speeches.hom/671121.asp> (Last accessed Feb. 5, 2012).



200. Joskow, Paul L. and Richard Schmalensee. 1998. "The Political Economy of Market-based Environmental Policy: The U.S. Acid Rain Program," *Journal of Law and Economics* 41:81-135.
201. Kamieniecki, Sheldon, David Shafie, and Julie Silvers. 1999. "Forming Partnerships in Environmental Policy: The Business of Emissions Trading in Clean Air." *American Behavioral Scientist*, 43(1): 107-123.
202. Kelman, Steven. 1981. "Economists and the Environmental Middle." *Public Interest* 64:106-26.
203. Kennedy, Harold W. 1954. *The History, Legal and Administrative Aspects of Air Pollution Control in the County of Los Angeles*. Los Angeles: Board of Supervisors of the County of Los Angeles.
204. Kennedy, John F. 1961. "Special Message to the Congress on Natural Resources," February 23, 1961. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=8466> (Last accessed Jan. 1, 2013).
205. Kennedy, John F. 1963. "Radio and Television Report to the American People on Civil Rights," June 11, 1963. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=9271> (Last accessed Nov. 12, 2013).
206. Kete, Nancy. 1993. "The politics of markets: The Acid Rain Control Policy in the 1990 Clean Air Act Amendments. Doctoral Dissertation, Johns Hopkins University 1993:83).
207. Kraft, Michael E. and Norman J. Vig. 1984. "Environmental Policy in the Reagan Administration." *Political Science Quarterly*, 99:415-439.
208. Krier, James E. and Edmund Ursin. 1977. *Pollution and Policy: A Case Essay on California and Federal Experience with Motor Vehicle Air Pollution 1940-1975*. Berkeley: University of California Press.
209. Kronholm, William. 7 March 1984. "Senate Environment Panel Approves Acid Rain Program," *Schenectady Gazette*.
210. Krupp, Fred. 2008. "The Making of a Market-Minded Environmentalist." *Strategy + Business*, 10 June 2008, 51.
211. L.A. APCD. 1959. *Annual Report, 1958-1959*. On file at SCAQMD Library, Diamond Bar.

212. Landua, Jack L. (1980). "Economic Dream or Environmental Nightmare? The Concept of Legality of the "Bubble Concept" in Air and Water Pollution Control. *Boston College Environmental Affairs Law Review* 8(4).
213. Landy, Marc K., Marc C. Roberts, and Stephen R. Thomas. 1994. *The Environmental Protection Agency: Asking the Wrong Questions*. New York: Oxford University Press.
214. Larner, Wendy. 2000. "Neo-liberalism: Policy, Ideology, Governmentality." *Studies in Political Economy*, 63: 5-25.
215. Latour, Bruno. 1999. *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge: Harvard University Press.
216. Lave, Rebecca, Philip Mirowski, and Samuel Randalls. 2010. "Introduction: STS and Neoliberal Science." *Social Studies of Science*, 40(5): 659-675.
217. Lave, Rebecca; Martin Doyle, and Morgan Robertson. 2010. "Privatizing Stream Restoration in the U.S." *Social Studies of Science*, 40(5):677-703.
218. Lees, Lester, Mark Braly, Mahlon Easterling, Robert Fisher, Kenneth Heitner, James Henry, Patricia J. Horne, Burton Klein, James Krier, W. David Montgomery, Guy Parker, Gary Rubenstein, and John Trijonis. 1972. *Smog: A Report to the People. A Report by the Environmental Quality Laboratory, California Institute of Technology*. Los Angeles: Anderson, Ritchie and Simon.
219. Lejano, Raul P., and Rei Hirose. 2005. "Testing the Assumptions Behind Emissions Trading in Non-Market Goods: The RECLAIM Program in Southern California." *Environmental Science and Policy*, 8: 367-377.
220. Lents, James M. 1988. "Los Angeles Areas Agency Seeks Industry's Help to Defeat Smog." *American Paint and Coating Journal*, 75(4):40.
221. Lents, James. 1990. "Polluters as the Cornerstones to Solution for Dirty Air." *Forum for Applied Research and Public Policy*, 43-46.
222. Lents, James M. 1993. "Trading Emissions Improve Air Quality." *Forum for Applied Research and Public Policy*. 8(2):45-48.
223. Lents, James M. and Patricia Leyden. 1996. "RECLAIM: Los Angeles' New Market-Based Smog Cleanup Program," *Journal of the Air & Waste Management Association*, March. 195-206.
224. Lents, James N. 1998. "Making Clean Air Programs Work." *Environmental Science and Policy*, 1:211-222.

225. Leong, Eugene. 1974. Air Pollution Control in California from 1970 to 1974: Some Comments on the Implementation Planning Process, Doctor of Environmental Science and Engineering thesis, University of California, Los Angeles.
226. Levin, M. H. 1982. Getting There: Implementing the 'Bubble' Policy. In E. Bardach and R.A. Kagan (eds.), *Social Regulation: Strategies for Reform*. San Francisco: Institute for Contemporary Studies.
227. Levin, Myron. 10 Jan. 1991. "DWP Plans to Clean Up Air with Fuel Switch." *Los Angeles Times*.
228. Levine, Adeline Gordon. 1982. *Love Canal: Science, Politics and People*. Lexington, MA: D.C. Heath and Company.
229. Lewis, Ben. 1972. Mayor of Riverside, Correspondence and Report to Governor Ronald Reagan, June 1, 1972.
230. Lipset, S.M. and W. Schneider. 1983. *The Confidence Gap: Business, Labor and Government in the Public Mind*. New York: The Free Press and Macmillian.
231. Liroff, R.A. 1980. *Air Pollution Offsets: Trading, Selling and Banking*. Washington, D.C.: The Conservation Foundation
232. Liroff, R.A. 1986. *Reforming Air Pollution Regulation: The Toil and Trouble of EPA's Bubble*. Washington, D.C.: The Conservation Foundation.
233. Liu, Feng. 2000. *Environmental Justice Analysis: Theories, Methods, and Practice*. Boca Raton, FL: CRC Press
234. Los Angeles Air Pollution Control District. 1949. Annual Report, 1948-1949. On file at SCAQMD Library, Diamond Bar.
235. Los Angeles Air Pollution Control District. 1970. Air Pollution Control District, Los Angeles County Biennial Report, Fiscal 1967-68, 1968-70
236. Luong, Danny et. al. 2003. Annual RECLAIM Audit Report for the 2001 Compliance Year. SCAQMD Diamond Bar
237. Lyndon B. Johnson: "Remarks Upon Signing the Clean Air Act." December 17, 1963. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=26421> (Last accessed June 1, 2014).
238. Lyndon, Johnson B. 1965. "Special Message to the Congress on the Right to Vote," March 15, 1965. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=26806> (Last accessed 3/4/2013).

239. Marini, Richard. 1990. "Commanding California's war on smog: James Marcellus Lents, Air-Quality Czar." *Popular Science*, 237:71-75
240. Mark, Milton and Stephen L. Taber. 1973. "Prospects for Regional Planning in California." *Pacific Law Journal*, vol. 4:133
241. Markowitz, Gerald and David Rosner. 2002. *Deceit and Denial: The Deadly Politics of Industrial Pollution*. Berkeley: University of California Press.
242. Markowitz, Gerald and David Rosner. 2013. *Lead Wars: The Politics of Science and Fate of America's Children*. Berkeley: University of California Press.)
243. Martin, Robert and Lloyd Symington. 1968. "A Guide to the Air Quality Act of 1967." *Law and Contemporary Problems* 33:239-274.
244. Mathews, Jay. March 14, 1988. "Southern California Battling Smog with 'New Sense of Urgency.'" *Washington Post*.
245. Mazmanian, Daniel A. 2001. "Los Angeles' Transition from Command-and-Control to Market-based Clean Air Policy Strategies and Implementation." Pp. 77-112. In Daniel A. Mazmanian and Michael E. Kraft (eds.). *Toward Sustainable Communities*. Cambridge, MA; MIT Press.
246. Mazmanian, Daniel A. and Michael E. Kraft. 2008. "The Three Epochs of the Environmental Movement." *University of Southern California School of Policy and Development, Environment and Sustainability*.
247. Mazmanian, Daniel A. and Michael E. Kraft. 2001. *Toward Sustainable Communities: Transition and Transformation in Environmental Policy*. Cambridge, MA: The MIT Press.
248. McCarthy, J, Prudham, S. 2004. "Neoliberal Nature and the Nature of Neoliberalism." *Geoforum*, 35:275-283.
249. McGuire, Claire L. 1976. *Emerging State Programs to Protect the Environment: Little NEPA's and Beyond*, *Boston College Environmental Affairs Law Review*, 5(3).
250. Meidinger, Errol. 1985. "Emissions Trading in U.S. Air Pollution Regulation." *Law and Policy* 7(4):447-479.
251. Melosi, Martin. 2010. "Lyndon Johnson and Environmental Policy." Pp. 119-120. In Robert A. Divine (ed.) *The Johnson Years: Vietnam, the Environment and Science*.
252. Melosi, Martin. 2012. "Chapter 11: Environmental Policy." Pp. 187-209. In *A Companion to Lyndon B. Johnson*, Mitchell B. Lerner (ed.). Boston: Wiley-Blackwell.

253. Merchant, Carolyn. 2002. *Columbia Guide to American Environmental History*. New York: Columbia University Press.
254. Middleton, John T. and Arie J. Haagen-Smit. 1961. "The Occurrence, Distribution, and Significance of Photochemical Air Pollution in the United States, Canada, and Mexico." *Journal of the Air Pollution Control Association*, 11(3): 129-134.
255. Moore, Curtis A. 2003. "RECLAIM: Southern California's Failed Experiment with Air Pollution Trading." <http://healthandcleanair.org/emissions/reclaim.pdf> (Last accessed Aug. 1, 2013).
256. Moore, Kelly. 2006. "Powered by the People: Scientific Authority in Participatory Science." Pp. 299-323. In *New Political Sociology of Science: Institutions, Networks and Power*, by Scott Frickel.
257. Murphy, Earl F. 1967. *Governing Nature*. Chicago: Quadrangle Books.
258. Murphy, Michelle. 2006. *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers*. Durham: Duke University Press.
259. Muskie, Edmund S. 1968. "Role of the Federal Government in Air Pollution Control." *Arizona Law Review*, 10.
260. National Academy of Sciences. 1980. "Case II: SOHIO at Long Beach" in *Seaward Development: Case Studies of Citizen Participation*, Academy Forum. Washington, D.C.: 83-118.
261. National Center for Environmental Economics. 6.12 Regional Clean Air Incentives Market. Online at <http://yosemite.epa.gov/ee/epa/eed.nsf/fa6512c6e51c4a208525766200639df2/f3840473f377d0638525777d000cbd05!OpenDocument> (Last accessed June 1, 2014).
262. National Commission on Air Quality. 1981. *To Breathe the Clean Air: Report of the National Commission on Air Quality*. Washington, D.C. National Commission on Air Quality.
263. National Research Council, 1983. *Risk Assessment in the Federal Government Managing the Process*. Washington, D.C.: The National Academic Press.
264. National Wildlife Federation. 29 March 1981. "Clean Air Act Reauthorization."
265. Nickerson, Michelle and Darren Dochuk (eds.). 2011. *Sunbelt Rising: The Politics of Space, Place, and Region*. Philadelphia: University of Pennsylvania Press.

266. Nixon, Richard. 1970a. "Special Message to the Congress on Environmental Quality," February 10, 1970. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=2757> (Last accessed June 1, 2014).
267. Nixon, Richard. 1970b. "Annual Message to the Congress on the State of the Union.," January 22, 1970. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=2921> (Last accessed June 1, 2014).
268. Noll, Roger. 1990. Discussion Paper on Marketable Emissions Permits, Dec. 1990. On file at SCAQMD Library, Diamond Bar, CA.
269. Offset ruling 40 CFR Part 51, Appendix S, Section I.V.c.5, Jan. 16, 1979.
270. Olshansky, Robert B. 1996. "The California Environmental Quality Act and Local Planning." *Journal of the American Planning Association*, 62(3).
271. Oreskes, Naomi and Erik Conway. 2011. *The Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco to Global Warming*. New York: Bloomsbury Press.
272. Organization for Economic Co-operation and Development (OECD). 2004. *Tradeable Permits Policy Evaluation, Design and Reform: Policy Evaluation, Design, and Reform*. Paris: OECD.
273. Ospital, Jean. 2006, October. Draft 2007 AQMP: Appendix I. South Coast Air Quality Management District. Online at [http://www.aqmd.gov/smog/historical/smog\\_and\\_health.htm](http://www.aqmd.gov/smog/historical/smog_and_health.htm). (Last assessed June 1, 2014).
274. Palmer, John L. and Isabel V. Sawhill. 1982. *The Reagan Experiment: An Examination of Economic and Social Policies Under the Reagan Administration*. New York: Rowman and Littlefield
275. Parker, Larry B., Robert D. Poling and John L. Moore. 1991. "Clean Air Act Allowance Trading." *Environmental Law*, 21: 2021-2068.
276. Pasternak, Judy. 5 March 1992. "AQMD Vote May Reshape Southland Clean Air Fight" *Los Angeles Times*.
277. Peck, Jamie. 2004. "Geography and Public Policy: Constructions of Neoliberalism." *Progress in Human Geography*, 28: 392-405.
278. Pellow, David N. 2000. "Environmental Inequality Formation: Toward a Theory of Environmental Injustice." *American Behavioral Scientist*, 4:581-601.

279. Pellow, David N. 2002. *Garbage Wars: The Struggle for Environmental Justice in Chicago*. Cambridge, MA: The MIT Press.
280. Pellow, David N. and Robert J. Brulle. 2005. *Power, Justice and the Environment: A Critical Appraisal of the Environmental Justice Movement*. Cambridge, MA: The MIT Press.
281. Peter, Ellen M. 2010. "Implementing Environmental Justice: The New Agenda for California State Agencies." *Golden Gate University Law Review* 21(4): 529-91.
282. Polesetsky, Matthew. 1995. "Will a Market in Air Pollution Clean the Nation's Dirtiest Air? A Study of the South Coast Air Quality Management District's Regional Clean Air Incentives Market." *Ecology Law Quarterly* 22: 359-411.
283. Portnoy, Paul. 1990. *Public Policies for Environmental Protection*. Baltimore: John Hopkins University Press.
284. *Proceedings: The Third National Conference on Air Pollution* 597. Public Health Service, Pub. NO. 1649, 1967.
285. Pub. L. 91-190, Sec. 2, Jan. 1, 1970, 83 Stat. 852 (NEPA of 1969).
286. Reagan, Ronald. 1981. "Nomination of Anne McGill Gorsuch to be Administrator of the Environmental Protection Agency," February 21, 1981. Online by Gerherd Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=43442>
287. Reilly, William K. 1991. "The New Clean Air Act: An Environmental Milestone." *EPA Journal* – January/February 1991. Online at <http://www2.epa.gov/aboutepa/new-clean-air-act-environmental-milestone>. (Last assessed June 1, 2014).
288. Rogers, Paul G. (1990). "EPA History: The Clean Air Act of 1970" *EPA Journal*, January/February 1990. Online at <http://www2.epa.gov/aboutepa/epa-history-clean-air-act-1970>. (Last assessed June 1, 2014).
289. Rome, Adam. 2003. "'Give Earth a Chance'": The Environmental Movement and the Sixties. *The Journal of American History*, 90(2): 525-554.
290. Rothman, Hal. 1998. *Devil's Bargains: Tourism in the Twentieth-Century American West*. Lawrence, KS: University Press of Kansas.
291. Rowe, Gene and Lynn J. Frewer. 2005. "A Typology of Public Engagement Mechanisms." *Science, Technology, and Human Values* 30: 251-290.
292. Ruckelshaus, William D. 1970. "The City must be the Teacher' of Man." Address to the Annual Congress of Cities, Atlanta, Georgia, 10 Dec 1970.

293. Ruckelshaus, William D. 1971. "Address to the Indiana State Legislature, 8 Feb. 1971, Ruckelshaus' Speeches File, EPA Historical Collection.
294. Ruckelshaus, William D. 1984. "Risk in a Free Society." *Risk Analysis*, 4(3):157-162.
295. Ruckelshaus, William. 1983. "Science, Risk, and Public Policy." *Science* 221(4615):1026-1028.
296. Russell, Dick. 1989. "Environmental Racism: Minority Communities and Their Battle Against Toxics." *Amicus*, 11:22-32.
297. S. 2959--97th Congress: Acid Deposition Study and Sulfur Emission Limitation Act of 1982
298. S. Rep. No. 403, 90th Congress, 1st Session 10-11, 17-19 1967; H.R. Rep. No. 728, 90th Congress, 1st Session, 25 1967.
299. S.B. 776 1972 Regular Session 67620
300. S.B. 776 1972 Regular Session 67635
301. Sahm, Barbara. 1979. "Project Approval Under the California Environmental Quality Act: It Always Takes Longer Than You Think," *Santa Clara Law Review*, 19.
302. Sanjour, William. 2013. *Memoirs of a Whistleblower*. Online at [www.sanjour.info](http://www.sanjour.info)
303. Savas, Emanuel A. 1987. *Privatization: The Key to Better Government*. Chatham, NJ: Chatham House Publishers
304. SCAB Coordinating Council. 1971. Meeting Notes. On file at SCAQMD Library, Diamond Bar, CA.
305. SCAQMD RECLAIM Socioeconomic and Environmental Assessments Report, 1993.
306. SCAQMD. "Environmental Justice Advisory Group." Online at [https://www.aqmd.gov/gb\\_comit/EJ\\_advisory/ejag.ht](https://www.aqmd.gov/gb_comit/EJ_advisory/ejag.ht) (Last accessed June 1, 2014).
307. SCAQMD. 1992. Regional Clean Air Incentives Market (RECLAIM) Summary of Recommendations EX-1-2. Diamond Bar: SCAQMD.
308. SCAQMD. 2007. *Over a Dozen Years of RECLAIM Implementation: Key Lessons Learned in California's First Air Pollution Cap-and-Trade Program*. Diamond Bar: SCAQMD.



309. Schulte, Bret. 2007. "Fred Krupp-Environmentalist." 12 Nov. 2007, U.S. News and World Report.
310. Schultz, G. 1971. Memorandum for the Heads of Departments and Agencies. Washington, D.C.: Office of Management and Budget. Online at <http://www.there.com/ombpapers/QualityofLife.htm> (Last assessed June 1, 2014).
311. Schwartz, Joel. 1993. "The Coalition Opposes RECLAIM as Currently Drafted: Defects Must be Remedied to Design and Effective Program." Testimony presented to the governing board of the South Coast Air Quality Management District. September 10, 1993.
312. Selmi, Daniel P. 1994. "Transforming Economic Incentives from Theory to Reality: The Marketable Permit Program of the South Coast Air Quality Management District," *Environmental Law Reporter*, December. 10695-10711.
313. Senate Committee on Environment and Public Works, *A Legislative History of the Clean Air Act Amendments of 1990*
314. Senate Report No. 403, 90th Congress, 1st Session 8-9 (1967).
315. Shabecoff, Philip. 1981. "U.S. Backs Trading in 'Credits' Allowing New Plants to Pollute." *New York Times*
316. Shabecoff, Philip. 1984. "Mondale Assails Glenn and Reagan on Acid Rain," *New York Times*.
317. Shabecoff, Philip. 1993. *A Fierce Green Fire: The American Environmental Movement*. Washington, D.C.: Island Press.
318. Shellenberger and Nordhaus. 2007. *Break Through: From the Death of Environmentalism to the Politics of Possibility*. New York: Houghton Mifflin Book
319. Silbergeld, Ellen K. 1991. "Risk Assessment and Risk Management: an Uneasy Divorce." Pp. 99-114 In Rachele D. Hollander (ed.) *Acceptable Evidence: Science and Values in Risk Management*. New York: Oxford University Press.
320. Simmons and Cutting, 1974. *A Many Layered Wonder: Nonvehicular Air Pollution Law in California*. *Hastings Law Journal*, 26.
321. Smith, Neal. 1984. *Uneven Development*. Athens: University of Georgia Press.
322. Smith, Thomas. 1986. "John Kennedy, Stewart Udall, and the New Frontier." *Pacific Historical Review*, 65(3): 329-362.

323. South Coast Air Quality Management District and Southern California Association of Governments, 1990. Draft Air Quality Management Plan: South Coast Air Basin, Diamond Bar: SCAQMD.
324. South Coast Air Quality Management District. 1993. RECLAIM NO<sub>x</sub> and SO<sub>x</sub> Vol. 1: Development Report and Proposed Rules, Draft. Diamond Bar: SCAQMD.
325. South Coast Air Quality Management District. 1994. RECLAIM Program Summary: A Market Incentive Air Pollution Reduction Program for NO<sub>x</sub> and SO<sub>x</sub>. Diamond Bar: SCAQMD.
326. South Coast Air Quality Management District. 2002. An Evaluation of the South Coast Air Quality Management District's Regional Clean Air Incentives Market: Lessons in Environmental Markets and Innovation. Diamond Bar: SCAQMD.
327. South Coast Air Quality Management District. 2002. An Evaluation of the South Coast Air Quality Management District's Regional Clean Air Incentives Market- Lessons in Environmental Markets and Innovation. November. Diamond Bar: SCAQMD.
328. South Coast Air Quality Management District. 2005. Guiding Principles of Environmental Justice. Diamond Bar: SCAQMD.
329. South Coast Air Quality Management District. Aug. 1992. Draft Working Paper for Proposed Rule 1402: Control of Toxic Air Contaminants from Existing Sources. Diamond Bar: SCAQMD.
330. South Coast Air Quality Management District. June 1987 Air Quality Management Plan Revision Working Paper No. 3: The Magnitude of Ambient Air Toxics Impacts from Existing Sources in the South Coast Air Basin I-2. Diamond Bar: SCAQMD.
331. South Coast Air Quality Management District. May 1997. The Southland's War on Smog: Fifty Years of Progress Toward Clean Air. Diamond Bar: SCAQMD.
332. South Coast Air Quality Management District. May 1997. The Southland's War on Smog: Fifty Years of Progress Toward Clean Air. Online at: <http://www.aqmd.gov/news1/archives/history/marchcov.html> (Last accessed June 1, 2014).
333. South Coast Air Quality Management District. Sept. 1988. Analysis of Ambient Data from Potential Toxics "Hot Spots" in the South Coast Air Basin. Diamond Bar: SCAQMD.
334. Southern California Environmental Digest. Sept. 1992. "RECLAIM May be the Best of Times, or the Worst of Times..." Accord: The View of the Digest: Southern California Environmental Digest.

335. Southern California Gas Company. 1993. "A Fair and Workable RECLAIM Proposal." On file at South Coast Air Quality Management District Library, Diamond Bar, CA.
336. Stammer, Larry B. 2 June 1990. "Air Quality District OKs Record Budget." Los Angeles Times.
337. Stammer, Larry B. 27 March 1986. "Smog Chief to Resign, Take Private Job." Los Angeles Times.
338. Stammer, Larry. 7 Dec. 1990. "Companies Told to Inventory Air Pollutants." Los Angeles Times.
339. Stanford Research Institute. 1949. The Smog Problem in Los Angeles County, Second Interim Report. Menlo Park, CA.
340. Stavins, R.N (ed). 1988. Project 88 Harnessing Market Forces to Protect Our Environment, sponsored by Senator Timothy E. Wirth, Colorado, and Senator John Heinz, Pennsylvania, Washington, D.C.
341. Stewart, Richard B. 1985. "Economics, Environment, and the Limits of Legal Control." Harvard Environmental Law Review 9(1).
342. Stradling, David. 2002. Smokestacks and Progressives: Environmentalists, Engineers, and Air Quality in America, 1881-1951. Baltimore: Johns Hopkins University Press.
343. Sugrue, Thomas. 2005. The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit. Princeton: Princeton University Press.
344. Sullivan, Patricia. 22 July 2004. "Anne Gorsuch Burford, 62, Dies: Reagan EPA Director." Washington Post.
345. Szasz, Andrew and Michael Meuser. 1997. "Environmental Inequalities: Literature Review and Proposals for New Directions in Research and Theory." Current Sociology, 45(3): 99-120.
346. Taylor, Dorceta. 2000. "The Rise fo the Enviromental Justice Paradigm: Injustice Framing and the Social Construction of Environmental Discourse." American Behavioral Scientist, 43:500-580.
347. The RECLAIM Program: Hearings Before the Subcommittee on Health and the Environment of the House Committee on Energy and Commerce, 103d Congress 1st Session 54-55 1993. Testimony of Citizens for a Better Environment.
348. Thomas, Tina A. 1993. "In Defense of the CEQA." Land Use Forum, 2(2): 102-108.

349. Tietenberg, T.H. 1985. Emissions Trading: An Exercise in Reforming Pollution Policy. Washington, D.C.: Resources for the Future.
350. Train, Russell E. 1996. "The Environmental Record of the Nixon Administration." *Presidential Studies Quarterly, The Nixon Presidency*, 26(1): 185-196.
351. Trankley, Lisa. 1978. "Stationary Source Air Pollution in California: A Proposed Jurisdictional Reorganization." *UCLA Law Review*, 26: 893
352. Trief, Jaymes. (April 1991). "It's a Small World." *California Business: Special Environmental Supplement* pp. 57-60.
353. Trumball, Terry A. 1972. "Federal Control of Stationary Source Air Pollution." *Ecology Law Quarterly*, 2: 283-
354. U. S. Environmental Protection Agency. 1974. California Environmental Quality Act: Innovation in State and Local Decisionmaking. Socioeconomic Environmental Studies Series. Washington, D.C.: EPA.
355. U.S. Environmental Protection Agency. 1981. Draft Controlled Trading Policy Statement: Guidance Concerning the Creation and Use of Emissions Reduction Credits, July 13, 1981. Washington, D.C.: EPA
356. U.S. Environmental Protection Agency. 1981a. Emissions Reduction Banking and Trading Status Report, March 1, 1981. Washington, D.C.: EPA
357. U.S. Environmental Protection Agency. 1981b. The Bubble Policy: Status Report 2, June 1, 1981. Washington, D.C.: EPA.
358. U.S. Environmental Protection Agency. 1987. EPA's Use of Benefit-Cost Analysis: 1981-1986. Washington, D.C.: EPA.
359. U.S. Environmental Protection Agency. 2003. "Tools of the Trade: A Guide to Designing and Operating a Cap-and-Trade Program for Pollution Control." United States EPA Office of Air and Radiation. Washington, D.C.: EPA.
360. U.S. Environmental Protection Agency. Environmental Equity: Reducing Risk for All Communities. Washington, D.C.: EPA.
361. U.S. Environmental Protection Agency. 2014. "Environmental Justice Key Terms." Online at <http://www.epa.gov/region7/ej/definitions.htm> (Last accessed Dec. 20, 2013).
362. U.S. EPA. July 2012. National Environmental Justice Advisory Council: Fact Sheet, Online at

- <http://www.epa.gov/environmentaljustice/resources/publications/factsheets/factsheet-nejac.pdf> (Last accessed June 1, 2014).
363. U.S. General Accounting Office. 1983. *Siting of Hazardous Waste Landfills and their Correlation with Racial and Economic Status of Surrounding Communities* (No. GAO/RCED-83-168). Washington, D.C. U.S. Government Printing Office.
364. U.S. Public Health Service. 1962. *Tomorrow is Already Here*. Washington, D.C.: U.S. Government Printing Office.
365. Udall, Stewart L. 1963a. "The Conservation Challenges of the Sixties." Speech given at University of California, Berkeley, April 19, 1963. Online at <https://nature.berkeley.edu/site/lectures/albright/1963.php> (Last accessed Feb.17, 2014)
366. Udall, Stewart L. 1963. *The Quiet Crisis*. New York: Avon Books.
367. United Church of Christ Commission for Racial Justice. 1987. *Wastes and Race in the United States*. New York: United Church of Christ.
368. US Environmental Protection Agency, Emissions trading policy statement, 51 Fed. Reg. 43, pp. 814–860, 4 December 1986.
369. Wandesforde-Smith, Geoffrey. 1981. *The Evolution of Environmental Impact Assessment in California*. In *Project Appraisal Policy Review*, edited by Timothy O’Riordan and W.R. Derrick Sewell. Winchester: John Wiley and Sons, 47-76.
370. Warren, Earl. 1973. "Lyndon B. Johnson and Civil Rights." *Texas Law Review*, 51(2): 197-206.
371. Waxman, Henry A. 21 April 1997. "Don't Believe Industry Hit on EPA's Clean Air Standards." Online at <https://waxman.house.gov/don%20B4t-believe-industry-hit-epa%20B4s-clean-air-standards>.
372. Whittington, Dale and W. Norton Grubb. 1984. "Economic Analysis in Regulatory Decisions: The Implications of Executive Order 12291." *Science, Technology, and Human*, 9(1): 63-71.
373. Wolman, Abel. 1968. "Air Pollution: Time for Appraisal." *Science*, 159(3822): 1437-1440.
374. Wood, Alfred and Samuel E. Heller. 1962. *California, Going, Going: Our State's Struggle to Remain Beautiful and Productive*. Sacramento: California Tomorrow.
375. Wynne, Brian. 2007. *Public Participation in Science and Technology: Performing and Obscuring a Political –Conceptual Category Mistake*. *East Asian Science, Technology, and Society: An International Journal* 1:99-110.

376. Yearley, Steven. 2005. *Making Sense of Science: Understanding the Social Study of Science*. Thousand Oaks: Sage.
377. Yost, Nicholas C. 1973. "NEPA's Progeny: State Environmental Policy Acts." *Environmental Law Reporter*, 3(1): 50090-50098.
378. Zimmerman, Joseph F. 1968. "Political Boundaries and Air Pollution Control." *Journal of Urban Law* 46:173-197.