Title
Climate Change from the Streets: A Community-based Framework for Addressing Local and Global Environmental Health Impacts

Author
Mendez, Michael A.

Publication Date
2015

Peer reviewed|Thesis/dissertation

Climate Change from the Streets:
A Community-based Framework for Addressing Local and Global Environmental Health Impacts

by

Michael Anthony Mendez

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

City and Regional Planning

and the Designated Emphasis

in

Science and Technology Studies

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Jason Corburn, Chair
Professor Malo Hutson
Professor David Winickoff

Spring 2015

Abstract

Climate Change from the Streets: A Community-Based Framework for Addressing Local and Global Environmental Health Impacts

by

Michael Anthony Mendez

Doctor of Philosophy in City and Regional Planning and the Designated Emphasis in Science and Technology Studies

University of California, Berkeley

Professor Jason Corburn, Chair

This dissertation analyzes the emerging epistemologies of climate change in California as articulated by social movements, experts, and subnational governments. As the world's eighth-largest economy and the only state in the U.S. to implement a comprehensive program of regulatory and market-based mechanisms to achieve reductions in greenhouse gas (GHG) emissions, California represents an important site of inquiry. The passage of Assembly Bill 32, the Global Warming Solutions Act of 2006 has made the state a global leader on climate change science and policy innovation. While no subnational government can halt climate change alone, California's environmental policies have a long history of success and replication. Through an extensive analysis of the state's climate policies and interviews with key stakeholders, this dissertation highlights the challenges California faces in influencing global climate policy while addressing the needs of local communities that are already adversely impacted by air pollution.

As cities and public agencies appropriate leadership roles in climate governance, policy formulation is increasingly emerging as an expert-driven process that emphasizes global GHG reductions as the goal and geographically-neutral economic and technological fixes as the solution. In this process, community-based strategies that integrate climate change interventions with population health outcomes are often excluded. This dissertation asks how environmental justice advocates are engaging strategically in the policymaking process in order to legitimize or contest regulatory policies regarding climate change in the face of ongoing pollution, illness, and injustice. In answering this question, the dissertation centers on three areas of inquiry: (1) the public health and environmental justice aspects of municipal climate action plans; (2) the conflict over statewide carbon pricing and use of its revenue for investment in communities most impacted by air pollution; and, (3) the social implications of international forest carbon-offset projects allowable under California's market-based climate change law. These cases provide critical insights into environmental inequities and the emerging epistemologies of climate change on multiple scales. The dissertation findings demonstrate that the implementation of climate policies can either serve to exacerbate or redress underlying environmental health inequities in urban communities. In particular, these cases highlight the environmental justice strategies that are challenging *a priori* policy expertise to produce new local, place-based conceptualizations of climate change that underscore population health and community well-being.

Table of Contents

Acknowledgements

First and foremost, I would like to thank my family, friends, and God for providing me with the strength, faith, and inspiration to complete this research. Over the course of this long journey, I have faced career changes, confronted doubts, and overcome vast challenges to reach the end goal.

I could not have completed this endeavor without the support and encouragement of my loving husband and best friend, Richard Stapler. The Lazzareschi Scholar-in-Residence program provided an intellectual and supportive family environment in which to carry out my studies. Blessings to the Mendez family for their prayers and encouragement throughout the years.

I would like to thank the Ford Foundation and the UC Chancellor's Pre-doctoral Fellowship programs for their financial support during my time at Berkeley. I am also grateful to the Sacramento Rainbow Chamber of Commerce, the Markowski-Leach Scholarship Fund, the UC Berkeley Center for Science, Technology, Medicine, & Society (CSTMS), the UC Center for Global Healthy Cities, and the Global Environments Summer Academy (GESA) for providing additional financial support and intellectual stimulation. Thanks to Carla Trujillo and Cynthia Ladd-Viti in the Graduate Division's Summer Research Opportunity Program (SROP), and Deb McKoy and Jennifer Wolch in the College of Environmental Design for providing me with invaluable teaching opportunities through the Y-PLAN (Youth – Plan, Learn, Act, Now!) and embARC Design Academy programs.

Special thanks go to Jason Corburn, for his guidance and persistent efforts to push me to new intellectual levels of inquiry; to Malo Hutson, for consistently being my cheerleader, colleague, and friend since my days at MIT; and to David Winickoff, for introducing me to the world of STS and pushing the limits of my writing and intellectual curiosity. I also thank the colleagues of the intellectual community of which I am now a part of: David R. Diaz, Shelia Jasanoff, Julie Sze, Jonathan London, Alvaro Huerta, Stephen Wheeler, Julian Agyeman, and Scott Mackenzie. Their work and ideas are cited throughout this dissertation, and their combined research and mentorship provided me a strong foundation from which to develop new conceptual models.

I offer my most sincere gratitude to all the California environmental justice advocates, leaders, and groups who provide the real inspiration of this multiscalar research. Finally, thank you to the Latinos legislating the climate from Sacramento: Assembly Speaker Fabian Núñez, State Senate *pro tem* Kevin De Leon, Senator Ricardo Lara, and most of all, my good friend, Sacramento County Supervisor and California Air Resources Board member, Phil Serna.

Prologue

Figure 1:
On January 17, 2014, an astronaut aboard the International Space Station photographed a thick layer of smog hovering over many regions of California during the winter months.
Source: Astronaut photograph ISS038-E-32446 (2014)

In the winter of 2013-2014, I began to write my dissertation in earnest, spending countless hours in my small home office in Sacramento converting years of data and interviews into scholarly research. During my marathon writing sessions, I often took a midday break for a four-mile run along the city's largest regional park and the Sacramento River, which parallels the busy Interstate Highway 5 (I-5). Increasingly, those runs began to weigh heavier on my chest, an effect of the pollution that accumulated during one of the driest winters on record. From Sacramento to Los Angeles, a haze of gray particles hung in the air most of the winter; for more than a month, the haze hindered visibility of the Sierra Nevada mountain range (Figure 1). Simultaneously, a high-pressure ridge, four miles high, settled off the West Coast, preventing Pacific storms from cleansing the air across most of central California. With no rain since early December 2013, pollution levels rose sharply throughout most of the state. In the Central Valley,

California's agricultural heartland and other parts of the state, fine particulate matter rose to unhealthy levels. No rain would alleviate much of the conditions until late January 2014 (Barboza, 2014a).

Air quality officials warned individuals on several occasions to stay indoors on "red alert days." On such days, levels of particulate matter (known as PM 2.5) are three times the normal amount -- a level that is unhealthy for all population groups. PM 2.5 is less than a fraction of the width of a human hair and is emitted by diesel engines, fires, and other combustion sources. They are of great concern to public health experts because they are inhaled deep into the lungs and can impair breathing. PM 2.5 can also damage the heart and blood vessels (Barboza, 2014a). On one red alert day, where I had spent too much time writing, I ignored the warning to take my daily run. By the third mile, my head started to ache and I began coughing heavily. Feeling nervous over my failure to heed the red alert warning, I ended my run and caught my breath before walking the last mile home.

The red alert days represented a rapidly changing reality for California air quality officials. Previously, air quality warnings were typically issued only in the summer and directed at sensitive populations, such as children, the elderly, and those with respiratory problems. Warming temperatures and extreme drought conditions, however, are increasing health risks for all population groups. In turn, air quality warnings in California are becoming more commonplace during the winter months (Cuff, 2015). In the Central Valley, where air quality conditions have deteriorated badly over the years, school officials in districts like Bakersfield, had long flown colored flags to indicate air quality; green for good; yellow for moderate; orange, unhealthy for sensitive groups; and red, unhealthy for all population groups. By January 2014, however, poor air quality required officials to introduce a new flag color – purple-- indicating "*very unhealthy*" air for all people. When a purple alert was declared in early 2014, schools were forced to fly their red flags because they had no purple flags; until then, such flags had never been needed (Figure 2). The purple alert banned all outdoor activity for teachers and the district's 29,000 students, save for basic movement between buildings and school buses. Physical education classes could not be held outdoors, and students and teachers were required to stay in classrooms all day (Mayer, 2014a).

According to one Central Valley elementary school principal, the winter of 2013-2014 was the "first time ever we have been on an inside schedule when it is cold outside. Usually we see this kind of thing when it is hot. Not in January" (Lollis, 2014). Yet, such bad air quality is not restricted to the Central Valley. As California entered its third consecutive year of drought, weather patterns helped create some of the highest levels of soot in the San Francisco Bay Area. In January 2014, the Bay Area Quality Management District issued 11 consecutive "Spare the Air" days (Cuff, 2015). The air district issues the alerts when it anticipates unhealthy soot levels. It also bans most indoor and outdoor wood burning because it is predicted that smoke and PM 2.5 levels would violate federal public health standards intended to protect people with asthma or heightened sensitivity to air

pollution. That month, the air in the region exceeded federal PM 2.5 standards on 3 of those 11 days (Cuff, 2014).

Figure 2
A red flag flies over an elementary school in the Central Valley on January 7, 2014. A purple flag level air alert was issued, but the school, like many schools in the region, lacked a purple flag. Source: Hara (2014).

A recent report by the California Air Pollution Control Officers' Association (CAPCOA, 2014) predicts that climate change and extreme weather, could set back decades of improvements in California's air quality. As the drought continues and the number of extreme heat days from global warming increases, smog formation and wildfires that release harmful smoke into the air will only intensify. Scientists, moreover, have found that the meteorological conditions that have caused California's drought are far more likely to occur in today's warming world than in one without human-caused emissions of greenhouse gases (Diffenbaugh et al., 2015). The CAPCOA report concludes that climate change poses enough of a threat to clean air that state policymakers and local air districts will need to break down policy silos and collaborate on new approaches that jointly address global greenhouse emissions and other localized co-pollutants. This includes targeting black carbon (a component of PM 2.5), a short-lived, global-warming pollutant that also has local public health impacts (CAPCOA, 2014).

As I neared the completion of my dissertation in the following winter of 2014-2015, the extreme drought persisted. Occurrences of poor air quality were on the increase in many of California's most disadvantaged communities. Nevertheless, I still went out on my daily runs, although I learned to heed the red alert warnings and exercised indoors on such days. Writing this dissertation, consequently, has provided me the opportunity to analyze something that is so basic, we often take it for granted – the air we breathe. But, as I learned from this research, not all air is created equal, and some communities in

California are more vulnerable than others to the impacts of climate change and pollution. This research tells the story of how disadvantaged communities are engaging strategically in the policymaking process. Their efforts are ensuring California's climate change policies not only tackle a global phenomenon but also address the needs of local communities that are already adversely impacted by air pollution.

CHAPTER 1:
Overview of Equity and Health in California's Warming Climate(s)

This dissertation investigates the emerging epistemologies of climate change in California as articulated by social movements, experts, and subnational governments.[1] As the eighth-largest economy in the world and the only state in the United States to implement a comprehensive program of regulatory and market-based mechanisms to achieve reductions in greenhouse gas (GHG) emissions, California represents an important site of inquiry. The passage of Assembly Bill 32, the Global Warming Solutions Act of 2006 (AB 32) has made the state a global leader in climate change science and policy innovation.[2] While no subnational government alone can halt climate change, California's environmental policies have a long history of success and replication. Through an extensive analysis of the state's climate policies and interviews with key stakeholders, this research project highlights the challenges California faces in influencing global climate policy while addressing the needs of local communities that are already adversely impacted by air pollution.

As California undertakes a leadership role in climate governance, policy formulation is increasingly emerging as an expert-driven process that emphasizes global GHG reductions as the goal and geographically-neutral economic and technological fixes as the solution (Park, 2009; Millard-Ball, 2012). In this process, climate change policies are not analyzed to determine how they can serve to either exacerbate or redress existing forms of environmental inequality in urban communities. Community-based strategies that integrate climate change interventions with population health outcomes are often excluded. Consequently, California's climate interventions have been met with uncertainty and socio-political contestation, where global scientific fact is being separated from local knowledge, culture, and history (Pitt and Randolph, 2009; Jasanoff, 2010; Wynne, 1992). Urban studies and public health scholars have rarely investigated how scientific expertise and climate governance is challenged amid the growing engagement of environmental justice[3] advocates to produce contextually relevant strategies that integrates climate change interventions with population health outcomes.

---

[1] A social movement is defined as "an action system, formed for a certain period of time and based on collective identity, of mobilized networks of groups and organizations which aim to bring about, prevent, or reverse social change by means of protest" (Garrelts and Dietz, 2014: Pg. 6). Social movements have been seen as more than single NGOs, citizen's initiatives, or activists. They are complex, often decentralized networks that can produce a powerful dynamic, generate considerable political and media pressure to make a decisive contribution to social change (Garrelts and Dietz, 2014).

[2] This introduction does not cover a detailed primer on the causes, consequences, and mechanics of climate change; additional detail is included in the subsequent chapters. A large body of literature explores climate change in the natural sciences and social science disciplines. For additional information, see IPCC, 2014; Adger et al, 2006; and Miller and Edwards, 2001.

[3] Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice can be achieved when all individuals enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making

Resistance to climate change science and policy typically has been framed through the deficit model, which views lay people, such as environmental justice (EJ) groups, as having insufficient knowledge about scientific problems. Under this model, such groups and individuals must be educated in order to see the world more like professional experts (Corburn, 2007; Brown, 2009; Beck 2011b). To address the shortcomings in the literature and contest the view of lay publics as "technically illiterate," this dissertation aims to provide a complex and nuanced interpretation of the phenomenon of climate change at its various sites of construction. In particular, this research asks how environmental justice advocates are engaging strategically in the policymaking process in order to legitimize or contest regulatory policies regarding climate change in the face of ongoing pollution, illness, and injustice. In answering this question, the dissertation centers on three multiscalar cases: **(1)** the public health and environmental justice aspects of municipal climate action plans; **(2)** the conflict over statewide carbon pricing and use of its revenue for investment in communities most impacted by air pollution; and **(3)** the social equity implications of international forest carbon-offset projects allowable under California's market-based climate change law. These interrelated case studies provide critical insights into environmental inequities and the emerging epistemologies of climate change on multiple scales.

The next sections of this chapter introduces the research objectives of the dissertation and the environmental justice strategies that are challenging *a priori* policy expertise to produce new local, place-based conceptualizations of climate change that underscore population health and community well-being. Section 2 describes the tension between two competing California climate policy approaches, *"Carbon Fundamentalism"* and "*Climate Change from the Streets,"* and argues how different epistemological frames take part in shaping conceptions of 'nature' and how it facilitates or hinders social inclusion and public health locally. Section 3 explores the multidisciplinary frameworks from the fields of urban studies, public health, and Science and Technology Studies (STS) to examine the multiple ways of knowing climate change as the phenomenon is configured through interrelated policy scales. In particular, it is argued that using a multidisciplinary approach highlights the socially and geographically uneven impacts of climate change throughout California, and the politics of knowledge production and expertise around climate change interventions. Section 4 describes the research questions and methods; it is followed by a brief summary of the multiscalar case study chapters.

process to have a healthy environment in which to live, learn, and work (U.S. Environmental Protection Agency, 2012).

Section 1.1: Tension between Carbon Fundamentalism and Climate Change from the Streets

As public concern grows for the changing climate and impacts to the environment, governments and scientists are becoming more focused on its causes, global GHG emissions. As a result, the goal of climate policy is to reduce the seven GHG emissions identified by the Kyoto Protocol[4] and California's Global Warming Solutions Act of 2006 (AB 32) without regard to public health concerns. This is because scientific studies have shown, these seven GHG emissions[5] have "no direct public health impacts" because they are global pollutants that mix uniformly in the atmosphere. They do not have localized effects like particulate matter (PM 2.5) and ground-level ozone (O_3) (CARB, 2008).[6] Evidence of observed climate change impacts, moreover, is reported as strongest and most comprehensive for natural systems (IPCCC, 2014).[7]

Despite the fact that GHG and co-pollutants, such as PM and O_3, (the key ingredients of smog) are emitted concurrently from processes such as fossil fuel burning in industry, motor vehicles and buildings, they are not addressed jointly in climate policies (Boyce and Pastor, 2013; Pastor and Boyce, 2012).[8] Since GHG emissions are seen as not having localized impacts, the health co-benefits[9] of GHG reduction strategies are often not analyzed, quantified, or even identified by policymakers. It is asserted that climate policy is most cost-effective when it is focused solely on global GHG emissions. Under this approach, "the most environmentally and economically effective way to address co-pollutants is to revisit existing local pollution laws and perhaps make them more stringent" (Stavins, 2011). Consequently, climate change responses leave out critical populations and seldom address the human scale of climate change. Climate change is generally perceived as an environmental problem, rather than a people problem. It is framed as

[4] The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding GHG emission reduction targets. The Kyoto Protocol was adopted in Kyoto, Japan, on December 11, 1997 and implemented on February 16, 2005 (UNFCCC, 2014).

[5] The seven GHG emissions under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride. The Kyoto Protocol does not include nitrogen trifluoride (NF_3). NF_3 was not widely used in the 1990s when the Kyoto Protocol was negotiated. Recent studies found that NF_3 has a higher global warming potential than CO_2, persists in the atmosphere longer, and is used in the manufacture of several consumer items, including photovoltaic solar panels, LCD television screens, and microprocessors (California Health and Safety Code, Section §38505(g)).

[6] Exposure to GHG emissions has human health impacts in concentrated form, such as their use in the workplace (WDHS, 2013). However outdoor exposure levels are considered to be *de minimis*; GHG emissions dilute as they mix uniformly in the atmosphere (CARB, 2008).

[7] For example, according to the IPCC (2014; Pg. 6) changing precipitation or melting snow and ice are altering hydrological systems in many, affecting water resources in terms of quantity and quality (medium confidence). Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, abundances and species interactions in response to ongoing climate change (high confidence).

[8] Co-pollutants include PM, O_3, nitrogen oxides (NO_X), sulphur oxides (SO_x), volatile organic compounds (VOCs) and carbon monoxide (CO) (Boyce and Pastor, 2013).

[9] For purposes of this research, "co-benefit" means an ancillary benefit of a GHG mitigation or adaptation policy that is produced in addition to the benefit targeted by the policy (Pittel and Rubbelke, 2008; Li, 2002; Burtraw and Toma, 2000).

an abstract scientific problem affecting the "natural" world, rather than a problem with everyday impacts on local communities.

In climate policy, the key greenhouse gas of concern is carbon dioxide (CO_2); it is one of the most abundant anthropogenic gases that contributes to global warming and persists in the atmosphere for many years (UCS, 2012). To quantify and monitor CO_2 and other GHGs, analysts convert the gas levels to a "CO_2 equivalent" (CO_2e). The CO_2 equivalency is calculated by multiplying its mass by the "global warming potential" (GWP), which indicates the equivalent greenhouse effect of a pound of the gas as compared to a pound of CO_2 (Table 1). References to GHG emission quantities in climate policy follow the international convention of using metric tons (2205 pounds) of CO_2 or the "CO_2 equivalent" when referring to non-CO_2 gases (CARB, 2014a).

Table 1: Greenhouse Gas CO_2 Equivalents

GHG	Global Warming Potential (20-years)	Global Warming Potential (100-year)
Carbon dioxide	1	1
Nitrous oxide	264	265
Nitrogen trifluoride	12,800	16,100
Sulfur hexafluoride	17,500	23,600
Perfluorocarbons	5,000-8000	7,000-10,000
Methane	84	28
Hydrofluorocarbons	100-11,000	100-12,000

Source: CARB (2014)

The strong adherence to CO_2 as the main global greenhouse gas of concern and the perception of climate change as impacting mainly "natural systems" has been conceptualized as ***"Carbon Fundamentalism."*** Allenby (2008), first introduced the term into the climate change lexicon with his view that the transference of social trends and behaviors into a simplistic equation of "CO_2 equivalency" or "carbon footprint"[10] marked a sign of a growing authoritarian governance structure and the moral valuation inherent in climate change solutions. He suggested that fundamentalism of any type encourages an authoritarian view of "nature" that rejects open dialogue and nuanced consideration of alternative policy solutions.

[10] A carbon footprint is defined as "a measure of the total amount of [GHG] emissions of a defined population, system or activity, considering all relevant sources, sinks and storage within the spatial and temporal boundary of the population, system or activity of interest. Calculated as carbon dioxide equivalent (CO_2e) using the relevant 100-year global warming potential (GWP100)" (Wright et al, 2011).

> The data driven exploratory processes of science are choked off by inculcation of belief systems that rely on archetypal and emotive strength. Importantly, the extreme language is directed not against those who deny anthropogenic climate change completely, but those who, while accepting the existence of the phenomenon, do not believe it is an existential and immediate crisis. The authority of science is relied on not for factual enlightenment but as ideological foundation for authoritarian policy prescriptions which might otherwise be difficult to implement (Allenby, 2008).

Under carbon fundamentalism, "nature" is used to describe desired environmental conditions and goals of climate governance: "achieving carbon reduction targets," "preventing dangerous anthropogenic interference with the climate system," and "limiting the average global surface temperature increase of 2°C (3.6°F) over the pre-industrial average." Scientific synonyms of nature include "biodiversity," "ecological integrity," and "natural systems." As explained by Hull (2006), these references describe a singular nature. Under carbon fundamentalism, society is shielded from seeing the multiple natures that evoke alternative environmental futures and political action. Furthermore, carbon fundamentalism disregards local context and socio-economic conditions influencing the phenomenon of climate change.

In analyzing California's climate governance, this dissertation has identified six key characteristics of carbon fundamentalism. The first, focuses on the GHG reduction potential of all climate policies and is measured in tons of CO_2 equivalency. AB 32 established a 1990 GHG emission level to serve as the 2020 emission limit of 427 million metric tons of carbon dioxide equivalent ($MMTCO_2$) GHG emissions (CARB, 2014a). Policymakers claim that Californians historically have supported such climate approaches to protect the "natural environment" and the high quality of life it provides (CARB, 2014a; Pg. 26). In implementing AB 32, state officials asserted that California was "sustained, in more ways than one, by the mountains, deserts, rivers, streams, forests, farmlands, rangelands, coastline, and temperate climate that form [the] natural environment" and define the state. These resources and their "natural beauty," is argued, together facilitate California's continued economic and cultural growth (CARB, 2014a; Pg. 26).

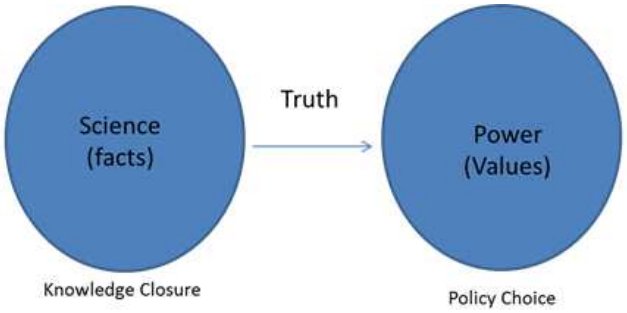


Figure 3: Speaking truth to power. Source: Jasanoff and Wynee (1998; Pg. 8

The second characteristic of carbon fundamentalism is that California's climate policies are built on a strong foundation in science. It is contended that policy has been supported, and advanced, by California's world-class research institutions, which have made the state perhaps the most studied region in the world when it comes to GHG emissions and climate policy (CARB, 2014a, Pg. 32). Working under a linear approach to expertise, California takes strides to ensure that 'sound' science compels policy action. The interaction between science and policy is viewed as a one-way process, in which scientific inquiry is conducted away from society, politics, and values ('truth speaks to power' – Figure 3). Under carbon fundamentalism, unbiased, dispassionate investigators assess facts about nature (Ezrahi, 1990). This positivist perspective assumes that science informs policymakers of objective facts or projections, after which policymakers factor in social or political considerations. Hence, California ascribes to a strong scientific framing of the phenomenon that is developed by a detached community of experts. According to Beck (2011b), Haas (1992), and Jasanoff and Wynne (1998), the linear model in climate change science and policy assumes three principles:

a) Certainty is the result of more and better research (the linearity of knowledge production);
b) More and better research helps resolve political disagreements (science serves as a harmonizing element);
c) By separating science from the vulgarities of politics; policy-making is evidence-based and rational (Figure 4).

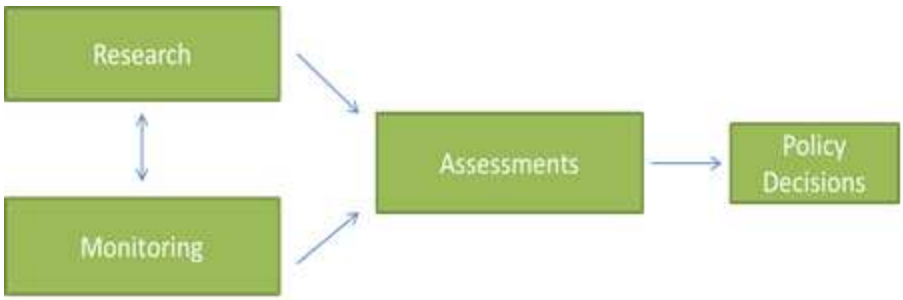
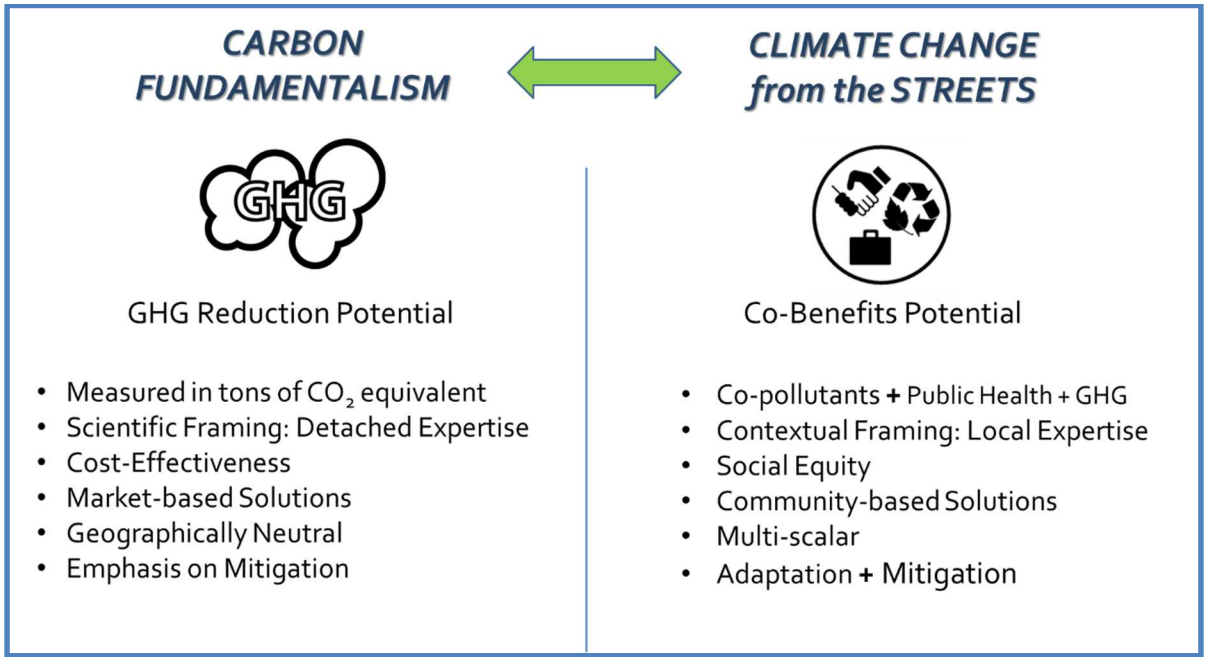


Figure 4: Science and policymaking. Source: Bolin (1997; Pg. 27)

The third characteristic of California's carbon fundamentalism asserts that appropriate action on climate change requires a continuum of measures to capture the maximum technologically feasible and "*cost-effectiveness"* emission reductions opportunities wherever possible, on an ongoing basis. AB 32 defines cost-effective as the "cost per unit of reduced emissions of greenhouse gases adjusted for its global warming potential" (California Health and Safety Code, sections §38505(d); 38560; 38561). Fourth, as outlined in Figure 5a, under carbon fundamentalism, cost-effectiveness is principally achieved through market-based mechanisms that provide an environment where businesses and polluters that make "smart investments can

be rewarded for developing advanced technologies" (CARB, 2014a; Pg. 104). Furthermore, carbon fundamentalism claims that "targeted, performance-based standards and technology-forcing rules can kick-start markets and drive technologies to higher volumes, and lower prices." Ultimately, the goal of these climate measures is to develop market-winning solutions, rather than just direct regulatory compliance approaches (also known as command-and-control regulations). Strategic financial investments and policy support is intended to accelerate market transitions to cleaner technologies (CARB, 2014a; Pg. 104).

Figure 5a: Tension between Carbon Fundamentalism and Climate Change from the Streets



The fifth characteristic of carbon fundamentalism focuses on the geographically-neutral scale of climate policy interventions. Under AB 32, policymakers narrowed climate measures to directly address GHG reductions across polluting sources, regardless of geography or scale. As GHG are global pollutants that mixed uniformly in the atmosphere, it is argued, specific locations for reducing GHG emissions do not matter, as long as California meet's its 2020 reduction targets. State policymakers, moreover, view California as a member of the global community and envision its climate policies to be part of a larger domestic and international carbon regime. The state has strategically chosen to move away from a "parochial" scale – even if it would result in the direct reduction of other co-pollutants (like O_3 and PM). California is scaling-up its efforts to the "global" to engage in a climate change policy arena on par with the world's nation-states (Mazmaian et al., 2008).

Finally, the last characteristic under carbon fundamentalism in AB 32 is its main focus on mitigation (Figure 5a). California's mitigation measures are intended to slow the rate at which human-caused GHG emissions are being emitted to avoid further disruptions to the Earth's atmosphere, rather than focusing on adaptation measures. The goal of adaptation measures is to protect lives, health, property, and ecosystems from actual or anticipated climate change impacts, such as heat waves, droughts, and flooding. Hence, mitigation can be viewed as activities to protect "nature from society," while adaptation involves ways of "protecting society from nature" (ICELI, 2009; Stehr et al., 2005; Pg. 1).

Conversely, California environmental justice advocates reject a strong adherence to carbon fundamentalism. They argue that the epistemology of climate change as an abstract, global, and scientific issue precludes the lived experience of individuals in pollution-adjacent neighborhoods, and further complicates environmental inequalities in communities of color. Carbon fundamentalism separates climate change from political and socio-economic factors, and most importantly, from the human-local scale (Park, 2009; Hulme and Mahony, 2010). EJ advocates argue that such positivist approaches privileges experts as the bearers of knowledge about both the problem and the solutions. As described by Barugh and Glass (2010), this type of climate policy often ignores the negative environmental and social impacts of climate change on environmental justice communities:

> There is a risk with regard to climate change that as the scientific nature is emphasized as the realm of experts, and the solution posited by the state is reducing carbon emissions, communities are disempowered to examine the issue for themselves, and communities are left with expert state and corporation driven solutions such as market-based pollution trading and technological fixes (Pg. 3).

Therefore, without proactive and contextual policies that emphasize the human-local scale to address equity concerns, EJ groups claim climate change will likely reinforce and increase current, as well as future health disparities in marginalized communities. Research has shown that population groups with low socioeconomic status (SES) are typically most vulnerable to climate change impacts, compared to wealthier groups, who are able to pay for protection against or recovery after such disasters (Curtis and Oven, 2011).[11] The scope and scale of climate policies are relevant to public health because climate change-related risks are place-specific and path-dependent. Location is an important determinant of hazardous exposure, and certain places will bear more risk than others (Hess et al., 2008). Understanding social vulnerability of communities is critical because climate change impacts such as risk of wildfires, drought, flooding, and extreme weather events have accompanying health impacts that are occurring sooner than projected (Pastor et al., 2009). Shonkoff et al. (2011) refers to such circumstances as the 'Climate Gap,' and further describing it as "the disproportionate and

[11] Social vulnerability to climate change is often defined by the ability for a community to anticipate, cope, and resist, and recover from the impact of extreme weather events such as hurricanes, floods, heat waves, air pollution, and infectious disease. As such, it is important to understand disparities in the costs and benefits of climate change, the abilities of different groups to adapt to it, and the mitigation/adaptation strategies developed to address it in order to better inform regulatory and policy action in the future (Shonkoff et al., 2011).

unequal implications that climate change and climate mitigation hold for people of color and the poor" (Pg. 486).

As a result, environmental justice advocates in California are pushing forward an alternative climate policy model, which this dissertation has conceptualized as ***"Climate Change from the Streets."*** As outlined in Figure 5a, Climate Change from the Streets (CCStreets) challenges the *a priori* policy practices of carbon fundamentalism by creating new methods and interventions that focus on how climate change responses can be embedded in social justice and public health, and intertwined with economic processes. The focus is not only on the degradation of 'nature' but also the degradation of communities (Agyeman et al., 2003; Park, 2009; Morello-Frosch et al., 2012). Through CCStreets, environmental justice groups approach climate change differently. They know and analyze the phenomenon through people's histories, cultures, place, and local knowledge[12] rather than solely through data gathered by experts and implemented by policy regimes (Park, 2009; Morello-Frosch, et al., 2012).

CCStreets places a strong emphasis on the co-benefits potential of climate policies, arguing that efficient policy design seeks greater emissions reductions where health co-benefits are greatest and most needed. CCStreets also seeks a concerted effort toward adaptation planning in addition to mitigation measures (Figure 5a). Adaptation is pursued in the acknowledgment of the fact that even if governments succeed in the future in reducing GHG emissions, certain irreversible and significant impacts from climate change are already underway and are inevitable. As such, some population groups are more socially vulnerable and will need additional safeguards from the immediate and anticipated climate change impacts (Few, Brown, and Tompkins, 2007; Shonkoff et al., 2011).

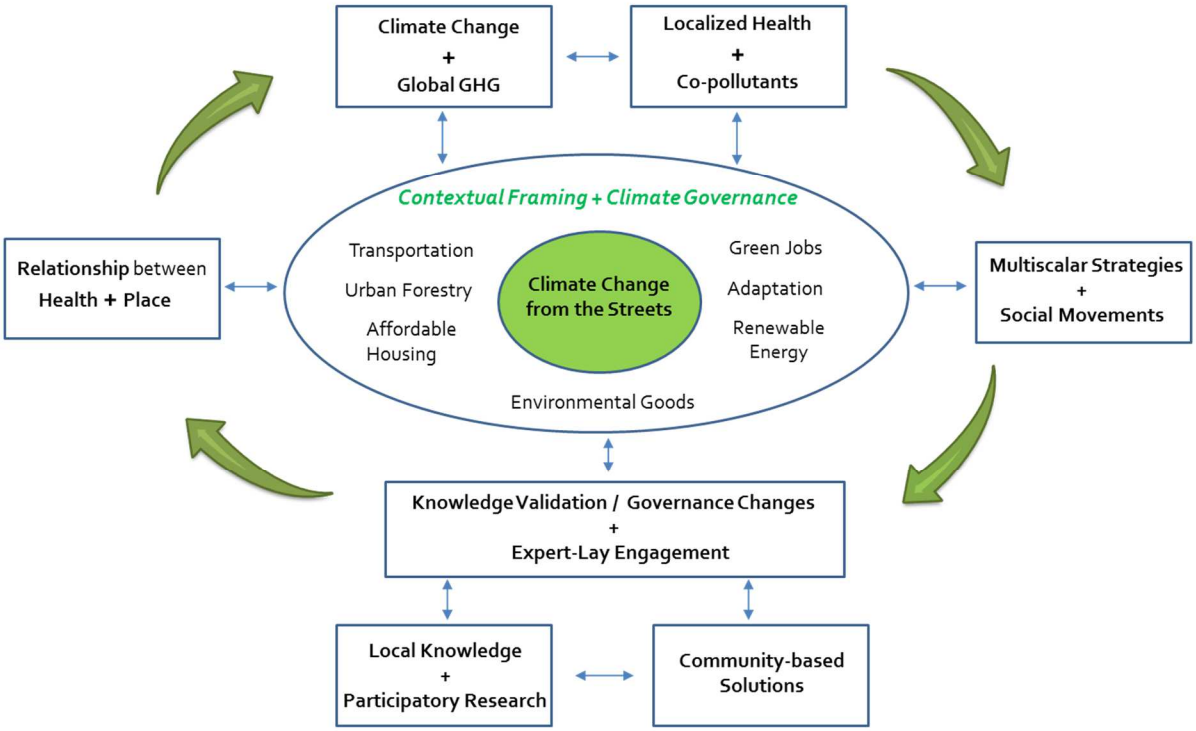
Advocates of the CCStreets model, consequently, are challenging experts over issues of truth and method in climate policy and demanding a greater role for themselves in decision-making processes that impact their lives (Iles, 2007; Corburn, 2007). Environmental justice groups are not only debating the political use and control of policy and expertise, but also the process by which technical knowledge is produced by claiming to speak credibly as experts in their own right. By embracing the use of local knowledge, they reject the employment of "universal knowledge" in environmental policymaking, which standardizes and generalizes the achievement of science to make it replicable in all contexts, without regard to of place (Clark and Murdock, 1997). As the dissertation case studies will elucidate, EJ groups are employing local knowledge of the environment to identify community-based solutions to climate change at multiple scales.

As conceptually illustrated in Figure 5b, CCStreets highlights the reciprocal and dialectical relationship between nature and society. The policy model institutes a socio-geographical

[12] Local knowledge is often defined by the International development literature as: a). information linked to a specific place, culture or identify group; b). dynamic and evolving knowledge; c). know-how belonging to groups of people who are intimate with the natural and human system within which they live; and, d). knowledge that has some qualities that distinguishes it from formal scientific knowledge (Corburn, 2003).

method to climate change interventions and human health. As a result, CCStreets acknowledges an understanding of how climate change is connected with other types of knowledge about the local environment, and enables different ways of knowing to play a valid part of framing a culture of climate change and its correspondingly policy responses (Brace and Geoghegan, 2010). In sum, as exemplified in Figure 5b, through CCStreets, we understand that a range of competing actors and institutions heterogeneously engineer the social and technical elements of climate change governance.

Figure 5b: Conceptual Diagram of Climate Change from the Streets



Section 1.2: Analyzing Climate Change through the Multidisciplinary Frameworks of Urban Planning, Science and Technology Studies, and Public Health

Climate governance has been defined as "the ways in which public and civil society actors and institutions articulate climate goals, exercise influence and authority, and manage urban climate planning and implementation processes" (Anguelovski and Carmin, 2011; Pg.169). It is through these processes that societies define the phenomenon of climate change, in the form of rules and norms, values, and solutions. Under carbon fundamentalism, California follows a conventional view of climate governance, in which local action is seen as being directly influenced by global-scale policy and international agreements. As previously noted, the primary focus of AB 32, is global GHG emissions reductions. California provides little way of guidance or mandates for cities to analyze and incorporate health co-benefits in mitigation and adaptation measures.

Throughout the world, there is growing evidence that local climate planning is neglecting issues of equity and human health (Bulkeley et al., 2013; Douglas et al., 2012; Finn et al., 2011; Hughes, 2013; Pearsall et al., 2010). Municipal climate action plans (CAPs)[13] rarely analyze or consider the disproportionate impact climate change will have on low-income neighborhoods and communities of color in regards to heat waves, air pollution, public health, and environmental justice (Bulkeley et al., 2013; Skonkoff et al., 2009). Carmin et al. (2013) has found that many experts providing advice to cities; believe successful climate planning requires grounding initiatives (in particular, adaptation) in scientific assessments without regard to the socioeconomic conditions in which the phenomenon takes place. Carmin et al (2013) conducted focus groups with leading practitioners in 14 cities in North America, Europe, Asia, and Africa to understand what constitutes successful uses of science and management of scientific uncertainty in urban adaptation planning. This research concluded that scientific evidence plays a critical role in climate planning. Climate leaders use science "as a discursive and symbolic tool" to legitimize climate-related activities and provide practitioners with the means to set priorities and identify appropriate cost-effective planning measures (Pg. 229).

The emphasis placed on scientific assessments as a foundation for climate planning is aligned with carbon fundamentalism or positivism, both of which are based on the assumption that scientific data and findings will guide policymakers to adopt the best course of action. Carmin's (2013) study of leading local climate practitioners also identified three critical limitations to a strict positivist perspective in climate planning: **(1)** the perspective ignores the fact that scientific analyses and findings, are themselves the product of social and political processes. The knowledge base of stakeholders involved in the process, shape both the types of assessments conducted and findings that are produced; **(2)** though science is often viewed as

[13] A climate action plan focuses primarily on reducing GHG emissions, including emissions resulting from both a local government's operations and from the community as a whole. It typically includes an analysis/strategy to reduce greenhouse gas emissions resulting from land use, energy use, transportation, solid waste disposal, buildings, lighting, and waste water treatment and water delivery (ICLEI, 2012).

producing unbiased and irrefutable results, the findings of assessments are often used as a basis for advancing political agendas, and when results diverge from the preferences of local policymakers, they may be compelled to change their options or challenge the methods or findings; and **(3)** "while many scholars and practitioners are focusing on how to design assessment processes that cities can adopt, as is the case with science in general, the estimation used in these and other types of urban climate assessments are inherently social and uncertain" (Pg. 223).

Cartwright et al. (2012) similarly cautions that strict positivist approaches in urban climate planning does not always result in substantive or swift climate action. She argues that no linear relationship exists between more and better climate knowledge and improved action in cities. In many situations, the more city officials understand about climate change and its consequences, the more difficult decisions become (Cartwright et al., 2012). On one hand, climate-adaptation theory suggests that as uncertainty increases, a stronger emphasis on flexibility, iterative progress, reflection, and continual learning as information becomes available is required (Desai et al., 2008; Hallegatte et al., 2011). Yet at the same time, local policymakers are being called upon to demonstrate proactivity in defining scientifically sound models of climate governance while weighing competing economic interests (Cartwright et al. 2012).

> Thus a tension between carefully engaging the science so as to create policy that will cope with uncertainty on the one hand, and the call for bold and transformative leadership on the other. It is unsurprising, then, that some city-scale decision-makers find themselves uneasy about taking climate change decisions in a systematic and responsible manner. The fact that climate change is only one of the competing imperatives -- alongside critical issues…such as economic growth -- demanding the attention of city officials and politicians makes defining the right action even more contested (Cartwright et al. 2012; Pg. 3).

Consequently, local governments often minimize normative judgments underlying climate risk assessments and plans under the platform of technical impartiality to promote rational planning decisions. According to Rosenthal et al. (2013), technical rationality has been adopted as the basis to guide many climate-planning decisions in major cities across the United States, a trend that has the potential to reinforce "existing patterns of privilege and exclusion" (Pg. 220). She asserts that a strong reliance on technocratic regulation has often resulted in the overconcentration of noxious uses in low-income neighborhoods and communities of color that have historically lacked the capacity to resist such facilities (Rosenthal et al., 2013; Northridge et al., 2003, Aygeman, 2001). These communities are often marginalized in public decision-making processes and less likely to engage in technical analyses that are required in regulatory processes based on professional science (Young 2002; Corburn, 2005).[14]

[14] In the United States, the field of urban and environmental planning has a long history of technocratic planning, in which risk assessment and cost-benefit methodologies are used to meet legal requirements under state and federals laws for environmental review of development projects and to ensure local economic development priorities (Burayidi, 2001; Umemoto, 2002; and Rosenthal et al., 2013).

As these examples illustrate, institutionalized expertise is emerging as a powerful instrument for creating boundaries between professional and lay expertise in climate policy, despite scientific and political uncertainity. The dominant epistemology of climate change discourages lay engagement and universalizes climate change without regard to local context. However, the questions of who counts as an expert, whose knowledge is accepted, and who participates in advisory and negotiating bodies are critically important elements in the development of climate governance.

Such boundaries are considered ineffective to maintain in addressing environmental challenges because these boundaries do not acknowledge how developments in knowledge and technological capacity are linked to human self-understanding and social relations. Nor do they reflect historical experience, social practices, or lay experimentation, which are not the same as knowledge acquired through lab experiments, formal climate models or methodically disciplined empirical observations. "To discover new facts about 'nature' [i.e. climate change] we change ourselves. To build on 'natural' facts without taking stock of associated social orders is risky business" (Jasanoff and Martello, 2004; Pg. 347). In this respect, the diverse ways of knowing are viewed as a method to provide safeguards against the consequences of scientific reductionism in climate change policy. Such a reality is placing new demands on experts to collaborate on developing findings in new settings and at multiple scales.

In California, environmental justice groups are challenging the positivist and detached expertise of climate policy. The CCStreets approach aligns with the findings found in the field of Science and Technology Studies (STS). STS examines the culturally contingent nature of techno-scientific practices, biases, and values that often conflict with community understandings and representation of local environmental conditions (Latour, 1987, Wynne, 1992; Bijker and Pinch, 1987; Corburn, 2005). As this dissertation will show, the CCStreets approach is changing the prevailing perception of climate knowledge as being stable, rather than an ongoing cultural creation, made and remade through the daily practices of experts and civil society actors (Jasanoff, 2008).

Using analytical frameworks from STS adds value to the analysis of climate policy because the field of urban planning has rarely documented the ability of EJ groups to challenge and transform the official knowledge practices in the regulatory institutions governing climate change (Corburn, 2005; 2007). STS scholars contend that local reconstitutions of climate change policies and scientific knowledge require examining both the structural and cultural aspects of the civic environments in which policymaking and decisions take place (Niemeir et al., 2012). This requires a broader understanding of the context in which lay people have constructed climate knowledge and technological expertise, and how it can vary within and across communities. Such an approach "highlights the importance of considering the intersection of race, class, and gender, the actions of environmental justice social movements globally and within communities" when developing climate policies (Niemeir et al., 2012; Pg. 14). Ottinger and Cohen (2011) argue that more research on approaches like CCStreets is needed to understand how the engagement of the environmental justice movement has opened up spaces for the transformation of techno-scientific practice. They view such approaches as

important sources of "ruptures" in technical practice (Pg. 3). Creating these ruptures is essential in environmental governance because certain types of evidence and knowledge are valued or discounted. Policymakers often do not mitigate the effects of pollution on a community until it is proven that pollution causes residents' environmental health issues (Ottinger, 2010).[15] The regulatory regimes rely on experts to set and define standards based on technical norms produced in labs and outside affected communities. As a result, the local knowledge that community groups bring to environmental problems is often disregarded or deemed irrelevant in the context of mainstream techno-scientific practice. Ezrahi (1990) states that by privileging scientific methods, experts and governments often retain legitimacy and power in science and environmental policy decisions because they are seen as objective and "technically disciplined," which is in contrast to the undisciplined, emotional, and biased positions of lay citizens (Table 2).

As the CCStreets case studies will show, lay publics are increasingly debating with experts over issues of truth and method in science. They are also demanding a greater role in environmental health decision-making that impacts their lives (Illes, 2007). Lay publics are not only challenging the political use and control of science and expertise, by claiming to speak credibly as experts in their own right, they are also challenging process by which technical knowledge is produced. Corburn (2007) argues that conventional science policy fails "to engage how scientific knowledge and notions of expertise emerge in the first place become institutionalized, and tend to bound out of their cognitive domain other ways of knowing and doing" (Table 2).

Knowledge Production Question	Local Knowledge	Professional Knowledge*
Who holds it?	Members of community – often identify group/place specific	Members of a profession, university, industry, government agency; sophisticated NGOs
How is it acquired? What makes evidence credible?	Experience; cultural tradition Evidence of one's eyes, lived experience; not instrument dependent	Experimental; epidemiologic Highly instrumentally mediated; statistical significance; legal standard
Forums where it is tested?	Public narratives; community stories; courts; media	Peer review; courts; media

Table 2: *Professional knowledge focuses on regulatory science, which consists of activities aimed at improving existing practices techniques and processes to further the task of policy development, including: knowledge production, knowledge synthesis; such as evaluation, screening and meta-analysis; prediction, such as predicting future risks or costs (Source: Corburn, 2005; 2007).

By extending science to include local knowledge, we can move beyond science's commitment to technical rationality and find opportunities to understand the technical insights that lay publics, like environmental justice advocates, can offer to environmental problem solving (Sze, 2007). The CCStreets approach in California builds off the practices developed from Community-Based Participatory Research (CBPR) is a popular method in the field of public

[15] This is often an insurmountable hurdle given scientific standards for proof (Byrant, 1995).

health, in which professionals and lay citizens collaboratively define problems, collect data, interpret findings, and develop policy options (Minkler et al., 2011; Gonzalez et al., 2007). CBPR derives from Paolo Freire's (1974) Participatory Action Research (PAR), which seeks to undo classic scientific analysis in which a subject observes an object or phenomena and instead focuses analyses on a community of subjects who reflect on themselves and their experience. In essence, CBPR seeks to build a community of grounded or indigenous experts. According to Gonzalez et al. (2007), when conducting environmental health research in environmental justice communities, "epistemologically, critical reflection by community is needed to access a complex phenomenon, such as health and quality of life, which is wrought by the intersection of social, historical, and physical determinants and not amendable to pure [scientific] observation" (Pg. 79).

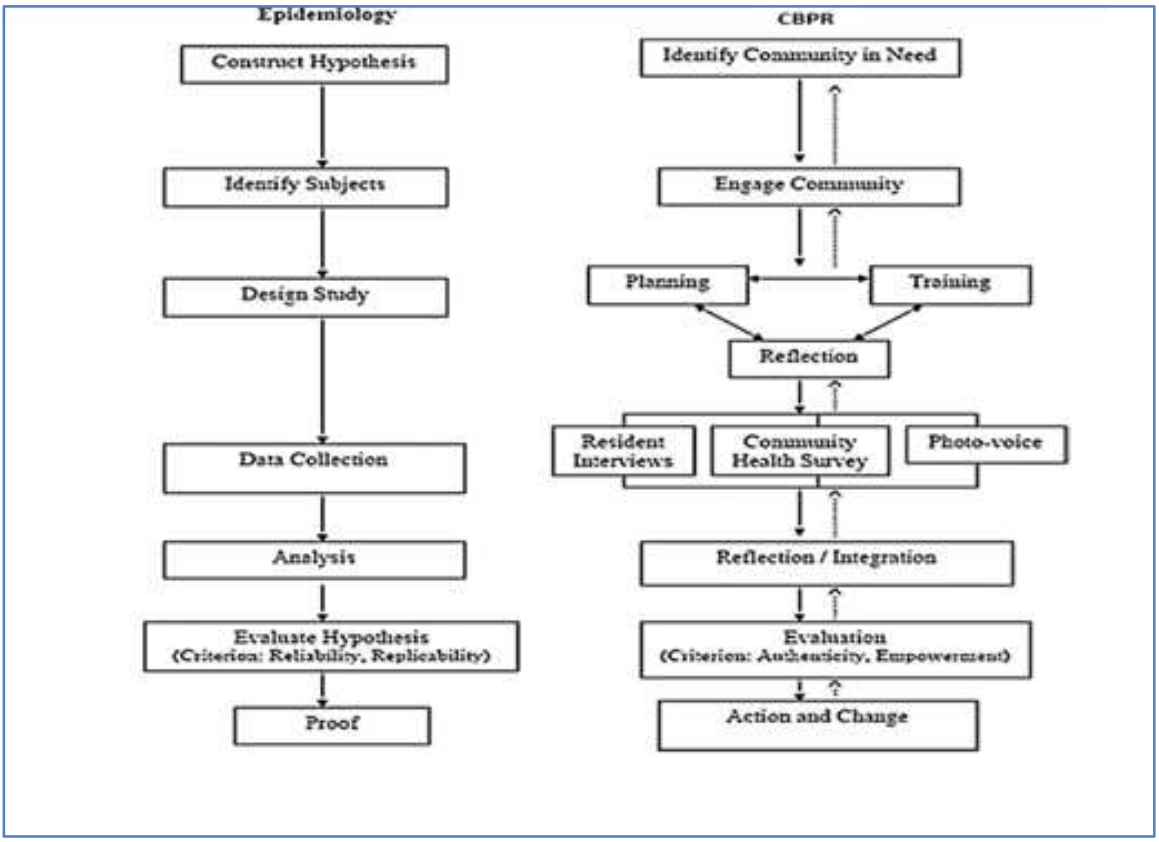


Figure 6: Conceptual Diagram of Epidemiology and CBPR. Source: Gonzalez et al. (2007)

Extending scientific practices to include lay publics is useful for highly complex environmental issues because it enables the integration of diverse methods of evidence and multiple ways of knowing. In urban settings, where there is a situation of high uncertainty, CBPR provides a model that can uncover new hypotheses, rather than test predetermined ones, as found in positivist modes of research, such as epidemiology (Figure 6). In CBPR, the goal is not to prove supposition with a high degree of statistical confidence, but to provide a complex (or thick)

description of the urban condition that is faithful to the lived experience of residents (Gonzalez et al., 2007).

Consequently, as environmental problems increasingly become more complex through the intricate interactions among biological, physical, and social systems, solutions based only in science become more difficult to reach, as in the case with climate change. Holistic solutions to climate change will need to depend on collaborations among scientists, policymakers, and diverse publics (Lemos and Morehouse, 2005). Implementing effective environmental policy requires not only the combined efforts of many disciplines to understand environmental problems, but also active interaction with stakeholders, such as environmental justice advocates (Lemos and Morehouse, 2005). CCStreets is transforming techno-scientific practice in climate governance by creating new forms of environmental expertise and localizing health equity in climate change decisions. Through these ruptures, EJ groups are creating methods of knowing and defining climate change at multiple scales.

Section 1.3: The Multiscalar Civic Epistemologies of Climate Change

Differences in the epistemologies of climate change can be witnessed in the various types of climate responses and expert knowledges produced across California. Some of these variants can be attributed in part, to the methods EJ groups are utilizing (such as CCStreets) to produce scientific and technical data to inform climate policy. These new forms of knowledge and governance can be understood as an articulation of ***civic epistemology***: "the institutionalized practices by which members of a given society test and deploy knowledge claims used as a basis for making collective choices" (Jasanoff, 2005; Pg. 255). Originally conceived by STS scholar Shelia Jasanoff (2005; 2011), civic epistemology was developed as an analytical tool to understand the practices, methods, and institutions by which a society identifies new policy issues, generates knowledge relevant to their resolution, and puts that knowledge to use in policymaking.

Through this concept, she explains the different ways in which citizens in Germany, Britain, and the United States "come to know things in common and to apply their knowledge to the conduct of politics" (Jasanoff 2005; Pg. 9) in relation to biotechnology and climate change. Throughout the CCStreets case studies, I use the concept of civic epistemology to examine the geographically specific and socio-cultural ways of knowledge production of climate change at multiple policy scales rather than simply at the nation-state level (Figure 7). Work on nation-state civic epistemologies has found that many key scientific definitions and policy responses are largely shaped by national contingencies, such as administrative and legal codes and styles, as well as culturally specific conceptions of risk, vulnerability, and impact (Grove-White, 2008; Jasanoff, 2005;2011; Iles, 2007; Miller, 2008).[16]

For instance, scientific studies deemed reliable and legitimate in one country may be dismissed in another as inadequate for policy guidance, even as regulators in both countries are "influenced" by similar social, political, and economic variables. Jasanoff (2011) argues that acceptance of anthropogenic climate change as a guide for national policies and multi-lateral agreements in Germany and Britain, and its rejection in the United States (which failed to ratify the Kyoto Protocol and failed to enact a national policy to curb GHG emissions) demonstrates the fact that informed citizens in one democratic society may reject as scientifically uncertain climate studies and projections that are deemed entirely acceptable in another (Jasanoff, 2010; 2011).

[16] Civic epistemology also includes a range of knowledge production processes, including scientific peer review, public participation mechanisms, methods of reasoning, government statistics, standards of evidence, and norms of expertise that typify public debates and political institutions (Miller, 2008; Illes, 2007).

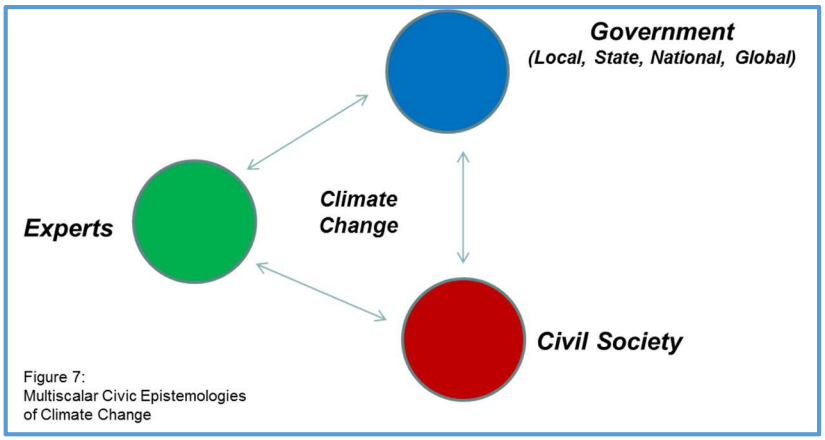


Figure 7:
Multiscalar Civic Epistemologies
of Climate Change

By focusing instead on "*multiscalar*" civic epistemologies, I argue the concept can elucidate the interrelated policy scales and knowledge production processes of climate change, which are quite different from those that solely occur at a national scale (Figure 7). Emphasizing multiscalar civic epistemologies assists in understanding how the construction of climate change can be influenced by local knowledge, culture, and history and can travel between scales. These variables are not explicitly acknowledged in Jasanoff's concept of nation-state civic epistemology.

The nation-state approach privileges knowledge production by elite global actors, without acknowledging that significant scientific and regulatory processes are also influenced by subnational and community-based actors. Nor does the approach analyze how race, gender, class, or power differentials shape civic epistemologies. As an analytical tool at multiple scales, civic epistemologies can examine the emerging relationships among experts, city planners, policymakers, and diverse publics for defining, measuring, and governing climate change and health. For example, research by Angotti and Sze (2009) has found that social justice activists in San Francisco and New York City have used the concept of 'environmental justice' as an analytic framework to understand community health and environmental problems and to advocate for solutions through community organizing and policy development:

> In both cases, we found that disparate health and environmental effects triggered community organizing, but we also discovered that environmental justice advocates consistently defined health as more than reducing disease rates. They developed their own plans and strategies that reimagined urban development and the built environment and advanced public health policies in broad, holistic terms (Pg. 21).

A holistic analysis of climate change also requires methods to identify whether equitable distribution and effectiveness of policy responses has been realized between the interrelated scales -- global, regions, nation-states, and most importantly, in local communities most impacted by climate change (Barrett, 2013; Pg.216). Hence, a single scale analysis runs contrary to the subject of environmental justice and climate change with

numerous actors occupying and traveling across scales. Moreover, it allows for an examination of the multiple ways in which environmental justice advocates invoke geographic scale(s) to validate or contest the meaning and extent of an environmental problem, among themselves and to influence the policymaking process (Kurtz, 2003). The environmental justice movement, as a result, is situated between local scales at which the community protests unwanted pollution, and the more broad geographic scales where they are produced and can be resolved through the policymaking process (Towers, 2000).

Subjecting climate knowledge to geographical or spatial inquiry helps to distinguish between the universalizing drive of scientific inquiry and what has been termed the instinct to make 'global kinds of knowledge.' Universal knowledge, according to Hulme (2010) is comprised of claims that are to be true irrespective of *scale and place*, such as the understanding of radiative properties of carbon dioxide molecules in the atmosphere. Truth (universal knowledge) becomes, in Shapin's memorable phrase, *"the view from nowhere"* (Shapin, 1985; Pg. 5). However, Hulme (2010) contends that globalized knowledge differs from universal knowledge. Globalized knowledge erases geographical and cultural difference and collapses scale to the global. "Rather than the view from nowhere, global kinds of knowledge claim to offer the view from everywhere" (Hulme, 2010; Pg. 559). Therefore, he argues, it is necessary to focus on illuminating the globalizing tendencies of knowledge production of climate change, and the role geographical difference and spatial relations play in the governing of such knowledge production.

Climate policy approaches that are insensitive to the uniqueness of 'place' and context result in singular, globalized interpretations and predictions of climate change. Globalized knowledge, hence, masquerades as universal truths that assert themselves as the irrefutable view from everywhere. Such claims result in the promotion of managerial instincts in climate governance and science, which seek to centralize political power and social control, thereby raising questions about who owns and controls the future and the global environment (Hulme, 2010; Scott, 1998; Anderson, 2010).

Consequently, in the earlier work on nation-state civic epistemologies, the role that local knowledge and environmental social movements play in shaping public policy decisions is not analyzed. It does not investigate how subnational governments address complex environmental health problems or why environmental justice actors gravitate toward engagement with the fields of public health and planning and many other specialized fields to solve environmental problems. In applying a multiscalar framework of civic epistemology, one may discover that environmental justice actors are also influencing environmental policy by learning how to "become" city planners, health practitioners, and climate modelers, when they interact with highly specialized knowledge, practices, and regulatory institutions (Angotti and Sze, 2009).

A multiscalar analysis of civic epistemology uncovers how the social and technical are heterogeneously engineered by a range of competing actors and institutions. Hence, the climate policymaking can be seen as a socio-technical process, which contains a set of contingencies that are the result of the co-evolution of problems and solutions. Through a

multiscalar concept of civic epistemology, I argue scientific knowledge and climate policy may on the whole remain relatively similar across expert communities globally; however, when scientific knowledge is used in different geographic scales and sociopolitical contexts, the democratic procedures of regulatory practices, public participation, and legitimating science differ greatly. Thus, multiscalar civic epistemologies can be interpreted as the multiple ways of knowing and public reasoning about policy problems intertwined with ways of organizing political order at various scales.

Section 1.4: Research Design and Questions

By examining the multiple ways of knowing climate change as the phenomenon is constructed at various scales in California, this dissertation presents a timely analysis of how different epistemological frames take part in shaping conceptions of 'nature-culture' and how it facilitates or hinders social inclusion and equity in relation to climate change and health policy. To investigate these dynamics, I have chosen the following primary research question for the dissertation:

How are environmental justice groups engaging in the climate policymaking process?

This question seeks to examine how environmental justice actors are influencing the conceptualization of climate change at various scales and how more scientifically legitimate and socially just decision-making related to climate change is implemented. The dissertation aims to highlight new findings that go beyond the familiar approaches of carbon fundamentalism by calling critical attention to the cultural and experiential dimension of climate change policy, knowledge production, and local practice (Brace and Geoghegan, 2010). To support the primary research question, the multiscalar case studies examine the following three subsidiary research questions:

1. **How and why do governments incorporate public health and equity in climate change policies?**

2. **Does local knowledge influence climate change policies?**

3. **What role does scale play in the adoption of climate change policies?**

Multiscalar case studies were selected because such studies are need to investigate social phenomena that cannot be examined in a single-bounded site. Through a multiscalar framework, this research seeks to follow people, connections, associations, and relationships across space and time, because they are often substantially continuous but spatially non-contiguous (Falzon, 2009, Pg. 2). Using this multiscalar approach, I examine environmental justice groups as they travel between geographies and policy scales to contest or legitimize climate polices. The three multiscalar cases include: **(1)** the public health and environmental justice aspects of municipal climate action plans; **(2)** the conflict over statewide carbon pricing and use of its revenue for investment in communities most impacted by air pollution; and **(3)** the social equity implications of international forest carbon-offset projects allowable under California's market-based climate change law. These interrelated case studies provide critical insights into environmental inequities and the emerging epistemologies of climate change on multiple scales (Figure 8). In particular, the dissertation illustrates how environmental justice groups in California are influencing climate change policy formation and implementation within and between nation-states.

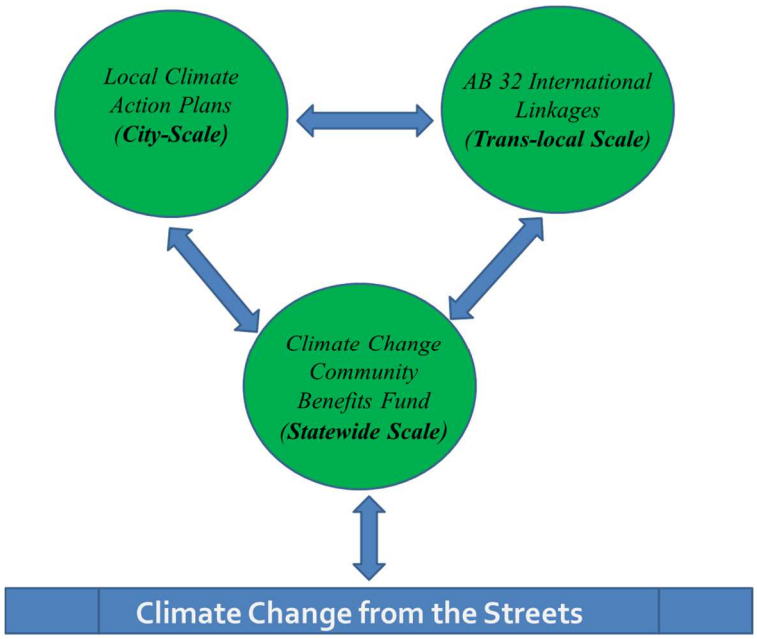


Figure 8: Multiscalar case studies

A multiscalar approach is supported by several decades of research in the fields of anthropology (Marcus, 1998; Krauss, 2009), human geography (Massey, 1999; Graham and Healy, 1999; Watts, 1999), and STS (Latour, 1987; 1996; Haraway, 1998; Jasanoff, 2005; Corburn, 2009a). Scholars in these fields have called into question the conventional conception of the field site as a bounded space containing a whole culture (Gupta and Fergus, 1997). In traditional anthropology, fieldwork frequently only took place in a village in a remote region (Burrell, 2009).[17] Consequently, reflecting on neo-Marxist movements, such as world-systems theory, anthropologists Marcus and Fisher (1986) envisioned new configurations of the field site to tackle emerging social issues. They advocated for anthropologists to explore "how to represent the embedding of richly described local culture worlds in larger impersonal systems of political economy" (Marcus and Fisher, 1986, Pg. 77). This type of fieldwork examined how larger systems were registered and materialized at the local level. Macro-scale social changes in the structures and interconnections of late capitalism, they argued, decreased the scale and complexity of social processes, and therefore prompted such methodological questioning. Consequently, the bounding of culture within a small delimited space, such as a village was increasingly seen as less complete (Burrell, 2009).

[17] Similarly, in traditional social science research (including urban studies), fieldwork is defined as "case study research, [that is] qualitative in approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents), and reports a case description and case-based theme." These cases are viewed as being distinct and often not interrelated (Creswell, 2007; Pg. 73).

Marcus (1998), therefore, argued that multiscalar approaches were needed because they defined, as their objective, the study of social phenomena that cannot be examined in a single bounded site. He further argued that under this new conceptualization, the movement of objects, individuals, ideas, discourses, and the fieldworker, result in the discovery of insights and objects of inquiry that were not visible in studies that presumed culture was spatially fixed (Burrell, 2009). Under multiscalar research, fieldworkers define their objects of study (phenomena) through several different modes or techniques. These include, among others, "follow the people," "follow the object," "follow the metaphor," "follow the biography/history," and "follow the conflict" (Marcus, 1998). These field techniques underscore how movement is central to social practice and how coherent cultural processes can also occur across great distances (sites), linking up distinct actors (Burrell, 2009).

Similarly, urban planning and public health scholars (Cummins et al., 2007; Corburn, 2009b) argue for theoretical research on urban health variation that incorporate multiscalar methods, or what they call a '*relational view'* that explores the reciprocal relationships between people and places. A relational perspective on health and place encourages fieldworkers to imagine place in terms of the ideas on the right of Table 3, rather than those on the left.

It is suggested that a "relational view" can act as an alternative to the conventional framings of place by emphasizing the "mutually reinforcing relationships between places, people, and meaning-making, on the one hand, and the political institutions and processes that shape these relationships, on the other" (Corburn, 2009; Pg. 15). Furthermore, a relational view places greater attention to the institutional processes that shape both environmental health policy approaches at various scales and locations (Cummins et al., 2007).

Specifically in regards to climate change, Hulme (2007) has argued that multiscalar approaches are necessary because "we have universalized the idea of climate, detached it from its cultural settings and failed to read the ways in which the knowledge claims emerging from climate science change meaning as they travel" (Pg. 9). Hulme (2007), moreover, argues against reifying what climate means in the physical sense, as indicated by the claims of climate policy, but instead seeks research methods that transform the idea of what climate means in different places and scales, to different peoples, and at different times. In sum, a multiscalar case study of climate change seeks to "follow" the actors (climate experts, EJ advocates, policymakers, planners, etc.) and to enter the network where climate change is simultaneously constructed as a universal and localized as a particular. Multiscalar approaches demonstrate that the world of climate policy is not separated from the social world. Nor is the phenomenon of climate change configured within a single place or scale. It exists through a network of highly mobile actors, scientific metrics, and interrelated scales that are attached to diverse civic epistemologies. Through such networks, actors are transforming facts about "nature" into matters of concern (Krauss, 2009).

'Conventional' View of Place	*'Relational' View of Place*
Spaces with geographical boundaries drawn at a specific scale	Nodes in networks, ***multi-scale***
Separated by physical distance	Separated by ***socio-relational distance***
Resident local communities	Populations of individuals who are ***mobile*** daily and over their life course
Services described in terms of fixed locations often providing for territorial jurisdictions, distance decay models describe varying utility in space	'Layers' of assets available to populations via ***varying paths in time and space***. Euclidean distance may not be relevant to utility
Area definitions relatively static and fixed	Area definitions relatively ***dynamic and fluid***
Characteristics at fixed time points, e.g. 'deprived' versus 'affluent'	Dynamic characteristics e.g. 'declining' versus 'advancing'
Culturally neutral territorial divisions, infrastructure and services	Territorial divisions, services and infrastructure imbued with ***social power relations and cultural meaning***
Contextual features described systematically and consistently by different individuals and groups	Contextual features described variably by different individuals and groups.

Table 3: 'Conventional' and 'Relational' Understandings of Place. Source: Cummins, et al. (2007, pg. 1827).

Section 1.4: Methods

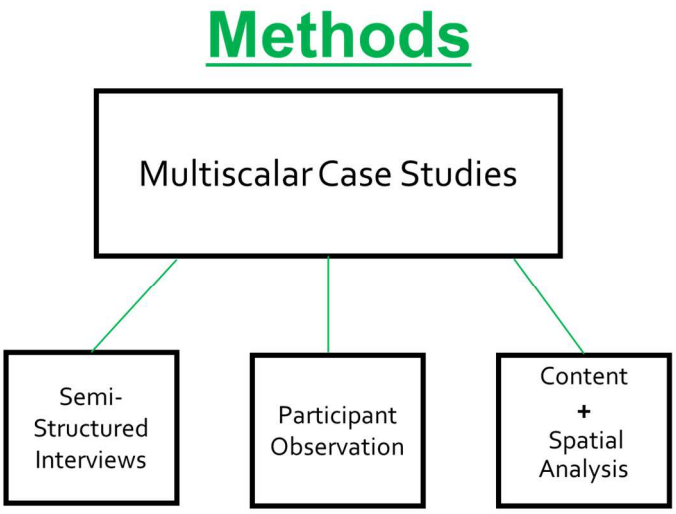


Figure 9: Mixed-methods used in dissertation research.

The dissertation is based on four years of fieldwork and analysis throughout California. The mixed-method analysis included more than 40 semi-structured interviews with environmental justice advocates, senior government officials, urban planners, climate experts, and other civil society actors embedded in multiscalar climate policymaking (Figure 9). Interviews were selected by assessing professional networks that I developed from more than a decade of work in the public and private sectors. This experience included working for the California State Legislature as a senior consultant to the Assembly Select Committee on Environmental Justice and serving as vice chair of Sacramento's Planning Commission. In these positions, I conducted applied research and actively engaged in the policymaking process. Through my networks and experience, I was able to identify the key actors involved in climate policymaking. This provided me with access to and knowledge of actors at various scales and geographies in California, thereby greatly improving the rate of access and reducing the start-up time of fieldwork.[18]

I also conducted participant observation across the three case studies, engaging in, and observing in excess of 30 community-based meetings, and local and state public hearings/meetings on climate policy and health equity. Additionally, I served as the instructor of record for two climate action planning studios at UC Berkeley. In these studios, the Oakland Climate Action Coalition, the Governor's Office of Planning and Research, and the California Natural Resources Agency acted as the studios' policy clients, and; students developed policy recommendations for improving local climate action plans. Final presentations were held at the

[18] Many of the participants interviewed remain actively involved in climate policy and planning in California. To address the sensitive issues explored in this research, in certain instances the interviewees were provided anonymity. In such circumstances, the only information provided is the type of organization the individual is affiliated with.

state Capitol to a panel of prominent environmental policymakers, and at community meetings in the San Francisco Bay Area. I also served as the head graduate student instructor for a UC Berkeley graduate-level course on environmental policy and regulation. Students in that course developed climate action plan recommendations for the city manager's office of the city of Richmond, California. The students' work product in the three courses, as well as my active engagement with key policymakers and EJ actors as the instructor, generated supplemental field data for the dissertation.

The final method I utilized was content and spatial analysis. This included review of grey literature and archival research, dozens of California's key statewide climate polices, and an analysis of 41 municipal climate action plans. Through spatial mapping techniques, I examined the role of scale and geography in the adoption of climate policies. In particular, I employed the California Environmental Protection Agency's (Cal EPA) Environmental Health Screening (CalEnviroScreen) tool to identify geographically the communities with census tracts in the state with the highest cumulative environmental impact scores (see Chapter 2). Through content and spatial analysis techniques, I sought to identify evidence of the development of climate policies that substantively engaged non-governmental actors in regulatory institutions to establish explicit interconnections between climate change, environmental justice, and public health at multiple scales.

Section 1.5: Multiscalar Case Selection

Central to this dissertation is the selection of cases as a method to examine knowledge production, equity, and policy outcomes of the phenomenon of climate change as it is constructed at various interrelated scales in California. As previously noted, the state of California was chosen because it has consistently been at the forefront of broader U.S. and global environmental action. The state's environmental policies have a long history of success and replication. California adopted the nation's first automobile tailpipe emissions standard in 1966, four years before Congress took similar action. After the Middle-East oil embargo of 1973, California again responded with strong household appliance energy efficiency standards signed into law by Governor Ronald Reagan the following year. California's 2009 clean car standard served as a model for the agreement that President Barack Obama forged with automakers in 2011 to double U.S. Corporate Average Fuel Economy (CAFE) standards to 55 miles per gallon by 2025 (Stone, 2012; EDF, 2012). California is a catalyst in the environmental arena in part because of its sheer size and impressive market power. The state's stricter energy efficiency standards forced automakers and appliance manufacturers to rework their products to maintain access to the nation's largest state economy.

In another impressive first, the adoption of AB 32 in 2006 made California the first state in the U.S. to adopt a comprehensive program of regulatory and market-based mechanisms to achieve reductions in GHG emissions. As a result of its environmental innovation, California is often seen globally as a homogeneous entity that values environmentalism and climate action uniformly throughout the state (Stone, 2012; EDF, 2012). This conception, however, universalizes the idea of climate change within the state, detaching it from its cultural settings and failing to understand the methods in which knowledge production and outcomes emerging from climate change policy and science change meaning as they travel throughout California and are localized. Accordingly, the multiscalar case studies illustrate how civic epistemologies invoke, across diverse geographies and scales, variations in knowledge production, equity, and policy outcomes in climate governance.

The three multiscalar case studies (see Figure 8), were specifically selected based on the initial semi-structured interviews, and content analysis I conducted. Through these methods, key climate actors and critical sites of contestation in the climate policymaking process were identified. The CalEnviroScreen spatial analysis, helped me identify census tracts with high cumulative environmental impact scores for further study. This information was supplemented by my direct professional experience and networks at the state and local levels working on environmental policy issues.

Section 1.6: Chapter Summaries

The following chapters seek to understand the new experiments in climate change governance and illustrate how developments in climate knowledge and technological capacity are linked to human self-understanding and social orders. These chapters specifically examine how the phenomenon of climate change is configured throughout California, and is influenced by diverse civic epistemologies. Looking across the multiscalar case studies, four constitutive and interrelated dimensions of civic epistemologies in California can be identified. These are: **(1)** participation of actors in knowledge-making; **(2)** the methods of validating knowledge; **(3)** the focus of climate policy; and **(4)** the role of scale in climate policymaking. Table 4 elaborates on the four dimensions of civic epistemologies, offering examples from chapters two through six. While Table 4 attempts to capture some recurrent elements in the case studies, it does not suggest that these elements are fixed and uncontested over time, or evenly distributed across California (Jasanoff, 2005). Similar to other aspects of culture, the elements of civic epistemology are constituted and reconstituted continually to maintain their validity in climate governance.

Chapter 2 presents a baseline survey of the public health and environmental justice aspects of climate action plans (CAPs) from 41 California cities. This chapter reveals that climate change presents a complex environmental health and justice challenge for the field of urban planning. Through interviews with urban planners and a content and spatial analysis of CAPs, this survey assesses how California cities with high levels of pollution and social vulnerability address climate change and public health. The findings show that CAPs in these cities rarely analyze whether GHG reduction strategies will also yield health co-benefits, such as a reduction in the co-pollutants of climate change (i.e., ozone, particulate matter, and nitrogen oxides). In many instances, the net co-benefits of health are not monetized, quantified or even identified by local governments. In California's most impacted cities, climate planning activities and work on public health are happening in a parallel manner rather than through an integrated approach. Moreover, the analysis illustrates that *carbon fundamentalism* is the predominant mode of climate planning in California cities. The results suggest a need for increased opportunities for interagency coordination and staff training to conduct health analyses, free and easily-accessible tools, methods for prioritizing funding streams, and the development of partnerships with community-based organizations to link climate planning and public health.

Chapter 3 contrasts the results of Chapter 2 with the case study of Oakland. Chapter 3 argues that environmental justice groups in this city are transforming *a priori* climate policy approaches, producing new placed-based conceptualizations of climate change that underscore population health and community well-being. Oakland's example provides empirical evidence of how EJ groups are instituting *CCStreets* approaches in climate governance. Through an in-depth case study of the city of Oakland's CAP, this chapter specifically examines how and why a city develops explicit linkages between climate change and population health. This chapter further argues that analyzing the methods in which CAPs are developed in practice can provide

a strategic understanding of the particular agendas, politics, and expertise influencing the development of climate policies and environmental justice outcomes.

Table 4. The Four Dimensions of Civic Epistemologies in California

	Chapter 2: Survey of Local Climate Action Plans	Chapter 3: Urban Climate Change in Oakland	Chapter 4: Statewide Carbon Pricing and Health Co-benefits	Chapter 5: Climate Change Community Benefits Fund	Chapter 6: International Forest Offsets and Black Carbon
Who produces climate knowledge?	Consultants, planners, academics, scientific advisors, and modelers.	Expert and lay groups. Engagement of diverse civil society actors.	State regulatory bodies, academics, mainstream environmentalists, public health experts, and consultants.	EJ groups, academics, and public health experts.	EJ groups, state regulatory bodies, consultants, and experts.
How is knowledge validated?	Strong reliance on peer-review, expert committees, risk assessments, and cost effectiveness.	Highly collaborative. Expert-lay judgment; community-based solutions.	Highly contested; resolved through political negotiation and litigation. Reliance on peer-review, expert committees, risk assessments, and cost effectiveness.	Highly contested; resolved through political negotiation and community-based research.	Highly contested; partially resolved through political negotiation, and community-based solutions.
What is the focus of climate policy?	Global climate metrics, ecological systems, and city-wide infrastructure	Neighborhood health co-benefits, ecological systems, and citywide infrastructure.	Tension between global and multiscalar climate metrics, health, and ecological benefits.	Nexus of local health co-benefits and global reductions of GHG emissions.	Variable
What is the role of scale?	Global scale GHG reductions, adherence to *Carbon Fundamentalism*	Multiscalar co-benefits – focus on *CCStreets* approach.	Highly contested	Highly contested	Highly contested

Chapters 4 and 5 argue that the legitimization of a local scale of climate change was highly contested in the State Capitol, as environmental justice advocates attempted to "rescale" California's Global Warming Solutions Act to focus on direct benefits to disadvantaged communities. These chapters examine the debates and epistemologies over the impacts of climate change and the appropriate policy scale(s) to address the environmental problem. Chapter 4, specifically highlights how in the legislative halls of the Capitol and the state's regulatory bureaucracy, a commitment to global kinds of knowledge or carbon fundamentalism influenced the definition of climate change. The pursuit of global GHG emissions reductions through market-based mechanisms often limited opportunities to realize public health co-benefits at the neighborhood scale.

Chapter 5 focuses particular attention on these debates through the lens of a four-year environmental justice campaign to enact "cap-and-dividend" legislation, better known as a Climate Change Community Benefits Fund (CBF). The adopted legislation required a dividend (or rebate) to be invested from a portion of the billions of dollars in cap-and-trade auction revenues in communities most impacted by air pollution. Through the passage of CBF legislation, several environmental justice groups are attempting to redress the limitations and inequities under a market-based system. The CBF allows for the scaling up of local knowledge and practices to fund new multi-scale approaches to climate policy (i.e., CCStreets). It validates community-based approaches that not only reduce global GHG emissions, but are also aimed at reducing the risk of asthma and respiratory diseases through transit-oriented development, renewable energy, and urban forestry projects. The passage of the CBF illustrates that opposition to cap-and-trade from EJ groups is not a rejection of the goals of AB 32, but a demand for climate solutions that are more equitable for all Californians.

The final multiscalar case study presented in chapter 6, investigates the social equity implications of international carbon-offset projects allowable under California's climate change law. These proposed projects compensate governments and landowners of the Global South (Chiapas, Mexico and Acre, Brazil) for preserving forests for their carbon sequestration capacities. This chapter argues that California's planned global expansion of its market-based mechanisms is creating emerging alliances between indigenous groups in the Global South and California environmental justice advocates. The chapter further explores how forest-offset projects may restrict access to indigenous land, while allowing industries to continue to emit pollution in California's low-income neighborhoods and communities of color. The chapter concludes with the other CCStreets approaches EJ groups are utilizing to mandate state policymakers and local air districts to work cooperatively on interventions that jointly address global GHG emissions and other localized co-pollutants. A co-pollutant of particular interest to environmental justice groups, is black carbon, a component of PM 2.5 and a short-lived, global-warming pollutant that also has local public health impacts.

In Chapter 7, the dissertation conclusion, I compare the multiscalar cases through the concept of civic epistemology. Through this comparison, I analyze the conditions and constraints that facilitate or impede the implementation of CCStreets approaches in climate policy. The last section of the chapter examines the overall research findings and their implication for climate

policy and planning practice. This is followed by the open-ended discussion of "*what is the next generation of the trans-local environmental justice movement*?"

In sum, this research concludes that for environmental justice groups to discover and address new knowledge about 'nature,' society must also revise institutionalized practices in innovative ways (Jasanoff and Martello, 2004). By infusing the human-local scale in climate change interventions and research, publics can better understand how existing environmental conditions are established. As a result, we can facilitate the development of alternatives to those existing environmental conditions and imagine more democratic climate future(s) (McFarlane, 2011).

CHAPTER 2:
Assessing Local Climate Action Plans for Public Health Co-benefits in Environmental Justice Communities

While climate change is considered a global issue, its source, greenhouse gas (GHG) emissions are increasingly seen as being produced and most readily controlled at the local level (Revi and Satterthwaite et al, 2014; Brown and Polsky et al, 2014). Municipal governments are uniquely positioned to create large reductions in GHG emissions because of their impact on local patterns of urban development, economic activity, transportation infrastructure and energy use (Anguelovski and Carmin, 2011; Rosenzweig, et al, 2010a). Cities around the world are now grappling with emerging scientific assessments when developing climate action plans (CAP)[19] to mitigate and adapt to the impacts of the phenomenon. These plans will have significant benefits and consequences for urban populations as they are likely to reconfigure urban infrastructures, services and decisions-making processes (Hughes, 2013).

Local plans for addressing climate change, however, have been largely analyzed in terms of their costs and potential for reducing the rate of increase in atmospheric concentrations of global GHG emissions. Less studied is whether efforts to mitigate GHG emissions will have a number of air quality co-benefits[20]. These co-benefits include a reduction in the co-pollutants of climate change (i.e. ozone, particulate matter, and nitrogen oxides)[21] and corresponding improvement in population health in environmental justice communities.[22] Co-benefits can serve as important decision criteria in analyses by policymakers and influence the implementation and timing of mitigation and adaptation measures (Jochem and Madlener, 2003).

Studies from around the world have found that the monetized human health benefits associated with air quality improvements can offset the cost of carbon policies, particularly in communities most impacted by pollution (Thomson et al., 2014; Nemet et al., 2010; Boyce et al., 2013). While health co-benefits have increasingly been utilized in several national and state-

[19] A climate action plan focuses primarily on reducing GHG emissions, including emissions resulting from both a local government's operations and from the community as a whole. It typically includes an analysis/strategy to reduce greenhouse gas emissions resulting from land use, energy use, transportation, solid waste disposal, buildings, lighting, and waste water treatment and water delivery (ICLEI, 2012).

[20] For purposes of this study, "co-benefit" means an ancillary benefit of a GHG mitigation or adaptation policy that is produced in addition to the benefit targeted by the policy (Pittel and Rubbelke, 2008; Li, 2002; Burtraw and Toma, 2000).

[21] Processes such as fossil fuel burning concurrently emit GHG and other co-pollutants (i.e. PM and 0_3).

[22] Environmental Justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice can be achieved when all individuals enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work (U.S. Environmental Protection Agency, 2012a).

level policies, they are rarely included in the assessment of local CAPs. In California, more guidance is needed to assist cities in incorporating health co-benefits in climate policies. The goal of this chapter is to determine whether and how CAPs developed by California cities with the highest rankings for cumulative environmental impact are considering the public health needs of socially vulnerable populations.[23] The results of this study indicate that due to a lack of funding, free and easily-accessible tools, substantive community engagement, and interagency collaboration and staff training to conduct health analyses, in many instances, the net co-benefits of health are not monetized, quantified or even identified by local governments.

[23] Social vulnerability to climate change is often defined by the ability for a community to anticipate, cope, resist, and recover from the impact of extreme climate events such as hurricanes, floods, heat waves, bad air quality days, and infectious disease. As such, it is important to understand disparities in the costs and benefits of climate change, the abilities of different groups to adapt to it, and the mitigation and adaptation strategies developed to address it in order to better inform regulatory and policy action in the future (Shonkoff et al., 2009).

Section 2.1: California Climate Change Policy and Planning

During the past decade, the state of California has enacted some of the nation's strongest climate policies. Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, requires the state to reduce its GHG emissions to 1990 levels by 2020 and 80 percent of this baseline level by 2050. What distinguishes California's climate change law from regulations passed by other subnational governments is that AB 32 requires that statewide measures to reduce GHG emissions must also consider how their implementation will impact communities that are already adversely affected by air pollution (California Health and Safety code sections §38565, 38591).

Motivated in part by increasing concerns over the risk of climate-related impacts and facilitated by the state's existing framework of energy and air quality policies, these mandates are creating significant health co-benefits at the statewide scale. It is estimated by 2025 that two key components of AB 32 -- the Low Carbon Fuel Standard and the Cap-and-Trade program[24] will result in 38,000 fewer asthma attacks and almost 75,000 fewer lost work days linked to air pollution (NRDC, 2008; CARB 2008; Franco et al, 2008). The multiple health co-benefit analyses advocates provided to policymakers and the public, has been cited as an important factor in the passage and successful implementation of the landmark legislation (Sze et al., 2009; London et al., 2013; EDF, 2014). The linkage to public health was also instrumental in the 2010 statewide campaign that defeated an oil-industry sponsored ballot referendum to repeal AB 32 (Lerza, 2011).

More recent health co-benefit studies indicate that AB 32 will decrease GHG emissions by 165 metric tons, as well as smog and soot by more than 179,000 metric tons in the next 10 years. These reductions will result in a cost-savings of $8.3 billion in pollution-related health costs (American Lung Association and EDF, 2014). Co-benefits remains a fundamental factor in the continued voter support of California's climate policies. In a 2013 statewide survey, 50 percent of Californians viewed climate change as a very serious threat to the state's quality of life and future economy. Similarly, 52 percent also specified that cap-and-trade auction revenue should be used to improve environmental conditions in disadvantaged communities. Most interestingly, 65 percent of Californians indicated that the state should act immediately to reduce GHG emissions, rather than wait until the economy improves – up 9 points from 2012. (PPIC, 2013).

As the eighth-largest economy[25] in the world and the only state in the U.S. to adopt a comprehensive program of regulatory and market-based mechanisms to achieve reductions in

[24] Cap-and-trade is a market-based mechanism that 'caps' the amount of emissions a power plant or industrial polluter can produce and requires these facilities to purchase credits (the trade) from the state to exceed the emissions cap. These credits purchased and sold at established auctions, enable facilities to continue to operate as they improve their equipment to reduce GHG emissions (CARB, 2008).

[25] Levy (2014). California Once Again the World's 8th Largest Economy. *Center for Continuing Study of the California Economy*.

GHG emissions, California represents an important site of inquiry for analyzing climate planning. While the state has taken important strides in reducing GHG and co-pollutant emissions on a statewide scale, AB 32 does not require any action to be taken by local governments.[26] Similarly, California's other landmark climate law, Senate Bill 375 (SB 375), only encourages local governments to work collaboratively with Metropolitan Planning Organizations (MPOs) to develop regional plans to achieve GHG reduction targets through land-use and transportation measures.[27] Regions that meet the targets receive priority funding for state and federal transportation grants. This incentive-based legislation, however, neither requires individual cities to adopt CAPs nor penalizes regions that fail to meet their reduction targets. Additionally, unlike AB 32, SB 375 does not mandate that GHG reduction measures to be designed with the consideration of how their implementation will impact communities that are already adversely affected by air pollution.

The state currently provides little guidance for cities to analyze and incorporate health co-benefits in mitigation measures. As a result, many municipal CAPs across California simply assert that climate change will have adverse public health impacts but do not substantively link these health threats to the local community (California Department of Public Health, 2012). The governmental agency responsible for tracking municipalities' progress in adopting climate action policies follows a similar approach. According to the 2012 Governor's Office of Planning and Research (OPR) Annual Planning Survey, more than 170 jurisdictions have indicated they are taking the initial steps to address climate change. This is a dramatic increase from only 53 respondents in 2008. Though the annual OPR survey provides the most comprehensive analysis of local governments engaged in climate planning, it does not provide any specificity of how they address the public health impacts of climate change or the needs of socially vulnerable communities.

Likewise, the majority of academic research on CAPs focuses on measuring local climate efforts and evaluating the general efficacy of adopted plans (Boswell et al 2010, Wheeler 2008; Pitt, 2010a; Pitt 2010b; Lubell et al, 2009; Jepson 2004, Saha and Paterson, 2008). Cumulatively, these studies argue that local socioeconomic and demographic variables (such as the fiscal health of cities, city size, and median household income) are important factors in implementing specific types of climate policies. Yet all these studies critically overlook the geographically and socially uneven impacts of climate change and the significance of including health co-benefits in CAPs. The California Department of Public Health (CDPH, 2012), accordingly, argues for developing an evidence base between the health impacts of climate change and the built environment. Research has shown that describing the local health consequences of climate change is compelling to the general public and may help broaden support for developing climate action polices (Myers et al., 2012; Maibach et al., 2010; 2011). Unlike the longer-term

[26] AB 32 only encourages municipalities to reduce GHG emissions 15 percent below today's levels by 2020 (CARB, 2008).

[27] A metropolitan planning organization (MPO) is a federally mandated and funded transportation policy-making organization in the United States comprised of representatives from local government and governmental transportation authorities (23 U.S.C. sections §134–135).

effects of climate change (i.e., sea level rise, biodiversity loss), the adverse health effects of co-pollutants can be seen locally and felt more immediately.

Section 2.2: Local CAPs as an Opportunity to Promote Health Co-Benefits

The chief objective of climate policy is to reduce GHG emissions that occur from the burning of fossil fuels. Benefits from the reduction of GHG emissions also yield opportunities for air quality "co-benefits" in the form of reduced emissions of nitrogen oxides, sulfur dioxide and particulate matter that are produced in fossil fuel combustion. These associated emissions are termed the "co-pollutants" of climate change (Boyce et al, 2013). Although it is not always framed this way in climate planning discourse, the reduction in co-pollutants can lead to substantial public health benefits (Nemet et al., 2010; Boyce et al., 2013; Kaswan, 2012).

The Intergovernmental Panel on Climate Change (IPCC) has indicated that GHG mitigation can have health co-benefits from reduced air pollution, which can offset the costs of mitigation (Smith et al., 2014). A survey of 37 worldwide peer-reviewed studies, Nemet et al. (2010) found a mean co-benefit of $49 per ton of carbon of dioxide avoided. In a study of emissions reductions in the U.S., researchers estimated that the monetized human health benefits associated with air quality improvements have the potential to offset between 26 percent and 1,050 percent of the cost of various carbon policies (Thompson et al., 2014). In other words, each dollar spent on air quality improvements can yield between 26 cents and $10.50 in savings associated with healthcare costs. Cumulatively, these studies recommend that policymakers should be able to directly compare the cost of climate change actions with the economic value of their benefits, in terms of avoided damage to human health and the environment. Health experts argue that if co-benefits vary across sources, then efficiency requires more emissions reductions where co-benefits are greater. Climate policy that ignores co-benefits are considered inefficient in two ways: first, it would choose suboptimal emissions reductions targets overall; second, it would fail to account for differences in abatement benefits across emission sources (Boyce et al., 2013; pg. 3).

While there is increased interest in health co-benefits, urban areas face major challenges in successfully linking climate change with regional air quality policy. Throughout the United States, 232 counties have exceeded national standards for ozone and 118 counties have exceed national standards for particulate matter in 2011 (US EPA, 2012b; 2012c). A recent study also found that residents in Southern California face some of the nation's highest risks of death from to air pollution. The study projected between 130,000 and 360,000 premature adult deaths in coming years, based upon an examination of ozone and particulate matter levels in 2005 (Fann, et al, 2012). A similar 2010 study estimated that air pollution in the South Coast and San Joaquin Valley air basins was responsible for 30,000 hospital visits from 2005-2007. Statewide, it was estimated that air pollution caused an estimated $193 million in medical cost during the study period (Romley et al., 2010). Consequently, the consideration of health co-benefits in CAPs is important because improvements in the built environment aimed at reducing GHG emissions can also improve air quality and lower the incidence of respiratory and cardiovascular illnesses. As described in Figure 10, these illnesses include asthma and heart attacks, which are exacerbated from climate change-related events such as heat waves and bad air pollution days.

According to the Third California Climate Change Assessment (CCCA, 2012), increasing temperatures are expected to exacerbate air pollution and illnesses across California. Climate change is also expected to include injuries and displacement due to more severe storms and flooding; greater number of heat illnesses as extreme heat events increase in frequency; and changes in the distribution of infectious diseases (CCCA, 2012). It is anticipated that climate change will also cause reductions in the availability of clean water and trigger disruptions in global food supply due to drought and extreme weather events (BARHII, 2013; CCCA, 2012). The combination of global climate change and environmental injustice are negatively impacting the overall health of many communities across California (Shonkoff et al, 2009).

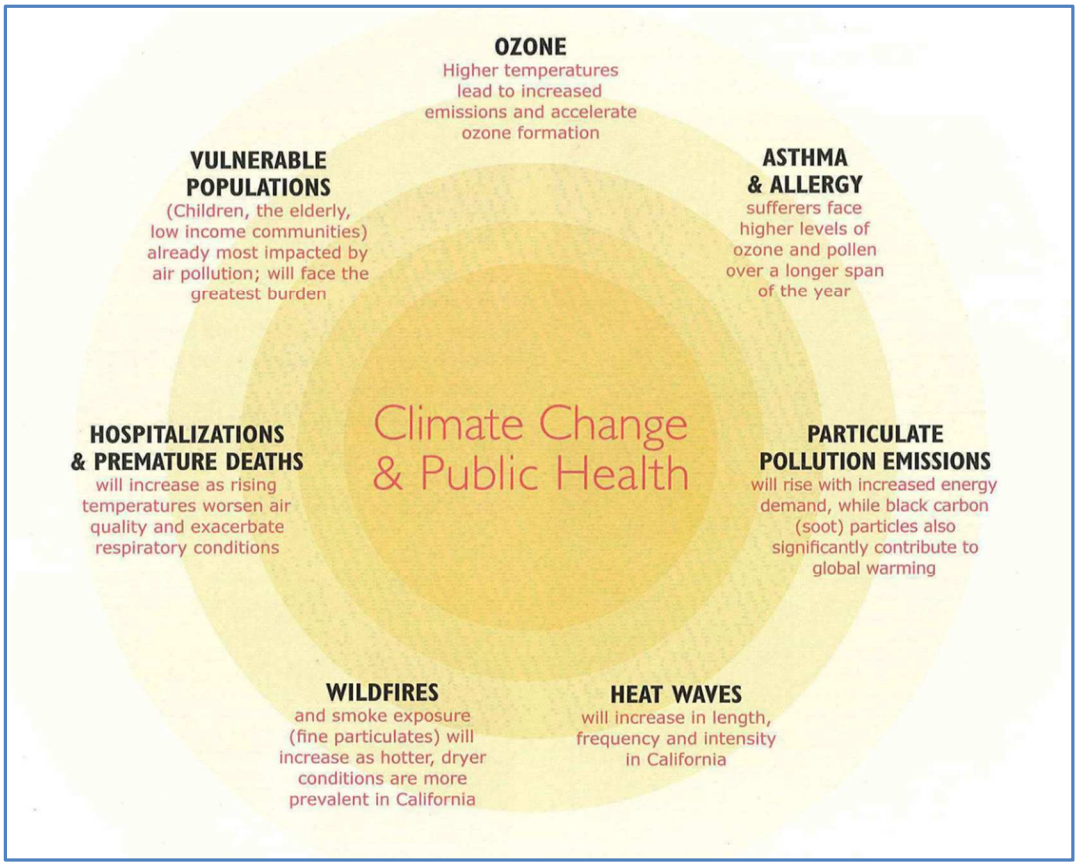


Figure 10
Respiratory Health Effects of Climate Change
Source: American Lung Association of California (2010)

These impacts are expected to be particularly felt among populations most vulnerable to air pollution, including children, the elderly, individuals with respiratory diseases, and low-income

communities (CARB, 2009). Health disparities[28] are even greater for people of color and low-income populations because they often live in poorly planned and under resourced urban areas. Residents in these areas are less able to pay for protection against or recovery after climate-related disasters (Curtis and Oven, 2011). They also are more likely to live near sources of pollution (Szasz and Meuser, 1997; Agyeman et al., 2003: Ringquist, 2005; Corburn, 2005; Shonkoff, et al., 2009; Morello-Frosch et al., 2011). In California, research has found that people of color are disproportionately more likely to live near major GHG-emitting facilities, even when controlling for income. African Americans are twice as likely as their white counterparts to live within 2.5 miles of polluting facilities, and more likely to reside near facilities that pose greater co-pollutant burdens (Pastor, et al., 2009; Boyce and Pastor, 2013).

Throughout the U.S., localities vary in terms of the adoption and comprehensiveness of CAPs (Hess, et al., 2008; Millard-Ball, 2012; Brown and Polsky et al, 2014). The pace and scope of adoption is relevant to public health because climate change related risks are place-specific and path-dependent. Location is a significant determinant of hazardous exposure, and certain places will bear more risk than others (Hess, et al. 2008). Climate change impacts in California, such as risk of wildfires, drought, flooding, and extreme weather events have accompanying health impacts that are occurring sooner than projected (Pastor, et al, 2009; CCCA, 2012). It is necessary to examine whether CAPs in California's most disadvantaged communities include health co-benefits because the distribution of co-benefits raises important equity issues. Efficient policy design would seek greater emissions reductions where co-benefits are greatest and most needed (Boyce et al., 2013).

[28] Health disparity is a type of difference in health that is closely linked with social or economic disadvantage. Health disparities negatively affect groups of people who have systematically experienced greater social or economic obstacles to health. These obstacles stem from characteristics historically linked to discrimination or exclusion such as race or ethnicity, religion, socioeconomic status, gender, mental health, sexual orientation, or geographic location. Other characteristics include cognitive, sensory, or physical disability (U.S. Department of Health & Human Services, 2009).

Section 2.3: Methods: Climate Action Plan Selection

Using the California Environmental Protection Agency's (Cal EPA) Environmental Health Screening (CalEnviroScreen) tool, I first identified geographically the communities in the twentieth percentile of census tracts in the state with the highest cumulative impact scores[29]. CalEnviroScreen uses a science-based method to develop a statewide analysis of the communities most burdened by pollution from multiple sources and most vulnerable to its effects. In developing the new tool, Cal EPA (2014) asserts that although traditional risk assessments may account for the "heightened sensitivities of some groups, such as children and the elderly, it has not considered other community characteristics that have been shown to affect vulnerability to pollution, such as socioeconomic factors or underlying health status" (Pg. 1).[30] CalEnviroScreen provides a relative, rather than absolute measure of impact. As a place-based tool, it offers information that can enable policymakers to focus their time, resources, and programs in areas that are most in need of assistance (Cal EPA, 2014).

As depicted in Figure 11, the overall CalEnviroScreen score is calculated from the Pollution Burden and Population Characteristics groups of 19 indicators by multiplying the two scores. Each group has a maximum score of 10, and the maximum CalEnviroScreen Score is 100. A percentile for the overall score is calculated from the ordered values. Maps are then developed illustrating the percentiles for each of the state's approximately 8,000 census tracts.

[29] Cal EPA has a working definition of cumulative impacts adopted in 2005 as follows: "Cumulative impacts means exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account sensitive populations and socioeconomic factors, where applicable and to the extent data are available." Emissions in the definition include the co-pollutants of climate change.

[30] While CalEnviroScreen is a peer-reviewed, science-based tool developed by government experts, it represents a culmination of more than 7 years of collaboration with environmental justice groups and industry officials on the methods and indicators that were included in the final tool adopted by the state (Cal EPA, 2014). In particular, the tool was significantly influenced by screening models initially developed jointly by environmental justice groups and university researchers (CEJA, 2012).

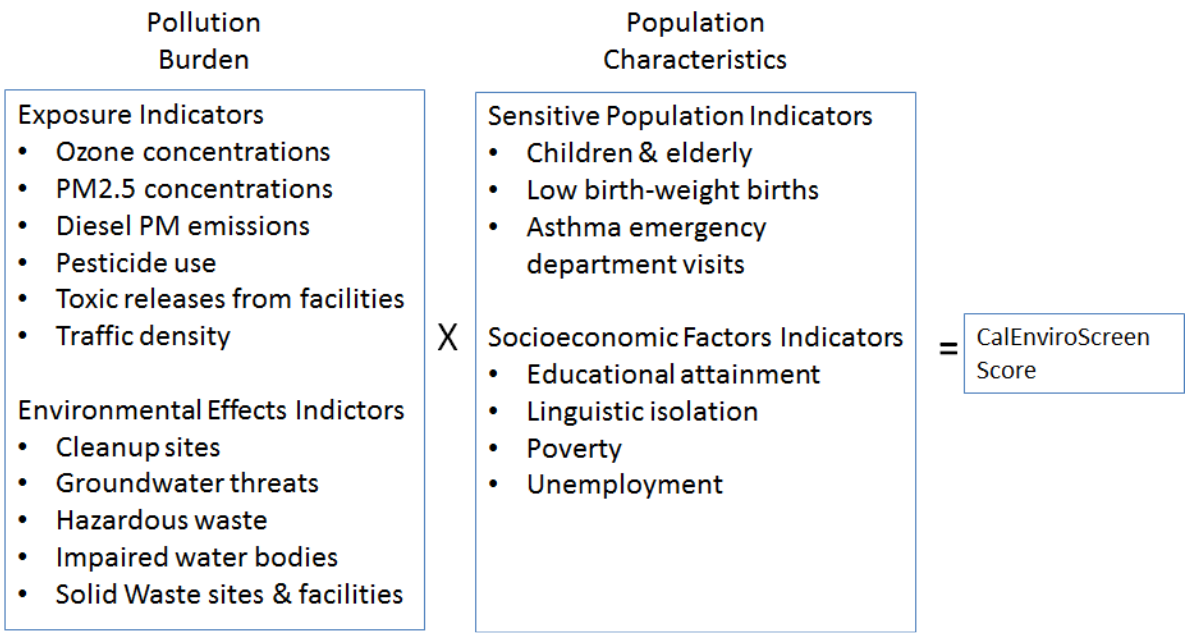


Figure 11: Formula for Calculating CalEnviroScreen Score. Source: Cal EPA, 2014.

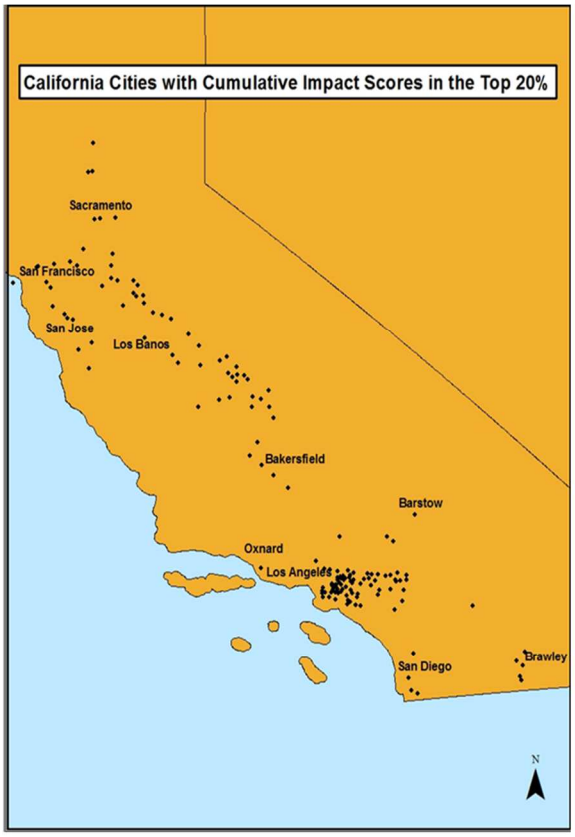
Through the CalEnviroScreen tool, I identified approximately 1,995 census tracts that placed in the top twentieth percentile of overall CalEnviroScreen scores.[31] Within this grouping, 161 incorporated cities were listed as having at least one high scoring census tract (see Map A). Many of these cities are located in the Central Valley, the San Francisco Bay Area, and the major metropolitan regions of Southern California. The highest-scoring neighborhoods sit next to busy seaports, rail yards, and freeways in places such as Long Beach, Oakland, Richmond, San Bernardino and San Jose. In these areas residents are particularly exposed to higher levels of air pollution from vehicle exhaust and industries. Also highly impacted by pollution are farming communities in the Central Valley and Oxnard. In these areas, residents near agricultural fields struggle with contaminated drinking water, poor air quality and pesticide exposure.[32]

Based on this list, I accessed state and local-level government internet databases to determine whether the 161 cities had developed a CAP. When the databases did not indicate whether a CAP had been produced, I contacted the city's planning department directly. As shown in Map B, this analysis revealed that while many communities within these cities are confronting multiple impacts, only 25 percent of cities (41) have adopted or have a CAP in draft form for

[31] The 20 percentile was selected for this study because Cal EPA (2014) has indicated in draft guidance that this is the agency's preferred threshold to identify "disadvantaged communities".

[32] Under the California Civil Rights Initiative (Proposition 209), approved by voters in 1996, state agencies are prohibited from using racial/ethnic preferences in governmental programs and decisions. The CalEnviroScreen tool does not include 'race/ethnicity' as an indicator because the tool will be used to distribute state grants to disadvantaged communities. However, a separate analysis by Cal EPA concludes that more than 35 percent and 28 percent of the state's Hispanic/Latino and African Americans populations, respectively, resides in communities ranked in the top twentieth percentile of the state's environmentally burdened communities. By comparison, only 7 percent of the state's total White population lives in similarly burden communities (Cal EPA, 2014).

public review. For example, despite topping the list with a census tract that is crisscrossed by freeways, where more than 3,000 people live with some of the state's highest levels of toxic air releases and asthma rates, the City of Fresno does not have an adopted CAP or one in preparation. Other cities with multiple high ranking census tracts and lacking CAPs are Bakersfield, El Monte, Ontario, Salinas, Riverside and Turlock.



Map A: The 161 California cities with census tracts identified in the top 20% for cumulative impact under Cal EPA's CalEnviroScreen Score.

Map B: The 41 California cities with Climate Action Action Plans (CAP) and census tracts in the top 20% for cumulative impact under CalEnviroScreen.

Section 2.4 Climate Action Plan Evaluation

Once the 41 cities were identified, I conducted a document analysis and plan evaluation of each city's CAP.[33] My approach builds upon the work of planning researchers Berke and Conroy (2000), Jepson (2004), Boswell et al (2010), Pitt, (2010a) and Wheeler (2008). These studies generally measured CAP quality by examining the extent to which a plan identifies clear goals and GHG reduction targets, and whether policies were developed in a method to ensure implementation and monitoring. My analysis complements this work by focusing on: 1) whether and how CAPs explicitly analyze health co-benefits through evaluative criteria; 2) identifying measures that are targeted towards disadvantaged communities and make specific references to environmental justice/social equity[34] and; 3) the extent to which the cities engage environmental justice actors in the policymaking process (see Table 5).

Initial data gathering was conducted between January 2014 and June 2014. In addition to analyzing CAPS, I conducted a review of policy literature, grey literature, relevant government/non-governmental websites and news articles to identify whether a city's CAP and its supplemental initiatives explicitly addressed the criteria listed in the plan evaluation matrix (Table 5). This method provided for the identification of CAPS developed in collaboration with non-governmental actors. It is important to note, that while some cities have developed several actions related to climate change in the absence of a CAP (i.e. green building standards or renewable energy projects), such stand-alone policies are not included in this study.[35] This research is focused on planning that attempts to take a comprehensive approach to climate change. This method is consistent with previous research that argues the presence of a CAP indicates systematic attention to the issue of climate change. It also serves as a potential framework for a city's ongoing action in which needs are analyzed, options are developed, progress is evaluated, and the public is involved (Wheeler, 2008).

As a key method in qualitative research, document analysis has the advantage of being "stable, unobtrusive, exact, and available over a long span of time" (Yin, 2003: pg. 86). The limitations of document analysis have also been noted, such as that results may be biased if the collection is incomplete. Document analysis may not fully capture the robust discussion that occurs during the drafting and adoption process, and is also likely to reflect the biases of the main authors (Yin, 2003). To compensate for these limitations, I conducted semi-structured interviews with twelve California climate planning practitioners from the public and private sectors to further inform the study's findings.[36] While outside the scope of a traditional document analysis, a

[33] Including plan updates and supplemental CAP documents, such as adaptation plans and public health assessments.

[34] An open definition of environmental justice and social equity was adopted during the data collection process to identify CAP measures that explicitly addressed perceived social, economic, and environmental inequality.

[35] This study also excludes Energy Action Plans and Sustainability Plans.

[36] The participants interviewed remain actively involved in local climate action planning in California. To address the sensitive issues explored in this study, the interviewees were provided anonymity. The only information

copy of the study's main findings was also provided to several interviewed participants, of which five provided written feedback.[37]

disclosed is whether the individual works in the public or private sector (i.e. public agency or private sector planner).

[37] In analyzing the results, this study acknowledges that the field of climate planning is a quickly evolving and highly iterative arena. As of writing of this chapter in the summer of 2014, additional public agencies may choose to initiate the CAP process or develop updates to existing plans as more resources become available.

Section 2.5: Results

A. Health Co-Benefits of CAPs

In reviewing the 41 California cities that were classified as having census tracts with high cumulative impact scores and CAPs, only 17 cities (41 percent) had plans that used evaluative criteria to explicitly analyze the health co-benefits of measures (Table 5). As illustrated in Figure 12, nearly all these cities qualitatively analyzed health co-benefits through graphic icons and bullet points. The graphics simply describe that the measures were selected for their opportunity to improve local air quality, decrease obesity, improve public health and create a healthy living environment. This qualitative evaluation often lacked a methodology and evidence to support the purported health co-benefits. Health co-benefits were also listed qualitatively alongside quantitative matrices that analyzed the potential of CAP measures to reduce GHG emissions and create cost-savings (Figure 13). In the study, only 5 cities (Inglewood, Los Angeles, Oakland, San Diego and San Francisco) explicitly indicated health professionals from county public health departments and community-based health organizations collaborated in developing measures or were currently assisting in developing supplementary public health assessments of CAPs.

The utility of analyzing health co-benefits is likely overshadowed by the main objective of municipal CAPs: the reduction and quantification of GHG emissions. While most GHG quantification models available have the capacity to also quantify co-pollutant reductions from CAP measures, they are often not included. A private sector planner stated that correlating co-pollutant and GHG reduction data with public health outcomes is "too onerous for the climate analyst and makes the report too data intensive for the city council" (author interview, 2014). The planner further noted that conducting a full health co-benefit analysis was typically beyond the level of effort and cost requested by most cities.

The strong emphasis of GHG reduction over health co-benefits may also be influenced by climate studies that indicate greenhouse gases have "*no direct public health impacts*" since they are global pollutants that mix uniformly in the atmosphere. GHG emissions do not have localized effects like particulate matter (PM) and ground-level ozone (O_3) (CARB, 2008).[38] Several planners supported this insight. In particular, a public agency planner noted, "climate planning has largely been focused on the mitigating the primary immediate cause of climate change, GHG emissions.[39] Public health, equity, and the co-benefits of reducing co-pollutants aren't well understood by planners and decision-makers in general. Therefore, it's rarely considered" (author interview, 2014). Research further suggests that since GHG emissions are

[38] Exposure to GHG emissions has human health impacts in concentrated form, such as their use in the workplace (WDHS, 2013). However outdoor exposure levels are considered to be de minimis; GHG emissions dilute as they mix uniformly in the atmosphere (CARB, 2008).

[39] As previously noted, processes such as fossil fuel burning concurrently emit GHG and other co-pollutants that have localized health impacts. However, in California, GHG and co-pollutants (i.e. PM and 0_3) are generally mitigated through separate policy programs.

invisible and because we breathe them without getting sick (unlike smog), many policymakers and laypersons have a difficult time making the links between GHG emissions, local air quality and public health (Moser and Dilling, 2007).

The perceived lack of a connection to human health has also resulted in some experts stating that the main focus of climate policies should be the reduction of global GHG emissions in a cost-effective manner. For example, Harvard University economist, Robert Stavins who was commissioned by the state and business groups to conduct economic analyses for the implementation of AB 32, argues against expanding the scope of climate polices to include localized health co-benefits. He instead proposes that the most environmentally and cost-effective method to address co-pollutants is to revisit existing pollution laws administered by regional air quality districts and perhaps make them stronger (Stavins, 2011; Schatzki and Stavins, 2009). A public sector planner confirmed that this perspective is prevalent in the field because air districts, rather than local planning agencies, are the lead agencies in combatting toxic and criteria air pollutants (author interview, 2014).

The California Department of Public Health (CDPH) suggests that while some planners may understand the links between health and climate planning, they lack quantitative data and tools to justify the investment. Inclusion of such data can establish the economic benefits of integrating public health in climate action planning (CDPH, 2012). According to a public agency planner, in his city "staff does qualitatively stress the public health and other quality of life benefits resulting from CAP implementation. However, we have limited exposure and experience with public health data." The planner attributes this as a result of the city-county "*Public Health Divide*," in which public health services are typically coordinated at the county-level with minimal city involvement (author interview, 2014).

CDPH further acknowledges that many CAPs likely only focus on achieving GHG reduction targets due to a lack of capacity for collaborative planning across sectors and budget constraints from current environmental initiatives. The time and resource-intensive activities already involved in climate planning leaves little opportunity to explicitly demonstrate how planning strategies can reduce GHG emissions and also achieve health outcomes (CDPH, 2012). As a result of this single-issue approach, in many cities, the net co-benefits of health are not monetized, quantified, or identified by policymakers. The findings of this study illustrate that climate-planning activities and work on public health in many of California's most impacted cities is happening in a parallel manner, rather than through an integrated approach.

Table 5: Results of California CAPs in Disadvantaged Communities

City	Population Size	Region of State	Explicitly Analyzed the health co-benefits of CAP measures	CAP Measures address Carbon Fundamentalism or CCSteets	CAP Measures include Opportunities for Promoting Environmental Justice/Social Equity	Adaptation measures in CAP or supplementary documents	City Established Task Force or Staff Committee to Develop CAP	Environmental/ Social Justice Groups Substantively Participated in Developing CAP	External Grant Primarily Funded CAP	Streamlined Environmental Review cited for adopting CAP
Antioch	106,455	Northern CA		CO_2Fundamentalism					X	
Burbank	105,543	Southern CA		CO_2Fundamentalism			X			x
Chino	81,747	Southern CA	X	CO_2Fundamentalism		X	X			x
Chula Vista	256,139	Southern CA		CO_2Fundamentalism		X	X			x
Corona	159,132	Southern CA		CO_2Fundamentalism			x			x
East Palo Alto	28,934	Northern CA		CO_2Fundamentalism			X		X	x
Escondido	147,102	Southern CA	X	CO_2Fundamentalism			X		X	x
Fullerton	140,131	Southern CA		CO_2Fundamentalism			X			x
Gilroy	52,413	Northern CA		CO_2Fundamentalism		X	X		X	x
Glendale	195,799	Southern CA	X	CO_2Fundamentalism		X	X		X	x
Inglewood	111,795	Southern CA	X	CCStreets	X	X	X	X	X	x
Lake Elsinore	56,718	Southern CA		CO_2Fundamentalism			X			x
Lodi	63,651	Central CA	X	CCStreets			X		X	x
Long Beach	470,292	Southern CA		CO_2Fundamentalism			X			
Los Angeles	3,904,657	Southern CA	X	CCStreets	X	X	X	X		x
Manteca	72,880	Central CA		CO_2Fundamentalism			x		X	x
Martinez	36,842	Northern CA	X	CO_2Fundamentalism		X	X			
Merced	81,130	Central CA		CO_2Fundamentalism			X		X	x
Monterey Park	61,777	Southern CA		CO_2Fundamentalism			X		X	x
National City	59,381	Southern CA		CO_2Fundamentalism			X			x
Oakland	404,355	Northern CA	X	CCStreets	X	X		X	X	x
Oxnard	203,645	Southern CA		CO_2Fundamentalism			X		X	x
Palmdale	154,629	Southern CA		CO_2Fundamentalism			x		X	x
Pasadena	137,122	Southern CA		CO_2Fundamentalism			X			
Redlands	69,882	Southern CA		CO_2Fundamentalism			X		X	x
Rio Vista	7,934	Northern CA	X	CO_2Fundamentalism			X		X	x
Sacramento	475,122	Central CA	X	CO_2Fundamentalism		X	X		X	x
San Bernardino	212,721	Northern CA		CO_2Fundamentalism			X		X	x
San Diego	1,345,895	Southern CA	X	CCStreets	X	X	X	X	X	x
San Francisco	836,820	Northern CA	X	CCStreets	X	X	X	X		x
San Gabriel	40,313	Southern CA		CO_2Fundamentalism			X		X	
San Jose	1,000,536	Northern CA		CO_2Fundamentalism			X			x
San Leandro	87,691	Northern CA		CO_2Fundamentalism			X		X	
San Pablo	29,465	Northern CA	X	CO_2Fundamentalism		X	X		X	x
Santa Clara	121,229	Northern CA	X	CO_2Fundamentalism			X		X	x
Stockton	300,899	Central CA	X	CO_2Fundamentalism			X			x
Tracy	85,146	Central CA	X	CO_2Fundamentalism			X			
Tulare	459,446	Central CA		CO_2Fundamentalism			X		X	x
Visalia	129,582	Central CA	X	CO_2Fundamentalism			X			
Watsonville	52,508	Northern CA		CO_2Fundamentalism		X	X		X	
West Sacramento	50,836	Central CA		CO_2Fundamentalism			X			x

Figure 12: City of Sacramento (2012) CAP Identified Health Co-Benefits for 'Mobility & Connectivity' Measures

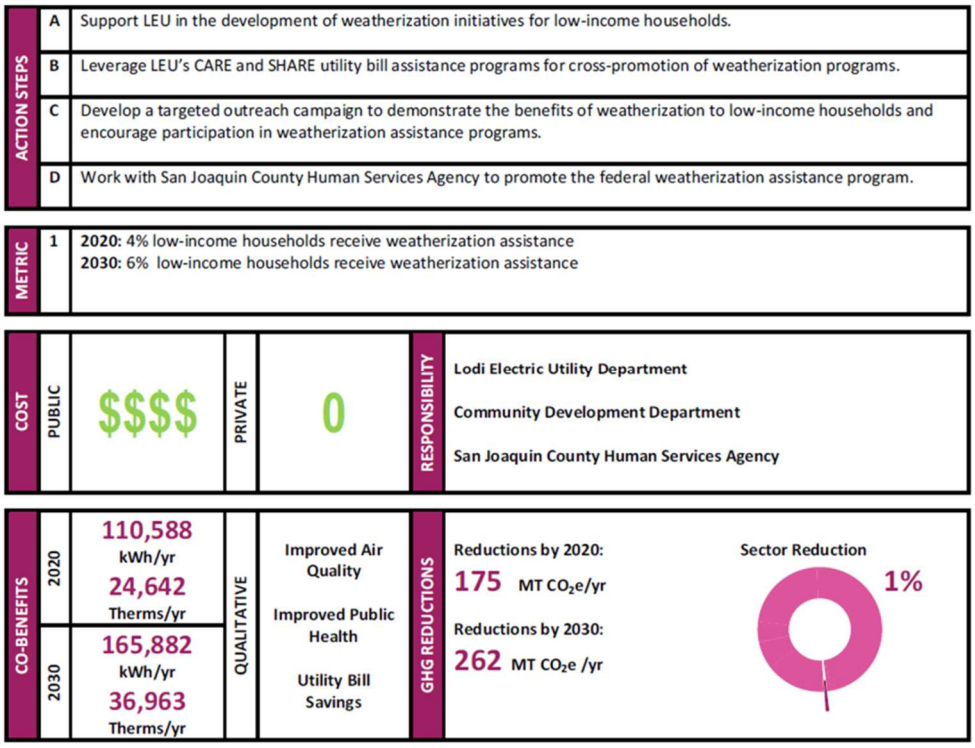


Figure 13: City of Lodi (2014) CAP Matrix of Co-Benefits of 'Low-income Weatherization' Measures

While the majority of California CAPs have not broadened climate planning to include health outcomes, some cities with larger resources and staff expertise are leading the way through innovative collaborations. The cities of San Francisco, Los Angeles and Oakland are working alongside environmental justice and community health groups to engage their county health departments to develop strategies to 1) communicate the potential health benefits of reducing GHG emissions to the general public and policymakers; 2) identify and quantify local land-use, transportation, water, and energy policies that reduce GHG emissions and support the design of healthy and sustainable neighborhoods; 3) provide guidance on climate preparedness to government officials and community partners to reduce health risks and adaptability, and; 4) build the capacity of public health and city planning staff to monitor health impacts, integrate climate preparedness, and improve climate responses.

The city and county of San Francisco – the state's only consolidated local government has developed the most innovative cross-sector approach to climate planning and health.[40] For example, its public health department, with a grant from the U.S. Centers for Disease Control and Prevention (CDC), completed a 30-page guidance document for "Assessing the Health Co-benefits of San Francisco's Climate Action Plan" (SFDPH, 2010). This report assesses the health co-benefits of the city's CAP, and the potential negative health consequences of proposed actions. The report provides recommendations to inform future CAP updates to ensure the city's climate change measures achieves emission reductions targets while improving the health of San Francisco's residents.

San Francisco is also the only city to develop a quantitative health study of its CAP. In collaboration with the U.S. EPA Region 9, the city developed a study for evaluating health co-benefits that can be used by decision-makers to optimize GHG mitigation, air quality, and monetary benefits (U.S. EPA, 2012d). The study estimates that the CAP measures would result in significant economic benefits ($114 million) from improved health outcomes as a result of reductions not only in GHG emissions, but also ozone and PM2.5 concentrations (US EPA, 2012d). The air quality benefit per ton of GHG reduced is also provided to demonstrate the relative air quality benefits of each CAP measure. For example, as shown in Figure 14, the [Energy] Residential Loan Program would result in $42.56 in reduced health costs saved for every ton of GHG emissions reduced (U.S. EPA, 2012d).

[40] As noted above, in California the vast majority of public health departments are delegated to county governments, not cities.

Measure	GHG Reductions ($MTCO_2e$ per year)	GHG Monetary Benefit	Air Quality Monetary Benefit (PM2.5 and Ozone)	Total Monetary Benefit	Air Quality Benefit per ton GHG Reduced ($/MTCO$_2$e)*
Community Transportation Demand Management	–	*$7,956,338*	*$8,715,665*	*$16,672,003*	*$30.67*
1a—Workplace TDM	53,046.63	$1,485,306	$1,627,265	$3,112,571	$30.68
1b—Community TDM	226,677.17	$6,346,961	$6,952,111	$13,299,072	$30.67
2—Ridesharing	4,431.14	$124,072	$136,288	$260,360	$30.76
Electric Transportation	–	*$1,190,317*	*$2,239,799*	*$3,430,117*	*$52.69*
3—Electric Vehicle Infrastructure	42,511.34	$1,190,317	$2,239,799	$3,430,117	$52.69
Energy Efficiency	–	*$8,744,683*	*$13,765,334*	*$22,510,017*	*$44.08*
4—RECO Update	92,225.86	$2,582,324	$3,929,332	$6,511,656	$42.61
5a—Residential Loan Program	1,909.59	$53,468	$81,263	$134,732	$42.56
5b—Commercial Loan Program	22,150.96	$620,227	$990,655	$1,610,882	$44.72
6—Energy Efficiency Legislation Support	194,513.13	$5,446,368	$8,700,335	$14,146,703	$44.73
7—Energy Efficiency Services	1,510.58	$42,296	$63,748	$106,044	$42.20
Renewable Energy	–	*$17,094,695*	*$26,107,386*	*$43,202,081*	*$42.76*
8—Renewable Energy Goal	610,524.81	$17,094,695	$26,107,386	$43,202,081	$42.76
Zero Waste	–	*$15,481,194*	*$95,452*	*$15,576,647*	*N/A***
9—Achieve Zero Waste	544,533.19	$15,246,929	N/A**	$15,246,929	N/A**
10—Digester Capture	8,366.61	$234,265	$95,452	$329,717	$11.41
Land Use	–	*$6,998,370*	*$5,624,485*	*$12,622,855*	*$22.50*
11—Land Use Measures	239,052.29	$6,693,464	$5,322,002	$12,015,466	$22.26
12—Transit Oriented New Jobs	7,598.40	$212,755	$277,103	$489,858	$36.47
13—Tree Planting	3,291.11	$92,151	$25,379	$117,530	$7.71

*An average value is provided for each sector.

**Criteria pollutant benefits were not calculated for *Achieve Zero Waste*. Accordingly, the total monetary benefit for this measure is equivalent to the GHG monetary benefit.

Figure 14: GHG and Air Quality Monetary Benefit by San Francisco CAP Sector and Measure.
Source: (U.S. EPA, 2012d).

The evaluation of San Francisco's CAP demonstrates quantitatively that GHG reduction measures can have multiple economic, social and environmental health benefits. The reports suggests that other municipalities can use this assessment process to develop and prioritize potential GHG reduction measures during the drafting of CAPs. However, the scalability of such health assessments in California is uncertain. The cost of adopting a conventional CAP can range between $100,000 and $450,000, depending on the comprehensiveness and technical complexity of the plan (author interviews, 2013; California SGC, 2013). Adding another level of quantitative assessment to a CAP may be cost-prohibitive for many cities without the aid of an external funding source or free guidance tools from the state. "GHG inventories are onerous enough," said one private sector planner. "Completing an air quality and health cost-benefit analysis would add a year and at least $60,000 to the project, which I don't think most municipalities can afford" (author interview, 2014). Nearly 60 percent of California cities analyzed in this study indicated that they only developed a CAP (which can take up to two years or longer) after securing state, federal, or philanthropic grants (Table 5).

B. Measures that Address Climate Change from the Streets or Social Equity

The CalEnviroScreen tool provides a new framework to help governments understand that some communities face a higher range of negative impacts than others. It also is intended to

help communities determine how policy analysis and development can holistically address these issues. In climate policy, such a holistic framing is often referred to as 'contextual vulnerability,' or what this dissertation refers to *Climate Change from the Streets* (CCStreets), which is based on a multidimensional view of climate-society interactions. Under this frame, both climate variability and change are considered to occur in the context of political, institutional, and economic and social structures, which interact dynamically with contextual conditions associated with a particular 'exposure unit' (O'Brien et al, 2007). [41] As described in Figure 15b, contextual conditions affect the exposure to climate variability and change, as well as proposed policy responses. From this perspective "reducing vulnerability involves altering the context in which climate change occurs, so that individuals and groups can better respond to changing conditions" (O'Brien et al, Pg. 76). A CCStreets approach stresses the need to develop mitigation and adaptation policy responses on the basis of equity (Adger et al, 2006).

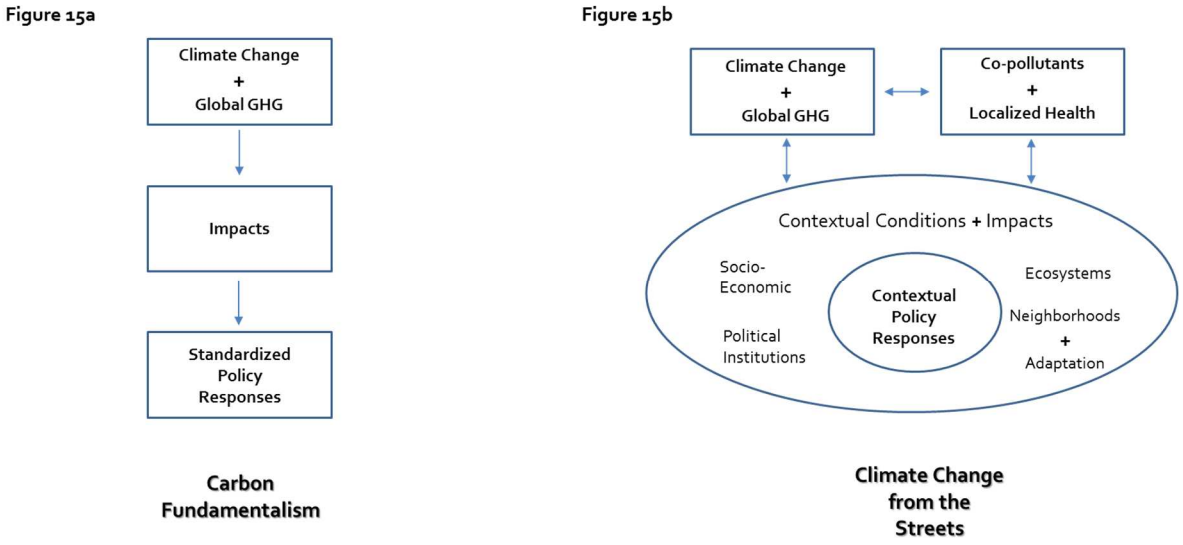


Figure 15: Approaches to Local Climate Action Planning in California.
Source: Adapted from O'Brien et al. (2007; pg. 75).

As illustrated in Figure 15a, 'outcome vulnerability' or what is referred to in this dissertation as *Carbon Fundamentalism*, in contrast, takes a linear framing of climate change. Vulnerability is the result of the projected impacts of climate change on a particular exposure unit, offset by mitigation and adaptation measures. This approach is typically used in climate planning, and impacts are measured through technical and sectoral measures without regard to the 'contextual conditions' in which it occurs in society (O'Brien et al, 2007).

[41] An exposure unit is an activity, group, region or resource exposed to significant climatic variations (O'Brien et al, 2007).

In California, six cities (15 percent) of those surveyed, explicitly utilize a CCStreets approach in their CAP process (Table 5). While cities like Tracy, Monterey Park, Watsonville, and San Pablo briefly state that "contextual conditions" (i.e. air pollution, poverty and health status) have impacts on their residents, they do not identify disadvantaged communities. Nor do they indicate if any of the CAP measures are targeted to specific communities or are intended to alleviate the social and geographical unevenness of climate change impacts. According to a public agency planner, during most CAP processes "there is a perception of climate change as an environmental problem, rather than a people problem. It's an abstract problem affecting the whole world rather than a problem that disproportionately affects disadvantaged communities" (author interview, 2014). As such, a carbon fundamentalism frame remains the dominant approach and presents a significant challenge for linking climate planning with health equity outcomes.[42]

A few cities, however, have explicitly implemented a variety of CAP measures that employ a CCStreets approach. San Diego, Inglewood and Lodi have devoted entire sections of their CAP to qualitatively describe how climate mitigation measures are addressing social equity and vulnerability. San Diego's chapter on "Social Equity and Job Creation" describes both the disproportionate effects of climate change on disadvantaged communities and the methods the city is undertaking to identify those communities. This includes the use of the CalEnviroScreen tool and the San Diego Council of Government's Regional Transportation Plan (RTP) analysis of "Low-income and Minority Communities" to prioritize the city's CAP programs and actions for disadvantaged populations. The chapter also argues that CAP policies can spur creation of well-paying jobs in the renewable energy sector and encourages these local jobs should be targeted to disadvantaged communities as pathways out of poverty (San Diego, 2014).

The city of Lodi has taken a similar but a more limited approach to CCSteets. Measures like the 'Low-income Weatherization' program were designed to help the city work toward reducing barriers to participation of marginalized groups in order to ensure full implementation of the CAP (Lodi, 2014). The city is focusing targeted outreach to the following population groups: low-income households, senior households, renter-occupied housing and non-native English speakers. Lodi officials intend to develop bilingual communication materials and social marketing events, aimed at Spanish-speaking residents, which compose the majority of non-native English speakers. These bilingual initiatives seek to provide opportunities for immigrant residents to participate in low-income energy efficiency and weatherization projects and other CAP related programs (Lodi, 2014).

Oakland, Los Angeles, San Diego and San Francisco have also worked collaboratively with county health departments, universities, and environmental justice groups to develop climate adaptation analyses focused on "contextual" impacts. The assessments utilize complex quantitative models and mapping tools to determine residents' social vulnerability to climate

[42] Health equity is achieved when every person has the opportunity to "attain his or her full health potential" and no one is "disadvantaged from achieving this potential because of social position or socially determined circumstances (Braverman, 2003; pg. 181).

change impacts and develop appropriate adaptation measures.[43] The plans were developed in contrast to conventional adaptation studies, such as regional sea-level rise models, that focus on threats to city-wide infrastructure and other vital city assets. Adaptation planning, however, is still considered an emerging field and due to resource constraints, many local governments are struggling with how to engage in the planning process (Anguelovski and Carmin, 2011). This study identified only 13 California cities (32 percent of those surveyed) that have employed varying approaches to adaptation planning (Table 5). The majority of cities have developed simple qualitative statements indicating that particular measures were intended to address adaptation, such as urban forestry, renewable energy projects and wetlands restoration.

C. Community Engagement of Environmental Justice Actors in Climate Planning

Localizing global climate change science is often faced with uncertainty, and many local governments are left with few polices and professional norms to guide their efforts. Thus, cities are creating new forms of climate expertise to fill these gaps by commissioning expert scientific advice to formulate policy goals and standards (Corburn, 2009). This includes working with the Cities and Climate Protection Program (CCP) developed by ICLEI – Local Governments for Sustainability[44] or hiring private sector planners to establish GHG reduction targets, develop emissions inventories and mitigation strategies (Alber and Kern, 2008). Local governments have also attempted to manage technical gaps through the establishment of task forces populated by scientists and experts from universities. Local governments have stated they often pursue an expert task force approach because they are unable to gain robust engagement from lay publics in climate-related issues. They attribute the lack of public engagement generally to the absence of personal relevance many people associate with climate change, as well as the scientific complexity of the issue (Slocum, 2004; Few et al., 2007; Rosenthal et al, 2013; Carmin et al, 2013).

In this study, 40 of 41 cities either established a hybrid taskforce populated with experts and residents familiar with aspects of environmental planning or created ad hoc committees consisting of city agency representatives (Table 5). Nearly all the cities hired private sector planners to assist in the technical aspects of developing a CAP. Community engagement was generally citied by all 41 cities as a key component of successful implementation of CAPs. However, community engagement in many instances only served as a method to solicit public comment after a draft report was completed. Community outreach and education efforts, it seemed, were conducted to achieve citizen buy-in, rather than providing open forums for gathering community concerns and recommendations. According to several planners, it is common for many cities to pursue standardized approaches that forge robust community engagement and opportunities to incorporate environmental justice goals.

[43] These cities are taking a concerted effort toward adaptation planning in acknowledging that, regardless of the degree of success in reducing GHG emissions, certain irreversible and significant impacts from climate change are already under way and will be inevitable (Few, Brown, and Tompkins, 2007).
[44] Founded as the International Council for Local Environmental Initiatives.

> My sense is that most municipal agencies don't have the resources or sophistication to conduct long-range planning efforts for climate action and sustainability using community-based, holistic approaches…Public health and environmental justice are an after-thought most of the time, with economic development and standardized approaches to land use planning and natural resource management being the primary motivators for most long-range planning efforts (private sector planner – author interview, 2014).

Over 78 percent of cities (32) in this study (Table 5) indicated a key factor for developing a CAP was to support economic development through a streamlined environmental review process for development projects subject to review under the California Environmental Quality Act (CEQA).[45] Projects that demonstrate consistency with an adopted CAP have the ability to report that no additional significant environmental impacts would occur. If a city has not adopted a CAP, project developers are required to conduct a costly analysis of GHG emissions and potential impacts (OPR, 2011). The cities of Chino and Stockton cited that they explicitly developed a CAP as a result of a CEQA legal settlement agreement with the state attorney general and environmental groups over the potential GHG emissions impacts attributed to their updated general plans, the 20-30 year blueprint cities adopt for growth and development (Stockton 2014; Tasci, 2012). Other cities including Tracy, stated that adopting a CAP was a preemptive measure against potential CEQA lawsuits (Firpo, 2009).

Consequently, only five cities (12 percent) explicitly stated that they developed tools or processes to engage disadvantaged communities in climate action planning. These five cities also developed CAPs that focused on 'contextual vulnerability.' The cities of Inglewood, Los Angeles, Oakland, San Diego and San Francisco explicitly mentioned the methods they conducted to identify and substantively engage environmental justice or community-based groups in the drafting of their CAPs and related updates. This included the establishment of multi-stakeholder policy forums and social events, with bilingual services to maximize participation. In several of these cities, community groups formed coalitions to collaboratively develop recommendations to address the needs of the communities they serve. In most instances, a representative from the coalition participated on a city taskforce or served as a key advisor throughout the CAP process. For example, in Oakland, after a three-year collaborative process with the Oakland Climate Action Coalition (OCAC), the city adopted a CAP based on a comprehensive community engagement process. Through this collaboration, the OCAC was able to research and produce 50 out of 150 measures adopted in the CAP (Fitzgerald, 2011 – author interview).

[45] The California statute passed in 1970, shortly after the United States federal government passed the National Environmental Policy Act (NEPA), to institute a statewide policy of environmental protection. CEQA requires state and local agencies to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts (California Department of Justice, 2013).

Section 2.6: Conclusion

According to the World Health Organization, climate change is one of the most serious public health issues of our time (Baum, 2009). Yet in California, the findings of this chapter indicate that climate planning activities and work on public health in the state's most impacted cities is happening in a parallel manner, rather than through an integrated approach.[46] The vast majority of municipal climate action plans (CAP) only focus on achieving GHG reduction targets. In this chapter, we understand that the predominant mode of local climate planning is *carbon fundamentalism*. Most cities have framed climate change as an "environmental" or scientific problem, without regard to the human and cultural dimension of the phenomenon. These CAPs could be easily judged as being modestly effective due to the failure to incorporate health co-benefits and safeguard the most vulnerable residents from climate change impacts. However, as one public agency planner insisted; "if CAPs do not have co-benefits explicitly stated as goals, then they cannot be faulted as being only modestly effective." The planner argues that climate planning is an emerging policy field, and practitioners need to be better informed as to why an exclusive focus on GHG reduction is ineffective (author interview, 2014).

A broader climate policy agenda can help move CAPs in the direction of holistically addressing public health and social vulnerability. The challenge for the field, however, is the resources it takes to generate substantive pubic engagement programs and cross-sector/multi-dimensional impact analyses. As astutely noted by a private sector planner; "in a perfect world, every local agency would have $500,000 to do a holistic-type CAP, but under existing frameworks, that is unlikely to happen" (author interview, 2014). California's climate policies do not adequately provide local governments with the necessary tools or funds to conduct more extensive analyses of the health co-benefits of CAP measures. As such, public health is considered too indirect by many cities and the focus remains on cost-effective reductions of GHG emissions.

In sum, this chapter has provided a baseline analysis of the public health and justice aspects of CAPs developed in California cities with high levels of pollution and social vulnerability. The findings show that such plans rarely analyze whether GHG reduction strategies will address health co-benefits or distribute them equitably. The results suggest a need for increased opportunities for interagency coordination and staff training to conduct health analyses, the development of free and streamlined tools, and methods for prioritizing funding streams. Most significantly, as this chapter illustrates, there is a strong need for cities to promote partnerships with residents and community-based groups to link climate planning with equity and health co-benefits.

[46] As previously noted, the field of municipal climate planning is a quickly evolving and highly iterative arena. As more resources become available, additional public agencies may choose to develop CAPs or initiate updates to existing CAPs.

CHAPTER 3
Changing the Climate from the Streets of Oakland: The Civic Epistemologies of Urban Climate Change

While the previous chapter provided findings on the importance of substantively engaging environmental justice groups and public health professionals in climate planning, its scope is limited. More research is needed to empirically understand how cities are engaging civil society actors to establish interconnections between climate change, equity and public health. Environmental governance entails a variety of decision points that involve determining who makes particular policy choices, and what scientific criteria and knowledge is used in making those decisions. Through an in-depth case study of Oakland, California's climate action plan (CAP), this chapter examines *how and why* a city develops explicit linkages between climate change and population health. Analyzing the methods in which CAPs are developed in practice can provide a strategic understanding of the particular agendas, politics and expertise that influence the development of climate policies and environmental justice outcomes.

Section 3.1: Introduction

Figure 16: Source: OCAC, 2010

> Up until the last decade, climate change tended to be a 'White,' affluent issue about saving the rainforest and polar bears. It hasn't had deep relevance for people trying every day to get by in the urban centers. Most of the messages of climate change are about eliminating global GHG emissions and not about people (Brian Beveridge, co-director of the West Oakland Environmental Indicators Project, – author interview).

As described in the preceding chapter, strategies for addressing climate change have been largely analyzed in terms of their costs and potential for reducing the rate of increase in atmospheric concentrations of global greenhouse gas (GHG) emissions. Less studied is whether efforts to slow atmospheric GHG accumulations will have a number of local co-benefits. These include a reduction in the co-pollutants of climate change (i.e. ozone, particulate matter, and nitrogen oxides) and a corresponding improvement of population health in environmental justice communities. Despite the fact that GHG and co-pollutants are emitted concurrently, they are often not addressed jointly in global and local climate policy (Pastor and Boyce, 2012).

There is growing evidence that local climate planning is neglecting issues of equity and human health (Bulkeley et al., 2013; Douglas et al, 2012; Finn et al, 2011; Hughes, 2013; Pearsall et al, 2010). Incorporating public health and equity in climate action plans may be problematic for several reasons. First, the structural conditions that have created environmental health inequities are often concealed by focusing primarily on universal climate variables, such as the amount of GHG emissions emitted, mean temperature and regulatory technologies. These variables seek GHG reductions on a global scale, without targeting efforts and health co-benefits to local communities already disproportionately suffering from poor air quality.

Second, the disconnect between climate planning and public health may be occurring because greenhouse gases are considered to have "*no direct public health impacts*" since they are global pollutants that mix uniformly in the atmosphere. They do not have localized health effects, as do particulate matter (PM) and ground-level ozone (O_3) — the key ingredients of smog (CARB, 2008). As noted in Chapter 1, since GHG emissions are invisible and because we breathe them without getting sick, many policymakers and laypersons have a difficult time making the links between GHG emissions, local air quality and public health (Moser and Dilling, 2007). This has resulted in climate policies focusing almost exclusively on reducing global GHG emissions without regard to the localized human health benefits (Jochem and Madlener, 2003).

The construction of climate change as an abstract, scientific issue with no direct human health impacts reinforces popular representations of melting ice caps and displaced polar bears as disproportionately suffering from the impacts of a changing climate (Figure 16). Such representations have little relevance to how climate change exacerbates existing health inequities or the 'lived experience' of individuals in environmental justice communities. The disconnect between public health and climate change can leave these communities disengaged from the policymaking process in developing climate action plans (O'Neil and Nicholson-Cole, 2009). Therefore, It is suggested that local climate planning should instead follow a 'relational' approach that: (1) acknowledges an understanding of how climate change is connected with other types of knowledge about the local environment; and, (2) enables different ways of knowing to play a valid part of framing a culture of climate change and its corresponding policy responses (Brace and Geoghegan, 2010).

In an effort to rectify this disconnect, several environmental justice advocates are taking such an approach. They are creating new methods and policy interventions that focus on how climate change impacts local communities, and are embedded in social justice and public health. In this chapter, I draw on the case study of Oakland's Energy and Climate Action Plan (ECAP) to illustrate the diverse ways environmental justice groups there are approaching climate change. They are analyzing climate change through people's lived experience, relationship to community and local knowledge.[47] This is in contrast to standardized approaches developed by experts and city planners (Park, 2009; Morello-Frosch et al., 2012). These new forms of knowledge and governance can be understood as an articulation of civic epistemology, "the institutionalized practices by which members of a given society test and deploy knowledge claims used as a basis for making collective choices" (Jasanoff, 2005; Pg. 255). Examining the ECAP through the concept of civic epistemology, demonstrates how environmental justice groups are challenging *a priori* policy expertise to produce new local, place-based conceptualizations of climate change that underscore population health and community well-being.

[47] Local knowledge is often defined by the international development literature as: a). information linked to a specific place, culture or identify group; b). dynamic and evolving knowledge; c). know-how belonging to groups of people who are intimate with the natural and human system within which they live; and, d). knowledge that has some qualities that distinguishes it from formal scientific knowledge (Corburn, 2003).

Section 3.2: Configuring Oakland's Climate(s)

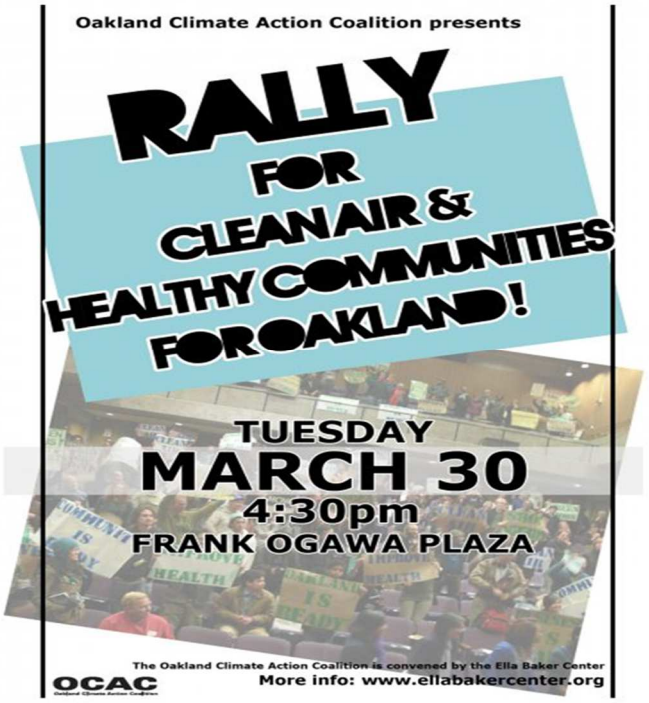


Figure 17 (OCAC, 2010)

> Climate change is the greatest public health challenge of this century…the Oakland Climate Action Coalition has done an amazing job in pushing the [City] Council and our communities to imagine and prepare for [it].
> -- Dana Ginn Paredes, Training Director for Asian Communities for Reproductive Justice
> (March 2, 2011, a day after the Oakland City Council passed one of the state's highest municipal GHG reduction targets).

With a population of nearly 400,000, almost two-thirds people of color, the city of Oakland has a long and rich history of civil rights and environmental activism. This activism is partly in response to a legacy of inequitable development practices that continue to cause environmental degradation in local communities. Toxic facility sitings, low socio-economic status (SES), economic activity from of one of the state's largest seaports, and lack of a fair distribution of environmental goods has created a degraded built environment in many Oakland neighborhoods. In those neighborhoods, residents face an increased risk of exposure to pollution and public health impacts, such as asthma, heart disease, cancer, premature death, and neo-natal problems (CEC, 2012; Minkler et al. 2011).

Local pollution sources within the city also contribute to a global environmental threat as well – the greenhouse gas emissions that fuel climate change. The California Environmental Protection Agency (Cal EPA) recently highlighted Oakland's role in global-local environmental health degradation through its Environmental Health Screening Tool (CalEnviroScreen). As illustrated

in Figure 18, more than 50,000 Oakland residents live in neighborhoods listed in the top 20 percent of California census tracts for cumulative environmental impact (Cal EPA, 2014). Neighborhoods in these high-scoring census tracts sit next to a major seaport, airport, rail yards, and congested freeways. In these areas, residents are exposed on a daily basis to higher levels of air pollution from vehicle exhaust and commercial operations.

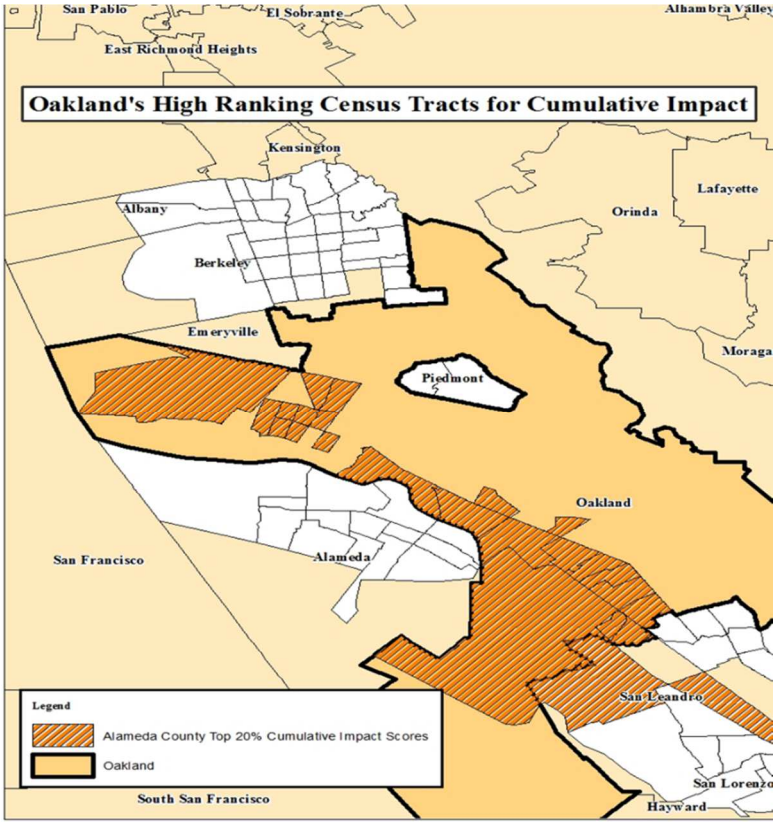


Figure 18: More than 50,000 Oakland residents live in neighborhoods listed in the top 20 percent of California census tracts for cumulative environmental impact. The top 20 percent census tracts are highlighted in dark orange.

Motivated by these disproportionate environmental burdens, the city of Oakland and locally-based, environmental justice groups sought ways to more explicitly link urban planning, public health and climate change. They developed a civic epistemology that partially displaced expert-driven processes that typically characterize climate action plans across the United States. The previous chapter has shown that local governments generally develop standards and climate policy through the establishment of task forces populated by scientists and experts, which rarely address issues of public health and equity (Bulkeley et al, 2013; Douglas et al, 2012; Rosenthal, et al, 2013; Rosenzweig et al., 2010; Corburn, 2009). Conversely, in Oakland, following a three-year collaborative process with the Oakland Climate Action Coalition (OCAC), the city in December 2012 adopted one of the state's highest city-scale GHG emissions

reduction targets.[48] The city's ECAP was largely driven by a diverse coalition of local and regional organizations who proactively focused on implementing an urban climate change regime that went beyond abstract notions of the environment. This process positioned environmental justice groups in the city to configure a holistic conceptualization of climate change that emphasized geographically and socially uneven impacts of climate change and promoted health equity.[49]

[48] The Draft ECAP was approved by the City Council in March 2011. However, final adoption was taken in December 2012 after the required Environmental Impact Report (EIR) was completed.

[49] Health equity is achieved when every person has the opportunity to "attain his or her full health potential" and no one is "disadvantaged from achieving this potential because of social position or other socially determined circumstances" (Braverman, 2003; pg. 181).

Section 3.3: Community-Based Climate Planning in Oakland

The Oakland Climate Action Coalition was first conceived in the small cinder-block basement of the Ella Baker Center for Human Rights in early 2009, shortly after the city announced that it would develop an ECAP. The Ella Baker Center identifying a strategic opening, quickly organized a crowded meeting of more than 50 people from 30 community-based organizations to brainstorm on how to produce a comprehensive local climate action plan that addressed the needs of Oakland residents most impacted by air pollution and poverty (Emily Kirsch, 2011 – author interview).

The Center began the strategic planning meeting by asking the following question: "*What would a People's Energy and Climate Action Plan look like in Oakland?"* After several hours of dialogue and facilitated discussion, participants covered the small basement walls with neon pink, green, and yellow Post-It notes detailing their suggestions and ideas for Oakland's climate action plan. Some of these suggestions included demands for locally produced renewable energy projects in disadvantaged communities, affordable housing as a GHG emissions reduction strategy, and increased public transit options to reduce co-pollutants and improve local air quality. Through this grassroots meeting, the Oakland Climate Action Coalition was officially established.

Convener

The Ella Baker Center For Human Rights

Steering Committee

- Asian Pacific Environmental Network
- Bay Localize
- Causa Justa :: Just Cause
- Center for Progressive Action
- Communities for a Better Environment
- Local Clean Energy Alliance
- Mobilization for Climate Justice West
- Movement Generation
- Pacific Institute
- Transform
- Urban Habitat
- West Oakland Environmental Indicators Project

Coalition Members

- Forward Together
- California Food and Justice Coalition
- Environmental Defense Fund
- First Unitarian Church of Oakland
- DIG Cooperative
- Greenbelt Alliance
- Greenlining Institute
- HOPE Collaborative
- inNative
- International Longshore and Warehouse Union Local 6
- Kehilla Synagogue
- Mandela Marketplace
- Planting Justice
- Progressive Jewish Alliance
- Starr King School for the Ministry
- Unitarian Universalist Legislative Ministry California
- The Workforce Collaborative

Allies

- Alameda County Green Business Program
- Alliance For West Oakland Development
- America Works
- California Interfaith Power and Light
- CiviCorps
- ClimateChangeEducation.org
- East Bay Alliance for a Sustainable Economy
- Environmental Conservation Options
- Food First/Institute for Food and Development Policy
- Global Alliance for Incinerator Alternatives
- Greywater Action
- Grind for the Green
- International Brotherhood of Electrical Workers Union Local 595
- Live Real
- Northgate Environmental Management
- Oakland Food Connection
- Oakland Resilience Alliance
- Pesticide Watch
- PUEBLO
- Rising Sun Energy Center
- Sierra Club
- Sungevity
- Sun Light & Power
- Sustainable Earth Initiative
- Sustainable Economies Law Center
- US Green Building Council
- Wellstone Democratic Club

Figure 19: Oakland Climate Action Coalition Membership 2009-2011.

The Ella Baker Center for Human Rights, named for a longtime twentieth-century U.S. civil rights leader and participatory democracy advocate, went on to be the convener of the cross-sector coalition of over 50 organizations that expanded to include labor unions, green businesses, and advocates for sustainable development, in addition to environmental justice

groups (see Figure 19 for full list). As the convener of OCAC, the Ella Baker Center provided staff to coordinate the coalition, led the drafting of the mission statement and goals, and facilitated steering committee and coalition meetings to ensure compliance with OCAC benchmarks.

OCAC's strength and success is largely due to the diversity of its members. They recruited coalition members throughout Oakland's diverse neighborhoods. Together, they were a powerful force that provided multi-sector expertise on a host of issues, including: transportation and affordable housing, energy, urban agriculture, adaptation planning and community engagement. According to Emily Kirsch, founding OCAC coordinator and green jobs Organizer for the Ella Baker Center, the coalition's diversity in expertise allowed them to work jointly with the city to move the ECAP beyond *a priori* strategies to a community-based plan.

> Having a diverse coalition with strong expertise is important in these types of policy initiatives. So we knew [the Ella Baker Center] were not experts on climate change. When you talk about climate change, its food, water, transportation, housing, energy, health equity and everything you possibly can think of. So we went around to our friends and allies to find out what sort of climate-related projects they were working on and the type of expertise they could bring to the coalition. Then we strategized how we could get included these projects in the ECAP and on the books as part of the city's plans (Kirsch, 2011 – author interview).

In developing the framework for the ECAP, the city initially followed traditional methods by seeking assistance from experts at the nongovernmental organization, ICLEI[50] and the private consulting firm CirclePoint, Inc. These organizations helped gather input at public workshops, identify and evaluate potential GHG emissions reduction targets, and strategies to address GHG targets. Under this conventional process, approximately 200 people attended city-sponsored workshops, representing a variety of interests; including the OCAC, government agencies, utilities, businesses, and individual residents. However, what is uniquely different about Oakland's ECAP is that the OCAC approached the city staff early in the process about being more directly involved in the development and defining of the ECAP. They specifically requested that the city not establish a formal expert taskforce but instead allow for alternative community-based approaches. Due to the diverse expertise of members in the coalition, which included politically influential and long-established community members, the OCAC persuaded city staff and the city council to let the coalition facilitate and fund a parallel, community-driven advisory process. This was in addition to the city-sponsored public workshops and mandatory public comment periods.

> The city did host their own workshops but they are pretty boring and held at 2pm in the afternoon. We attended and gave our input. That is because we get paid to attend. But we wanted to hold workshops that were more accessible to the public and were fun and engaging… So we hosted a series of workshops in the flatlands of East and West Oakland, knowing that communities most

[50] Most cities typically participate in the Cities and Climate Protection Program (CCP) developed by ICLEI – Local Governments for Sustainability, to establish targets for carbon emissions reductions, developing GHG emissions inventories, and mitigation strategies, including provisions for monitoring and evaluation (Alber and Kern, 2008).

impacted by climate change are often least represented in terms of decision making. We hosted workshops with coalition members that already had relationships in those communities (Kirsch, 2011- author interview).

Through this collaborative process, the coalition achieved a major accomplishment. They produced scientific rationale that convinced the city to pass one of the highest municipal greenhouse gas reduction targets in California: 36 percent reduction from 2005 levels by 2020 and 85 percent reduction by 2050[51]. While other California cities have also set GHG reducation goals, Oakland's target levels are the first to comply with the reductions recommended by the Intergovernmental Panel on Climate Changes (Lemer, 2011 – author interview; CARB, 2008). These reductions are more than double the California Air Resources Board's recommendation that local governments reduce GHG emissions 15 percent below today's levels by 2020 (CARB, 2008). Hence, by tapping their collective expertise, the OCAC proposed bold, science-based GHG reduction targets for the city. The coalition was strategic in this process because they knew that higher GHG reduction targets offered greater opportunities to insert community-based measures representing their conceptualization of urban climate change.

Evaluative Criteria for Considering Potential Energy and Climate Actions

Evaluative Criteria	Issues to Consider
GHG Reduction Potential	• Magnitude of GHG reductions • Measurability of reductions
Implementation Cost and Access to Funding	• Cost to City budget • Cost to other stakeholders • Access to funding
Financial Rate of Return	• Return on investment to City and/or stakeholders implementing the action • Protection from future costs
GHG Reduction Cost Effectiveness	• Relative cost/benefit assessment in terms of estimated GHG reductions
Economic Development Potential	• Job creation potential • Business development and retention potential • Workforce development potential • Cost savings to community • Education benefits for community
Creation of Significant Social Equity Benefits	• Benefits to disadvantaged residents in the form of jobs, cost savings, and other opportunities • Reduction of pollution in heavily impacted neighborhoods • Equity in protection from impacts of climate change
Feasibility & Speed of Implementation	• Degree of City control to implement the action • Level of staff effort required • Resources required • Degree of stakeholder support • Amount of time needed to complete implementation • Time period during which implementation can begin
Leveraging Partnerships	• Leverage partnerships with community stakeholders • Leverage partnerships on a regional, state or national level • Facilitate replication in other communities
Longevity of Benefits	• Persistence of benefits over time • Opportunity to support future additional benefits

Figure 20

Source City of Oakland, ECAP Appendix (2011)

[51] On December 11, 2008, the California Air Resources Board (CARB) approved the Scoping Plan for implementing AB 32, the Global Warming Solutions Act of 2006. The plan outlines a combination of existing, strengthened, and new policies and programs to cut the state of California's GHG emissions to 1990 levels by 2020. As part of the Scoping Plan, cities and counties are encouraged but not required to adopt targets to reduce GHG emissions by 15 percent below today's levels by 2020. In the Scoping Plan, "today's levels" are based on the statewide GHG inventory for 2005. However, cities and counties are encouraged to set a minimum of at least 15 percent GHG reduction target for both municipal operations and the community as a whole based on the most current GHG inventory conducted. http://arb.ca.gov/cc/scopingplan/scopingplan.htm

In addition to setting one of the state's highest GHG reduction benchmarks, the Oakland ECAP is also one of the first cities to explicitly develop evaluative criteria to incorporate co-benefits for traditionally disadvantaged communities (Figure 20). The plan includes specific measures to reduce air pollution in heavily impacted neighborhoods and provide equity in protection from the impacts of climate change. For example, the ECAP considered and analyzed whether the benefits of the plan outweighed the burdens that the measures may impose on disadvantaged communities. This includes ensuring that GHG emissions reduction measures like transit-oriented development (TOD) prevented displacement of low-income residents by encouraging the use of tenant protections and preserving affordable housing options. In this context, providing an adequate supply of affordable housing near transit was put forth as a valid climate solution. This made Oakland the nation's first city to explicitly link climate change policy with affordable housing.

The OCAC argued that even though constructing TOD projects in existing high-density neighborhoods is an effective GHG mitigation measure, it also has the potential to displace low-income people, seniors and renters as older housing stock is replaced with new market-rate units. The OCAC claimed that housing displacement from TOD projects, in actuality, could undercut GHG mitigation strategies if lower-income residents were forced to move to cheaper suburban locales with fewer transit options. As a result, many individuals may be forced to buy a car for access to work and community services, thereby increasing not only the region's vehicle miles traveled (VMT) but its GHG emissions (OCAC Steering Committee Member, 2013 - author interview).

The OCAC collaboration in the ECAP, moreover, represents a rupture in conventional practice in local climate action planning. Not only did it partially displace the scientific advisory commission process, it also validated the local knowledge of coalition members alongside established expert communities. Most municipalities engaged in the ICELI program often represent public participation as only a normative goal, rather than a substantive one, in formulating climate change risks and strategies. City officials claim they are unable to garner significant public interest because of the complexity of the science and long-term and uncertain nature of climate change (Few, Brown, and Tompkins, 2007). Many cities opt to establish an expert taskforce and hire environmental consultants to compensate for a lack of public participation. Therefore, the decision-making processes in urban climate change planning in many localities is embedded in relations of power and techno-scientific expertise.

As described by a long serving member of the Oakland City Council, the OCAC's involvement in developing the ECAP stands in sharp contrast to previous city environmental initiatives.

> I've been a Councilmember for 16 years and I've seen a lot of environmental plans. Oakland's Energy and Climate Action Plan is unique because it lifts the voices of low-income communities and communities of color. -- Nancy Nadel, Oakland city council member (2012).

The OCAC's parallel policy and community engagement process consequently, enabled the OCAC to research and produce 50 of the 150 ECAP measures (Fitzgerald, 2011 – author interview). This was primarily achieved through the establishment of six policy committees, which studied and provided justification via research and local community knowledge for GHG reduction measures and targets (Garzon, 2013 – author interview). Policy committees addressed issues involving transportation and land use; building and energy use; consumption and solid waste; food, water and urban agriculture/forestry; adaptation and resilience; and community engagement. Each committee had two co-chairs -- one from a policy-based organization, the other from a grassroots-based group -- to assure a balance of expertise in policy development and on-the-ground experience. Through this organizational structure, the committees convened several times a month to conduct research and develop policy (Garzon, 2013; Kirsch, 2011 – author interviews).[52] The OCAC, in developing climate policy and expertise for the ECAP was guided by the following key principles:

1. Climate Justice and Equity
2. Clean Up Air Pollution and Create Healthy Communities
3. Create Local Green-Collar Jobs
4. Community Local Knowledge
5. Climate Adaptation and Community Resilience
6. Polluters Pay

Garrett Fitzgerald, the city of Oakland' Sustainability Coordinator and a collaborator with the OCAC in developing the ECAP, acknowledges the coalition's key role in developing the innovative climate action plan (Fitzgerald, 2011 – author interview). "The OCAC made my job a lot easier by providing smart, specific recommendations for the plan and doing a lot of work to bring more of Oakland's voices into the process. It's rare to find community partners as dedicated and willing to collaborate with city staff as the OCAC" (Fitzgerald, 2012). In fact, even before city staff released their first draft of the ECAP, the OCAC had already developed and presented their own comprehensive ECAP to city officials based on the community workshops they hosted in Oakland's low-income and immigrant neighborhoods. City staff incorporated the majority of the proposed policies into various ECAP drafts and the final plan that was adopted by the city council. By working collaboratively across sectors and organizations, the OCAC illustrated its ability to effectively focus climate action planning on measures that reduce GHG emissions and simultaneously provide direct benefits to local communities.[53]

[52] Coalition members also participated in monthly General Coalition meetings. The OCAC Steering Committee was comprised of co-chairs of the OCAC's policy committees.

[53] After the city released its first and second drafts, the OCAC submitted edits via track changes, which allowed the city to simply copy and paste their suggestions into the updated and final drafts (Kirsch, 2011 and Lemer, 2011 – interviews with author).

> What drew these unlikely partners together is the goal of a just and equitable energy and climate plan for the city. Whether they were a green enterprise looking to grow their business in a green and sustainable way; or a labor union looking to ensure jobs in a new economy for their members; or an environmental group that has done the research to know the catastrophic effects of global warming– they all had a stake in making sure that the ECAP was done right for the City of Oakland (Kirsch, 2011).

As Table 6 illustrates, the Oakland ECAP represents a unique case because it differs greatly from conventional climate action plans in six key areas: (1) it included local knowledge in the development of climate policy; (2) public participation was embedded in the regulatory science and policy processes; (3) climate Impacts focused on the human-scale; (4) CAP measures were chosen for their potential health co-benefits; (5) adaptation plans focused on socially vulnerable communities; and, (6) the CAP includes explicit references to social equity and environmental justice.

TABLE 6: Climate Action Plan (CAP) Metrics in California

	Conventional CAP	*Oakland ECAP*
Regulatory Science & Policy Processes	Climate policy, protocols, models, methods and strategies primarily established via expert commissions, consultants, and university partnerships. Expert/Professional knowledge emphasized.	Climate policy, protocols, models, methods, and strategies developed through a community-based process (local knowledge). Lay-expert knowledge engagement
Public Participation	Generally normative goal achieved during mandatory public comment period or workshops after the protocols/methods of regulatory science and policy have been established.	Occurred concurrently with the regulatory science and policy processes and public comment periods and workshops.
Focus of Climate Impacts	Ecological Systems and city-wide Infrastructure	Human-scale, socially vulnerable neighborhoods/populations, ecological systems, and city-wide infrastructure
Co-benefits of CAP	Cost-savings, efficiency, economic development	Public health, cost-savings, efficiency, local green jobs and energy
Focus of Adaptation	Typically normative goal only focused on city-wide infrastructure and ecological systems. No comprehensive neighborhood-scale studies or risk models.	Human health, socially vulnerable neighborhood/populations and city-wide infrastructure. Comprehensive neighborhood-scale studies and risk models.
Explicit references to Social Equity or Environmental Justice	Rarely cited in documents	Cited as a guiding principle

Source: Author's survey of 41 California CAPs in cities with census tracts ranked in the 20th percentile under Cal EPA's CalEnviron Screen Tool and review of the literature on the development of CAPs (Buckley et. al, 2013; Millard-ball, 2012; Anguelovski and Carmin, 2011; Few, Brown, and Tompkins, 2007

Oakland also stands out as an exceptional case because the OCAC is officially listed on the adopted ECAP as being a major contributor in the development of the plan. Rarely are environmental justice organizations listed on such government documents as official knowledge producers of climate policy. The work of the OCAC to develop, pass and implement the city's ECAP makes Oakland a model for what urban communities across the country can do to localize urban climate change solutions.

Section 3.4: Localizing Climate Change for Community Action

Figure 21. Source: OCAC (2009)

Through a collaborative process with the city, the OCAC successfully advocated for ECAP measures that not only reduced GHG emissions, but also promoted health co-benefits. The OCAC was unique in its explicit efforts to organize low-income families and communities of color around defining how climate change was to be addressed in Oakland. The coalition actively attempted to change the conceptualization of climate change as a global, non-urban phenomenon that was primarily focused on impacts to polar bears and ecological systems. As illustrated in Figure 21, they sought to mobilize people to demand policies and programs, such as urban agriculture, alternative transportation and local green-collar jobs, which held greater relevancy to their communities (Brian Beveridge, 2013 – author interview).

In order to transform the conceptualization of climate change in Oakland, the OCAC convened and funded 14 urban climate change workshops throughout the city. These workshops were mainly held in Oakland's low-income and immigrant neighborhoods, and they engaged more than 1,500 city residents in developing various options and local solutions to climate change. Several of the workshops were conducted in multiple languages. For example, the nonprofits Movement Generation and the Asian Pacific Environmental Network (APEN) facilitated workshops in Spanish and Chinese that included many immigrant residents. The inclusive process led to widespread support and engagement for the plan by Oakland residents most impacted by pollution and poverty. This was a key factor in the adoption of the coalition's recommendations and local expertise in the final plan (Kirsch, 2011; Lehmer, 2011; Fitzgerald, 2011- author interviews). These OCAC events are a significant accomplishment in community engagement because, as previously noted, only 200 individuals attend the city-sponsored workshops.

The OCAC further localized climate knowledge through the development of a series of youth engagement programs. For example, the OCAC hosted a solar-powered concert featuring legendary hip-hop artists Pete Rock & CL Smooth to promote a Climate Adaptation Work Day at Laney Community College. More than 350 Oakland residents, many of them youth, helped install a garden and rainwater catchment system at the college. An OCAC member organization, Forward Together, organized in East Oakland a youth workshop that brought together 80 high school students in role-playing activities on what climate solutions could look like in their homes, schools and neighborhoods. A Community Convergence for Climate Action Day was also held, featuring a theatrical performance on climate change by high school-aged girls, live hip-hop concerts, and a report-back from residents who attended OCAC's climate workshops in East and West Oakland (Figure 21). The Community Convergence event was intended to demonstrate the high level of interest by local residents in the development of the ECAP, and to create a space for residents to participate in climate solutions that went beyond conventional GHG emission reduction strategies.

Additionally, the OCAC facilitated workshops on disaster preparedness for low-income communities that focused on the impact of climate change through interactive games and learning initiatives. The games and initiatives included an activity workbook titled, '*Are You a Climate Change Survivor?*' (Figures 22 and 23); board games with names like *Climate Justice Human Bingo* and *Community Resilience Lifeboat*, and fact sheets with activities designed to raise awareness about climate change impacts in Oakland neighborhoods. Through such collaborative projects, Oakland set the trend for a holistic approach to climate action planning. According to Brian Beveridge, co-executive director of the West Oakland Environmental Indicators Project and OCAC member, the interactive activities were developed to focus on creating spaces where diverse people could imagine solutions that protect residents as they face local climate impacts, such as heat waves, floods, wildfires, poor air quality and rising utility costs.

> We have developed climate action education tool kits and a series of fact sheets that grew out of our previous work on air quality, health and transportation. We held several community trainings to explore how to engage community residents on these issues. We started by bringing people together and talking about assets and vulnerability. Talking about things they want to protect. It starts as a mapping exercise, we look at all the places we are strong before we look at our vulnerabilities….At the community level it is not technocratic. You can't just say there is some technological fix for people because we are really not protecting hard assets; we are talking about people surviving as a community during a disaster (Beveridge, 2013 – author interview).

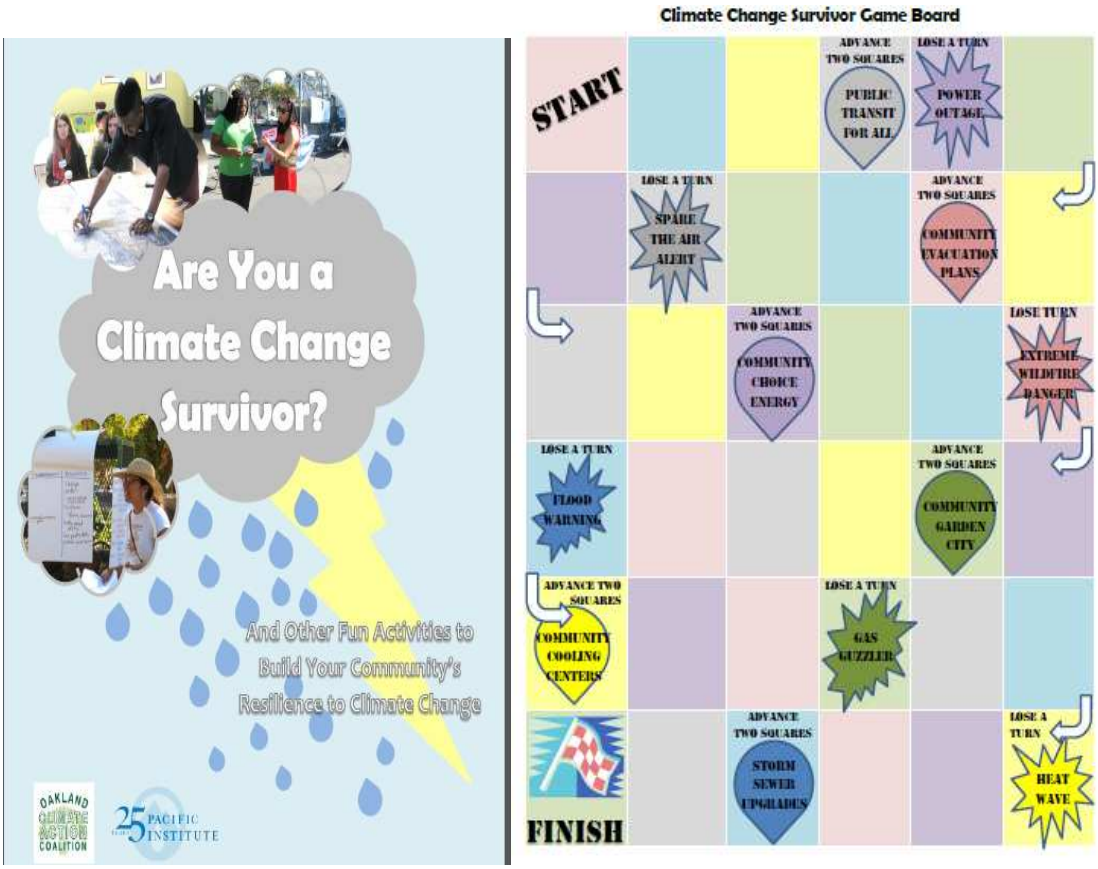


Figure 22: OCAC Climate Change Games and Fact Sheets (Pacific Institute and OCAC, 2013)

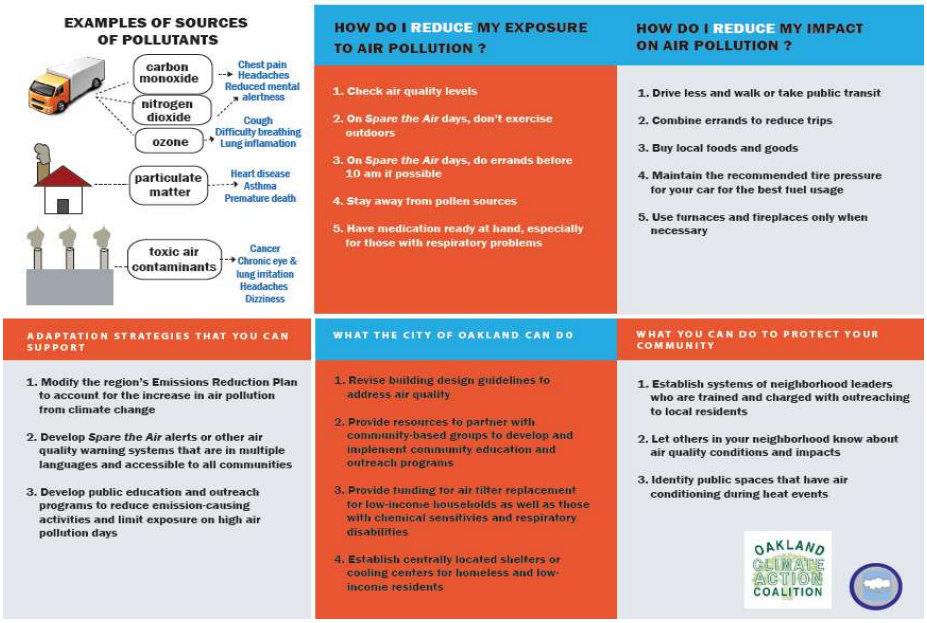


Figure 23: OCAC Climate Change Games & Fact Sheets (Pacific Institute and OCAC, 2013)

In addition to community engagement events, the OCAC turned to electoral politics, specifically the 2010 mayoral and city council races. On March 30, 2010, the OCAC organized a 200 person rally at City Hall where Oakland city councilmembers and candidates listened to labor and community leaders' recommendations on how the ECAP should be developed and adopted:

> I spoke at the [city hall] rally to show that labor leaders and community leaders are united for job-creating climate solutions. By passing a strong ECAP, we can get our members off the bench and into jobs. -- Andreas Cluver, secretary-treasurer, Alameda County Building Trades Council (OCAC, 2012).

The OCAC also hosted a larger formal event, the Green Mayoral Forum on September 14, 2010. At the event, more than 200 local residents, a majority of them people of color, convened to listen to candidates describe how they would advocate for a community-based ECAP (Figure 24). For example, Silvia Lopez, member of the organization Mujeres Unidas y Activos, asked mayoral candidates, what they "would do to ensure that low-income communities have the resources to grow their own food" and how the ECAP could support urban farms (OCAC, 2012). Hosting the Green Mayoral Forum and the rally at City Hall set a strong precedent that elected officials in the city needed to have an explicit policy agenda linking climate change with job creation and health equity (Garzon 2013; Beveridge, 2013; Kirsch, 2011 – author interviews).

Figure 24: The OCAC (2012) hosts the Green Mayoral Forum at the Oakland Museum.

Section 3.5: Participatory Research in Climate Adaptation Planning

> Climate action planning is typically focused on mitigation and how you reduce emissions. But the truth is, the impacts are already happening now and it is just going to get worse. So figuring out how communities and people can adapt, and be prepared for those changes, is important (Emily Kirsch, 2011 – author interview).

The OCAC also developed a concerted effort toward adaptation planning in acknowledgment of the fact that even if the city succeeds in reducing GHG emissions in the future, certain irreversible and significant impacts from climate change are already underway and are inevitable (Few, Brown, and Tompkins, 2007). The OCAC fought for the inclusion of neighborhood-scale adaptation planning in the ECAP to address the most harmful climate impacts to socially vulnerable communities in the near term. This is in contrast to conventional climate studies, such as regional sea-level rise models, which typically only focus on threats to city-wide infrastructure and other hard assets. However, as Brian Beveridge notes, due to limited city resources, time constraints, and, most importantly the lack of expertise at the city staff level, adaptation was initially only included as a normative goal in the ECAP.

> As originally drafted, the adaptation component of the ECAP was just a text paragraph and basically stated that, yes, this is an issue that the city should be looking at in the future. There was no action measures associated with it in the ECAP. I would say adaptation planning for socially vulnerable communities is a hard sell, especially when there are limited resources to plan and protect the entire city. We didn't see anyone talking about what happens to communities like West Oakland if we can't avert climate degradation. How do these neighborhoods adapt? So we, along with the Pacific Institute, started this whole discussion of adaptation, vulnerability, and resilience (Beveridge, 2013 – author interview).

Ultimately, the OCAC, through grants from the California Energy Commission (CEC) and the San Francisco Foundation, developed their own adaptation planning data and models to supplement the ECAP. Through a Community-Based Participatory Research (CBPR)[54] process, they identified geographic areas within Oakland with heightened risks to projected climate impacts. These adaptation models were developed to help guide policymakers and affected communities on where to focus climate adaptation efforts (CEC, 2012; Garzon, 2013 – author interview). [55]

---

[54] Community-based Participatory Research (CBPR) is an approach to the research process that integrates the technical expertise of researchers with the experiential knowledge of non-academically trained community partners who are directly affected by the issue being studied (Minkler and Wallerstein, 2008).

[55] The CEC and San Francisco Foundation grants were awarded in 2010, a year after the city started their ECAP process. As a result, the Oakland ECAP references the OCAC's community-based adaptation study as a priority action that the city is supporting in the near future. The ECAP is updated every five years, and it is anticipated that the OCAC study will be incorporated and expanded in the next update (Garzon, 2013 – interview with author).

A program affiliated with an OCAC member, the Pacific Institute's Community Strategies for Sustainability and Justice Program – administered the CBPR study on climate adaptation. As an academically trained research organization, the Pacific Institute facilitated the Oakland Adaptation planning research meetings from May 2010 to November 2011, in collaboration with OCAC members at key points in the research decision-making process (Figure 25). These decisions included the types of climate impacts and vulnerability factors to be considered, the methods that should be used to map social vulnerability to local climate impacts, the interpretations of research results, and ways to share the results with key audiences (CEC, 2012).

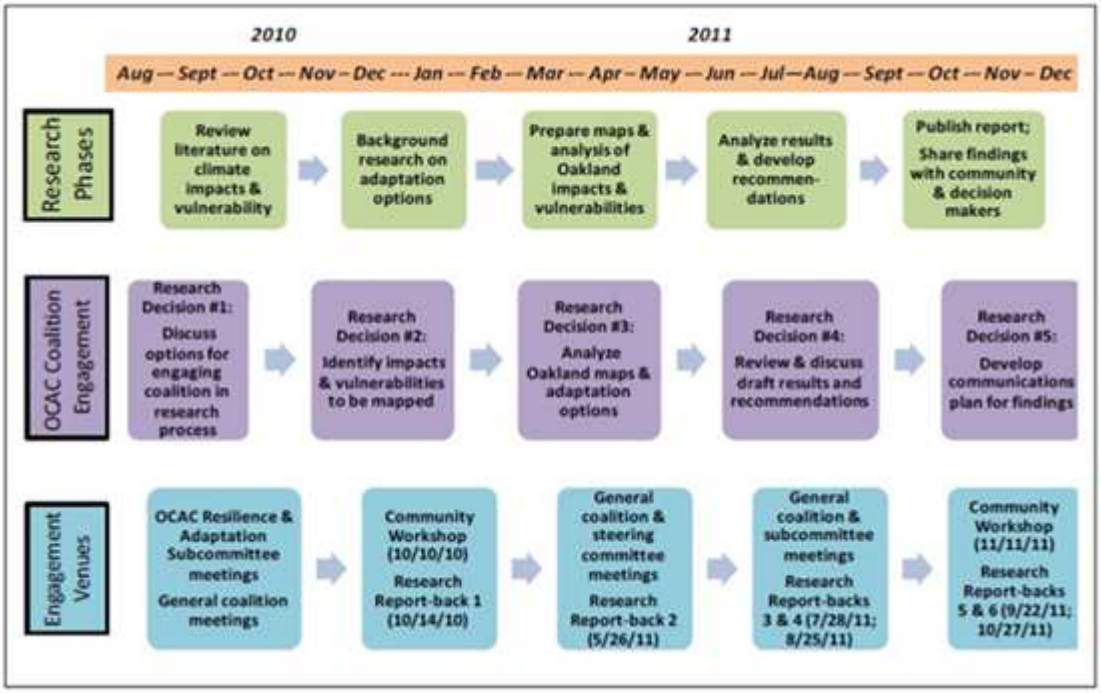


Figure 25: Community Partner Engagement in Oakland Climate Adaptation Study. Source: CEC (2012).

The methodology used by OCAC, included: (1) obtaining geographic data on the extent and severity of projected physical impacts of climate change to determine exposure to these impacts; (2) gathering of data on indicators of social vulnerability that relate to these impacts on an appropriate geographic scale; and (3) overlaying vulnerability and exposure layers to produce a composite of exposure and vulnerability. The areas of overlap illustrated those areas with increased risks of being impacted by climate change as a result of exposure and social vulnerability (CEC, 2012; Garzon, 2013 – author interview). According to Catalina Garzon, Pacific Institute's the lead researcher on the project, the CBPR process offered a strong emphasis on valuing local context and creating a process to engage stakeholders in helping define priorities. It also identified types of data needed to develop policy and programmatic options to address those priorities (Figure 25).

> We held a total of six joint sessions with OCAC members, called 'research report-backs,' at key decision points in the research process. We presented research and draft methods for best practices in the field for looking at community vulnerability in adaptation planning...We facilitated discussion about the implications for OCAC members' work on local climate change – to understand what would be useful for their own work. Then we would present draft results from the mapping and climate models and asked OCAC members what adaptation measures can be best implemented locally to address climate impacts and social equity (Garzon, 2013 – author interview).

Due in part to Oakland's geography and built environment, the OCAC focused on developing detailed local impact models that analyzed the city and its neighborhoods as being vulnerable to a number of climate impacts, such as coastal flooding due to sea level rise, extreme heat, wildfires, and increases in particulate matter (PM) concentrations from warmer temperatures (Figures 26-28). Through these models, the OCAC argued that certain population groups and communities within Oakland might be more susceptible to a public health threat from exposure to a climate change impact. In particular, they asserted that the most socially vulnerable populations would be less likely to prepare for, respond to and recover from projected climate impacts (CEC, 2012; Cutter et al., 2009). As shown in Figure 26, nearly half of Oakland's residents live in areas of high-medium social vulnerability to extreme heat, flooding, poor air quality, and wild fires. However, the areas of highest social vulnerability are concentrated in the flatlands near the Port of Oakland, major freeways, and the Oakland International Airport (CEC, 2012).

Once the research results were completed, the OCAC held a final community workshop on equity and resilience on November 11, 2011. Pacific Institute researchers presented background information on local climate change impacts and adaptation options for vulnerable communities in Oakland. Over 100 participants attended the workshop, which included speakers and discussions on how to build and sustain a movement for climate adaptation and resilience. At the workshop, participants brainstormed impacts of concern and potential policy solutions at breakout sessions (CEC, 2012; OCAC steering committee member, 2012 – author interview).

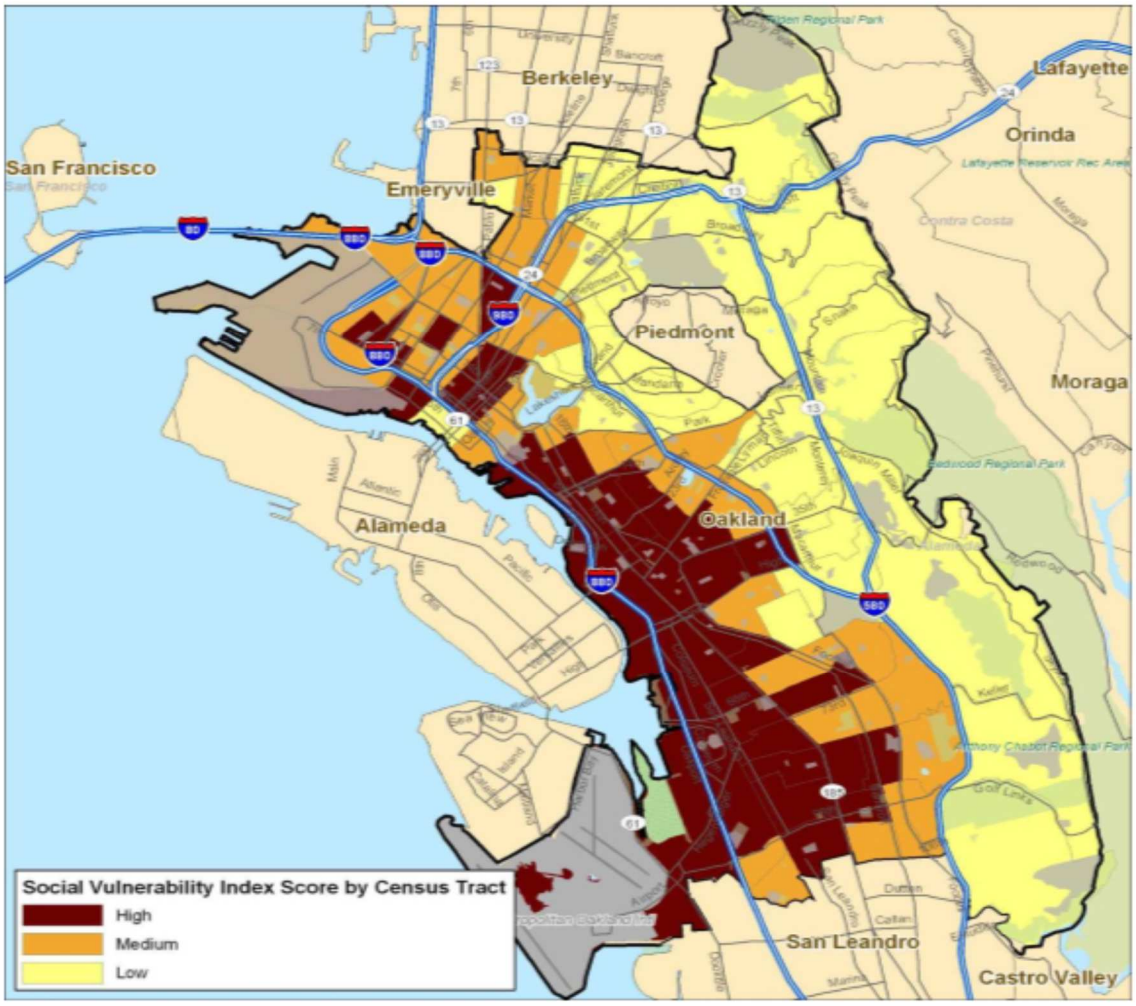


Figure 26: Social Vulnerability and Climate Change in Oakland. Source: CEC (2012)

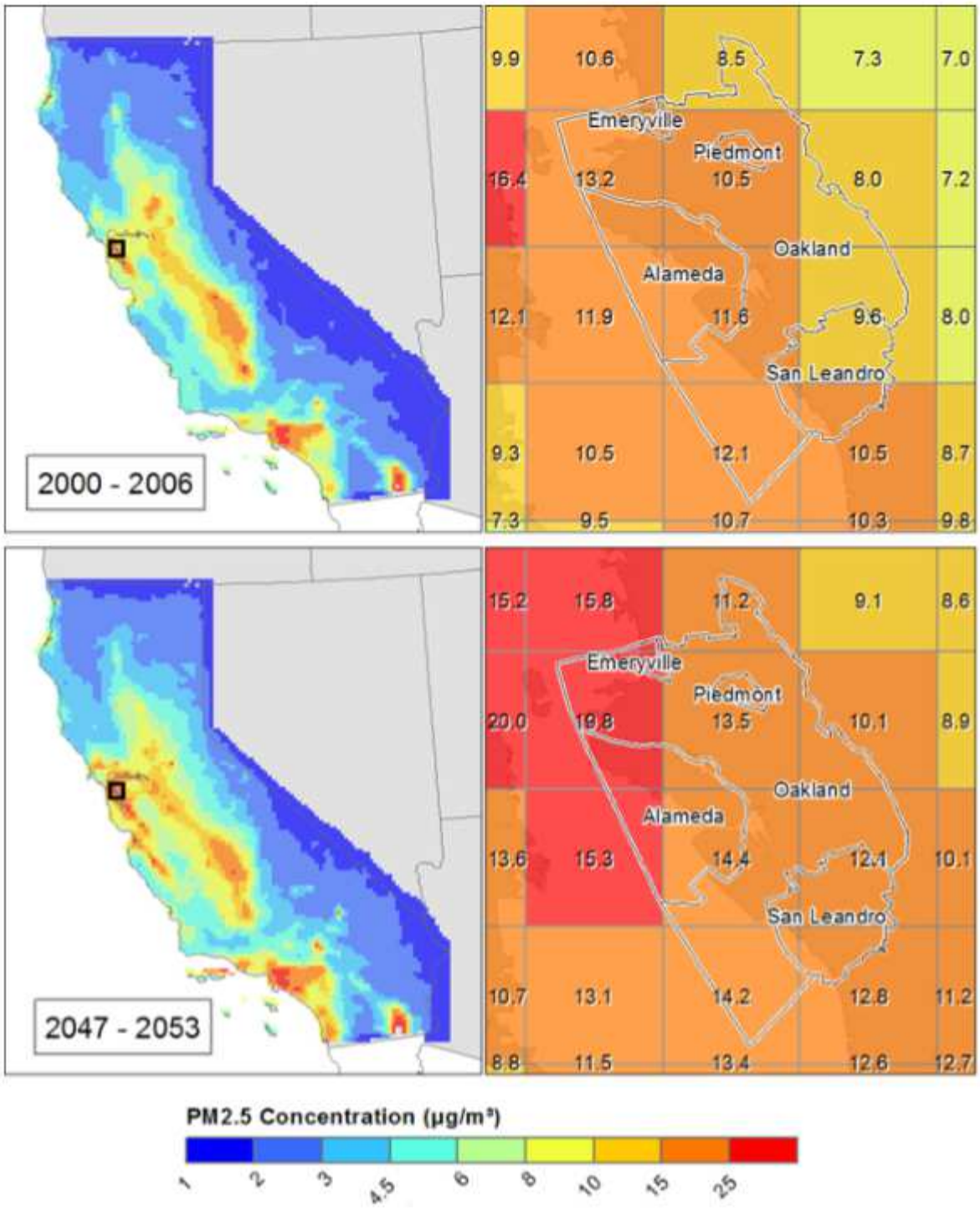


Figure 27: Modeled Particulate Matter Concentration (micrograms per cubic meter) in the Atmosphere around Oakland over the years 2000-2006 (above) and 2047-2053 (below). Source: CEC (2012)

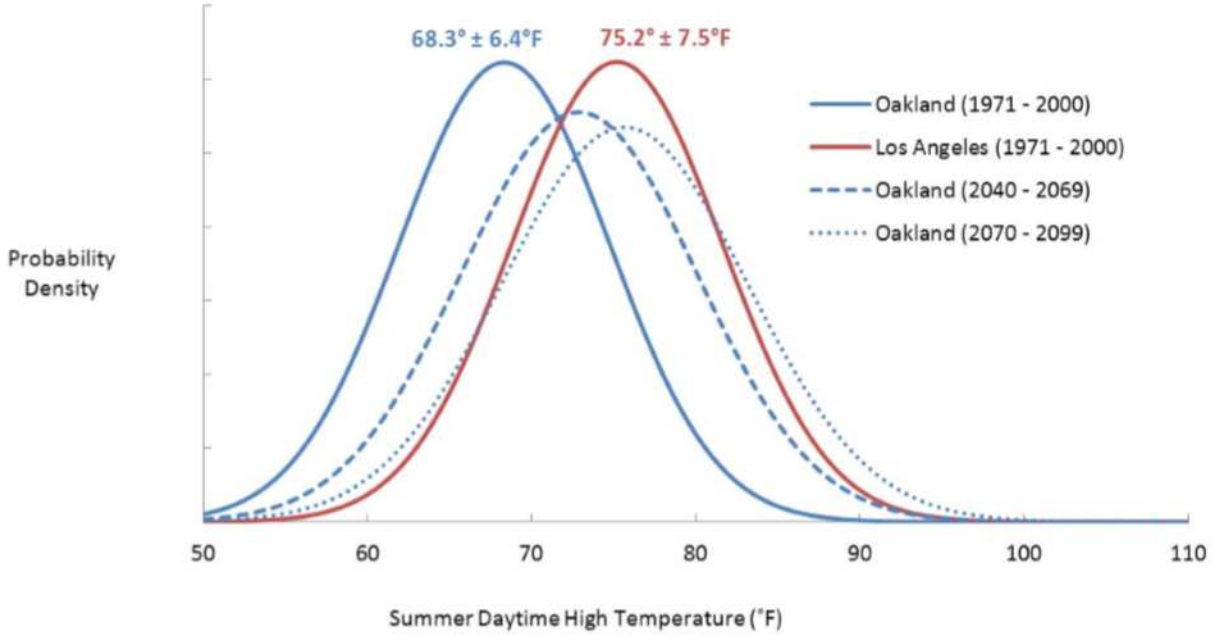


Figure 28: Distribution of Oakland Summertime (May-Oct 31) Daily Maximum Temperatures in the Historical Period (1971-2000) and for Future Periods under A2 Emissions Scenario. Source: CEC (2012).

Evaluating the number of extreme heat events is necessary for developing emergency preparedness and response plans. According to Garzon (2013 – author interview), this information was difficult for community member to grasp conceptually. In order to convey the information contextually, under the A2 emissions scenario, the OCAC illustrated to residents that the distribution of daily maximum temperatures in Oakland for the period 2070-2099 closely resembles the distribution for Los Angeles for the baseline period of 1971-2000, as shown in Figure 28. Source: CEC (2012).

The OCAC utilized some of the newest approaches to social vulnerability and adaptation modeling techniques. These techniques identified climate impacts to population groups connected to particular places and communities. Such approaches define what counts as vulnerability based on what particular people value and view as worthy and in need of protection (Martello, 2008). According to the social scientist and risk analyst, Al Irwin (1995) social vulnerability analysis requires an understanding of the ways in which specific residents and their communities view the world. "Judgments about risk and safety will reflect one's position in the social structure – and also one's degree of trust in the social institutions which currently decide about these questions on others' behalf" (Irwin, Pg. 45). Therefore, social vulnerability entails not only an understanding of how people interact with their physical and biological surroundings, but also how they interact with each other and the institutions that make environmental policy decisions.

Thus, the OCAC took a multidimensional view of climate-society interactions in their adaptation modeling. Under their approach, they considered both climate variability and the changes to occur in the context of political, institutional, economic, and social structures. These variables interact dynamically with contextual conditions associated with a particular exposure unit. As

described in Chapter 2, a multidimensional view of climate-society interaction (CCStreets approach) is traditionally not addressed in adaptation research. Due to limited expertise and resources, many local governments are often unable to address social vulnerability directly in their climate planning process. As a result, climate impacts are simply addressed through technical and sectoral measures without regard to the contextual conditions in which it occurs in society.

Engaging in new forms of social vulnerability analysis such as in the case of Oakland, allowed for negotiation among diverse civil society actors, granting local residents from EJ communities a voice in urban climate change planning (Martello, 2008). The inclusion of these residents in the adaptation planning, is creating 'ruptures' in techno-scientific practice. As detailed a coalition member, the OCAC's adaptation process helped serve as basis to engage community stakeholders in other regional projects to address climate impacts and health equity.

> Through the coalition's advocacy and research to support adaptation planning processes, I think we succeeded in getting more focus on social equity in the ECAP. We got the city to commit to completing a comprehensive adaptation and social vulnerability plan based on our research…We are now focus on implementation – ensuring that adaptation planning is included in all land use projects and approvals, like the pending Oakland Army Base Redevelopment project and West Oakland Specific Land Use Plan. We are now working on convening an interagency working group at the regional level, including the Alameda County Public Health Department, Bay Air Quality Monitoring District, and Bay Conservation Development Commission to develop a strategy with local community stakeholders to address adaptation within these types of big development plans that are currently underway (Garzon, 2013 – author interview).

OCAC's participation in the adaptation process moreover, helped improve research design by refining research questions, methods and instruments for greater accuracy and relevance. The participation of the coalition in the data analysis and interpretation also enhanced the interpretive validity of the research findings relating to social vulnerability and climate adaptation (CEC, 2012).

Section 3.6: Urban Civic Epistemologies and Oakland's Transformative Climate

> Climate change can be reframed as related not simply to 'the environment' in the green or scientific sense, but in relation to a holistic view of 'the environment', which emphasizes the linked nature of humans and the environment. Rather than being something external to human society, the environment can be defined as the totality of what we live in, natural or constructed, spatial, social, and temporal (Barugh and Glass, 2010; Pg. 5).

The direct engagement of OCAC in the development of the Oakland ECAP represents new transformations in how climate governance is established and defined at a local scale (Table 7). First, the ECAP focused on socially vulnerable communities that have the most to lose from the impact of climate change, and suggested not only mitigation but also adaptation plans for these areas. Second, the coalition helped create a sustainable development model based on GHG reductions, health co-benefits, and affordable housing at transit-oriented developments. Third, it brought together a diverse group of community interests that created a transformative space that contested *a priori* strategies. As one of OCAC's key steering committee member describes, the coalition was instrumental in pushing policymakers and experts to work with community members to imagine and prepare for climate change.

> We pretty much wrote the plan for city, the way we wanted to see it. Then gave the plan to the city and said we did your homework for you. So when the first draft of the plan came out, the coalition got together and just combed through it line by line, section by section. So we provided constructive feedback via track changes to the city. So again if the city understood our feedback and were supportive of it, they could literally just cut and paste our recommendations into the plan. It made their lives a lot easier. Instead, I think what often happens from my experience from social justice work is that, we say something is just not equitable -- As opposed to saying what we want or what do we want this to actually look like. So I think it was a process for the coalition to understand that this was a chance to come up with our own solutions (OCAC Steering Committee Member, 2011 – author interview).

Through the framework of civic epistemologies, the ECAP has become a site of innovation in both the production of knowledge and the ordering of political activity. The coalition helped develop a new conceptual model of '*nature'* and new relationships among experts, residents, and public officials for defining and measuring urban climate change. More than just technical changes in how a locality measures and tracks climate change, the ECAP represents new experiments in environmental governance (Table 7). Such experiments, according to Miller (2005), "are important features of new emerging civic epistemologies in local, regional, and global settings…they are technologies through which people are co-producing new ways of knowing and ordering the world at these scales" (pg. 405).

Transformative ECAP Action Measures	Outcomes
1. One of the Highest GHG Reduction Goals in the State.	The higher GHG reduction target the coalition demanded, the more community-based climate solutions it could insert.
2. Community Knowledge and Expertise shaped the ECAP.	The ECAP represents a new conceptual model of nature and society. This is changing relationships among experts, residents and the public for defining and addressing urban climate change.
3. Social Equity in Urban Climate Action Plan	a) Defines affordable housing at transit-oriented developments as a valid GHG mitigation policy. b) Requires the development of local adaptation plans in socially vulnerable communities. c) Defines "urban climate change" as a public health challenge. d) Encourages urban farms by growing food on idle, underutilized or vacant lots.
4. Energy Democracy. Calls for the establishment of a Community Choice Aggregation (CCA) district to pool electric utility users to form a co-op.	a) Provides locally produced renewable energy options within the city. b) Provides alternatives to service provided by the investor-owned utility, Pacific Gas & Electric (PG&E).
5. Holistic approach to urban climate action planning and community engagement.	The inclusion of local knowledge in the ECAP represents an innovation in both the production of knowledge and the ordering of political activity.

TABLE 7: Transformative Urban Climate Change in the Oakland ECAP.

The government's role as producer and consumer of statistical knowledge holds an important space in the development of civic epistemologies. This is the result of the disciplining and institutionalization of quantitative social sciences in policy contexts and decision making (Scott, 1998). In this process, quantitative statistics serve as a principal instrument of statecraft, "used both to imagine society, the economy, and the nation and to lend to the exercise of public policy a semblance of rationality, control, and accountability" (Miller, 2005; pg. 406). The concept of urban climate change, accordingly has gained relevance in policy settings, partly through methods to quantify and measure it. In this process, there is often an exclusive focus on the rate of global GHG emissions produced and reduced within a locality, and the use of that data to guide public decisions. The inclusion of health co-benefits and the use of local knowledge in the development of Oakland's ECAP, therefore, provides an example of how this occurrence took place against the institutionalized use of GHG accounting statistics in environmental governance (Miller, 2005). This contestation of quantitative knowledge, or what is often referred to as *'carbon fundamentalism*' in local climate action planning, was evident in the early stages of the Oakland ECAP, according to Aaron Lemer, one of OCAC's steering committee members.

> The ECAP was seen as an environmental justice and local green economic development strategy for the community and coalition. From the city's standpoint, initially it was a bit of struggle to frame it in this manner. At first, they held a ***carbon fundamentalism*** that often comes with climate work, where people get focused just on the GHG emissions and they lose sight of the broader community benefits…But working closely with talented city staff, we were able to reframe it to the city council as a plan that could address global GHG emissions and also public health and equity (Aaron Lemer, 2011 – author interview).

Thus, the construction of urban climate change in Oakland is the result of extensive experimentation with public participation in expert advisory processes. These processes create new local civic epistemologies that require experts to collaborate in multiscalar approaches with diverse stakeholders in society, including interdisciplinary experts and lay publics. In these processes, quantification functions primarily as a technology of visibility (Miller, 2005). This is in contrast to other methods of civic epistemologies in the United States, in which quantification serves a technology of trust and accountability or of control (Miller, 2005; Scott, 1989). In the case of the urban climate change in Oakland, through the ECAP, environmental justice communities helped transform the environment into an object that is comprehended, measured and governed locally.

The concept of civic epistemology, moreover, highlights the contested roles and rights of residents in regard to the production of public knowledge. Governments often strive to define environmental issues and the terms in which residents are included in relevant policy decisions and debates. This process influences which knowledge claims are more likely to be considered valid and used in environmental governance processes (Illes, 2007). This chapter adds to the emerging theoretical analysis of civic epistemologies by focusing on the interaction among experts and environmental justice groups in developing strategies that integrate climate change interventions with population health at the local level. With the case of urban climate change, I have shown how various actors gather, evaluate, and use scientific and public health knowledge in different ways when determining what impacts from climate change pose risks and require policy intervention. These variants of civic epistemologies may change between local communities, thereby helping to illustrate "how different regulatory systems differ in their underlying suppositions and policymaking processes" (Illes, 2007; pg. 373). Expert commissions typically limit the scope of data that they will consider in their deliberation and may be less open to resident input. Environmental justice groups, conversely, may demand definitions of climate change risks to include human health impacts, rather than only focusing on threats to city infrastructure and ecological systems (Table 8).

The construction of urban climate change, accordingly, depends on how knowledge is produced and the interaction between power and heterogeneous actors in society. By focusing on the civic epistemologies of urban climate change, we can see how local knowledge emerges as supplements, and in some cases, alternatives to techno-scientific instruments. It can serve as a means to overcome problems of introducing universal science and *a priori* policy into various "local" contexts (Martello, 2001). In this process we understand that "global solutions to environmental governance cannot realistically be contemplated without at the same time

finding opportunities for local self-expression" (Jasanoff and Martello, 2004; pg. 5). The phenomenon of urban climate change in Oakland, in essence, is creating a distinct social order that is changing epistemic cultures and democratic societies. This process is forcing professional experts and policymakers to give up some control over how climate change is defined and addressed at the local level, and how research is formulated and conducted. Oakland's climate change policies are entwined with attempts to reimagine what the city stands for, and how environmental rights and justice is produced.

> As lay people help scientists [or experts/policymakers] to fill out the picture of the citizen, these people may reject the very notion of vulnerability as the organizing concept because this term tends to connote victimization and reactive ways of responding to global change. Citizens, if permitted to exercise a voice in the scientific process, might favor instead a concept such as resilience, which, for some, holds more positive connotations and implies a more proactive form of agency (Martello, 2008; Pg. 112).

Table 8: Civic Epistemologies of Oakland's Climate Change

Oakland	**Urban Climate Change**
Spatial frame	**Multiscalar:** Local/Regional + State/Global
Climate Goals	**Co-benefits Potential**: Co-pollutants + GHG emissions
Knowledge + Expertise	**Expert-lay judgment**
Institutional Governance	Contextual Framing: **Community-based organizations**, government agencies, businesses
Definition of Climate Change	Urban environment, ecosystems, adaptation and GHG mitigation, **co-pollutants, public health, equity**, cost-effectiveness

Source: Adapted from Miller (2005, pg. 414).

The diversity of experts that emerge in response to the phenomenon of global climate change can be seen as having strong connections to particular places and communities. Through the use of local knowledge in climate projects, disadvantaged groups can earn some degree of voice, representation and agency (Martello, 2008). As shown in Oakland, environmental justice communities are featured centrally in the city's urban climate change interventions. EJ communities have also attained valuable recognition, both in terms of what they know about the socio-ecological dynamics of their environments and how they put that knowledge to use in the policymaking process to benefit their communities.

Section 3.7: Conclusion: Urban Climate Change and Community Well-Being - A Non-Linear Model of Expertise

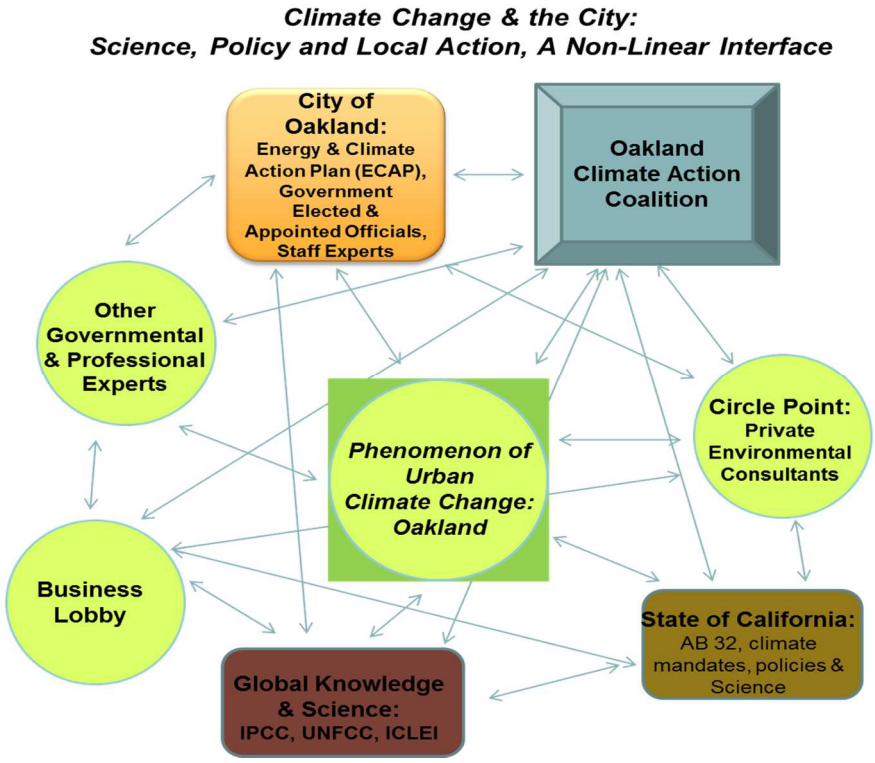


Figure 29

The case study of climate change governance in Oakland demonstrates a transformative story in which environmental justice groups are creating new forms of knowledge and linking them to public decisions. Oakland's ECAP represents a shifting of power and authority in environmental governance that traditionally favors techno-scientific practice. This process is also changing relationships and identities. Government experts are being moved from their position of control over the definition and production of technical knowledge about nature (Figure 29). It is important to note that these types of approaches, however, have limitations and are not easily scalable in all regions. Climate planning and science, as presented in this chapter, is likely only effectively influenced by lay publics that expend a significant amount of social capital to organize local coalitions, develop knowledge frameworks, and strategize on changing the terms of political discourse of climate policy. For disorganized communities, the opportunities of persuading a city to implement a CAP that integrates GHG reductions measures with public health and social equity are not likely to manifest.

Therefore, as an emerging analytical and policy domain, urban climate change policy represents a series of challenges for scientists, city planners, lay publics, and policymakers. The combination of uncertain science, local relevance, and heterogeneous policy contexts requires

new experiments in environmental governance mechanisms that acknowledge the difficulty in localizing global climate change, while maintaining technical legitimacy and social authority (Corburn, 2009). This chapter illustrates how new experiments in environmental governance and knowledge production are linked to human self-understanding and social relations. To discover and address new knowledge about nature, institutionalized practices need to be revised in innovative ways. Urban climate change in Oakland, moreover, highlights a novel approach in environmental governance that values and reflects historical experience, culture, social practices, and lay experiments, which are quite different from knowledge produced through laboratory experiments or disciplined empirical observations.

Oakland's climate change, in essence, is a representation of the natural world that gained validity not through detachments from local context, but through mutually sustaining interaction between the senses of the ***is*** and the ***ought***: of how things are and how they should be (Jasanoff, 2010). Epistemic claims of environmental science are often most trusted when they utilize practices that confer techno-scientific practices, but also the cultural practices of democratic politics and values. Conventional climate policies, on this basis, are problematic because it separates the epistemic from the normative, divorcing *is* from *ought.*

> Crudely put, it detaches global fact from local value, projecting a new totalizing image of the world as it is, without regard for the layered investments that societies have made in worlds as they wish them to be. It therefore destabilizes knowledge at the same time as it seeks to stabilize it. To know climate change as science wishes it to be known; societies must let go of their familiar, comfortable modes of living with nature (Jasanoff, 2010; pg. 236).

In closing, the construction of climate change in Oakland provides an exemplar of the emergence of local knowledge as a resource for achieving greenhouse gas emission reductions, health co-benefits and community well-being. Through the framework of civic epistemology, we understand how the definition of 'expert' is transformed and expanded to allow lay publics to be included in expert communities in developing conceptions and strategies about urban climate change. This chapter has shown how environmental justice groups are generating new data inputs for the localization of climate change that go beyond *a priori* approaches to climate policy by calling critical attention to the cultural and experiential dimension of knowledge production and local practice.

CHAPTER 4
Contentious Capitol Climates: Conflict over the Local Scale of Global GHG Emissions

In the preceding chapter, the civic epistemology of climate change included a geographic scale of the local. For civil society actors, there was little conflict in situating the phenomenon of climate change and its impacts in the streets of Oakland. Environmental justice groups collaborated with the city government to develop multiple conceptualizations of climate change and its corresponding policy responses. At the state Capitol, though, the legitimization of a local scale of climate change was highly contested when environmental justice advocates attempted to 'rescale' California's landmark *Global Warming Solutions Act* in a method that delivered direct benefits to disadvantaged communities.

In the legislative halls of the Capitol and the state's regulatory bureaucracy, a commitment to carbon fundamentalism influences the definition of climate change. The pursuit of global GHG emissions reductions through market-based mechanisms often limits opportunities to realize public health co-benefits at the neighborhood scale. This chapter examines the debates and civic epistemologies surrounding manifestations of the impacts of climate change and the appropriate policy scale(s) to address the environmental problem. I will further, illustrate how the various scales in which the phenomenon is addressed produces very diverse benefits, consequences, and trade-offs.

Section 4.1: Introduction

In 2006, California lawmakers passed climate change legislation that went far beyond any other state in the country. Assembly Bill 32, the Global Warming Solutions Act (AB 32) requires the state to reduce its greenhouse gas (GHG)[56] emissions to 1990 levels by 2020 and 80 percent of this baseline level by 2050 (Kaswan, 2008; Hanermann, 2008). To achieve this, AB 32 '*authorized*' the California Air Resources Board (CARB) to establish a market-based mechanism, such as a cap-and-trade system. Under this system, the amount of emissions a power plant or industrial polluter can produce is "capped," these facilities then must purchase credits (the trade) from the state to exceed the emissions cap. Facilities that purchase credits at established cap-and-trade auctions established by the state may remain in operation as they improve their equipment to reduce GHG emissions. Under this market-based approach, AB 32 directed the proceeds from credit sales (estimated to be several billions dollars over the next decade) to go to programs to carry out the law's purposes. Such activities include the reduction of global GHG emissions, promoting the green innovation economy and spurring job creation within the state (Hanermann, 2008).

AB 32 is distinguishable from legislation passed by subnational governments in that the climate change law requires the state to "consider" the impact that implementation of GHG reduction measures will have on communities that are already adversely affected by air pollution (California Health and Safety Code, section §38565). This approach was adopted because California EJ advocates soundly rejected the idea that neoliberal practices[57] alone can address environmental health inequities. During the drafting of AB 32, EJ advocates strategically fought to require the state to explore various options in addition to a cap-and-trade system for reducing GHG emissions and achieving public health goals. As a result, AB 32 included the following key environmental justice provisions: **(1)** an Environmental Justice Advisory Committee (EJAC) to advise CARB on the development of measures to reduce GHG emissions; **(2)** a requirement to hold public workshops in areas of California with the "most significant exposure to air pollutants, including, but not limited to communities with minority populations, communities with low-income populations, or both"; and, **(3)** a Community Empowerment Amendment designed to provide opportunities for disadvantaged communities to participate in and benefit from public and private investment in GHG reduction programs. (California Health and Safety Code, sections §38565; 38591).

[56] As previously noted in chapter 1, AB 32 defines greenhouse gases to include the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perflurocarbons, sulfur hexafluoride, nitrogen trifluoride (California Health and Safety Code, section §38505(g)). While the measure regulates these seven gases, consistent with carbon fundamentalism, most regulators tend to focus on carbon dioxide since it is the most prevalent contributor to climate change.

[57] According to Liverman and Vilas (2006), neoliberalism is often defined as a political philosophy of free markets and less government. The mainstream argument in favor of neoliberalism "is framed in terms of the efficiency of the market in contrast to the inefficiencies and high costs of government interventions" (Pg. 329).

When AB 32 moved from the Legislature to the regulatory rule-making process at CARB, however, the fundamental questions of environmental justice were ultimately disregarded. These unexplored questions included concerns voiced by advocates that the state's adoption of a 'cap-and-trade' system could create geographically uneven reductions in the co-pollutants of climate change (i.e., ozone, particulate matter, and nitrogen oxides), while limiting the opportunity for health co-benefits at the neighborhood scale. This tension between the law's purported focus on environmental justice and the perceived uneven character of its cap-and-trade mechanism eventually became a source of discord between EJ advocates, mainstream environmental organizations, and state agencies (Environmental Justice advocates, 2013 – author interviews; London, et al., 2013). This culminated in seven of the eleven state appointed members of the EJAC signing onto a lawsuit against the state, alleging violation of substantive aspects of the legislation, such as failing to study alternatives to a cap-and-trade program in AB 32's implementation plan. Through a court order, EJ advocates eventually forced CARB to conduct a study of alternatives, but it was a hollow victory. CARB's compliance with the judgment amounted to merely producing the court-mandated analysis while maintaining that its selection of a cap-and-trade mechanism was the only valid and feasible policy direction, based on a thorough consideration of all available alternatives (CARB, 2011a).

In this chapter, I argue that California's implementation of AB 32 represents a form of what Jessop (2002) and Holifield (2004; 2007) characterize as a 'neocommunitarian' strategy for sustaining the project of neoliberalism. Instead of attempting to equitably redistribute environmental impacts, this strategy involves efforts to *build trust* in environmental justice communities through community engagement processes and the promise of incentives to encourage economic development in disadvantaged neighborhoods. As implemented by CARB, California's approach to environmental justice and climate change emphasized advisory public participation mechanisms as a method to manage EJ communities that likely would oppose the adoption of a cap-and-trade system. This approach pledges that GHG emissions reduction strategies will not only improve public health but also stimulate new private and public investment in disadvantaged communities. Throughout this chapter, however, I show how the deployment of a neocommunitarian strategy was in direct conflict with the techno-scientific regulations and neoliberal mechanisms adopted by CARB. These mechanisms consistently scaled-up the phenomenon of climate change to the global. As a result, they obscured the local scale of environmental injustices and prevented direct investments and health co-benefits in disadvantaged communities.

The California experience provides a strategic understanding of the divergent civic epistemologies state experts and EJ advocates held in regards to how the politics of scale, the market, and race underpin the appropriate interventions in which to tackle climate change. In the next section, I first provide a background on the role Democratic Latino legislators and EJ advocates played during the drafting of AB 32 in localizing climate change to focus on public health and job creation in the most polluted communities. Secondly, I analyze how the local scale of environmental justice and climate change were challenged when AB 32 moved from the Legislature to the state regulatory process, an arena that privileges global kinds of knowledge.

Section 4.2: Latinos Legislating the Climate

> Climate change is a reality and it puts in danger our sustainability. It should be of special importance to Latinos because Latinos for the most part live in the inner cities and are exposed to many carbon-based [and toxic] gases from industry, which not only impact the environment but public health.
>
> *-- California Speaker Fabian Núñez speaking to the National Latino Congreso shortly after California became the first state in the U.S. to adopt a comprehensive program of regulatory and market-based mechanisms to achieve reductions in GHG emissions (September 11, 2006).*[58]

The person behind the state's landmark law to curb climate change does not fit the stereotypical image of a California environmentalist: a Brie-eating, Chardonnay-sipping, Prius driving surfer whose environmental priorities center on oceans and wildlife. Rather, in former California Assembly Speaker Fabian Núñez, we get a different view of environmentalism – a view that explicitly links climate change to a public health context. As a child growing up in the low-income Latino immigrant communities of San Diego, Núñez saw firsthand the impact that poor air quality could have on residents. Of particular note were the young children in such neighborhoods who suffer from disproportionately high rates of asthma and lead poisoning (Castro, 2013). So when Assembly Member Fran Pavley, a silver-haired environmental maven who hailed from a wealthy, predominately Anglo coastal district that included Malibu, approached Núñez about her Assembly Bill 32, he was personally eager to help (Núñez, 2006). In fact, Núñez's agreement to take over as the principal co-author of the legislation, prevented the measure from continuing to languish in the state Legislature amid opposition from moderate Democrats. Chief among the opponents of AB 32 were members of the California Legislative Latino Caucus (Senior Capitol staff member, 2013 -author interview).

California's new demographic reality as a majority-minority state, made the Latino Legislative Caucus increasingly influential in passing important environmental legislation.[59] As the caucus grew, many of its new members came from more politically moderate districts in the Central Valley and Orange County, in addition to traditional urban Latino population centers.[60] New suburban and rural Latino seats in the Legislature in the mid-2000s were often from swing districts, where Democratic voter registration only led Republicans by a few percentage points. As a result, these legislators had to engage in a delicate balance between environmental stewardship and promoting economic development to remain in office (Senior Capitol staff member, 2013 – author interview; Adler, 2013; Bernstein, 2013).

---

[58] Bowels (2006). *Assembly Speaker Fabian Núñez puts Global Warming into a Public Health Context*. The Press Enterprise.

[59] According to 2005 Census data, almost 44 percent of California's population at the time AB 32 was passed, were non-Hispanic whites, with more than 35 percent Latino, 12 percent Asian, and nearly 7 percent African American. In 2006 the Latino Legislative Caucus represented 23 percent (28 members) of the state Legislature (State of California, Official California Legislative Information, 2006).

[60] In this chapter, the term "member" refers to both state Assembly Members and Senators.

Consequently, initial opposition to AB 32 hinged on its lack of relevancy to low-income communities of color and the potential for job creation. The legislation was sponsored by two mainstream national environmental organizations, the Natural Resources Defense Council (NRDC) and the Environmental Defense Fund (EDF). Many EJ advocates and members of the Latino Legislative Caucus viewed NRDC and EDF as "elitist" organizations. They were seen as promoting environmental legislation that often did not directly address inequities in communities of color or the potential consequences of environmental regulations on California's low-income workers (Former Latino Legislative Caucus Assembly member, 2013 - author interview).[61] In this sense, Democratic Latino legislators particularly from swing districts, were reluctant to take a political risk in supporting controversial legislation that had no relevance to the actual lived experiences of the environmental and economic impacts in communities of color. An environmental justice advocate, who routinely works on legislative issues in the Capitol, insightfully noted the dynamic at play between Latino legislators and environmentalists from mainstream groups like NRDC and EDF:

> With the changing demographics, if you look at it just from a political perspective, the number of districts that are being represented by people of color has doubled, tripled in the last ten years. But in terms of support for the environment, a lot of the representatives are wishy-washy and on the fence and susceptible to being influenced by the oil industry or Chamber of Commerce….because they haven't heard of what are the environmental benefits for their districts...Mainstream environmentalists don't have any history in these districts, they are not relevant, they are greeted with skepticism. The California Chamber of Commerce is very persuasive because they frame [environmental] programs as job killers (Environmental Justice Advocate, 2013 - author interview).

Figure 30. Graphic from the California Chamber of Commerce Job Killer Bill List website (2013).

[61] This trend continues today. In the 2013 legislative session, key members of the Latino Legislative Caucus, including its co-chair, Senator Ricardo Lara were accused of derailing Senate Bill (SB) 405, which sought to ban plastic shopping bags statewide (Rosenhall, 2013; Perez and Gutierrez, 2013). During a lengthy floor debate, Lara, was the first Democrat to speak in opposition to the bill, stating it would result in the loss of 700 jobs at a plastic bag factory in his district. "These are hard-working immigrant families who are undereducated, monolingual, and are not going to have an opportunity to find another type of employment." Backing up Lara's argument, four more Latino Democratic legislators spoke against the legislation, including Senator Kevin De Leon, who stated "So I consider myself an environmentalist, but this is not an abstract concept to me. These are real jobs. These are real lives" (Senate Floor Session, SB 405 Vote - May 30, 2013. Source: California Channel archives).

While the Asian Pacific Islander and African American legislative caucuses had a presence in the Capitol at the time, their membership were much smaller. Furthermore, in a review of strategy documents of AB 32's sponsors, NRDC only listed the Latino Legislative Caucus among the four influential legislative voting blocks to strategically lobby. The other voting groups included: (1) 'Business Democrats' (which had significant overlap with Latino members); (2) 'Moderate Republicans'; and, (3) 'Strong Environmental Supporters' (NRDC E2, 2006).

Section 4.3: Ensuring the Local Relevance of Climate Change

Keenly aware of the contentious political realities in the Capitol, Assembly Speaker Núñez sought to craft legislation that addressed the diverse needs of all Democratic members and specifically the Latino Legislative Caucus. He knew that focusing AB 32 on GHG emissions reductions and abstract notions of global environmental protection alone were not enough. During an election year, such an approach could place vulnerable swing district members at risk of voting for a bill that was perceived as a 'job killer' by powerful business interests (California Chamber of Commerce, 2006).[62] Working with key environmental justice advocates and the Latino Legislative Caucus, Núñez helped rescale the debate of climate change to focus on two elements: (1) public health, particularly air pollution and respiratory diseases that are epidemic in California's low-income communities of color; and, (2) the jobs and economic opportunity that would flow from an investment in a clean sustainable economy (Former Latino Legislative Caucus Assembly member, 2013 - author interview).

These efforts were further supported by EDF's hiring of a Latino lobbyist who had worked in the Capitol for various elected officials, to focus exclusively on legislators of color and outreach to EJ groups. The lobbyist, Rafael Aguilera, focused his efforts on key swing members in the Legislature, stressing the link between localized climate change, job creation, and public health (Aguilera, 2013 –author interview).[63] In this work, Aguilera also helped address concerns of environmental justice groups when Núñez floated draft language that would have '*mandated*' market-based mechanisms, such as cap-and-trade, to achieve the goals of AB 32. This amendment was put forward at the request of then-Governor Arnold Schwarzenegger, who threatened to veto the legislation if it did not mandate cap-and-trade.[64]

The EJ groups strongly opposed market-based mechanisms and threatened to voice their concerns to sympathetic members of color who were already on the fence over supporting the controversial legislation. Jane Williams, director of the statewide EJ group, California Communities Against Toxics, argued that a cap-and-trade system could create geographically uneven reductions in GHG emissions and the co-pollutants of climate change. Moreover, it would limit the opportunity for health co-benefits at the neighborhood scale (Figure 31).[65]

---

[62] Each year the California Chamber of Commerce releases a list of "job killer" bills to identify legislation that it believes will "decimate economic and job growth in California." The Chamber tracks the bills throughout the legislative session and works to "educate legislators about the serious consequences these bills will have on the state." In 2006, AB 32 was listed as Chamber's number one priority bill to defeat in the legislature (California Chamber of Commerce, 2013).

[63] After the passage of AB 32, Rafael Aguilera went on to serve as a legislative director and chief of staff to several moderate Latino Assembly Members.

[64] Though the proposed amendment was never linked to any mainstream environmental group, EDF was also publically known as a staunch supporter of cap-and-trade (Environmental Justice Advocate, 2013 - author interview).

[65] California Communities Against Toxics, California Environmental Rights Alliance, California Environmental Justice Working Group (now renamed as the California Environmental Justice Alliance or CEJA) were the main organizations representing interests of EJ communities during the drafting of AB 32. CEJA is comprised of the

Companies operating high-polluting facilities, for example, could buy pollution allowances[66] from another company that had not exceeded their cap and continue running the facility, which emit both carbon dioxide and other co-pollutants that contribute to localized air pollution (Martin, 2006). Firms with the most antiquated facilities generally emit the highest amount of emissions and are often located in low-income communities of color. Environmental justice advocates claimed that these companies were likely to purchase the most emissions allowances (Kaswan, 2008).

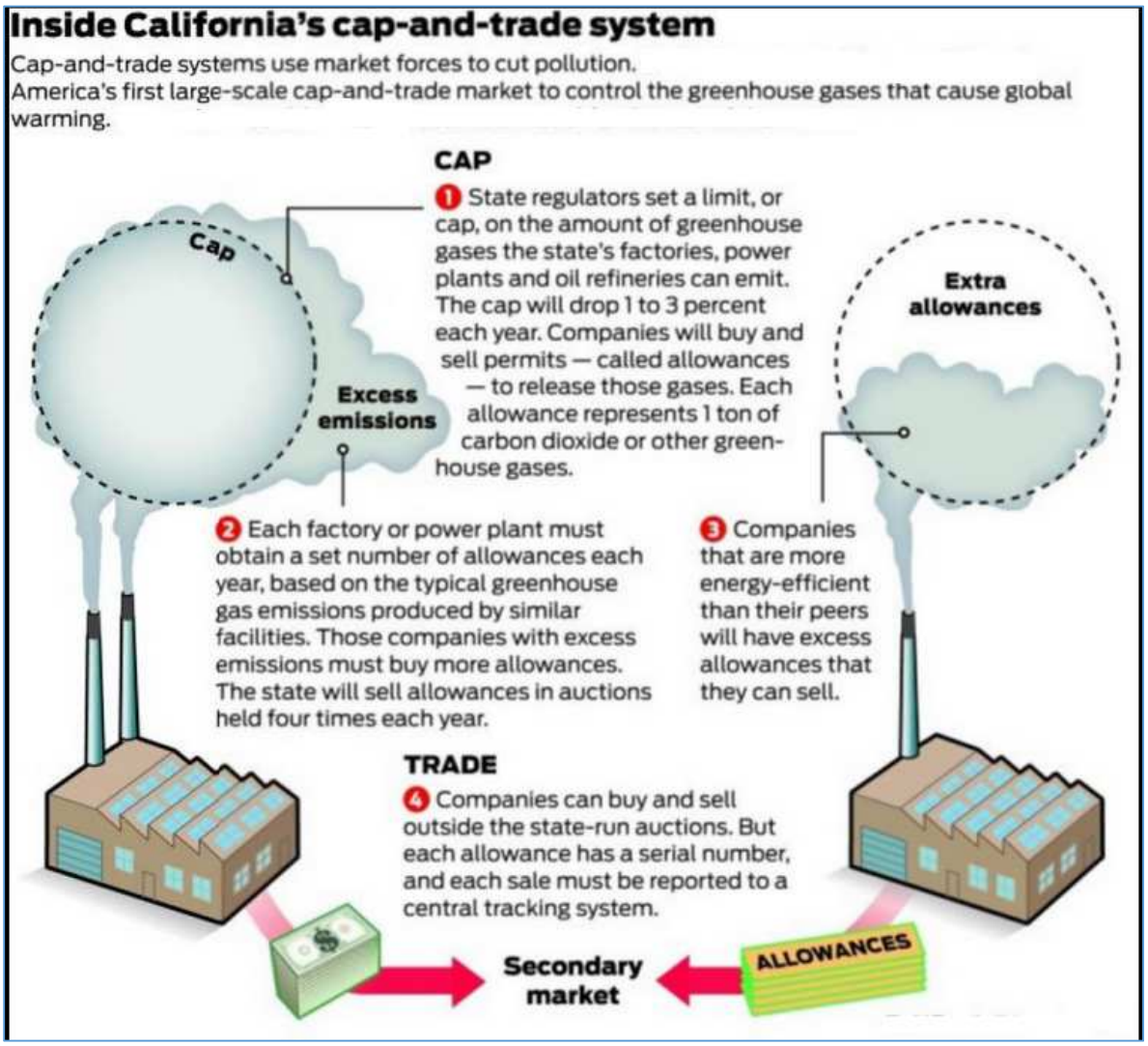


Figure 31: Cap-and-Trade Process. Source: Trumbull and the San Francisco Chronicle (2012).

following organizations: Asian Pacific Environmental Network (APEN), Center for Community Action and Health Justice (CCAEJ), Communities for a Better Environment (CBE), Environmental Health Coalition (EHC), People Organized to Demand Economic and Environmental Rights (PODER).

[66] AB 32 defines 'allowance' as "an authorization to emit, during a specified year, up to one ton of carbon dioxide equivalent" (California Health and Safety Code §38505(a)).

To support this claim, EJ advocates pointed to a study of the Regional Clean Air Incentives Market (RECLAIM), an emissions trading program developed to reduce nitrogen oxide emissions in Southern California. The study indicated that the RECLAIM program may have increased nitrogen oxides emissions in Wilmington, a working class, Latino immigrant neighborhood of Los Angeles (Figure 32), while reducing emissions on a region-wide scale (Lejano and Hirose, 2005). According to another study by Drury et al. (1999), one regulation under the RECLAIM program allowed licensed car scrappers to purchase and destroy older, high polluting vehicles in exchange for emissions credits from the South Coast Air Quality Monitoring District (SCAQMD) that could be sold to oil refineries. The study reported that four oil refineries purchased a majority of the emissions credits to avoid the cost of installing pollution reduction technologies in Wilmington. As a result of the trading scheme, local residents and workers were exposed to benzene (a human carcinogen), and other volatile organic compounds contained in the emissions. The authors of the study claimed that these emissions could have been mitigated at the time by readily available pollution reduction technologies (Drury et al., 1999).

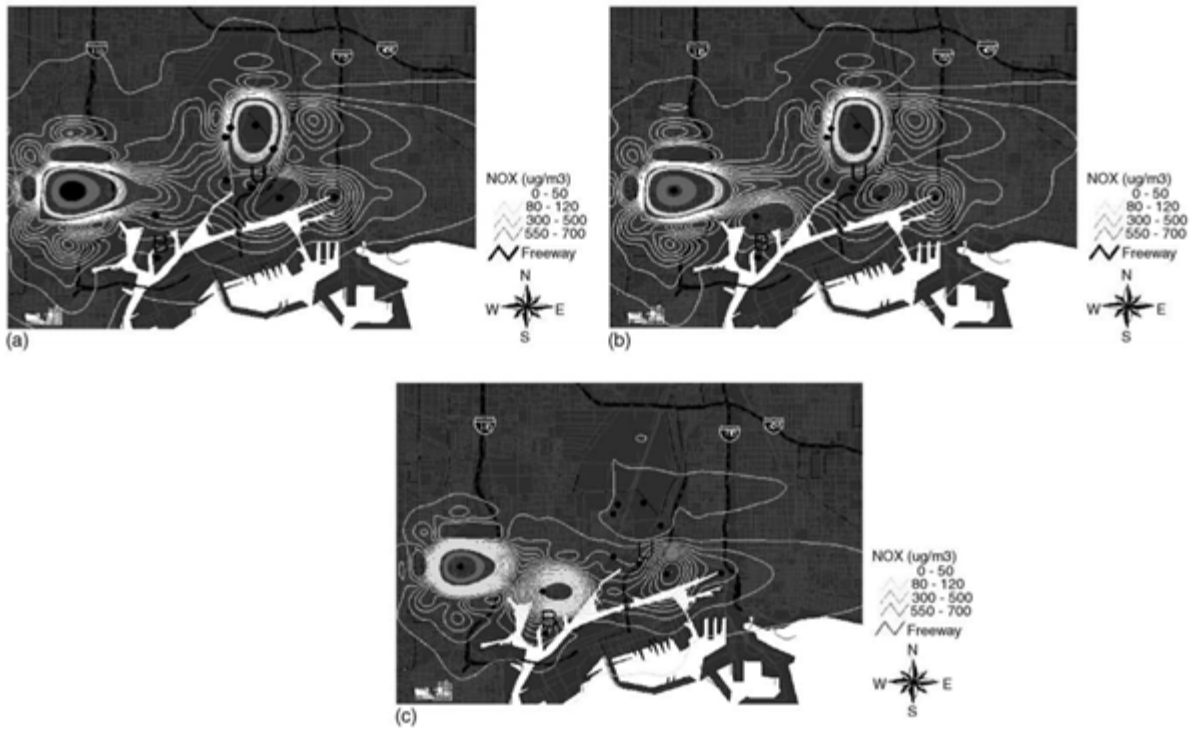


Figure 32: (a) NO_x concentrations in 1996 Wilmington, California (with RECLAIM); (b) NO_x concentrations in 1996 in Wilmington, California (without RECLAIM); (c) NOx gap map for 1996 in Wilmington, California.
Source: Lejano and Hirose (2005; Pg. 372)

Based on these examples, EJ advocates argued that the state needed to develop a more effective policy approach for regulating emissions sources that contribute to both climate change and toxic air pollution. An exclusive focus on reducing GHG emissions, without regard to health co-benefits that can be achieved through the lowering of co-pollutants, would ensure that while air quality improves at the regional scale, the air in environmental justice communities could worsen (Morello-Frosch et al., 2009).

Section 4.4: Community Empowerment and Public Health in AB 32

The registered opposition of EJ groups provided a potentially convenient excuse for wavering legislators to avoid supporting AB 32 (Senior Capitol staffer, 2013- author interview). To appease EJ groups and prevent the loss of key swing votes, Speaker Núñez dropped the draft provision that would have mandated California to adopt a cap-and-trade mechanism, despite the governor's veto threat. Eventually, the Democratic Legislature and Republican governor agreed on a statewide emissions cap for 2020; however, they could not reach agreement in the statue as to what that entailed. As a result, they collectively evaded the issue, delegating to CARB key decisions over implementing the state's GHG emissions reduction strategies. One such decision left to CARB was whether the board would allow either market-based mechanisms or command-and-control regulations, which EJ groups preferred (EJ advocates, 2013 –author interviews; Rabe, 2007).[67]

Moreover, the strong influence of EJ advocates, yield key environmental justice provisions in the bill's final version. These provisions required CARB to the extent feasible, to "*consider*" cumulative emissions impacts in communities adversely affected by air pollution, and design any market-based mechanism to maximize co-benefits in the state and prevent increases in the emissions of toxic air pollutants (California Health and Safety Code, section §38570) (Table 9). The lobbying efforts by EJ advocates are significant because scientists consider, greenhouse gases to be global pollutants that mix uniformly in the atmosphere and therefore have "no direct public health impacts." They do not have localized effects like sulfur dioxide or lead (CARB, 2008).[68] As a result, most climate policy strategies worldwide focus almost exclusively on the potential to reduce the rate of increase in atmospheric concentrations of global GHG emissions. They are adopted without regard to the localized human health benefits that can be achieved through policies that reduce GHG emissions from sources that also emit toxic air pollutants (Jochem and Madlener, 2003). Furthermore, EJ advocates, through their Latino legislative allies, helped ensure that issues of equity were not excluded when regulators were considering which mitigation and reduction mechanisms to adopt.

[67] Command-and-control regulation refers to environmental policy that relies on direct government regulation (permission, prohibition, standard setting, and enforcement) as opposed to financial incentives, that is, economic instruments of cost internalization (OECD, 2001).

[68] Exposure to GHG emissions has human health impacts in concentrated form, such as their use in the workplace (WDHS, 2013). However, outdoor exposure levels are considered to be *de minimis*; GHG emissions dilute as they mix uniformly in the atmosphere (CARB, 2008).

Environmental Justice Concepts	Corresponding AB 32 Legislative Language
Use of Market-based Mechanisms	*Authorizes* but does not mandate CARB to adopt market-based mechanisms to comply with AB 32 regulations. Requires the state to consider various options in addition to a cap-and-trade system.
Public Health Connection	Prior to the inclusion of any market-based mechanism, CARB must (1) Consider the potential for direct, indirect and cumulative emission impacts from these mechanisms, including localized impacts in communities that are already adversely impacted by air pollution. (2) Design any market-based compliance mechanism to prevent any increase in the emissions of toxic air contaminants or criteria air pollutants. (3) Maximize additional environmental, health and economic benefits for California, as appropriate.
EJ and Public Participation	(1) Requires the institutionalization of an Environmental Justice Advisory Committee (EJAC) to advise CARB on the implementation of the AB 32 Scoping Plan. (2) Requires public workshops to be held in regions that have the most significant exposure to air pollutants.
Community Empowerment Amendment	Requires opportunities for disadvantaged communities to participate and benefit from public and private investment from the GHG reduction programs established by the Scoping Plan.

Table 9: Environmental Justice and AB 32. Source: California Health and Safety Code, sections §38570 and 38591.

With the principle of equity driving their efforts, the environmental justice advocates secured two additional provisions in AB 32 (Table 9). The first provision required the institutionalization of an Environmental Justice Advisory Committee (EJAC) to advise CARB on the implementation of the Scoping Plan (the proposed framework for achieving the AB 32's GHG reduction targets). While the inclusion of an environmental justice advisory committee is not unique to environmental governance, its codification as one of two committees specifically mandated in the bill is symbolically significant, as well as the composition of the EJAC itself (Sze et al., 2009).[69] The committee is required to include representatives from California communities with significant exposure to air pollution, particular attention paid to minority and low-income communities (California Health and Safety Code, section §38591).

[69] AB 32 also mandates CARB to create the Economic and Technology Advancement Advisory Committee (ETAAC) and instructs ETAAC to advise on activities that will facilitate investment in and implementation of technological research and development opportunities under California's Climate Change program (California Health and Safety Code, section §38590).

The Community Empowerment Amendment in AB 32

> The state board shall ensure that the greenhouse gas emission reduction rules, regulations, programs, mechanism, and incentives under its jurisdiction, where applicable and to the extent feasible, direct public and private investment toward the most disadvantaged communities in California and provide an opportunity for small business, schools, affordable housing associations, and other community institutions to participate in and benefit from statewide efforts to reduce greenhouse gas emissions (California Health and Safety Code, section §38591).

AB 32 also included a provision in section §38591 known as the "Community Empowerment Amendment". This provision is intended to require the state to allow disadvantaged communities to directly participate in and benefit from the AB 32 GHG reductions plan. It further mandates that CARB should seek to direct public and private investment, such as green jobs and renewable energy projects to the state's most disadvantaged communities. The amendment was conceived as a method to mitigate gaps in environmental and economic well-being in disadvantaged communities, relative to statewide efforts to reduce global GHG emissions (Boyce, 2009). While this EJ supported provision sought to stimulate private and public investment in disadvantaged communities, Democratic legislators had to contend with how exactly AB 32 could reduce GHG emissions and promote technological innovation for California's economy as a whole. As such, this pressure increasingly created a conflict between "*community empowerment*" and "*neoliberal*" approaches to investment.

Section 4.5: Carbon Markets & Neoliberal Latino Lawmakers

While appeasing EJ groups, Assembly Speaker Núñez and the sponsors of AB 32 also had figh opponents' allegations that climate change legislation was a "job killer." Traditional business groups, such as the California Chamber of Commerce and Farm Bureau Federation vocally opposed the legislation in a key election year. The Chamber began a multi-million dollar campaign that included radio advertising and targeted mail in competitive legislative districts to torpedo support for AB 32 as the 2006 legislative session came to a close. Opponents argued that AB 32 would force companies out of California to avoid regulations, or compel many businesses to curtail production to meet them. Similarly, they warned that AB 32 would force electricity utilities to increase prices as they sought cleaner energy sources (Martin, 2006; California Chamber of Commerce, 2006).

To counter these claims and insulate vulnerable Democratic caucus members, Assembly Speaker Núñez, mounted a counter campaign with the aid of EDF and NRDC. They sought to convince cautious legislators that AB 32 would spur innovation and could uplift California's economy, mimicking the state's early adopter success in the biomedical and high-technology industries. To bolster these claims, they enlisted the support of several influential venture capitalists and entrepreneurs, who argued that new climate change regulations could create a boom in industries such as solar power and biofuels, possibly powering the state's economy for decades. AB 32 proponents also circulated a University of California, Berkeley economic study that estimated reducing GHG emissions in the state could create 17,000 new jobs and add $60 billion (Table 10) to the gross state product by 2020 (Roland-Holst, 2006).[70] Governor Schwarzenegger supplemented these efforts by creating a special task force, the Climate Action Team (CAT), which was charged with identifying methods to reduce GHG emissions. This task force found that a cap-and-trade program could add more than 80,000 new jobs over the next several decades (Martin, 2006). Eventually, these efforts not only helped convince members to vote in favor of the legislation but to also sign on as co-authors. Of the 28 members of the Latino Legislative Caucus, 21 signed on as co-authors of AB 32; all but two members of the caucus ultimately voted for the legislation (State of California, Official Legislative Information).[71]

[70] Separately, University of California economists organized a letter to the legislature and Gov. Arnold Schwarzenegger urging state leaders to accelerate climate action. It called emissions caps a "particularly potent strategy" and warned that "the most expensive things we can do is nothing." The letter was signed by 60 Ph.D. economists from across California - including three Nobel laureates (UC Berkeley News, 2006).

[71] Assembly Member Nicole Parra, from the Central Valley, was the only Latino Legislative Caucus member to vote against the bill. From her first election in 2002, and her subsequent two elections in 2004 and 2006, her seat was consistently ranked as the most vulnerable Democratic seat in the state Assembly. Parra won the 2002 election over Republican businessman Dean Gardner by 266 votes. Los Angeles state Senator Gil Cedillo was absent when AB 32 was scheduled for a vote (State of California, Official Legislative Information, 2006; Senior Capitol staffer, 2013 - author interview).

Table 10: Macroeconomic Impacts of 8 CAT Policies Plus a 2020 GHG CAP[72]

Annual Impact	8 CAT policies + Cap	8 CAT policies + Cap w/Innovation Incentives
Gross State Product (2006 dollars)	**+$60 Billion** (+2.4%)	**+$74 Billion** (+3.1%)
Employment (thousands) **% change from 2020 baseline**	**+17** (+.08%)	**+89** (+0.44%)

Source: Roland-Holst, 2006; Pg. 3

Interestingly, the campaign to link AB 32 to green innovation and economic development was successful enough to virtually eclipse other arguments in support of the legislation for health co-benefits and direct investment in disadvantaged communities. For example, during the final vote for AB 32, the vast majority of Assembly Members speaking in favor of the legislation mainly commented on the potential for protecting the environment while creating thousands of new jobs in California (Assembly Floor Debate, August 30, 2006; California Channel archives). Assembly Speaker Núñez's closing statements before the final vote best captured these sentiments.[73]

> Necessity is the mother of invention. And if you don't create the demand [AB 32 GHG reduction regulations] in the market for new technologies, you are never going to get it…Today we do have an opportunity to be bold. To look into the future with not fear or trepidation but to look into the future with the courage that California has always had when it comes to innovation. When it comes to new technology, when it comes to taking the right risks that in the end have made this state the sixth largest economy in the world…This is going to be good for California. ***It's going to create over 17,000 jobs in less than six years. With over $6 billion in investments, and it's the right thing to do.***
> -- *Assembly Floor Session, AB 32 Concurrence Vote, August 30, 2006.* Source: California Channel archives.

Despite the lack of a mandated a cap-and-trade program, AB 32's linkage to economic development created a notion among legislators that a market-based mechanism was the only way to create the demand for the tens of thousands of jobs the legislation promised. Many legislators effectively engaged in a promotion of neoliberal discourse or what is also known as 'market environmentalism.' The term "market environmentalism" refers to a mode of resource management that proponents contend promises "a virtuous fusion of economic growth, efficiency and environmental conservation" via market means (Bakker, 2005, Pg. 543).

[72] In April 2006, the California Environmental Protection Agency's Climate Action Team (CAT) released a set of GHG mitigation policies recommended to the California executive and legislature for implementation to meet the 2020 and 2050 emission targets. These recommendations included a cap-and-trade system (CAT, 2006).

[73] AB 32 passed the Assembly on a 46 to 31 vote, with only one member of the Republican Caucus, Assembly Member Shirley Horton supporting it. Horton won reelection in 2006 and was termed out of office in 2008. A Democrat now represents her moderate San Diego district. Only 41 votes were needed to pass AB 32 and send it to the governor for signature (State of California, Official Legislative Information).

A basic assumption under neoliberalism is that environmental degradation is caused by the failure of unregulated markets to assign adequate property rights and values to natural resources (Bailey, 2007; Pg. 532). Neoliberal policies assume that the environment is best managed when resources rights are "definable, defendable, and divestible" (Lieverman and Vilas, 2006; Pg. 329). This mode of reasoning has made a cap-and-trade system seem so appealing to many policymakers and mainstream environmentalists. It focuses on the supply side of the pollution equation, with governments allocating emissions allowances to polluters. As a result, firms receive unfettered opportunity to trade allowances and to concentrate abatement where it can be achieved most 'cheaply.' "This price signal is also claimed to stimulate innovation" as firms compete to benefit from the sale of new technologies (Bailey, 2007; Pg. 532).

While neoliberalism is often perceived as a "powerful ideological and political project in global governance," it is not hegemonic in any way (McCarthy and Prudham, 2004; Pg. 275). Instead, as with the case of climate change in California, it can be viewed as a result of several competing processes, such as the commodification and marketization of nature, and institutionalization of environmental justice goals (Albrecht, 2013). Commodification and marketization both reference processes in which "phenomena that were previously shielded from market exchange" (Castree, 2008, Pg. 142), such as GHG emissions are given values so that "invaluable and complex ecosystems are reduced to commodities through pricing" (Heynen and Robbins, 2005; Pg. 6). Combining these concepts with issues of justice, however, takes a "special kind of neoliberalism to make room for the concerns of the U.S. grassroots environmental justice movement" (Holifield, 2007; Pg. 203).

For example, the linking of neoliberalism with environmental justice was first identified by Holifield's (2007) study of the U.S. Environmental Protection Agency's (EPA) Superfund hazardous waste site remediation program. He contends that the EPA's approach to environmental justice incorporated a 'neocommunitarian' strategy for sustaining neoliberalism.[74] Instead of attempting to redistribute environmental impacts more equitably, this strategy involved efforts to *build trust* in environmental justice communities through community engagement processes and the promise of incentives to encourage economic development in disadvantaged neighborhoods (Jessop, 2002). Neocommunitarian strategy is characterized as underscoring:

> The neocommunitarian strategy focuses on less competitive economic spaces (such as inner cities, deindustrializing cities, or cities at the bottom of urban hierarchies) with the greatest risk of losing from the zero-sum competition for external resources…It aims to redress the imbalance between private affluence and public poverty, to create local demand, to re-skill the long-term unemployed and reintegrate them into an expanded labor market, to address some of the problems of urban regeneration (e.g., in social housing, insulation, and energy-saving), to provide a different kind of spatiotemporal fix for small and medium-sized enterprises to

[74] See Liverman 2004; Bakker 2005; and Castree 2006 for greater elaboration on the consequences of increased private-sector involvement for environmental governance, social equity, and the valuation of nonhuman natures.

> regenerate trust within the community, and to promote empowerment (Jessop, 2002; Pg. 463).

According to Holifield (2007), the U.S. EPA's environmental justice strategy was developed in response to President Bill Clinton's 1994 Executive Order 12898 - "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." Under this executive order, federal agencies "replaced the aggressive neoliberalism of the Reagan era with what might be called a 'kindler gentler' neoliberal policies" (Holifield, 2007; pg. 203). Thus, Clinton's neocommunitarian approach, contrasts with the concept of "roll-back" neoliberalism, which emphasizes gutting government regulations and dismantling institutions rooted in the Keynesian welfare state (Peck and Tickell, 2002).

Holifield (2004; 2007) describes the U.S. EPA's deployment of a neocommunitarian strategy as a method to make the idea of environmental justice, often cited in EJ activist discourse as a challenge to market-driven environmental policy, compatible with the process of neoliberalization. Though the strategy did not incorporate the more "radical demands" of the environmental justice movement (see "Principles of Environmental Justice," 1991), he asserts it directly addressed numerous EJ themes, such as community empowerment, citizen involvement, and economic self-sufficiency. For example, although the U.S. EPA did not accept demands for full democratic participation in environmental decision-making, the agency made "public participation" central to its environmental justice policy. It implemented public participation as a form of improved public relations, making the agency's decisions more "accessible" and allowing the public to submit recommendations through "carefully managed community involvement" (2007; Pg. 204). Secondly, the U.S. EPA treated environmental injustices as an opportunity to create private-sector jobs and to stimulate new investment in neglected communities. The agency established grant programs for EJ communities, created job-training programs for cleaning up hazardous waste, and provided incentives to redevelop brownfield sites (Holifield, 2004; 2007). The EPA's incorporation of environmental justice under a neocommunitarian strategy provided subtle ways to bring EJ communities within the fold of the project of neoliberalism -- by working to earn their trust in EPA decision-making, and in offering people new opportunities to develop their economic and political self-sufficiency (Holifield, 2004).

This example is relevant to California's drafting of AB 32, in that it also required a *'special kind of neoliberalism'* to make room for the concerns of environmental justice. The goal to manage GHG emissions reduction strategies to include local benefits to disadvantaged communities had to be juxtaposed within a strategy that prioritized market-based mechanisms critical to sustaining a innovative statewide economy. The engagement with a neocommunitarian strategy was most evident in Speaker Núñez's closing remarks before the passage of AB 32 and his speech one week later at the National Latino Congreso (a major summit of Latino elected officials and community leaders). For example, in his Assembly floor speech in support of AB 32 on August 30, 2006, Núñez explicitly endorsed a cap-and-trade program. He asserted the virtues of neoliberal approaches and spoke as if it were a forgone conclusion that a market-

based mechanism was the best method for attracting innovation and private investment to California.

> Members this is a bi-partisan bill…that has good corporate citizens supporting it, including Pacific Gas & Electric, which has a third of the utility customers in the state of California. They have found a way to support this bill because they know that they are already investing in those new technologies. They are already investing in those innovations that will ultimately put more equity in their pocket when ***this market mechanism kicks in and we develop a cap-and-trade system.***
> *-- Assembly Floor Session, AB 32 Concurrence Vote, August 30, 2006.* Source: California Channel archives.

Compare these statements with his speech on September 8, 2006 to hundreds of Latino elected leaders and community members at the National Latino Congreso. While never specifically mentioning a cap-and-trade program, Núñez gave a powerful speech in which he linked AB 32 with economic development and the health of those exposed to air pollution. Most importantly, consistent with Holifield's interpretation of neocommunitarianism, Núñez (2006) framed AB 32 as an opportunity to promote community empowerment and job creation in Latino communities:

> I'm excited to tell you leaders from all over the country what we're doing here in California to slow climate change. Because I know our success means you can do it too. And that not only means better health for our planet, it also means ***more jobs and opportunities in our communities as we develop the green technologies to combat climate change***…One of my hopes for AB 32, with the broad support that has come out behind this bill, is that we are witnessing if not the birth, the maturity of a coalition between Latino leaders and communities and environmental advocates and communities that will ***impact policy*** for years to come.

In the next section, I examine how the neocommunitarian strategy placed environmental justice groups on an uneven playing field when AB 32 moved from the Legislature to the regulatory implementation process at CARB (an agency over which the governor has some direct oversight authority).[75] As AB 32 went through the regulatory phase, it seemed that the governor, and most importantly, CARB, the state agency charged with implementing the law, had already determined that a cap-and-trade program was the best approach to achieve California's ambitious GHG reduction goals. In this process, the local scale of climate change, public health, and community empowerment were significantly challenged.

[75] While the California Air Resources Board (CARB) is generally considered an independent body, the Governor proposes its annual budget, appoints members to its board and selects its chair (subject to state Senate confirmation), and hires and fires executive staff.

Section 4.6: The *Fait Accompli* in CARB's Scoping Plan

The man behind AB 32 was genuinely motivated by his lived experienced growing up in some of the most polluted neighborhoods in Southern California. However, as the principal author of California's ambitious climate change law and as the leader of the state Assembly, Fabian Núñez had to engage in a delicate balance between environmental stewardship, ensuring public health benefits in EJ communities, and promoting economic development statewide. Without his pragmatic approach to policymaking, it was likely the measure would have failed amidst a looming national economic recession and the state's structural budget deficits (in the tens of billions of dollars) that had plagued California for years. For example, when Assembly Member Fran Pavley originally introduced AB 32, the measure received no significant political traction for nearly two years until Núñez took over as its principal author.

With a background in union and community organizing, Núñez held close the principles of community empowerment, equity, and reinvestment in low-income communities. As such, he strongly believed that AB 32 could effectively 'roll-out' market environmentalism while 'making room for environmental justice.' Unfortunately, these normative goals were not entirely upheld in AB 32 when the measure went through the regulatory rule-making process at CARB. As previously noted, throughout the legislative drafting of AB 32, Governor Schwarzenegger publicly supported the economic benefits of a cap-and-trade system without regard to its implications to environmental justice communities. At one point, he even threatened to veto the measure if it did not mandate the implementation of cap-and-trade. Unable to reconcile these differences, but eager to claim credit for global climate leadership, the Legislature and the governor eventually enacted AB 32 without settling their differences (Senior Capitol staff member, 2013 – author interview; Rabe, 2007). Instead, the legislation delegated key decisions on implementing GHG emissions reduction strategies to CARB.

Perhaps, then, it was not much of a surprise that the provisions EJ groups supported in AB 32 were severely undercut less than three weeks after Schwarzenegger signed the measure into law. Despite the inclusion of language in AB 32 that only authorized CARB to '*consider'* a cap-and-trade program among other options, Schwarzenegger quickly transformed the discussion into a foregone conclusion with Executive Order S-20-06. This order declared that emissions trading schemes provided the most cost-effective[76] method for reducing California's GHG emissions and required state officials to assemble such a program.

The executive order specifically instructed CARB to develop a comprehensive, market-based compliance program, while the California Environmental Protection Agency was directed to establish a Market Advisory Committee (MAC) to advise CARB on the program's formulation (Schwarzenegger, 2006). Speaker Núñez quickly criticized the executive order, calling it an attempt to give the executive branch more power than authorized under AB 32. Furthermore,

[76] AB 32 defines 'cost-effective' as the "cost per unit of reduced emissions of greenhouse gases adjusted for its global warming potential" (California Health and Safety Code, section §38505(d)).

Núñez said, the governor's emphasis on a market-based approach ignored other aspects of the law, including the environmental justice provisions. "You can't rewrite a law through executive order. This is totally inconsistent with the intent of the law and with the way that it is written" (Martin, 2006).[77] Núñez further claimed the governor was reinterpreting the legislation based on draft proposals the Legislature had previously rejected.

Many environmental justice representatives perceived Schwarzenegger's executive order as a betrayal. To them, it also underscored notions that the inclusion of EJ elements in AB 32 may have been intended as mere "tokenism" to prevent them from opposing the measure (Rafael Aguilera, 2013 – author interview). So when CARB convened the Environmental Justice Advisory Committee (EJAC) to advise on implementation of the Scoping Plan a lack of trust was evident and an apparent conflict ensued over cap-and-trade, according to a CARB representative. "[T]here was a view from the EJAC that it had expressed all along that cap-and-trade was just a non-starter, and obviously the Air Board has been seriously considering cap and trade the whole time…and I think folks in the EJAC did not like that" (quoted in London et al., 2013).

Based on CARB's actions, the agency appeared to view community empowerment and public participation as a means to preoccupy and pacify aggrieved communities without addressing the fundamental, structural causes of environmental injustice. For example, during the course of 16 formal committee meetings between March 2007 and April 2009, CARB and the EJAC fought bitterly over the development of the Scoping Plan and its effect on low-income communities of color. Throughout this multi-year process, the EJAC complained they did not receive adequate state support, research, and funding similar to levels of the Marcket Advisory Committee (MAC) or other scientific and economic committees advising CARB on AB 32 implementation (EJ advocates, 2012 – author interviews; Lerza, 2011).

Similarly, the public workshops held in low-income communities of color pursuant to AB 32, were administered with scant resources or agency support. No public records or documentation were kept for the workshops, and little is known about what exactly transpired at these workshops, aside from the official presentations given by CARB staff. Records of the community's response to these presentations were never kept (Sze et al., 2009). While the EJAC issued advisory reports to CARB, many EJAC deliberations were not recorded. Most significantly, the committee meetings and the public workshops were not translated into Spanish or other commonly spoken languages in environmental justice communities. One EJAC member described CARB's public participation process as disturbing, "There's no transcript; there's no nothing. So it sort of goes towards there's no real record of what we talked about but for notes on it, which is somewhat disturbing" (quoted in Sze et al., 2009; Pg. 182). Likewise, EJAC members who advocated for the implementation of the Community Empowerment Amendment claimed that it received virtually no support from CARB staff in

[77] Schwarzenegger's enthusiastic support for cap-and-trade even resulted in the firing of CARB chief, Robert Sawyer in 2007, citing disagreements over how to address climate change. Shortly thereafter, the board's executive officer, Catherine Witherspoon, resigned, alleging excessive micromanagement of CARB from the governor's office (Rabe, 2007).

developing mechanisms to turn its language into concrete policy actions (EJ advocates, 2012 – author interviews).

Section 4.7: Are all Market-Based Mechanisms Created Equally?

Due to a lack of support from CARB and its method of "managing" public participation, the EJAC supplemented state support with funding from a small number of foundations. This enabled members to produce hundreds of pages of policy recommendations for the Scoping Plan. These recommendations proposed immediate and direct GHG reduction measures, but did not include cap-and-trade (EJ advocates, 2012 – author interviews; Lerza, 2011). The EJAC encouraged California to address greenhouse gas reductions through standards and regulations, incentives, and a carbon tax (EJAC, 2008). The committee argued these three elements worked together by reinforcing each other to form the foundation for a comprehensive plan.

The EJAC proposed measures, such as energy conservation, the production of renewable energy, and quantifiable carbon reduction targets for local governments and the agricultural industry (EJAC, 2008).[78] In many of their recommendations, members of the EJAC essentially advocated traditional 'command-and-control' mechanisms that relied on direct government regulation or intervention. The 'command' in this approach requires the setting of quality standards/targets for emissions by a government authority that regulated entities (i.e., polluters) must follow. The 'control' part represents the manner in which it must be achieved (i.e., installation of pollution-control technologies) to avoid negative sanctions that may result from non-compliance (OECD, 2001; Baldwin et al., 2011).

The EJAC claimed CARB was completely avoiding emissions standard-based rule-making. They stated the agency resisted adopting such rules despite their use in the U.S. EPA's acid rain program – generally the program cap-and-trade proponents most frequently identify as successful. The EJAC cited Title IV of the U.S. Clean Air Act of 1990, which "requires 110 power plants to reduce their emissions to a level equivalent to the product of an emission rate of 2.5 lbs. of SO_2/mmBtu an average of their 1985-1987 fuel" (EJAC, 2008). According to the EJAC, the U.S. EPA also required all the facilities to install 'Continuous Emissions Monitors' to verify emissions levels and ensure compliance – yet CARB had not proposed such monitoring. The EJAC claimed that without underlying emissions standards and monitoring, establishing correct allocation levels would be impossible. As such, pollution credits could be over-allocated. Over-allocation, they argued would "strip away the incentive for businesses to reduce emissions because emissions credits remain cheaper than the cost for changing emissions levels" (EJAC, 2008). Moreover, the complex nature and sources of GHG emissions, led committee members to view as less straight-forward as the acid rain program. The program, they claimed, was only limited to a relatively small number of pollution sources. The path to compliance, moreover,

[78] The Scoping Plan only encourages but does not mandate municipalities to set GHG reduction targets (CARB, 2008). The EJAC further asserted "local and regional land use authorities have not been provided [via the Scoping Plan] with adequate standards, guidance, or incentives to ensure that local and regional development decisions will contribute to AB 32 greenhouse gas reduction targets" (EJAC, 2008).

was clearer: switch to low-sulfur coal, install scrubbers (or similar technologies) and/or implement energy efficiency mechanisms (EJAC, 2008).

The lack of strong emissions standards linked to cap-and-trade system led the EJAC to advocate for a 'carbon tax' as their principal recommendation for the draft Scoping Plan. The carbon tax, supported by many EJ activists, is itself a market-based mechanism; however, it is structured and regulated closely by the state. According to London et al. (2013), they recognized that in "the neoliberal political climate (personified by famously business-friendly Governor Schwarzenegger) a carbon tax was as close as they could come to an alignment with their values" (Pg. 795). Hence, the EJ activists' support for a carbon tax was pragmatic, not ideological.

A carbon tax is a tax per ton of CO_2 and typically calls for the tax to start low and rise over time (RFF, 2012). The EJAC claimed that a tax on carbon reflected the "real" social costs of such emissions. It accounts for the damages that are expected to arise from climate change, including harms to agricultural productivity and human health, coastal inundation, and other changes. The EJAC argued that a carbon tax would produce the most equitable carbon reductions in all neighborhoods by creating immediate incentives (i.e. risk of government sanctions for non-compliance) for emitters to invest in new clean technology for polluting facilities (Aguilera, 2013 – author interview). A carbon tax, they claimed would be more transparent and visible, and harder to evade. The tax revenue would be subject to public disclosure to determine which entities were actually complying with the regulation (Table 11). In contrast, under cap-and-trade, the specific entities trading and selling pollution permits are not subject to the state's public disclosure laws (Andrews, et al., 2010).[79] Polluting entities argue that public records disclosure of the selling and trading of allowances may affect the competitive positions of participants in an emissions trading program (WCI, 2013).

The EJAC also argued that under a cap-and-trade system, low-income communities of color, where polluting facilities are most often sited, would still bear the brunt of impacts if industries were allowed to trade for the rights to continue polluting there. They viewed cap-and-trade mechanisms as inequitable because they neither impose an adequate cost on polluting entities, nor place direct responsibility on the entities to reduce pollution. Members of the EJAC joined a coalition of statewide EJ groups to issue a declaration against cap-and-trade and in support of a carbon tax (EJ Matters, 2008). The declaration stated that pollution already disproportionately affected their communities and they would "fight at every turn" against regulations creating a carbon-trading system that would only exacerbate those trends. "[C]arbon trading is undemocratic because it allows entrenched polluters, market designers, and commodity traders to determine *whether and where* to reduce greenhouse gases and co-pollutant

[79] Under California's cap-and-trade program, GHG emissions data submitted to CARB is public information, but reporting entities (i.e., polluters) can request that material be classified as confidential based on the entity's belief that the information is either a trade secret or otherwise exempt from public disclosure under the California Public Records Act (CARB, 2011a).

emissions without allowing impacted communities or governments to participate in those decisions" (EJ Matters, 2008).

	Carbon Tax	Cap-and-Trade
Price-setting Mechanism	Legislature sets carbon price per ton of CO_2 emitted (i.e. $30/ton C02).	State Agency creates declining number of GHG emissions allowances (i.e. 500 millon tons available in 2013; 400 million tons available in 2014).
What Influences Price?	State would need to raise tax via legislation.	Carbon price is driven by scarcity of allowances and compliance costs for regulated entities.
Important Distinctions	Requires 2/3 approval of the Legislature, which is politically challenging. *Emphasis on 'command-and-control' policies. *Tax revenue could be spent on a discretionary basis.	Option (1). Some or all of allowances are auctioned. Option (2). All allowances are given away for free. *Revenue must be spent to further reduce GHG emissions statewide. *Emphasis on free-markets, innovation, market incentives and flexibility for polluters.

Table 11: Major Differences between Carbon Pricing Mechanisms under Scoping Plan Consideration.

At the same time the EJAC was denouncing a cap-and-trade system, it was ignoring the potential problems the Canadian province of British Columbia (BC) experienced with the implementation of a carbon tax. In 2008, a study by the Canadian Centre for Policy Alternatives (CCPA) showed the BC carbon tax regime was progressive only for the first year, providing the largest benefits to the top 20 percent of households through personal and corporate income tax cuts. However, as the carbon tax increased, it was projected to become regressive for low-income households, meaning low-income families would pay a greater share of their income than their higher-income counterparts (CCPA, 2008). A follow-up study by CCPA and the BC Sierra Club in 2011 found four critical flaws with the adoption of BC's carbon tax: (1) the carbon tax was too low to significantly reduce emissions; (2) tax cuts and credits reduced provincial revenues by greater amounts than the carbon tax generated, making the tax "revenue negative"; (3) taxpayers paid an additional tax to offset the "revenue negative" carbon pricing

program; and, (4) even after tax cuts and credits, the carbon tax had a disproportionate impact on low-income households, mostly benefiting the highest-income households that are also the biggest emitters of pollution (CCPA and BC Sierra Club, 2011; pg. 4-5). Despite these published accounts of BC's problems with a carbon tax, the EJAC continued to strongly support the mechanism.

In California, mainstream environmental groups such as EDF and NRDC, understanding the limitation of both carbon pricing mechanisms, strongly supported a version of a cap-and-trade system. The system they favored would limit the amount of carbon allowances that CARB could issue for free, with a remainder of the allowances sold at auction (Table 11). These groups advocated for allowing the market to determine the price instead of allowing politics and policymakers to set the price too low, as was the case in British Columbia. Under this approach, auction proceeds would be used for projects like renewable energy, green jobs training programs, and programs to help low-income consumers adjust to higher energy costs. Mainstream environmental groups claimed that well-designed market compliance mechanisms could meet AB 32 reduction goals and address environmental justice concerns (Sheppard, 2008).

Similarly, CARB administrators and members of the MAC and the Economic and Technology Advancement Advisory Committee (ETAAC) perceived the 'command-and-control' approaches favored by the EJAC as stifling competition. They stated that a carbon tax would limit opportunities to spur innovation in the green economy due to inflexible and complicated rules (Table 11). It was also viewed that such an approach would be administratively cost-prohibitive. A carbon tax, moreover, would not ensure any particular level of emissions reductions as required under the 'cap' portion of a cap-and-trade mechanism (MAC, 2007). Under this neoliberal perspective, emissions trading systems (ETS) allow the firm to avoid significant government regulation; while under a carbon tax, the firm is subject to government regulation through administration of the tax. Andrews et al. (2010), have argued that "in an ETS the freedom of the firm and concomitant property rights assigned to carbon permits are intact, with climate change being managed by a speculative market for emissions permits so that property rights are sacrosanct" (Pg. 614). According to neoliberalism a carbon tax is not just an example of government action but a form of government intervention" (Pg. 614). In sum, the proponents held that a deregulated market would result in the most cost-effective approach to GHG emissions reductions. By removing regulatory interventions, such as carbon taxes or precise standards for polluters, proponents argued the market would seek out the most efficient means of achieving the same emission reduction goals (Wysham, 2008; Pg. 28).

In essence, the debate over the appropriate carbon pricing mechanism to implement centered on the appropriate scale and scope of issues the mechanism should cover. Throughout the Scoping Plan process, CARB subscribed to a civic epistemology that sought to limit the scale of mitigation policies to only address GHG reduction across facilities at a statewide/global scale. They argued that the "cap" part of the cap-and-trade system was inherently equal – everyone can benefit from the cap in GHG emissions, no matter where you live. Conversely, the EJAC held that the "trade" part was not equal because those reductions and consequent reductions in co-

pollutants, would not be evenly distributed geographically (Pastor et al., 2013). The EJAC rationalized that while overall emissions might decline, the burden for overly polluted communities could potentially worsen, or improve at rates lower than the statewide average. As a result, they asserted the localized health benefits from the reduction of co-pollutants would not materialize (EJAC, 2008; Pastor, et al, 2013).

As explained by Hecht (2011), the EJAC's opposition was also based on their concern regarding the decreased opportunity for community input into local land-use and other regulatory decisions under a cap-and-trade system. In such a system, it was argued low-income communities would be precluded from participating in the trading and purchasing of allowances that could impact the spatial distribution of reductions in GHG emissions and co-pollutants.

> [B]y their nature, trading programs leave little to no opportunity for community input. This may be the EJ community's most fundamental objection to trading programs. Command-and-control regulation [direct state regulation] typically provides opportunities for community input on a case-by-case basis. Local communities can influence the regulatory process by participating in permitting proceedings and variance proceedings, by commenting on proposed rules, and by undertaking or intervening in direct administrative or court enforcement actions or urging regulators to pursue these actions. By contrast, once a trading program is in place, the regulated parties, entities that control and regulate the pool of available offsets, and investors and traders will form the system that dictates the regulatory outcome on a local level by controlling available carbon emission allowances (Hecht, 2011).

Consequently, these concerns partly came to fruition when Western Climate Initiative Inc. (WCI), the corporation created by CARB to manage California's cap-and-trade auctions was incorporated in the state of Delaware. As an entity outside of California, it is not subject to many of California's state open meetings or public disclosure laws (Grimes, 2012).

Section 4.8: The EJAC's Lack of Scientific Data and Rigor

The EJAC's expansive scope and scale of climate change was sharply criticized by CARB officials as beyond the intent of AB 32. They claimed the EJAC's climate strategy had the potential to derail the central goal of the legislation -- the reduction of 'global' GHG emissions. The EJAC's strategy was rejected by proponents of cap-and-trade as being more grounded in emotion than science. For example, at a 2006 conference panel on developing cap-and-trade programs, Dan Skopec, then undersecretary for the California Environmental Protection Agency, stated that:

> [A] lot of people use the issue of global warming to tackle the problems that they've been working on for the last 10, 15, 20, 30 years, and I think that ***these problems are not necessarily related to global warming***. I think that's a folly that we will have to be careful about. The challenge of global warming is so great it is going to be a major adjustment to our economy…The challenge is so great that it should be the sole focus of this effort. Using the umbrella of global warming to *satisfy other agendas* is really going to distract from the solution and create *inefficiency.* So as we go forward, I hope that we can all focus this effort on the problem of *reducing greenhouse gases* and not try to solve everyone else's unsolvable problems in other areas (ELN, 2007; Pg. 42).[80]

Another CARB representative, however, took a slightly more nuanced interpretation of the EJAC's climate strategy:

> "I think the problem is the environmental justice community really sees AB 32 as a vehicle for doing a lot of things…It's not the greenhouse gas emissions, it's all the other stuff they want: which, I don't blame them, I would want them too. I'd want see all the refineries shut down in my community…[So] if you talk about transitioning to a lower fossil fuel economy, then you'd think that they would be supportive of greenhouse gas emission reductions and it theoretically doesn't matter where those emissions reductions come from in the state as long as we're getting reductions but…they want to see reductions in their communities and they're concerned that AB 32 doesn't really focus on localized reductions (quoted in London et al, 2013; Pg. 794).

While the EJAC strongly criticized CARB for not developing robust analyses of potential impacts of the draft Scoping Pla on vulnerable communities (EJAC, 2008), they did not provide any primary scientific data to support their claims. As previously noted, environmental justice groups only presented secondary data from Lejano and Hirose (2005) and Drury et al. (1999) that studied the health impacts of a nitrogen oxide emissions trading systems in the working

[80] Dan Skopec is currently the vice president of regulatory and legislative Affairs (i.e. chief lobbyist) for San Diego Gas & Electric (SDG&E) and Southern California Gas Co. (SoCalGas), Sempra Energy's California regulated utilities. These entities are considered some of the largest emitters of GHG in the state and are regulated under AB 32.

class, Latino immigrant community of Wilmington. However, the EJAC produced no original data to analyze public health scenarios under an AB 32 cap-and-trade program.

Table 12:
Public Health Benefits of Global Warming Pollution Reduction Measures in California in 2020 (NRDC Study)

Avoided Health Impacts in the Year 2020	Climate Action Team Measures	Additional Early Action and Proposed Measures	Potential Additional Measures	Total	Value (in millions of dollars)
Premature Death	330	250	140	710	$3,200 -5,000
Hospitalization (respiratory)	70	50	30	140	$2.7 -4.2
Hospitalization (cardiovascular)	120	94	50	270	$6.0 -9.5
Asthma and other Lower Respiratory Symptoms	8,300	6,400	3,500	18,000	$0.2 -0.3
Acute Bronchitis	690	540	290	1,500	$0.3 – 0.5
Work Loss Days	50,000	39,000	21,000	110,000	$12 - 18
Minor Restricted Activity Days	290,000	220,000	120,000	630,000	$18 - 29

Source: NRDC, 2008

Both cap-and-trade proponents and mainstream environmentalists soundly dismissed such secondary studies. For example, NRDC produced its own study showing that under CARB's Scoping Plan, air pollution and health risks would be greatly reduced on a statewide basis, including in communities of color (Table 12). According to the study, measures under consideration for implementation under AB 32 could prevent more than 700 premature deaths and thousands of other negative health impacts annually, saving $3.2 billion to $5 billion in health costs by the year 2020 (NRDC, 2008; Pg. 3).

Furthermore, CARB's public health analyses and accompanying technical appendices also undermined the EJAC's arguments. CARB's analyses found that implementation of a cap-and-trade system under AB 32 would provide additional support to existing state efforts devoted to protecting and improving public health. These health analyses rested on the assertion of GHG emissions as global pollutants that have no direct, local effects on public. As such, a California company could utilize a large amount of allowances without disproportionately jeopardizing the health and welfare of neighboring communities. In these analyses, CARB did specifically acknowledge that manufacturing and electricity generation from capped sources also emit co-pollutants that posed adverse health effects on exposed populations. However, in their model evaluation of Wilmington, under a cap-and-trade program "the [co-pollutants] emission impacts were extremely small" (CARB, 2008; Pg. A-13).

Table 13 Estimated 2020 Emissions Reduction Co-Benefits "After" Scoping Plan for Wilmington Area (*CARB Study*), Tons per Day			
Category	**NO_x**	**PM 2.5**	**Predominant Fuel**
Electricity			
Renewable Portfolio	0.076	0.002	Natural Gas
Efficiency & Million Solar Roofs	0.058	0.001	Natural Gas
Combined Heat & Power	N/A	N/A	Mixed
Residential/Commercial Fuel	0.048	0.0054	Natural Gas
On-Road Gasoline	N/A	0.022	Gasoline
On-Road Diesel	0.11	0.005	Diesel
Goods Movement	1.5	0.05	Diesel
Industrial			
Refineries	*	0.04	Mixed
Oil & Gas	0.006	minor	Mixed
Boilers & IC Engines	0.042	0.009	Mixed
Subtotal of calculated reductions	1.8	0.12	
TOTAL Non-RECLAIM Reductions	**1.7**	**0.12**	

Source: CARB, 2008

The Scoping Plan Appendix H Public Health Analysis of Wilmington (2008) also found that most emission reductions benefits would most likely fall outside the community. "[C]o-benefit emission reductions in the study area would produce regional health benefits. A relatively small portion of these benefits would occur in the study area…" (Table 13). Based on CARB's methodology, it was estimated that approximately 24 premature deaths in the region would be avoided through emission reductions in Wilmington, as a result of the Scoping Plan. Similarly, the California Department of Public Health, in its analysis of the Scoping Plan found that though "statewide impacts are largely negligible, some communities will likely benefit more than others, and a few communities *may* be negatively impacted" (2010; Pg. 95).[81]

[81] The Department of Public Health also noted that due to limitations in local health data and an inadequate ability to model local economic and environmental impacts result from implementation of the cap-and-trade program, "a precise community-by-community analysis of prospective local health impacts is out of the scope this work [health analysis]"(2010; Pg. 89).

Table 14 Percent of Emissions Reductions Between 2008 and 2020: Richmond Area (*CARB Study*)			
	NO_x	PM 2.5	ROG
BASELINE Emissions Reductions from Existing Controls & No Emission Reductions at Cap-and-Trade Industrial & Electricity Generation Facilities	28%	-1%	16%
SCENARIO 1 Emissions Reductions from Existing Controls & Emission Reductions at all Cap-and-Trade Industrial & Electricity Generation Facilities	30%	0%	16%
SCENARIO 2 Emission Reductions from Existing Controls & Emission *Increases* at all Cap-and-Trade Industrial & Electricity Generation Facilities	**27%**	**-2%**	**14%**
SCENARIO 3 Emission Reductions from Existing Controls & Addition of New Facility	28%	-2%	16%

Source: CARB 2008

CARB also conducted a co-pollutant emissions assessment for the Northern California city of Richmond (Table 14). Richmond is located among a nexus of major transportation corridors, large refineries, and other industrial and electricity generation facilities. The concentrated emissions from these sources contribute to air quality problems in the local community, and in downwind areas. As with Wilmington, Richmond has a number of facilities that would be subject to cap-and-trade regulation. In their analysis, CARB staff did not find a situation where emissions increases were clearly attributable to implementation of cap-and-trade. For example, the Scenario 2 model (Table 14) evaluated the potential general impact of an emissions increase of 4 percent at every cap-and-trade industrial and electricity generation facility in the Richmond region. This hypothetical upper-bound increase in emissions produced slight reductions in the overall benefits of the ongoing control program. Resulting in a drop of 2 percent in Reactive Organic Gases (ROG) benefits, a 1 percent reduction in nitrogen oxide (NO_x)

benefits, and an additional 1 percent increase in PM 2.5 emissions. In this scenario, CARB claimed that cumulative emissions of NO_x and ROG in the Richmond area would still be lower in 2020, compared to the 2008 baseline year (CARB, 2008).[82]

The EJAC soundly dismissed the CARB public health analyses as lacking a rigorous methodology and failing to undergo a scientific peer-review process. They again reverted to citing existing studies documenting the disproportionate impact under the RECLAIM emissions trading program in Wilmington (EJAC, 2008). Consequently, as a method to finally debunk those studies, cap-and-trade proponents cited a widely circulated 2011 peer-reviewed study by Indiana University professor Evan Ringquist. Ringquist (2011) analyzed 14 years of activity for the largest emissions trading market (comprising more than 2,000 emitters) under the sulfur dioxide allowance-trading program (ATP) created by amendments to the federal Clean Air Act. His study concluded that the ATP did not produce the unintended consequence of concentrating SO_2 emissions in African American and Latino communities.

Ringquist further claimed that emissions trading, even under different scenarios did not produce racial or ethnic environmental inequities (Figure 33). "The ATP pollution market, it seems, may play a role in remedying existing environmental inequities. These results are robust across different dependent variables, different definitions of affected community, and different model specifications." Through his various quantitative modeling of the program, he strongly asserts there is "scant evidence that markets for sulfur dioxide concentrate pollution in poor communities" (Pg. 321). The study, however, did reveal that the benefits were not fairly distributed, either: more pollution existed in communities with "large percentages of adults without a high school diploma" (Pg. 322). Ringquist dismissed this finding as irrelevant for public policy, since people with low educational levels are not a protected class under the 1964 Civil Rights Act and its associated regulations. Nevertheless, policymakers held this study was credible in proving that cap-and-trade programs did not impact public health in environmental justice communities.

[82] CARB also conducted co-pollutants emissions studies from cap-and-trade scenarios in the Central Valley Community of Bakersfield/Oildale, the Ore Grande community in the High Mojave Desert, and the community of Wilmington. Under these assessments, CARB also did not find situations where emissions increases were clearly attributable to implementation of a cap-and-trade program (CARB, 2008).

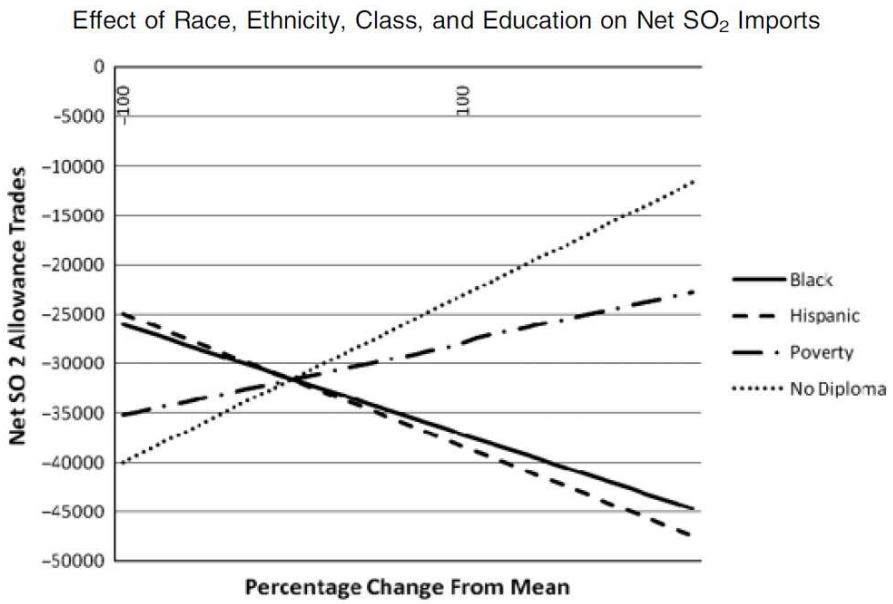


Figure 33. Source: Ringquist, 2011 (Pg. 320)

By appropriating scientific methods in the development of the Scoping Plan, CARB and mainstream environmentalists retained legitimacy and power in the decision-making process because they were seen as objective and "technically disciplined." This view directly contrasted to the view of EJ advocates as undisciplined individuals and groups offering biased positions (Ezrahi, 1990; Pg. 69). Throughout the multi-year Scoping Plan process, members of the EJAC could not produce rigorous research and scientific data to validate their anecdotal information on climate change impacts to socially vulnerable communities. While many universities and nonprofits have partnered with EJ groups in the last 20 years to develop public health and scientific analyses to influence public policy, these types of partnerships were not evident in California during the Scoping Plan process.

In the policymaking process, credibility is essential in the validation of climate knowledge. To translate their on-the-ground experience in disadvantaged communities, EJ advocates are expected to produce rigorous research and scientific data to prove claims, test new approaches, and bring new policy approaches to scale. However, according to Daniel Faber (2001), who has studied the EJ movement for decades, such expectations are often difficult to achieve because environmental justice groups face limited financial and technical resources. The environmental justice movement, he argues, is perhaps the most underfunded social movement in the United States.

While a few of the largest organizations in the movement have seen their budgets grow in recent years, most EJ groups continue to face greater resource constraints than other nonprofits and mainstream environmental groups. The vast majority of EJ groups have fewer than five paid staff; many still function primarily as volunteer organizations (Park, 2009). Unlike the Sierra Club, EJ groups lack a dues-paying membership to offset the cost of

technical experts who aids in advocacy campaigns. Moreover, this technical capacity asymmetry was further exacerbated by the fact that the EJAC did not receive significant state support, research, and funding similar to levels of the MAC or other scientific and economic committees advising CARB on AB 32 implementation. According to an EJAC letter to CARB chair Mary Nichols, there was "no request for proposals or other efforts to seek outside expertise on how best to understand, research, and answer the constellation of questions" presented by the implementation of AB 32. As a result, they claimed, CARB could not fully evaluate the total costs and impacts of the Scoping Plan on the environment and public health (EJAC, 2008).

In addition to the lack of state funding and EJ staffing, the pressure for immediate policy action intensified the power differentials already at hand within the Scoping Plan process. As pointed out by the EJAC chair, Angela Johnson Mezaros, "one of the issues that makes this climate work really different than some of the other issues I've worked on, is this frame of immediacy. It's really dynamic, fast-moving, high-paced policy-making which makes it another level of challenge for organizations that are small, underfunded, and otherwise under-resourced, without access to decision-makers and information that is useful and relevant" (Park, 2009). In sum, the AB 32 Scoping Plan process highlights the difficulties EJ groups encountered in building up their scientific capacity to influence state-level climate policy. The development of climate policy moves quickly in California; the problem is further complicated by policy responses geared towards global objectives, not local action or public health goals.

Section 4.9: Divergent Civic Epistemologies and the Politics of Scales in AB 32

Bolstered by what many viewed as scientifically and economically sound evidence, on December 12, 2008 CARB officially approved a Scoping Plan that focused only on reducing GHG emissions at the statewide scale. CARB argued cap-and-trade was the mechanism best aligned with the legislative intent of AB 32. Rather than mandating a specific technology or a direct carbon tax, CARB contended that the flexibility afforded by emissions trading markets helped identify ***where*** and ***how*** emissions reductions could be achieved in the most cost-effective manner (CARB, 2008; Farber, 2013). Invoking a neoliberal discourse, CARB stated that cap-and-trade rewarded commercial innovation. Under the system, a company that exceeded its goal in reducing GHG emissions earned credits it could sell to others in the market. Through this process, CARB asserted the market could find the best solutions and stimulate the development of new technology (and jobs). This in turn, could enable greater emissions reductions at lower costs (CARB, 2008; Doerr, 2006).

However, another factor likely influenced CARB's preference for cap-and-trade (though never explicitly stated) was that a direct carbon tax, as favored by EJ advocates, was politically untenable for the Legislature and governor. A tax in California requires a two-thirds supermajority vote of the state Legislature or passage of a state ballot measure. Under cap-and-trade, a "fee" (emissions allowances sold at auction) is set administratively each quarter by CARB, allowing elected officials to avoid voting for a tax.[83] Political dynamics in the Capitol at the time, which continue today with the addition of more politically moderate members, makes the passage of a direct tax on industry difficult (Senior capitol staff member, 2013 – author interview). For example, before the commencement of the first trading auction in November 2012, Assembly Member Henry Perea, chair of the Legislative Moderate Caucus (and member of the Latino Legislative Caucus) requested that the nonpartisan Legislative Analyst Office (LAO) research the feasibility for CARB to issues GHG allowances for free rather than through an auction. He further inquired about the steps needed for the Legislature to block the auction from proceeding (Perea, 2012).[84] Similarly in 2014, Perea introduced AB 69 which sought to delay for three years a cap-and-trade rule requiring the energy industry to purchase allowance

[83] The distinction between a "fee" and "tax" in AB 32 was challenged in a lawsuit filed by the California Chamber of Commerce. The Chamber argued that the auctioning rules for emission allowances exceeded CARB's scope of authority under AB 32 and violated California's Proposition 13, which requires a supermajority vote of the Legislature to increase state taxes for purposes of raising revenues. AB 32 passed by a simple majority vote. The Chamber further argued that CARB is required to provide free emission allowances (rather than selling them at auction) to comply with the proposition. The California Superior Court of Sacramento County in November 2013 ruled that the auctions did not violate Proposition 13 because they are not a tax but revenues generated by sales of valuable commodities (emissions allowances). The Chamber appealed the decision in February 2014 (Walters, 2014).

[84] Similarly, in 2010 Assembly Member Felipe Fuentes, a member of the Latino Legislative Caucus, introduced Assembly Bill 2529 which would have created administrative roadblocks to implementing a cap-and-trade auction. The measure passed out the Assembly with a majority of Latino Legislative Caucus members voting in favor of the legislation or abstaining. AB 2529 eventually stalled in the Senate Committee on Business, Professions and Economic Development (California Legislative Info, 2010).

permits for transportation fuels. In a letter to CARB chair Mary Nichols, 16 moderate Democrats (most of them also members of the Latino Caucus) stated the legislation was necessary to prevent gas price increases that would hurt low-income Californians. This legislation was eventually held in the Senate without receiving a policy committee hearing (State of California, Legislative Info, 2014).

The political realities in California, consequently, have led to the continued retrenchment of direct state regulation and the preference for market-based public policy (Martinez-Alier et al, 1998; Harrison, 2001; Pastor et al, 2013). In this process, California is seen as an important site of contestation over the adoption of neoliberal approaches in environmental governance. Discussions and disagreements over the administration of climate change place private and public-sector interests supporting market-based systems at odds with EJ groups seeking stronger state intervention in the regulation of pollution and health (London et al, 2013). As shown in Table 15, this conflict demonstrates the competition between two fundamentally different civic epistemologies in addressing climate change. The first centers on the goal of greenhouse emissions reductions at the global scale used by state regulators; the second, meanwhile embraces the goal of *localized* emissions reductions and health co-benefits advocated by environmental justice advocates. Environmental justice advocates, for example, argued that the public reasoning by CARB to support a cap-and-trade system did not factor in the racialized impacts on low-income neighborhoods and communities of color. They further opposed CARB's approach to climate change, perceiving it as doing nothing to address existing environmental inequities experienced by residents in disadvantaged communities.

> It is market-based decisions, within a framework of structural racism in planning and zoning decisions, which has created the disparate impact of pollution that exists today; relying on that same mechanism as the 'solution' will only deepen the disparate impact (EJAC members, Johnson-Meszaros and Williams 2008 letter to CARB Chair Mary Nichols).

In sum, these tensions between civic epistemologies occur not merely because of the actual use of a particular market-based mechanism (as we have seen with the problems of British Columbia's carbon tax), but due to the application and implementation that approach represents for the politics of race, place, and scale.

Table 15
Divergent Civic Epistemologies of California Climate Change

	CARB	*EJAC*
Carbon Pricing Mechanism and GHG Reduction Measures	Focus on markets and cost-effectiveness via a cap-and-trade system. Emphasis on the free market to provide flexibility for polluters and incentivize/reward their GHG emissions reductions.	Focus on direct state intervention via a carbon tax (polluter pays). Emphasis on traditional 'command-and-control' regulatory methods that impose specific, inflexible emissions limitations with which all affected sources must comply.
Geographic Scale of GHG Emissions Reductions	Goal of overall statewide/global GHG emissions reductions, regardless of place or context. Emissions reductions are uniformly equal throughout the state.	Goal to require (localized) emissions reductions where they occur most. Emphasis on reducing GHG emissions in "disadvantaged" communities.
Reduction of Co-pollutants	AB 32 requires statewide GHG emissions reductions only. To the extent feasible the reduction of co-pollutant emissions shall be "considered".	GHG emissions reductions measures should coincide with a reduction of the co-pollutants of climate change.
Science of Climate Change	Regulatory science established by CARB. Peer-Review process often utilized. Local knowledge excluded.	Inclusion of local knowledge and community-based climate mitigation projects.
Co-benefits	Market efficiency, cost-effectiveness, and statewide job creation and emissions reduction. Emphasis on statewide health co-benefits.	Localized public health benefits, cost-savings, and local green jobs. Benefits focused on socially vulnerable populations
Public Health Impact	GHG emissions do not represent a public health threat. Exposure to co-pollutants under cap-and-trade is largely negligible.	Cap-and-trade creates toxics hot spots. The co-pollutants associated with GHG emissions are a public health threat to EJ communities.
Public Participation	Emitters have flexibility to participate in a cap-and-trade program. The general public provides comments during CARB quarterly updates. The EJAC provides comments during the Scoping Plan and its scheduled updates. WCI not subject to open meeting or state disclosure laws.	Cap-and-trade precludes communities from directly influencing California's Climate Change law. EJAC is only "advisory" and is not fully funded. Input can be disregarded by CARB. Preference for direct public participation in regulatory proceedings.

According to Jonas (1994), this contestation over scale is best understood as a relational process and, a struggle among different actors to reframe a particular issue to their own advantage. He contends that scale is used by domineering organizations (such as the state) to control the subjugated by confining them to a manageable scale. This concurs with Scott's (1998) analysis in "*Seeing Like a State*," where he examines the methods modern states use to impose order to chaos, to make societies more legible, and thereby simplify state functions of taxation and conscription. His examination of the state's ordering of nature in the agriculture and forestry industries, moreover, shows how the state homogenizes the heterogeneous aspects of the world in order to obtain a level of control over it. Scott's analysis of state simplification coincides with CARB's public statements indicating that AB 32 is intentionally focused solely on GHG emissions at the global scale. "We have a whole array of programs that deal with a variety of different kinds of contaminants…and we don't want people to somehow get into a mind-set where they think that AB 32 is the tool they have to use to deal with those" (CARB spokesman Dave Clegern, 2013).

Exacting a level of state control over issues of risk and pollution, however, is often at odds with the 'scales of everyday experience' that EJ advocates engage in, both in California and internationally. Their experienced-based knowledge is derived from their continual exposure to pollutants and other socio-economic inequities in their communities. Kurtz (2010) argues that, in formal administrative proceedings activists experiential knowledge is challenged by state and corporate actors exerting spatially "abstract" and expert knowledge built around statistical significance and enumeration units. This creates a significant tension between 'particular' versus 'abstract' forms of knowledge production in environmental governance.

> Closely intertwined with knowledge production, a tension between the particular and the abstract pervades EJ as a political concept and fulcrum of possibility. Stated broadly, EJ activists and scholars studying EJ activism work in different ways to make the particular legible with reference to the abstract and the abstract accessible with reference to the particular (Kurtz, 2010; Pg. 102).

As a result of these circumstances, Jonas (1994) states, "subordinated groups attempt to liberate themselves from these imposed scale constraints by harnessing power and instruments at other scales" (Pg. 258). By refusing to address climate change policy only at a global scale, environmental justice groups are challenging the notion of scale as ontologically pre-given. They are exposing "the ways in which the social construction of scale shapes and is shaped by political and economic processes" (Kurtz, 2003; Pg. 888). In this approach, scale is argued to be both an empirical and epistemological tool for understanding and representing the world. Scale is not understood as natural; instead it is seen as both socially produced (via social processes and social struggle) and socially producing, exerting coercion and hegemony in a Gramscian sense (Williams, 1999; Sze et al., 2010).

The environmental justice movement, hence, is situated between local scales at which the community protests unwanted pollution, and the more broad geographic scales where they are produced and can be resolved (Towers, 2000). Appeals for environmental justice are a strategic response to the opportunities and constraints of regulatory procedures that are present within a particular spatial and political context (Brenner, 1997). In Kurtz's (2003) analysis of a controversial industrial facility-siting proposal, she highlights the various methods in which EJ activists strategically utilize geographic scales. Kurtz concludes that "[t]he very concept of environmental injustice precipitates a politics of scale, as the locally experienced problem of burdensome pollution can hardly be resolved at the local scale, whether by capital or the state, when it originates in political and economic relationships that extend well beyond the scale of the locality" (Pg. 891). Similarly, in Towers (2000) research on environmental health policy, he develops a conceptual framework that illustrates the interplay between "scales of meaning," the scale at which a problem is experienced and framed in political discourse; and "scales of regulation," which defines the phenomena administered by decision-making bodies.

Section 4.10: Implementing Carbon Markets and Defending Lawsuits

The significant differences in scales of meaning and scales of regulation ultimately led seven of the 11 EJAC members to abandon the advisory process and join a lawsuit on June 11, 2009 against CARB over the implementation of AB 32. The lawsuit was filed by the Center on Race, Poverty, and the Environment (CRPE) and Communities for a Better Environment (CBE) on behalf of 13 plaintiffs, collectively referred to as the Association of Irritated Residents (AIR).[85] In the lawsuit, AIR litigants claimed CARB's Scoping Plan violated substantive aspects of AB 32. This included failing to study alternatives to a cap-and-trade program and not adhering to the legislative provisions of AB 32 to safeguard the public health of environmental justice communities in the implementation of GHG reduction strategies.

At the trial court on March 18, 2011, Judge Ernest Goldsmith summarily dismissed the environmental justice and public health concerns. He opined that CARB's interpretation of AB 32 and public health impacts was not "arbitrary and capricious." The judge indicated that the state agency had legislative authority to interpret the climate change law and acted "within its discretion, right or wrong…to choose cap-and-trade as the primary methodology" (Goldsmith, 2011).[86] Judge Goldsmith, however, in his ruling principally focused on whether CARB properly analyzed feasible alternatives, such as a direct carbon tax for implementing AB 32 in the environmental review process. He determined that CARB sought to "create a *fait accompli* by premature establishment of a cap-and-trade program before alternatives can be exposed to public comment and properly evaluated" (Goldsmith, 2011). In analyzing the Scoping Plan, the judge further held the state agency improperly began implementing the plan before the California Environmental Quality Act (CEQA) process was complete and, as a result, undermined the public participation process required by CEQA.

> Most notably, the scoping plan fails to provide meaningful information or discussion about the carbon fee (or carbon tax) alternative in the scant two paragraphs devoted to this important alternative. The brief fifteen line reference to the carbon fee alternative consists almost entirely of bare conclusions justifying the cap and trade decision. Informative analysis is absent. [C]ARB fails to describe what a carbon fee program consists of, how fees or taxes are established, criteria for setting the amounts, what the California, United States and worldwide experience has been, how it is administered and by who, what are the alternatives for use of the revenue and what sectors of the economy it should be considered for, or not, and why (Goldsmith, 2011).

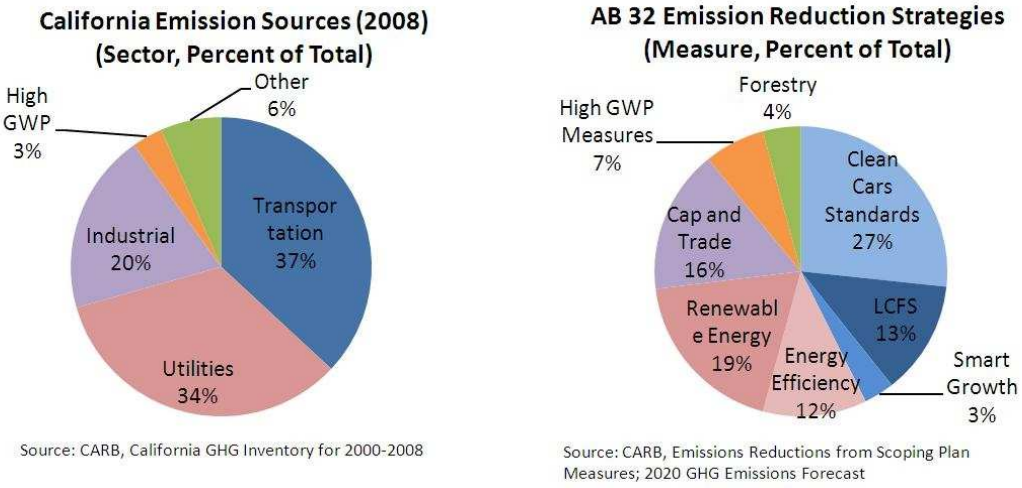
[85] *Association of Irritated Residents v. California Air Resources Board et a*l., No CPF-09-509562.

[86] CARB acts in a quasi-legislative capacity in interpreting and effectuating legislation. Accordingly, the court applied an arbitrary and capricious standard of review affording great deference to the agency in its interpretation of AB 32's substantive mandates (Goldsmith, 2011).

Judge Goldsmith ordered CARB to revise the Functional Equivalent Document (the FED was developed by the agency to evaluate the Scoping Plan's environmental impacts). He further instructed CARB to halt implementation of the Scoping Plan until it was in compliance with CEQA and a public comment period was reopened for the revised FED.

While the court denied EDF's request to intervene on behalf of the state in the AIR lawsuit,[87] other mainstream environmental groups, such as NRDC, remained neutral on the lawsuit, despite their strong support of a cap-and-trade mechanism (Egelko, 2011; O'Conner, 2011). Nevertheless, expert proponents of cap-and-trade, such as Robert Stavins, a Harvard University professor of business and government, publicly derided the environmental justice lawsuit against CARB as "misguided" because AB 32 would not only reduce California's overall GHG emissions, but also lower the state's overall emissions of co-pollutants. He asserted that if current laws regulating co-pollutants were thought to be insufficient, then the best response by environmental justice groups was not to "scuttle a statewide system that can achieve AB 32's ambitious targets at minimum cost. Rather, the most environmentally and economically effective way to address such pollution is to revisit exiting local pollution laws and perhaps make them more stringent" (Stavins, 2011). EJ groups dismissed these assertions as ignoring the lax enforcement of local air quality laws, countering that existing air pollution laws were inadequate for safeguarding low-income communities of color. In particular, they noted that local and state agencies typically only evaluate a specific pollution source in a vacuum, without considering the scientific reality that other pollution sources and environmental stressors in an area can combine to create a new, elevated and unsafe health risks, also known as cumulative impacts (Pastor et al., 2011).

Figure 34



[87] Though the court did not allow EDF to join the case as a directly affected party to the lawsuit, EDF was allowed to submit a "friend of the court" (amicus) brief. During the legal process EDF helped advise CARB and, through the amicus brief, provided the court with relevant information in support of cap-and-trade and the Scoping Plan (Egelko, 2011; O'Conner, 2011).

Other critics of the AIR lawsuit claimed that the EJ groups were erroneous in their opposition to cap-and-trade because the mechanism represented less than one-fifth of the Scoping Plan's overall GHG reductions, with the vast majority of reductions coming from other measures (Figure 34). However, the EJAC countered that the cap-and-trade mechanism was the key component of the Scoping Plan that would directly control and regulate GHG emissions from the industrial sector. LAO's chief analyst, Mac Taylor supported this assertion in an independent analysis he produced for the state's legislative leaders. He stated that less than 1 percent of 2020 GHG emissions reductions in the Scoping Plan were intended to come from direct "command-and-control regulation" of the industrial sectors. In short, he claimed, although the industrial sector (including power plants, refineries, and cement plants) is the third largest producer of GHG emissions, under the Scoping Plan, the industrial sector's contribution to emission reductions is to come almost entirely through its compliance obligations under cap-and-trade (Taylor, 2012).

Throughout the legal battle and the final adoption of the Scoping Plan, the state Legislature, including members of the Latino Legislative Caucus, largely remained silent. The bill's author, former Assembly Speaker Fabian Núñez, called the court ruling "disappointing" and stated "*it's a false assertion, there won't be more pollution*…it's another roadblock to California being able to achieve its predominance in the environmental world by being the first state in the country to implement CO_2 reductions in a serious way" (Rogers, 2011). Núñez however, chastised CARB for not taking the concerns of environmental justice groups more seriously early in the Scoping Plan process, such as implementing the 'Community Empowerment Amendment'.

Without substantive support from their Latino allies in the state legislature or mainstream environmental organizations, the court order proved to be a hollow victory for EJ advocates. Though the courts compelled CARB to examine alternative approaches, the agency merely produced a supplemental analysis to comply with the judgment. In this analysis, CARB maintained that its selection of the cap-and-trade mechanism was the only valid and feasible policy direction based on a thorough consideration of all available alternatives (CARB, 2011a). CARB exhibited a cavalier attitude in defending its use of a cap-and-trade program and also in its response to public comments received on the supplemental FED.

During a 45-day public comment period, CARB received a total of 109 comment letters, many of them from EJ organizations, concerning the potential impacts of co-pollutants on socially vulnerable populations. When CARB approved the supplement to the FED on August 24, 2011, it dismissed many of these comments as inconsequential. Such comments, they stated, were outside the scope of the environmental analysis of alternatives; CARB referred the public to previously conducted public health analyses of AB 32.

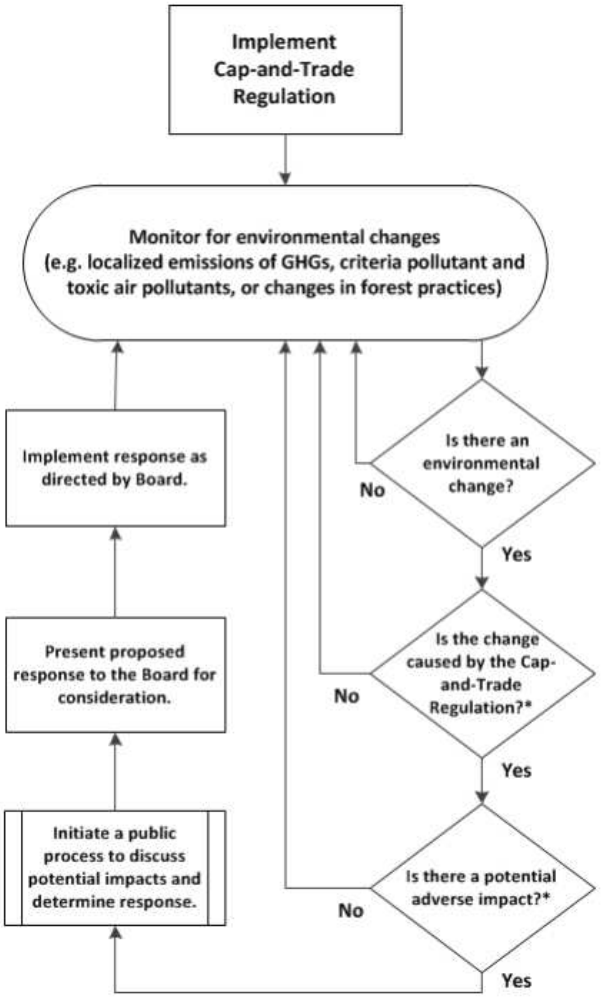
> [CARB] staff made minor modifications to the supplement based on responses to comments and other updates…None of the modifications alter any of the conclusions reached in the supplement or provide new information of substantial importance relative to the supplement…Although ARB disagreed with the findings of the court, to remove any doubt about the matter and to be consistent with ARB's interest in public participation and informed decision-making, ARB prepared the Supplement to the 2008 FED and circulated it for public comment for 45 days (CARB 2011a, Pg. 1).

The lead litigant in the lawsuit against CARB, the Center for Race, Poverty, and the Environment (CRPE) responded to the supplemental FED with a terse statement claiming that it was merely a *post hoc* rationalization of CARB's 2008 decision to adopt a cap-and-trade mechanism and a contradiction of good-faith efforts at public participation. "[C]ARB's supplement and its actions to continue implementing cap-and-trade while creating the alternatives analysis makes a mockery of the letter and spirit of CEQA, public participation and informed decision-making" (CARB, 2011a, Public Comment 89-1).

Satisfying the court's ruling, on October 20, 2011, California went on to make history as the first state in the U.S. to formally adopt a comprehensive program of regulatory and market-based mechanisms to achieve reductions in GHG emissions. As the centerpiece of California's climate change efforts, CARB unanimously approved the cap-and-trade program (2011). Several CARB board members, however, noted their apprehension in moving the state into uncharted territory and the potential for unintended environmental health consequences. In recognition of this fact, CARB adopted an adaptive management plan that attempted to address localized air quality impacts expressed by environmental justice groups (Figure 35). The plan created a framework for the state agency to identify whether unanticipated environmental health impacts have occurred relating to implementation of the cap-and-trade program, and respond accordingly (CARB, 2011b). Alegria De la Cruz, the CRPE's legal director, however, sharply characterized the plan as too vague, unenforceable, and heavily reliant upon CARB's expertise and discretion:

> The adaptive management plan…allows for action if emissions increases happen. But CARB has said that *if* it finds there are increases, it has to find that emissions increased as a *result of the cap and trade rule*. Those causal connections will make it nearly impossible for CARB to take any action when [co-pollutant] emissions increases happen. Given these two impossibly high hurdles…this adaptive management plan will most certainly not address health concerns raised by the cap and trade rule (De la Cruz, 2011).

Figure 35
CARB (2011b) Adaptive Management Process



* These questions will be addressed based on the evaluation of a range of data sets and will involve technical judgment and other available tools and methods.

With the adoption of the cap-and-trade program and the adaptive management plan, California went on to conduct its inaugural auction of emissions allowances on November 19, 2012. Before the launch of the auction, Núñez (2012) publically reiterated his preference for a 'neocommunitarian' strategy. He stated that California was at the cusp of an extraordinary opportunity in which the state could "limit pollution, protect public health, and spur a clean energy revolution." As author of AB 32, he reaffirmed that the Legislature recognized that a market-based program like cap-and-trade, offered a range of environmental and economic benefits (Núñez, 2012).

One year after its first auction, California's climate program was widely hailed as a success and cited as proof of the viability of market-based mechanisms. In 2013, the state raised nearly $1 billion from auction proceeds. Although the cap-and-trade program is not designed to raise

money, the first year of auctions demonstrated that the sale of GHG allowances can generate a significant amount of money. In the first quarter of 2014, allowances were selling at just over $11 per ton of CO_2 (CARB, 2014).[88] California's program is now the world's second-largest carbon market (trailing only the European Union), and covers 85 percent of the state's GHG emissions (EDF, 2014).

[88] AB 32 requires that auction proceeds be invested in further reducing GHG emissions.

Section 4.11: Conclusion -Bridging Climate Science and Policy – Whose Reasoning and Epistemology Counts?

The case of California's cap-and-trade system highlights the role that expertise and economic incentives play in environmental policymaking. In the Legislature, environmental justice groups worked primarily with legislators of color, influencing multi-scalar connections between public health, jobs, and climate change. In particular, key members of the Legislative Latino Caucus advanced a neocommunitarian strategy that emphasized 'community empowerment' and 'job creation' in disadvantaged neighborhoods. However, as AB 32 went through the regulatory rule-making process at CARB, environmental justice groups quickly lost their capacity to affect the implementation of the law.

Incorporating environmental justice in California's climate change policy became problematic for several reasons. First, the structural conditions that have created environmental health inequities at the community level were concealed by CARB's primary focus on universal scientific variables such as the amount of carbon emissions produced, and market-based mechanisms, regardless of place or context. These approaches separate climate change from political and socio-economic factors, and most importantly, the human-local scale (Jasanoff, 2010; Hulme and Mahony, 2010). Moreover, CARB regulators continually pushed up the scale of climate change to the 'global.' They framed climate change as an environmental problem with little or no public health consequences and a problem best solved by efficient market mechanisms. Secondly, under these approaches, experts – not activists -- hold the key to knowledge about both the problem and the solutions (Barugh and Glass, 2010). The negative environmental and social impacts of climate change on local communities, as a result, were often ignored (Park, 2009; Bulkeley, et al, 2013).

Climate change presents a complex environmental health and justice challenge; its scientific nature disempowers communities to independently examine the issue. In crafting AB 32, EJ advocates and their Latino legislative allies never fully came to a resolution with Governor Schwarzenegger over the question of how to attain the emission reduction targets, whether through command-and-control regulation or through cap-and-trade. Instead, they evaded the question altogether and delegated the decision to CARB. This helped reify the role of the 'expert' and the global scale of climate change by affording CARB wide discretion on the research techniques and scientific methods to implement AB 32. California appellate court Judge Stuart Pollak (2012) noted this assertion, stating that AB 32's provisions were:

> exceptionally broad and open-ended. They leave virtually all decisions to the discretion of the [CARB] Board, from determining the nature of a scoping plan, to determining the best available research techniques, to determining incentives for emissions reduction that are "necessary and desirable," to weighing economic, environmental and public health benefits, to determining what is most "feasible and cost-effective."

Moreover, while environmental justice groups were able to collaborate and relate to legislators of color based on a shared 'lived' experience, staff experts at CARB and its leadership remained largely dominated by white individuals. For example, when the Scoping Plan was adopted in 2008, the entire CARB board membership was white, as was the executive agency staff. When the Supplemental FED was adopted in 2011, the racial composition slightly improved to include one African American on CARB's nine-member board, and one Asian American on the agency's six-member executive staff.[89] Consequently, the challenge to AB 32 revealed how climate change science and policy in California still remains highly homogenous by race and class in its leadership. These variables raise significant questions about how they impact the production of knowledge, policy, and science around climate change (Park, 2009; Agyeman et al, 2003).

Such variables likely came into play when CARB, in the regulatory process weighed the importance of various normative goals stipulated under AB 32. While AB 32 included opportunities for investment in disadvantaged neighborhoods through the 'Community Empowerment Amendment' and the reduction of co-pollutants, CARB perceived these goals as being strictly permissive. CARB regulators saw their statutory mandate as reducing the state's overall GHG emissions most "*cost-effectively*" (California Health and Safety Code, sections §38560, 38561). To further this cost-effective mandate, CARB used public participation processes as a method to 'manage' aggrieved communities and bring the EJ movement into the fold of the neoliberal project. Such an approach is evident in CARB chair Mary Nichols' statements that the agency enlisted extensive and unparalleled public participation opportunities while simultaneously developing a cap-and-trade program.

> Our process for developing the Scoping Plan was unprecedented in its openness and transparency, including many opportunities for substantive comment and interaction as the plan went through the draft process and through the final adoption. Ironically, some of the plaintiffs sit on CARB's Environmental Justice Advisory Committee (created by AB32) and enjoyed unparalleled access to CARB staff and board members throughout plan preparation. As to the underlying concerns about cap-and-trade, we are in the early stages of developing a proposal...Now is the time to begin focusing on mechanisms to assure that the program is designed to assure that the communities that are most negatively impacted by industrial pollution receive a proportionately greater share of the benefits... (quoted in Hecht, 2009).

While Nichols' comments indicate that the public participation process may have been more robust than other regulatory processes, it did not necessarily result in the agency adopting the participants' recommendations. Lievanos (2012) has problematized this type of misalignment between the regulatory outcomes from the formal structures of public participation and the normative goals of legislation as an issue of "state resonance". He argues such conflicts occur when environmental justice is institutionalized according to the state rather than social movement values.

[89] As of Spring 2014, two board members of color (both Latino men) had been appointed by Governor Jerry Brown to CARB, and two individuals of color were part of CARB's executive team (1 Asian American woman and 1 Latino male).

Cases like the implementation of California's ambitious climate change law, accordingly create a fundamental tension between distributive justice and the pursuit of economic efficiency. Environmental justice advocates focus squarely on the fair distribution of environmental health burdens and benefits. This is in contrast to the main goal of market-based systems, which is to achieve '*the greatest good for the greatest number*' by allowing the state to achieve global GHG reduction targets at a lower cost (Kaswan, 2008; Chinn, 1999). As further asserted by Kaswan (2010), however, to achieve economic efficiency, market-based systems like cap-and-trade often must ignore distributional impacts. In essence, if cap-and-trade continues to operate in a streamlined process in California without input from local communities, the greatest reduction in GHG emissions will occur in areas where the co-benefits of human health are the lowest.[90]

> If facilities with high costs of control are located in polluted areas and rely upon allowance purchases rather than reducing emissions, air quality will not improve. Meanwhile, if facilities with low costs of control are located in less polluted areas, then the emissions reductions will be concentrated in the areas where they are least necessary. Thus, pursuing economic efficiency could come at a cost of distributive justice (Kaswan, 2010; Pg. 240).

Despite the potential for uneven geographical distribution of health co-benefits, policymakers, academics, and economists continue to tout cap-and-trade as the perfect solution to climate change. This is due to the mechanism's 'cost-effectiveness' in reducing global GHG emissions and perceived ancillary economic benefits, particularly job creation. California's institutionalization of cap-and-trade provides a poignant example of how environmental governance is embedded within a complex socio-political and economic system in which particular agendas, and expertise influence the development of climate policy and environmental justice outcomes. As London et al. (2013) contends, the California experience also illustrates a strategic understanding of the divergent epistemologies held by state experts and environmental justice advocates on cap-and-trade as being grounded in "contentious politics of scale, the market and race" (Pg. 798).

At the same time, however, the California experience points to the possibility of new civic epistemologies of climate change. The next chapter examines the new multi-scale policy approaches EJ groups are using to legislatively mandate direct engagement of issues of "race" and equity when analyzing and implementing climate change interventions. I analyze how environmental justice groups are rescaling the market-based mechanism of cap-and-trade to create multiscalar civic epistemologies in California. These CCStreets approaches replace the geographically-neutral focus on carbon reductions with new, localized interventions to address mitigation, adaptation, and health co-benefits for the most socially vulnerable populations.

[90] Firms with the most antiquated facilities that emit the highest amount of GHG emissions are often located in low-income communities of color. These companies are likely to purchase the most emissions allowances (Kaswan, 2008).

CHAPTER 5
Cap and Trade-Offs: Rescaling Neoliberal Practices for Community Benefits

Despite a philosophical conflict with cap-and-trade, environmental justice groups are creating a new civic epistemology that rescales the program's geographically-neutral approach to address impacts in disadvantaged communities. The central element of this rescaling activity is a 'cap-and-dividend' strategy, better known as a Climate Change Community Benefits Fund (CBF). Under cap-and-dividend, the state directs a dividend (or rebate) totaling 35 percent of AB 32 auction proceeds, to be invested in low-income communities most affected by air pollution. CBF recipients can use the money for activities and programs that mitigate the effects of climate change and co-pollutants.

Through the passage of CBF legislation, several EJ groups are attempting to use a market-based system to redress the limitations and inequities faced by communities harmed by pollution. The CBF allows for the scaling up of local knowledge and practices to fund CCStreets approaches in climate policy. These approaches validate community-based projects that reduce global GHG emissions while aiming to harness policy solutions such as transit-oriented development, renewable energy, and urban forestry projects to lower the risks of asthma and respiratory diseases. The creation of the CBF illustrates that opposition to cap-and-trade from EJ groups is not a rejection of the goals of AB 32, but a demand that climate solutions produce more equitable outcomes for all Californians.

In this chapter, I first provide an analysis of how, after four years of lobbying and gubernatorial vetoes, EJ groups established a CBF in 2012 through enactment of Senate Bill (SB) 535. Second, I examine the scientific instruments environmental justice groups are utilizing to shift California's climate action strategy towards a focus on direct benefits to disadvantaged communities. Finally, this chapter discusses how EJ groups are using multiscalar policies to reconceptualize the phenomenon of climate change.

Section 5.1: The Cap-and-Trade Dividend

> Might the challenge of climate change provide an opportunity to rethink the meaning of development and economic growth in ways that promote redistribution of power and wealth while simultaneously protecting the environment? (Hartmann, 2010; Pg. 242)

The concept of 'cap-and-dividend' first seriously entered the public discourse in May 2009, when Governor Arnold Schwarzenegger's administration established the California Economic and Allocation Advisory Committee (EAAC). The 16-member panel was composed of economists and climate policy experts charged with providing guidance to the California Air Resources Board (CARB) in measuring the economic impacts of the AB 32 Scoping Plan and the best ways to allocate emissions allowances under a cap-and-trade program (EAAC, 2010). In his welcome letter to EAAC members, Schwarzenegger (2009) emphasized one particular concept he urged them to explore. "[T]he concept of returning the value of allowances back to the people, including through an auction of allowances and distribution of auction proceeds in the form of a rebate or dividend, in order to minimize the cost to California consumers and maximize the benefits to the state's economy". In later months, however, the governor's administration seemed to back away from its initial interest in cap-and-dividend.

At an October 7, 2009 EAAC meeting, David Crane, Schwarzenegger's special advisor for jobs and economic growth, failed to mention the concept in his testimony to the committee. Instead, he emphasized that the EAAC's recommendations for implementing AB 32 needed to be developed in the "most effective and economically positive fashion" (Inside Cal EPA, 2009a). Similarly, several EAAC members at the meeting seemed unenthusiastic about suggesting a cap-and-dividend approach. While committee members did not specifically criticize the proposal, they indicated such an option would be inefficient because it failed to fund key programs to lower GHG emissions through technology advancement. Committee members believed the key to addressing climate change required an approach that promoted innovation, while stimulating the economy (Inside Cal EPA, 2009a).

While EAAC members were cool to the idea of the cap-and-dividend policy, mainstream environmentalists objected to a plan with a proposed rebate on an equal per capita basis to offset the potential price increases for goods and services, such as electricity. They opposed the redistribution of auction proceeds on an equal basis on the grounds that dividends would go to people who "do not need them" (Boyce, 2009). A representative of the Sierra Club California stated "we don't favor returning carbon revenue to people as a cash giveaway…when it is likely to leave inadequate funding for essential climate measures." The Sierra Club instead favored spending allowance revenue on green technology and energy efficiency programs for low-income households (Inside Cal EPA, 2009a).

On an independent and separate track, environmental justice groups like the Ella Baker Center, Asian Pacific Environmental Network (APEN) and the California Environmental Justice Alliance

(CEJA) were lobbying to persuade the EAAC to direct a significant portion of the auction revenue to disadvantaged communities. By doing so, the program could reduce not only global GHG emissions but also co-pollutants of climate change (i.e., O_3 and PM 2.5). In their comments, EJ groups cited a memo by EAAC member James Boyce, an economics professor at the University of Massachusetts, Amherst, that outlined three key policies: **(1)** investment of allowance revenue to a community benefits fund; **(2)** establishment of a co-pollutant surcharge; and **(3)** creation of a zonal trading system (Boyce, 2009; EJ advocates, 2013 – interviews with author). Under Boyce's proposal, the community benefits fund would provide at least 10 percent of auction revenue to fund local community "environmental improvement" projects and programs in "overburdened communities." The co-pollutant surcharge would levy an additional fee on allowances in overburdened jurisdictions, while directing fee revenue to community benefits funds in the jurisdiction where it was collected. The zonal trading systems would require a minimum level of emissions reductions in high-priority locations where potential co-benefits were the greatest (Boyce, 2009).

The environmental justice advocates also noted that Boyce's recommendation for the climate change community benefits fund was similar to a "California Carbon Trust" proposed in 2008, by the California Economic and Technology Advancement Advisory Committee (ETAAC) in a report to CARB outlining options for auction revenues: [91]

> By setting aside a fixed portion of its funds to be distributed to projects based on cumulative impacts, geographic location, demographics, and/or associated co-benefits, this Trust could also help to reach important environmental justice goals. Distributing funds based on geography or demography would ensure that disadvantaged communities receive a pre-determined amount of funding from projects that not only reduce carbon emissions, but also foster community development and protect low income consumers from rising energy prices…the Trust could choose to favor projects with ancillary benefits, such as green collar job creation, technology demonstration, or criteria and toxic pollution clean-ups. In these cases, the Trust would pay not only for carbon reductions, but would also consider co-benefits such as local air quality benefits (ETAAC, 2008; Pg. 2-5).[92]

Ultimately, in its final report in March 2010, the EAAC only came to a consensus on recommending a cap-and-trade program and various other cost-efficiency measures. The EAAC could not reach agreement on any version of a cap-and-dividend approach. According to the final report, "some members of the committee favored distributing allowance value (auction proceeds) to households in the form of income tax reductions or avoided income tax increases" (Pg. 4). Other committee members preferred distributing allowance value through rebate

[91] AB 32 mandated CARB to create the Economic and Technology Advancement Advisory Committee (ETAAC) and instructed ETAAC to advise on activities that will facilitate investment in and implementation of technological research and development opportunities under California's Climate Change program (ETAAC, 2009).

[92] Similarly, in a paper funded by the California Chamber of Commerce and the Western States Petroleum Group titled "Addressing Environmental Justice Concerns in the Design of California's Climate Policy," Schatzki and Stavins (2009) proposed that allowance revenue "could be directed toward funding or creating incentives for measures designed to improve air quality or health services in particular communities of concern" (Pg. 28).

checks to all households on an equal per capita basis, or suggested "allowance value [revenue] could be used to assist disadvantaged communities" (Pg. 53). Similarly, a December 2010 health impact assessment of a cap-and-trade program by the California Department of Public Health (CDPH) also provided an inconsistent endorsement of a climate change community benefits fund. CDPH indicated its support for establishing such a fund but advised "the distribution of [auction] revenues requires further broad-based public discussion" (Pg. 98).

The lack of a full endorsement by CARB's advisory bodies meant delays of several years in turning a climate change community benefits fund from concept to reality. As detailed in the previous chapter, when CARB re-approved the AB 32 Scoping Plan on August 24, 2011, it chose not to immediately adopt any measures to compensate environmental justice communities for the potential impacts of a cap-and-trade program. CARB noted in the Scoping plan that the "most appropriate use for some of the allowances and revenue generated under AB 32 may be to retain it within or return it to the [industry] sector from which it was generated." The agency included a sparse recommendation that revenues could be used to "enhance greenhouse gas emission reductions that also provide reductions in air and other pollutants that affect public health." However, CARB indicated it would not adopt such measures until it sought more input from a broad range of experts and stakeholders in a separate "open public process" (2008; Pg. 70). Additionally, in the formal October 20, 2011 resolution adopting cap-and trade, CARB (2011d) stated "the Board has considered the community impacts of the Final Regulation Order, including environmental justice concerns," and concluded the cap-and-trade regulation was consistent with CARB's environmental justice policies and that it would equally benefit residents of any race, culture, or income level (Pg. 6-7).

Section 5.2: Towards a Legislative Redress of Carbon Markets

Anticipating that CARB would eventually ignore recommendations for the equitable distribution of cap-and-trade revenue, EJ advocates pursued a parallel legislative approach. In a strategic move, they chose to return to their Latino allies in the state Legislature in early 2009 to ensure the carbon markets established by CARB would have statutorily mandated robust social and environmental provisions. Keenly aware that environmental justice considerations in AB 32 were written permissively and supplanted by a strict mandate of "cost-effectiveness," environmental justice groups were confident they could realign California's statewide climate change policy to explicitly focus on a positive interaction between race, place, and the market.

The rationale to seek a legislative mandate for a CBF was first provided by Shankar Prasad, a science fellow for the Coalition for Clean Air (CCA). Prasad previously served as deputy secretary for science and environmental justice at the California Environmental Protection Agency (Cal EPA). As a trained scientist and physician, Prasad had more than 20 years of environmental health and public policy experience. In his years of public service, he informed EJ advocates only two things brought about real change in environmental governance: "one is the legislative mandate; and the other is a state budget appropriation" (Prasad, 2013- author interview).

Prasad had witnessed the establishment of several environmental justice goals and policies without any substantive implementation. In particular, he recalled where former Assembly Member Judy Chu's legislation establishing an "Environmental Justice Small Grants" program to fund a variety of environmental and public health projects, was eventually signed into law in a weakened form in 2002. As originally introduced in the Legislature, Assembly Bill (AB) 2312 would have required Cal EPA to deposit 10 percent of all revenue collected from environmental fines and penalties into a fund created by the bill (State of California, Legislative Information, 2002). The fund would be used for awards to grassroots organizations working to solve environmental problems; such awards could be used for an organization's participation in decision-making processes at the local and state levels.

Regulated industries, including those represented by the California Manufacturing and Technology Association (CMTA), strongly opposed AB 2312. Opponents claimed the legislation created the potential for inappropriate use of state funds. They argued it could "support litigation of any kind, advocacy against either government or private entities, or development of technical assessments that may be used to challenge government assessments" (CMTA, 2002). Cal EPA, similarly, was concerned the funds would divert revenue collected from fines that were already earmarked for specific purposes, including personnel costs and administration (Inside Cal EPA, 2002). The opposition prompted the Assembly to add amendments to the bill removing the dedicated revenue source for the Environmental Justice Fund. Another amendment simply called for the Legislature to approve funding for environmental justice- related projects. The lack of a mandate and committed source of funding meant the fund would be inconsistent: the Legislature could appropriate no money to

the fund year after year, or endow it with millions of dollars on a consistent basis (Prasad, 2013 – author interview).

AB 2312 was signed into law in 2002, but prolonged state budget deficits prevented the Legislature from appropriating funds to the program for several years. Finally in 2006, the Environmental Justice Fund received a modest $350,374 from existing programs within Cal EPA. In that year, Cal EPA awarded 18 grants of up to $20,000 to community-based organizations and federally recognized tribal governments for environmental improvement projects. After 2006, funding was more sporadic, totaling between $250,000 and $280,000 per award cycle. In fiscal years, 2008, 2010, 2011 and 2012, the fund received no funding at all (Cal EPA, 2013).[93] According to Prasad, the lack of dedicated funding made the Environmental Justice Fund's viability difficult. "There was no funding stream attached to an Environmental Justice Program in any of the agencies or departments. So it all had to be carved out somehow from existing programs" (Prasad, 2013 –author interview). Each year, Prasad had to plead with Cal EPA department heads and program managers to "donate" a portion of their budgets to help fund local environmental justice projects.

Consequently, fearing that the environmental justice community would face a similar fate with cap-and-trade revenue, Prasad developed a concept paper in March 2008 as part of his duties with CCA. The paper, titled "AB 32 Community Benefits Fund to Reduce Cumulative and Disproportionate Impact," argued that the state should be required to invest revenue generated by any carbon pricing mechanism (whether a carbon tax or cap-and-trade) in climate measures that simultaneously tackled unhealthy air quality and greenhouse gases at the local scale (Prasad and Carmichael, 2008). Armed with this proposal, he approached environmental and social justice groups like the Center for Race, Poverty, and the Environment (CPRE) and the California chapter of the National Association for the Advancement of Colored People (NAACP) about sponsoring legislation to create a community benefits fund.

Though these groups were apprehensive about returning to the legislature, they understood from Prasad's Cal EPA experience - as well as their own encounters with regulatory processes - that real change would require a legislative mandate. According to Nidia Bautista, CCA's legislative advocate in Sacramento, advancing CBF legislation was a delicate issue for EJ groups, many of which were skeptical about cap-and-trade.

> I think they were concerned that by engaging in this [legislation] that they might be validating the cap-and-trade program. And honestly some of them were understandably concerned that if we were moving forward with legislation, we might also be undermining their efforts at the time. As you know in 2009 they had a lawsuit against the California Air Resources Board…We wanted to be really respectful of that but at the same time we just felt like the political momentum was…that a carbon tax was unlikely and it didn't get the traction that cap and trade was getting. So if [the State of California was] moving forward with [cap and trade], we should at least guarantee that we are making the commitment in AB 32 for direct investments in disadvantaged communities (Bautista, 2013 – author interview).

[93] $250,000 was provided in fiscal year 2013.

Eventually, CRPE, along with the California NAACP and the Greenlining Institute, agreed to co-sponsor the proposal with CCA. They return to Sacramento in January 2009[94] to approach a legislator about authoring CBF legislation. While environmental justice groups like CPRE did not support a cap-and-trade system, it shared the belief that implementation of AB 32 needed to be done in a way that maximized benefits to local communities most adversely impacted by air pollution. According to Sofia Parino, CPRE's senior staff attorney, CPRE ensured the CBF legislation was written in a fiscally neutral manner and; did not specifically link the CBF to cap-and-trade. As initially proposed, the legislation simply stated that the CBF would be funded from AB 32 revenue, which at the time could have included revenue from a carbon tax, since CARB had yet to formally adopt a cap-and-trade regulation.

> CPRE became a sponsor of [the CBF] in its early stages. This is while we were still working on the AB 32 litigation and thought there was a possibility that we could get something other than cap-and-trade. We saw some of the groups that were bringing forward this legislation were not EJ groups in the beginning…so we felt that we needed a voice and somebody that had a connection to the community…We were really fighting that we didn't want [AB 32] tied to cap-and-trade. At the time the CBF was still tied to other [undetermined] revenues from AB 32 (Parino, 2013 – author interview).

[94] Though in early 2009, CRPE and the other AIR litigants had yet to file their lawsuit against CARB, they were preparing to do so at the time. The AIR lawsuit was officially filed on June, 11, 2009.

Section 5.3: Introduction of AB 1405 – The First CBF Legislative Attempt

With Assembly Speaker Fabian Núñez term-limited out of office, environmental justice groups turned to Núñez's childhood friend, Assembly Member Kevin De Leon, for assistance. A former union organizer, immigrant rights advocate, and close political ally to the author of AB 32; environmental justice groups felt De Leon was the appropriate person to introduce the CBF legislation. CCA's Nidia Bautista said the co-sponsors specifically approached De Leon because "he represents a community that obviously would be impacted by climate change…and he had already demonstrated some leadership on the issue" (Bautista, 2013 – author interview). Throughout his legislative career, De Leon made a commitment to improving air quality in his Northeast Los Angeles district, which is crisscrossed by six freeways and has some of the worst air quality in the nation.

In an attempt to secure his childhood friend's legacy and fulfill AB 32's promise that low-income communities of color would not be last in line for the benefits of cleaner air and new jobs in the clean tech economy, De Leon agreed to sponsor the legislation. As Núñez and the Latino Legislative Caucus had done in 2006, De Leon continued to promote neoliberal approaches to link California's climate change program to public health and job creation. In February 2009, he authored Assembly Bill (AB) 1405, stating during its introduction:

> Monies set aside in the [Community Benefits] fund will give access to health and environmental clean-up funds to our state's most economically disadvantaged and most often polluted communities. According to the guidelines set forth in AB 32, these funds will also ensure these communities see the benefit of California's investment in the clean technology economy. We're looking at a win-win for these communities, cleaner neighborhoods and better jobs with skills that will be in demand in the new economy.

The introduction of AB 1405 was heralded as the first attempt to fulfill the provisions of AB 32, which required to the extent feasible the "direct public and private investment toward the most disadvantaged communities in California…"(California Health and Safety Code, section §38565). Its co-sponsors claimed two major areas in which AB 1405 established a precedent for investing in local communities: **(1)** a minimum threshold of 30 percent of fees generated under AB 32 to be deposited in a Community Benefits Fund, for investment in disadvantaged communities to accelerate GHG emissions reductions, mitigate co-pollutants, and create jobs; and **(2)** a requirement that CARB develop a scientific methodology to identify the state's poorest and most polluted communities (Taruc, 2013 – author interview).

Figure 36: AB 1405 Fact Sheet (CCA, 2009)

As AB 1405 moved through the legislative process, it encountered strong opposition from industries regulated under AB 32. In its first Assembly policy committee hearing in April 2009, major industry organizations, including the CMTA, argued that the legislation was premature and that CARB's Scoping Plan would appropriately address environmental justice concerns. Additionally, they argued, there was no need for a separate fund for environmental justice purposes because the Legislature would be involved continuously with CARB's AB 32 program through the annual budget appropriation process.

> AB 1405 is premature since a cap and trade regulation is still in development at CARB. It is unknown what, if any auction will be included in the program. CARB must *balance cost-effectiveness, co-pollutant impacts, and technological feasibility* as they develop the regulation. AB 1405 allows CARB to ignore these criteria, and there is no economic or environmental analysis to justify the bill. An arbitrary amount of funding for broad unrelated purposes with unknown economic and environmental impacts is the bill's shaky foundation (CMTA, 2010).

The co-sponsors of AB 1405 met with the California Chamber of Commerce (Cal Chamber) and the Western States Petroleum Association (WSPA) in a good-faith effort to address their concerns. In the meeting, industry representatives expressed their support "in concept" for a CBF but were concerned that the fund could siphon off billions of dollars from cap-and-trade revenue. However, when the AB 1405 co-sponsors pressed industry on what they felt would be an appropriate amount, they asserted that "only $100,000 or so should be placed in the pot" for environmental justice purposes (Bautista, 2013 – author interview). It quickly became apparent during the meeting that the polluting industries had a sense of ownership over the potential AB 32 revenue.

Industries felt that due to AB 32's "cost-effectiveness" mandate, fee revenue should be returned to the industrial sectors from which it was generated as subsidies to upgrade facilities for direct emissions reductions, and not used for the CBF. As Bautista aptly put it: "I think for some of the industries, they felt like they were the one's paying the fees, and it was their money. They felt that they shouldn't have to give it to anybody, and industry should have control over it" (2013 – author interview). The industries'' position directly conflicted with the key environmental justice principle of "polluter pays." Meanwhile, the co-sponsors of AB 1405, saw no room for compromise on the legislation; in their view, industries were paying for the right to pollute. The fees generated under AB 32 were "public" dollars because industries were polluting a public good, the 'environment.' In essence, they argued that cap-and-trade revenue belonged to the general public, not industry, and should be invested by the public (Medina, 2013; Seku-Amen, 2013 – author interviews).

Without a compromise, CMTA and the Cal Chamber continued to oppose the bill during policy committee hearings. Nevertheless, the Assembly passed AB 1405 and sent it to the state Senate, by the time it went to the floor for debate on September 1, 2009, AB 1405 had 16 legislative co-authors and support from more than 30 environmental, social justice and public health organizations. Simultaneously, the business lobby increased its efforts to defeat AB 1405 on the Senate floor. Opponents had a greater chance in the Senate, which is considered more politically conservative than the Assembly; there, many controversial bills fail to receive the 21 votes needed to pass legislation off the floor (Senior capitol staffer, 2012 – author interview). Industry groups like CMTA began to actively lobby senators before AB 1405 was scheduled for a floor vote. They accused Assembly members like De Leon of working on a "money grab" before CARB had even implemented a cap-and-trade system. Meanwhile, Dorothy Rothrock, CMTA's vice president of government relations, informed senators the purposes and projects the bill sought to fund were "very broad and not necessarily associated with the impacts of AB 32 compliance, or the cap-and-trade program" (Inside Cal EPA, 2009b).

Figure 37: AB 1405 was listed on the Cal Chamber annual list of Job Killer Bills. Graphic Cal Chamber (2013)

The business lobby's rhetoric of cost-effectiveness and charges that AB 32 was intended to reduce global GHG emissions, not "raise funds," hit home with many senators. With less than a week left in the 2009 legislative session, AB 1405 lacked the votes to make it off the Senate floor and to the governor's desk. According to Bonnie Holmes-Gen (2010), policy director for the American Lung Association of California, at the time there was "very serious industry opposition to AB 1405. The state Chamber of Commerce said it's a job killer" (Figure 37). Additionally, CARB opposed the bill, arguing that it was premature since the Economic Allocations Advisory Committee (EAAC) had not developed its final recommendations. In an August 13, 2009 letter to De Leon, CARB stated that the EAAC "has explicitly included equity as one of the issues to be addressed in its deliberations…We do not believe it is wise or necessary for the Legislature to determine the method or proportion of revenues to be allocated to any specific fund unit, at a minimum, until the committee has given us its recommendations." The combined opposition from business lobbies and CARB, eventually led De Leon to move AB 1405 to the Senate Floor Inactive File on September 10th; making it a 2-year bill. By delaying a vote on the bill until the next legislative session, the sponsors felt they would have ample time and resources to convince a majority of senators and the governor on its merits.

Section 5.4: Establishing New CBF Coalitions and Confronting Vetoes

While De Leon and the sponsors regrouped to determine how to proceed in the upcoming legislative session, it became apparent that CRPE could no longer publicly support AB 1405. As described in the previous chapter, CRPE was involved in the AIR lawsuit against CARB, which was filed on June 11, 2009. As the main litigant in the lawsuit, CRPE faced increasingly difficult odds in justifying to its EJ constituency why it supported legislation in Sacramento that could potentially be linked to a cap-and-trade system. By the Fall of 2009, CRPE withdrew its support of AB 1405, and informed De Leon and other co-sponsors that the move was intended to eliminate any perception of inconsistencies in their position on cap-and-trade. According to CRPE's senior staff attorney, CRPE's continued support of AB 1405 could be seen as incentivizing cap-and-trade and implying to EJ communities that it was an appropriate policy approach.

> I think about the same time when the bill moved to a two-year bill, it was also clear that cap-and-trade was going to be the mechanism. And we weren't going to have some other type of market-mechanism or there weren't going to be any fees or anything like that. So we decided we weren't going to sponsor the next iteration …because fiscally [AB 1405] was neutral but in practicality it was [funded] from cap-and-trade. Our communities gave us a strong sense that they didn't want to have anything to do with it. That it was dirty money…and one of our clients often stated that they didn't want a 'gold plated inhaler'…I did understand this idea that we were being paid off in a way and feelings from some of our communities that we don't want to become addicted to it…such that if there were ever a point to find a better system we would be afraid to because of what it would mean economically, like losing programs. So it was really a difficult decision for us going forward (Parino, 2013 – author interview).

Though CRPE withdrew its support for AB 1405, it did not oppose the legislation. It took the politically nuanced position of "neutral." In this manner, CPRE could maintain its opposition to a cap-and-trade system without undermining the establishment of a community benefits fund. Perhaps in an attempt to maintain their allies and not burn political bridges in Sacramento, CRPE helped secured the California Environmental Justice Alliance (CEJA) as an official co-sponsor of AB 1405 before CRPE withdrew its support for the bill. At the time, CEJA had just been formed as a statewide coalition of EJ organizations to advocate at the state and local levels for policies protecting public health and the environment. As one of the founding members of CEJA, CRPE strategically recruited CEJA to ensure that AB 1405 supporters maintained a balance of expertise in policy development and on-the-ground experience.[95] With CEJA anchoring an environmental justice perspective, other EJ and social justice groups from the San Francisco Bay Area also joined as co-sponsors (EJ advocates, 2013 – interviews with author).

[95] CEJA membership includes CRPE, the Asians Pacific Environmental Network (APEN), Communities for a Better Environment (CBE), Center for Community Action and Environmental Justice, Environmental Health Coalition, and People Organizing to Demand Environmental & Economic Rights (PODER).

The Ella Baker Center for Human Rights and the Asian Pacific Environmental Network (APEN), encouraged by their early success in creating an equitable Energy and Climate Action Plan (ECAP) for the city of Oakland, saw the advancement of a CBF as an opportunity to link their grassroots work on community-based climate solutions to the state level. According to Emily Kirsch of the Ella Baker Center, establishing a CBF was important, regardless of the fee mechanism chosen, as long as the money being collected was set aside for people and communities most impacted by air pollution (Kirsch, 2011 – author interview). Moreover, the Ella Baker Center believed community-based groups across California could offer models for equitable climate mitigation and adaptation projects. Limited by small staffs and budgets, a CBF could help such groups secure even greater reductions in GHG emissions and health co-benefits in pollution-adjacent communities:

> We are tying the work of the Oakland Climate Action Coalition to the work of the Ella Baker Center's Green-Collar Jobs Campaign at the state level. As we look at AB 32 and the billions of dollars that will be generated by making polluters pay for their pollution, we can point to cities like Oakland and point to plans like our ECAP and say that's where this money should go, to implement climate solutions rooted in equity (Kirsch, 2012).

Similarly, Marie Rose, the statewide organizing director for APEN, stated EJ organizations like hers, felt a responsibility to use the lessons learned and their successes at the local scale to influence larger statewide policy:

> Oakland has a really strong Energy and Climate Action Plan. The biggest barrier to that being implemented is funding. A lot of cities have climate action plans that are grand ideas, but how are they going to get the resources to support the implementation or creation of the infrastructure for those kinds of ideas? So that's why it's important to do state advocacy, to make sure that state funds are going to flow back to the local communities, whether it's local government or non-profits (2013 – author interview).

With the addition of new bill sponsors, and De Leon settling into his leadership role as a more seasoned chairman of the powerful Assembly Appropriations Committee,[96] the prospects for moving AB 1405 to the governor's desk for signature seemed brighter in the 2010 legislative session. According to CCA's legislative advocate, De Leon spent the next several months personally lobbying key senators to gain their support for the CBF bill (Bautista, 2013 – author interview). His growing reputation as an effective chairman in the Assembly persuaded several senators from politically moderate districts to reconsider their position on AB 1405. Moreover, in January 2010, De Leon announced his intention to run for the open 22nd state Senate district

[96] De Leon was appointed chairman on June 13, 2008. The Assembly Appropriations Committee reviews all bills with any fiscal impact after passage by a policy committee. The goal of the committee is sound, responsible fiscal policy. The chairperson of the Appropriations Committee has enormous power to bring home special projects (sometimes referred to as "pork barrel spending") for his or her district as well as having the final say on whether a member's legislative proposal is considered "too costly" for the state to implement (Senior capitol staffer, 2013 – author interview).

seat in Los Angeles. The lack of major rivals portended De Leon would capture the seat. De Leon's rising political stature and the possibility of election to the state Senate prompted, some senators to develop a more collegial relationship with De Leon by supporting AB 1405.

> His leadership was huge. He would walk the halls to go lobby members. He drove out to the Imperial Valley to go meet with a member. He offered to drive out to the Inland Empire to meet with a member…He offered to drive up to Santa Ana to meet with another member. He really worked it. He made several efforts to meet with the [Governor's] administration. So, his leadership [role] was huge. We couldn't have picked a better author (Bautista, 2013 – author interview).

After several months of lobbying for AB 1405, De Leon moved the CBF legislation from the Senate Inactive File on August 19, 2010. The bill was subsequently amended to reduce the required minimum investment threshold of 30 percent to just 10 percent. The author and co-sponsors rationalized that a 10 percent threshold might be more palatable and seem less arbitrary to opponents and moderate Democratic senators. When the amended version of AB 1405 finally came up for a floor vote on August 30th, the new amendments and lobbying strategy immediately paid off. AB 1405 passed the Senate with 22 votes, one more than needed. The measure passed almost on a strict party-line vote, with all Republicans and 1 Latino Democratic senator from Orange County opposing it. AB 1405 returned to the Assembly, which immediately voted to concur with the Senate amendments; and sent it to Governor Schwarzenegger's desk for consideration (California Legislative Info, 2010).

While AB 1405 swiftly made it out of the Assembly and to the governor for consideration, it did not escape controversy. During the Assembly concurrence vote, Republican Assembly Members took the opportunity to denounce California's AB 32 climate change program. In particular, they questioned whether communities were truly negatively impacted by GHG emissions and why such communities deserved to receive money from the cap-and-trade program. Several Republican members further argued that global GHG emissions did not cause health impacts, like other pollutants, such as nitrogen oxide or particulate matter. They stressed that the cap-and-trade program would actually hurt low-income communities of color by raising energy and fuel prices (California Channel Archives – August 31, 2010).

Assembly Member Chuck DeVore (R-Irvine) stated that AB 1405 "lays bare what all this cap-and-trade is about regarding climate change…because it's not about the climate. At the end of the day, it's about power and taking money from certain industries and carving that money out and shipping it to politically favored groups." In defending the measure, De Leon and other Democratic members, countered that AB 32 required "co-pollutant" reductions where possible, and that funding from AB 1405 would help reduce both GHG emissions and its co-pollutants. They further argued that a CBF could help create new "green jobs" in California's most disadvantaged communities (California Channel Archives – August 31, 2010; Inside Cal EPA, 2010).

While not as vocal or divisive as Assembly Republicans, CARB opposed AB 1405. As it did in the 2009 legislative session, CARB maintained that it was premature for the Legislature to dictate specific provisions of the cap-and-trade program. At the time, CARB was still drafting regulations to implement the system, which were on track for adoption in November 2010, contingent on any potential court delays from the AIR lawsuit (Inside Cal EPA, 2010).[97] Consequently, Schwarzenegger echoed CARB's position, in vetoing AB 1405 on September 30, 2010 he stated the measure was premature and questioned the need for legislation to address climate impacts to disadvantaged communities. In his veto message, Schwarzenegger also encouraged EJ advocates to work with CARB during the pending regulatory process instead of sponsoring legislation. The pending regulatory process, he said, presented an opportunity for an open public discussion on the issue:

> When the Legislature passed and I signed AB 32, we made a commitment to California's disadvantaged communities that we would ensure that the impacts of climate change and the impacts of reducing climate change would not fall disproportionately on their communities. Throughout [CARB's] process, they have kept this commitment in mind and have fashioned every aspect of this program in a manner that attempts to lessen any disproportionate impact on these communities. I am confident CARB will keep on this path as they continue the important work of fashioning market-based mechanisms that will reduce the burden on California's business community while still achieving our climate change reduction goals (Schwarzenegger, 2010a).

According to a senior appointee in the Schwarzenegger administration (2013 – author interview), AB 1405 was vetoed mainly because the dynamics at play at the time with the state Environmental Justice Advisory Committee (EJAC), CARB, and the AIR litigants. There was a sense from the CARB leadership that if EJ groups were suing them, "why should we reward them?" The situation had become so politically charged by June 2010 that more than 100 environmental justice advocates protested outside the home of CARB chair, Mary Nichols over the enforcement of toxic diesel pollution from railway operations (Leung, 2010).[98]

Another factor in the governor's veto was his chief of staff, Susan Kennedy, whom the senior appointee noted was still upset with EJ groups over the passage of AB 32 in 2006. Kennedy, the appointee claimed, was annoyed that Schwarzenegger had accepted language EJ advocates wanted in the context of "disadvantaged groups" and the establishment of the EJAC, yet, never came on as official supporters of AB 32 or joined the governor during the signing ceremony. This background, consequently, may have made Kennedy and others in the administration

[97] As previously mentioned, the EAAC released their final report on March 2010 and the committee was unable to come to a consensus on a CBF or any type of a cap-and-dividend program.

[98] In June 2010, CARB had recently released a plan detailing a number of pollution reduction goals for railway operators, but EJ activists claimed the proposals were too weak. According to Penny Newman, executive director of the Center for Community Action & Environmental Justice, "we had a march in front of Mary Nichols' house to bring home to her how serious the situation is…I think people are outraged. You can't stand by and continue to let people be harmed. It's killing people. It's literally killing people" (Leung, 2010).

more inclined to accept the business lobby's rationale for vetoing AB 1405 (Senior Schwarzenegger appointee, 2013 -author interview).

> Governor's Schwarzenegger's veto was primarily due to the influence some of the [business] lobby had and Susan Kennedy's refusal toward giving in to the people who did not support AB 32 in the first place…In a political sense, that was the stumbling block. [The] Chevrons of the world really took [AB 1405] as a job-killing bill…They basically portrayed it as a taking. However clear it was made that the community benefits fund will not be given as a voucher, it will be focused on state programs that bring about emissions reductions in specified areas; they portrayed it as actually taking money away from the big picture…facilities upgrades and new technology…[T]hat was the message that somehow convinced Susan Kennedy, the administration, including Mary Nichols, who quite frankly was a little reluctant in the beginning (Senior Schwarzenegger appointee, 2013 – author interview).

Section 5.5: Another Legislative Session, More Coalition-Building and Some Political Intrigue

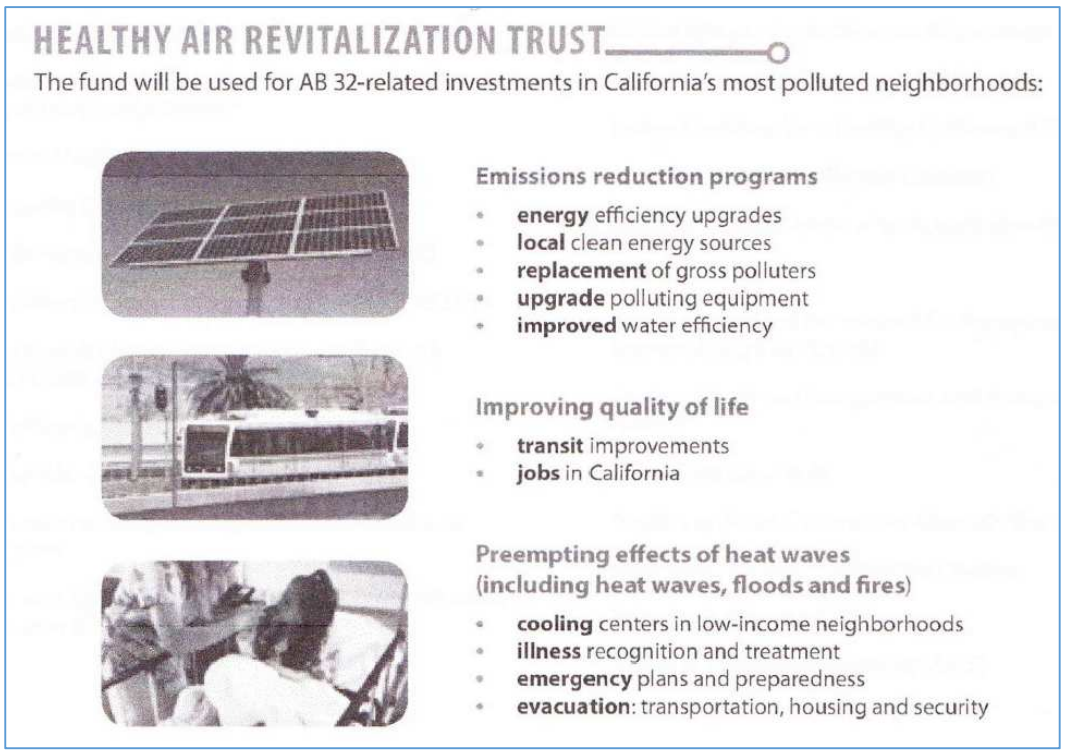


Figure 38: SB 535 Fact Sheet. Source: CCA, 2012.

Undaunted by Governor Schwarzenegger's veto, newly elected Senator Kevin De Leon was even more determined to ensure AB 32 funds were invested in California's 'disadvantaged communities in the 2011 legislative session. With the inauguration of Jerry Brown, a progressive Democrat, to his third term as governor (Brown had served as governor between 1975-1983), De Leon believed the CBF legislation had a much stronger possibility of being enacted. In moving forward new legislation, he wanted to get past the lawsuits and the collective grudges between CARB officials and EJ groups. The senator was looking to change the political dynamic since he didn't see himself as being from any EJ group or the governor's administration. According to Alfredo Medina, who was responsible for environmental issues in the senator's office, De Leon understood his responsibility in representing communities that had been impacted by climate change and air pollution. By enacting CBF legislation, he hoped to ensure that his communities were not forgotten and were accounted for in the AB 32 cap-and-trade equation (2013 – author interview).

Figure 39: SB 535 Fact Sheet. Source: APEN, 2011.

On February 17, 2011, Senator De Leon reintroduced the CBF legislation as Senate Bill (SB) 535, the "Communities Healthy Revitalization Fund" or CHART (Figures 38 and 39). The legislation maintained the same co-sponsors as the final version of AB 1405. However, it added an important political ally to the list: the National Resources Defense Council (NRDC), a mainstream environmental group. In the previous two years, NRDC and other mainstream environmental groups supported the CBF legislation but did not actively lobby or put any resources into its passage. At the time, they supported "in concept" the investment of AB 32 funds in disadvantaged communities, but were ambivalent about legislatively mandating it. NRDC's addition as an official co-sponsor of SB 535 marked a turning point in gaining broader support for the legislation. As one of the original sponsors of AB 32 and staunch defender of a cap-and-trade system, the NRDC provided additional authority and legitimacy for establishing a CBF. In courting NRDC as a co-sponsor, Senator De Leon hoped it would influence CARB officials and Governor Brown.

As anticipated, the new CBF coalition helped SB 535 sail through the Senate and Assembly policy committees with broad support among environmental and community-based organizations.[99] In committee voting in favor of SB 535, several lawmakers cited that the Legislature should exert more direct control over key policies under the cap-and-trade program, rather than allowing CARB to determine all the decisions. The Legislative Analyst's Office (LAO), the legislature's nonpartisan fiscal and policy advisor had previously endorsed this reasoning. In 2009, the LAO's Mark Newtown, urged lawmakers at a Senate budget subcommittee hearing to take a more substantive role in establishing rules for the cap-and-trade program. "The use and design of cap-and-trade mechanisms are very complex and involve a lot of policy choices, and we think those should be signed off by the Legislature. And we highly recommend a policy bill that would provide direction for cap-and-trade."

Conversely, business and industry groups continued to attack the legislation, arguing that it was jumping ahead of regulatory proceedings at CARB. At a June 27, 2011 Assembly Natural Resources Committee hearing, Brenda Coleman, a lobbyist with the Cal Chamber, further

[99] SB 535 passed in the Senate with 23 votes. However, two members of the Latino Legislative Caucus, senators Lou Correa and Gloria Negrete-McLeod, voted against SB 535. Both senators represent moderate suburban districts in Southern California (State of California, Official Legislative Information).

questioned whether “disadvantaged” communities would suffer any additional health impacts from implementation of a cap-and-trade program. She cited a recent CARB report that determined the program would not cause an increase in co-pollutants. The California Council for Environmental and Economic Balance (CCEEB) similarly asserted that SB 535 wrongly conflated the impacts from criteria air pollutants such as particulate matter and ozone and the “alleged” impacts from GHG emissions. A CCEEB lobbyist further testified that global GHG emissions had “no localized impacts on residents” and that the state had regulatory mechanisms to control co-pollutants, which would be fully enforced while cap-and-trade was implemented (California Channel Archives, 2011; Inside Cal EPA, 2011).

Despite the strong opposition by industry, the CBF legislation appeared on track to pass out of the Legislature and reach the Governor’s desk in record time. Yet SB 535 met a political road block on August 25, 2011 in the Assembly Appropriations Committee – the same committee that De Lon had previously chaired. The committee held the legislation without discussion during a hearing on all pending fiscal bills.[100] In a private meeting, the chair of the committee, Assembly Member Felipe Fuentes informed De Leon that SB 535 would not be considered for passage at the time (Medina, 2013 – author interview). According to several other Capitol sources, the committee held SB 535 under direct instructions of Assembly Speaker John Perez. The Speaker was allegedly angry that De Leon had recently withdrawn his support for Perez’s high-profile bill, AB 46. The measure sought to dissolve Vernon, a tiny city located in both member’s districts that had been riddled with corruption problems. As retribution, it was believed that Perez held SB 535 in the Appropriations committee. The move made SB 535 a “two-year” bill, ineligible for committee consideration until the next legislative session (Senior capitol staff members, 2013 - author interviews).

AB 46 died four days later on the Senate floor. De Leon led the charge to vote down the Perez measure, arguing that it was no longer necessary since he had negotiated an agreement with Vernon city officials to voluntarily adopt a package of governance reforms. Among those reforms included $60 million payout by the city to fund community and environmental projects in the small, working-class cities surrounding Vernon. De Leon at the time argued that the reform package was superior to dissolving Vernon, in part because it brought direct benefits to the residents who live around the largely industrial city. The 5.2-square-mile city, located south of downtown Los Angeles, had about 1,800 businesses but only 112 residents at the time; furthermore, the city is surrounded by densely populated Latino communities. In media accounts, De Leon stated that the fund would help mitigate years of pollution, traffic, and other problems caused by Vernon's factories and the "predatory" policies of its top officials (Allen, 2011; Maddaus, 2011).

[100] As previously noted, AB 1405 passed out of this committee without identifying substantial costs to the state.

Section 5.6: The Scientific Tools of Environmental Injustice

> I do have what I believe to be a major responsibility to protect those that have little or no voice. Whether they are being choked by freeways or stationary emitters of CO2 or traditional pollutants, if they don't have a voice here, then they have no voice anywhere else. So I'm looking forward to a very close and proactive working relationship with you Mr. Rodriquez.
> ---*Senator De Leon to Cal EPA Secretary Matt Rodriquez during his Senate Rules Confirmation Hearing* (Senate Television, 2012).

With the second setback for CBF legislation in as many years, De Leon and the SB 535 co-sponsors retreated, taking the following months to determine their next course of action. After several strategy meetings, the coalition decided to focus on implementing a key provision of the CBF legislation through the regulatory process at Cal EPA while awaiting the bill's fate in the Assembly Appropriations Committee. The various iterations of the CBF legislation had required the state to develop a scientific methodology for identifying and investing in environmental justice communities. Advocates envisioned this methodology – based on a ten year effort by EJ advocates to commit California to create a comprehensive Cumulative Impacts Tool (CI) -- would systematically identify communities most burdened by multiple sources of pollution and most vulnerable to its effects. By identifying such communities across California, advocates felt the state would better understand where to prioritize limited resources.

Focusing their efforts on the regulatory implementation of the CI tool was a strategic move. The interim Cal EPA Secretary, Matt Rodriquez was scheduled in early 2012 to be confirmed by the Senate Rules Committee, of which De Leon was a member. Through the Senate confirmation process, SB 535 supporters hoped that De Leon could get a commitment from Rodriquez to fully implement a CI tool within the next year. Moreover, by gaining Cal EPA's pledge, it also could bolster SB 535's probability of being signed by Governor Brown, as the legislation would be consistent with his administration's on-going regulatory efforts (Bautista, 2013 – author interview).

Since 2004, statewide policies highlighting the significance of cumulative impacts had been on the books and thoroughly documented in rigorous scientific literature.[101] Yet, political leaders in Sacramento continually punted on adopting a state-sanctioned CI tool. This impasse finally forced CEJA to form a strategic partnership in 2010 with academic experts, Manuel Pastor (University of Southern California), Rachel Morello-Frosch (UC Berkeley), and Jim Sadd (Occidental College) on the on-going development of their Cumulative Impact screening tool, the Environmental Justice Screening Methodology (EJSM). While CARB funded the initial

[101] Cal EPA has a working definition of cumulative impacts adopted in 2005 as follows: "Cumulative impacts means exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account sensitive populations and socioeconomic factors, where applicable and to the extent data are available."

analytical work on the EJSM and developed it with input from agency scientists and an external scientific peer review committee, the academic experts had solicited feedback early on from EJ groups regarding their interpretation of preliminary results and selection of appropriate indicators. The strategy of soliciting peer review from agency personnel, scientific experts, and community stakeholders was aimed at ensuring that the final EJSM was methodologically sound and transparent to diverse audiences in the regulatory, policy, and advocacy arenas (Sadd et al, 2011).

CEJA contracted with the academic researchers in 2011 to test the draft EJSM tool in 11 environmental justice communities statewide. In the process, they organized more than 70 community residents and 30 community organizers to "ground-truth" the model and test its validity (CEJA, 2012). The final EJSM tool, moreover, was developed as a collaborative, community-academic research model, with residents and EJ advocates in each of the targeted geographic areas trained to verify the accuracy of data and incorporate local knowledge into the model (Figure 40).

This community-based participatory research approach was intended to not only verify the results, but also help inform community members about their environmental surroundings and build local capacity. Moreover, the approach provided on-the-ground observations from residents that public databases often miss. For example, CARB has several definitions for "sensitive sites" and "hazardous receptors," but according to CEJA they might not include places that residents identify as hazardous or sensitive, such as nail salons. Ground-truthing was cited by the coalition as a method to check the accuracy of "official" government data, which can contain erroneous facility locations or completely omit them (CEJA, 2012).

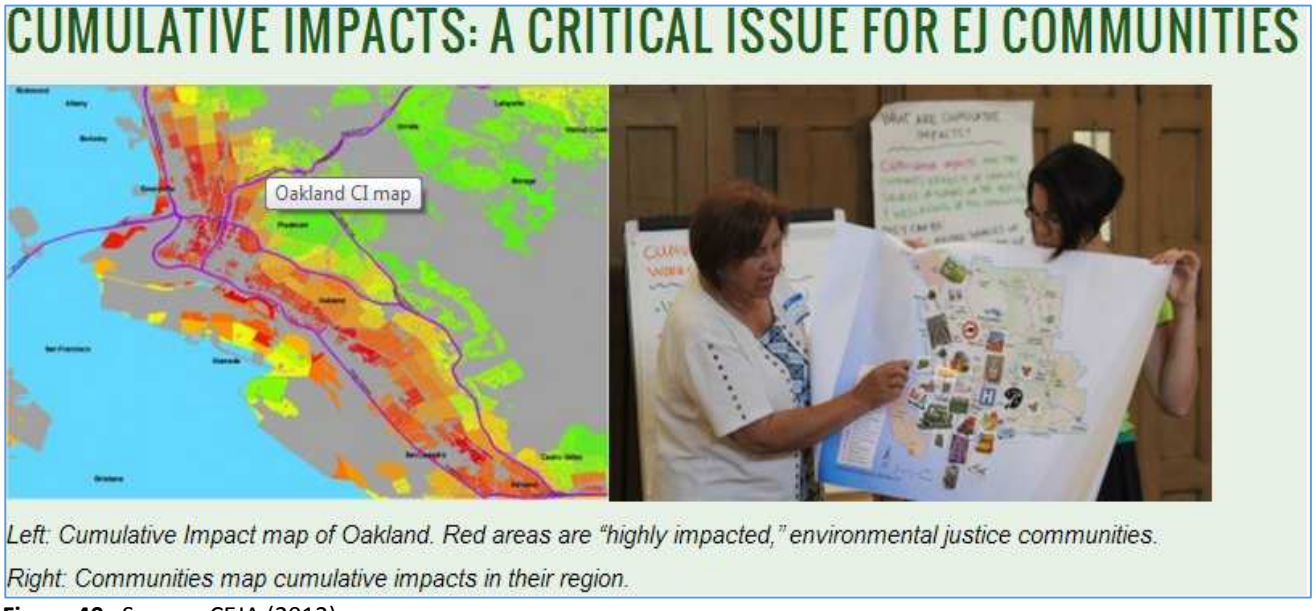


Figure 40 Source: CEJA (2012).

The environmental justice advocates described the EJSM as including the most comprehensive indicators of environmental, health, and socioeconomic factors to develop a relative scoring system to assess cumulative impacts at the neighborhood level. The scoring system is based on 23 indicators of cumulative impacts that have been identified in academic and scientific research and through community-based input. The EJSM integrates three measures to produce an overall cumulative impact score for a census tract. These measures include:

- the proximity of people to environmental hazards, and the number of sensitive land uses (such as parks and playgrounds, childcare centers, schools, and hospitals);
- the exposure and risk experienced by residents from air pollution; and
- the overall extent of social and health vulnerability, as measured by demographic, economic, health and political indicators (CEJA, 2012).

Using Geographic Information Systems (GIS) mapping techniques and land-use data, the EJSM assesses the number and volume of indicators present, and their proximity to sensitive land-uses in a particular census tract. This screening is used to develop a "cumulative impact" score, and color-coded maps. As illustrated in Figure 41, the scores range from 3-15, with 15 being "highly impacted" (CEJA, 2012).

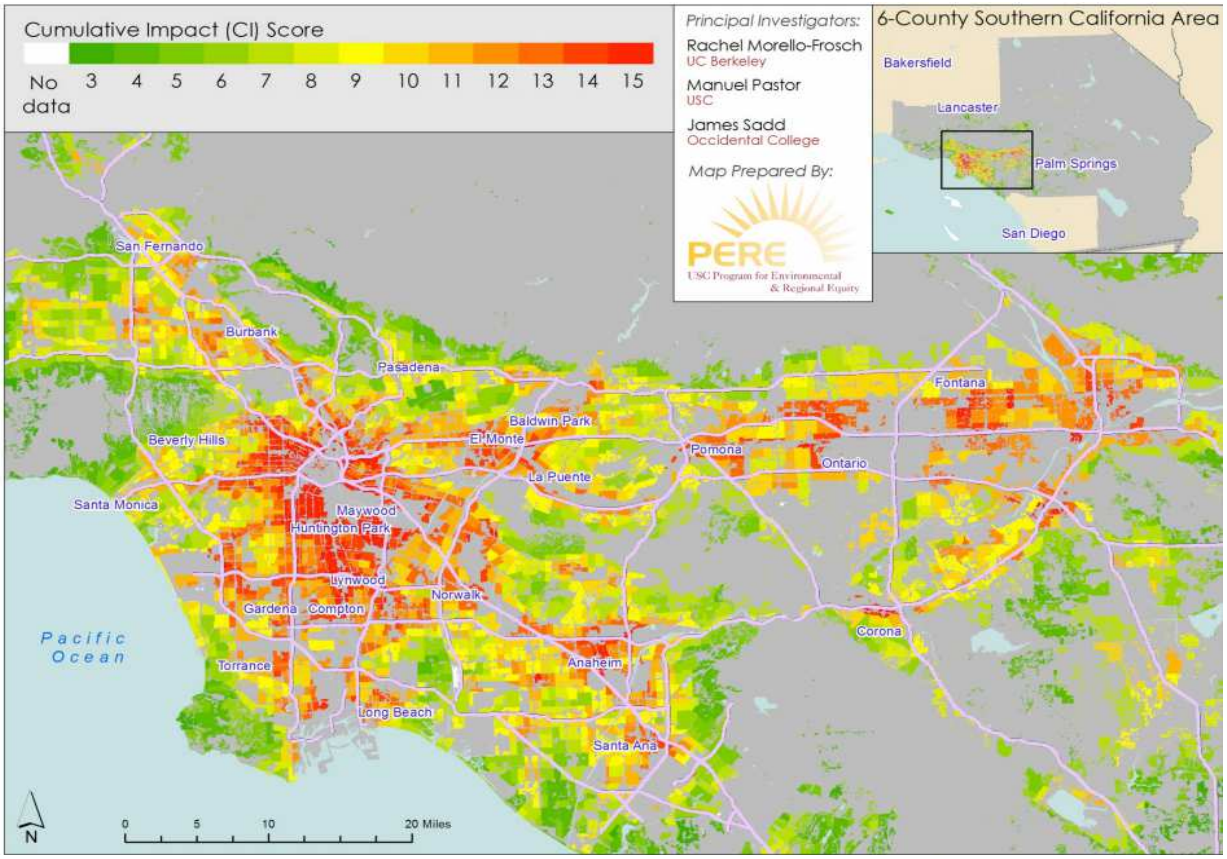


Figure 41. Cumulative Impact Score for the 6-County region of Southern California. Source: CEJA 2012.

Through the EJSM, more than 15 square miles of California environmental justice communities, in urban and rural settings, were field-tested. CRPE and UC Davis Professor Jonathan London supplemented this work in developing the Cumulative Environmental Vulnerability Assessment (CEVA) methodology, specific to environmental concerns in the Central Valley. This dual engagement allowed EJ groups to compare the two models, understand how the tools were best applied, and increase their comprehension of the science of cumulative impact methodologies (CEJA, 2012). According to CEJA and their allies, after years invested in developing and testing methodologies, they considered themselves experts on cumulative impacts and understood how the state could effectively implement a science-based tool. Their EJSM field work revealed that low-income neighborhoods and communities of color across California are subject to high poverty rates, surrounded by hazardous land uses, and exposed daily basis to emissions from toxic industries (Vanderwarker, 2013 – author interview).

Consequently, the field-testing by EJ groups increasingly put pressure on state regulatory scientists to develop their own methodology for assessing cumulative impacts and meeting the provisions of AB 32 (California Health and Safety Code section §38570(b)(1) and section §38562(b)(2)). The state eventually developed a draft CI tool, partly based on the EJSM. The state however, chose to bypass a community-based participatory research approach in the development of their tool. State scientists at the Office of Environmental Health Hazard Assessment (OEHHA) and CARB truncated several indicators selected by EJ advocates in the EJSM tool and focused on a regional screening approach, instead of a neighborhood-scale assessment (CARB, 2010; OEHHA, 2012). In releasing their drafts, OEHHA and CARB indicated that it would need more input and analysis from a broad set of stakeholders, including representatives of business and nongovernmental organizations before a final version of the tool could be released for public comment (CARB, 2010; Alexeeff et al, 2012).

CEJA and their allies were angered by the realization that the state process potentially could take several more years. CEJA believed the state had no reason to delay the implementation of a CI tool, since the best-available science on cumulative impact screening already existed in the EJSM and CEVA tools. CEJA (2012) argued that OEHHA's geographic scale, using zip codes did not effectively identify highly impacted communities. Since zip codes encompass a large geographic area that contains both impacted and unimpacted communities, some results might reflect a "washing out" of some environmental justice communities. CEJA identified 11 other key deficiencies in the state's CI tool, including the lack of a pesticide exposure indicator (CEJA, 2012).

Moreover, CEJA asserted that the EJSM was ready to implement since it had been peer-reviewed and thoroughly field-tested through a community-based approach. They claimed it would be a poor use of limited state resources for CARB and OEHHA to undertake a time-consuming regulatory process to finalize another tool when a scientifically peer-reviewed model already existed (CEJA, 2012).

> CEJA supports Cumulative Impact tools in statewide policy; the time has come to take action on this critical issue. For years, a concern with incorporating CI into policy-making has been that we lack the scientific basis to identify communities that face disproportionate impacts. ***We now have the science***. Like all science, it is constantly evolving, but with the existing models out there, we now have highly regarded methodologies that are based in academic literature and scientific analysis (CEJA comment letter to OEHHA, 2012).

According to a former senior Capitol staff member, Cal EPA may have deliberately stalled the implementation of a CI tool in the face of opposition from industry (2013 – author interview). Since academic experts developed the EJSM with CEJA, without significant input from the business community, businesses challenged the scientific validity of the EJSM. The tool was perceived as being too biased, while the formulas assigned to indicators were cited as arbitrary, and potentially distorting findings. For example, some business representatives worried that the EJSM placed too much weight on measures that might not reflect actual exposures, such as proximity to hazardous waste sites (2013 -- author interview). Industry groups for years have raised concerns about the use of cumulative impact studies, arguing that they could prompt additional environmental reviews and health assessments beyond the scope of existing regulations. At a public meeting held to review the draft OEHHA CI tool, a representative from the Chemical Industry Council of California expressed concern that "the obvious intent of some is to push [CI] into the regulatory realm." Other industry representatives at the meeting urged caution in using the tool because communities with high scores might scare away industry and business investment (Inside Cal EPA, 2012).

According to Mari Rose Taruc, APEN's statewide organizing director, CEJA understood the implications from the growing opposition to the state implementing any type of CI methodology, particularly one developed by environmental justice groups. As a result, CEJA shifted their focus to support OEHHA in finalizing a state-sanctioned CI tool in a timely manner. They amended SB 535 to provide CalEPA with only general criteria to identify disadvantaged communities, which include: **(1)** areas disproportionately affected by pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation; or **(2)** areas with a concentration of low-income people who suffer from high unemployment rates, low homeownership levels, high rent burdens, or low educational attainment levels (California Health and Safety Code, section §39711). By proposing flexibility in the state's development of a CI tool, instead of mandating a specific methodology, advocates anticipated a smoother route to passage for SB 535 in the upcoming legislative session.

> Earlier on there was a bit of debate of which tool to use to identify communities. Because really SB 535 was one of the first pieces of legislation and law to say you have to use tools to identify where these impacted communities are at…We had thought that the [EJSM] was a superior tool…but we understood that first identifying cumulative impacts and where these communities are at across the state, is big to even just identify them. We always get asked, well what is environmental justice and where are you? Policymakers and technical experts always ask us for

> this information. For us to be able to point to a scientific tool, the things that we know from the community that are true but have to be supported by research; so it was just great to have this tool to point to (Taruc, 2013 – author interview).

With a shift in strategy, the co-sponsors and Senator De Leon set their sights on the upcoming Senate Rules Committee confirmations of Cal EPA Secretary Matt Rodriquez, OEHHA Director George Alexeeff, and several CARB appointees. During the public hearings and in private meetings, Senator De Leon questioned nominees on their position to fully implement a CI tool within the year and their support for investing cap-and-trade funds in disadvantaged communities. As part of this line of questioning, De Leon directly placed gubernatorial appointees on the public record regarding their positions (Bautista, 2013 – author interview). This strategy proved effective in getting Cal EPA Secretary Rodriquez in his February 12, 2012, confirmation hearing to commit his support for a CI tool, and reaching a compromise with the Legislature on investing cap-and-trade funds in disadvantaged communities.

> Part of AB 32 and part of what CARB is doing is providing information. Let's get as much information on these areas as we can. One of the things I want to work on, not just in AB 32, but generally, is to continue to get information so that we can identify disadvantaged communities in the state. Why do we need this information? So that we can then focus programs on various kinds to help areas that are disadvantaged…[In regards to investing in impacted communities], I have been unable to come to a position on what floor or threshold we should have…we know we have to work with the Legislature on how these funds will be expended. I think we will be able to, I mean I know we are going to have to come to an agreement with the Legislature on how these funds can be expended (Rodriquez, 2012 – response to Senator De Leon at Senate confirmation hearing).

According to CCA's Nidia Bautista, the commitment De Leon extracted from Secretary Rodriquez and other gubernatorial appointees was instrumental in getting OEHHA to develop a draft CI tool by the end of 2012. Staff scientists and appointees in the Brown's administration who were skeptical about adopting a CI tool in previous years were now required to follow through on its implementation. The state officially finalized and adopted a CI tool, CalEnviroScreen in 2014. The tool uses a science-based method to develop a statewide analysis of the communities most burdened by pollution from multiple sources and most vulnerable to its effects. In developing CalEnviroScreen, Cal EPA (2014) asserts that, while traditional risk assessments may account for the "heightened sensitivities of some groups, such as children and the elderly," it has not considered other characteristics that have been shown to affect vulnerability to pollution, such as socioeconomic factors or underlying health status (Pg. 1).

While CalEnviroScreen is a peer-reviewed, science-based tool developed by government experts, it represents a culmination of more than a decade of collaboration with EJ groups, academics, and industry officials (Cal EPA, 2014). In particular, the final CalEnviroScreen tool was significantly influenced by screening models initially developed jointly by environmental

justice groups and university researchers. Before OEHHA formally adopted the tool, CEJA and their allies continued working with the state to engage in the development of the various iterations of CalEnviroScreen. Through this process, the researchers and EJ groups added several indicators from the EJSM methodology to CalEnviroScreen, including neighborhood scale analyses at the census tract level rather than zip codes (EJ advocate, 2013 –author interview).

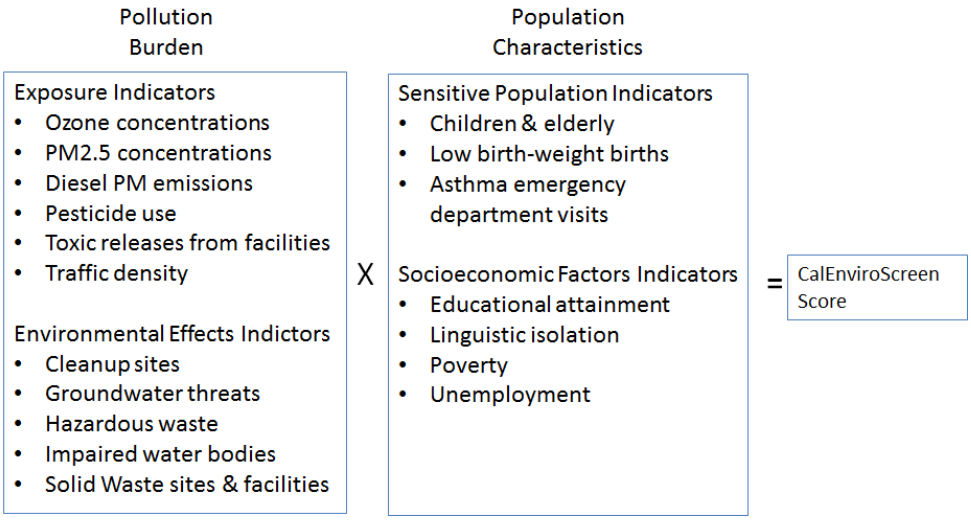


Figure 42: Formula for Calculating CalEnviroScreen Score. Source: Cal EPA, 2014.

As depicted in Figure 42, the overall CalEnviroScreen score is calculated from the pollution burden and population characteristics groups of 19 indicators by multiplying the two scores. Each group has a maximum score of 10; the maximum CalEnviroScreen score is 100. A percentage for the overall score is calculated from the ordered values. Maps are then developed illustrating the percentiles for each of California's approximately 8,000 census tracts. As shown in Figure 43, these maps illustrate areas in the state with the highest pollution burdens and social vulnerabilities.

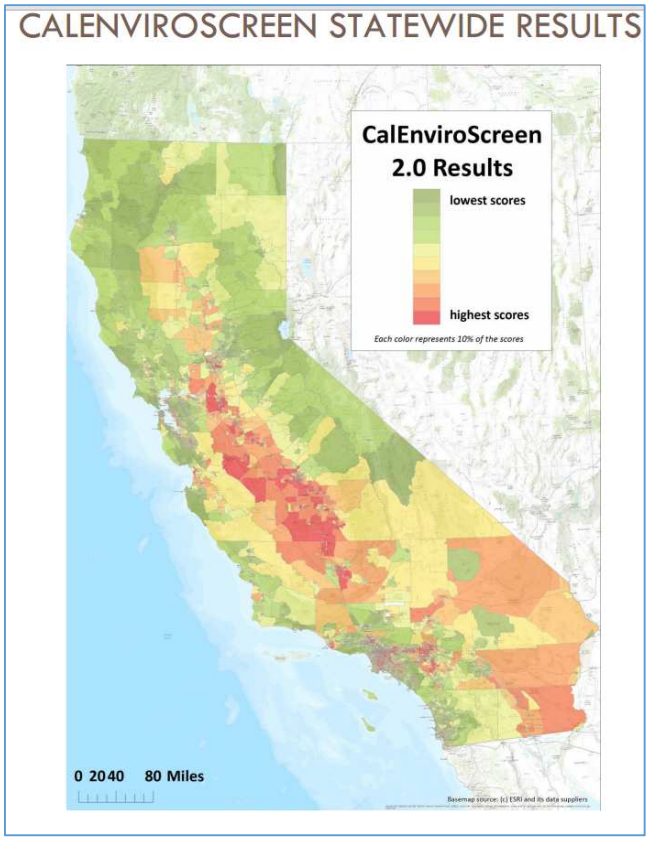


Figure 43: CalEnviroScreen Statewide Result. Source: Cal EPA (2014)

The CalEnviroScreen tool, however, does not include 'race/ethnicity' as an indicator because the tool will be used to distribute state grants to disadvantaged communities. Under the California Civil Rights Initiative (Proposition 209), state agencies are prohibited from using racial/ethnic preferences in governmental programs and decisions. A separate analysis by Cal EPA found that more than 35 percent of the state's Latino population and 28 percent of the state's African American population, resides in communities ranked in the top 20 percent for cumulative impact (Figure 44). Only 7 percent of the state's total White population lives in such communities (Cal EPA, 2014). Cal EPA concludes in its analysis that "Hispanic/Latinos and African Americans disproportionately reside in highly impacted communities…Whites are over-represented in least burdened communities" (Cal EPA, 2014; Pg. 4).

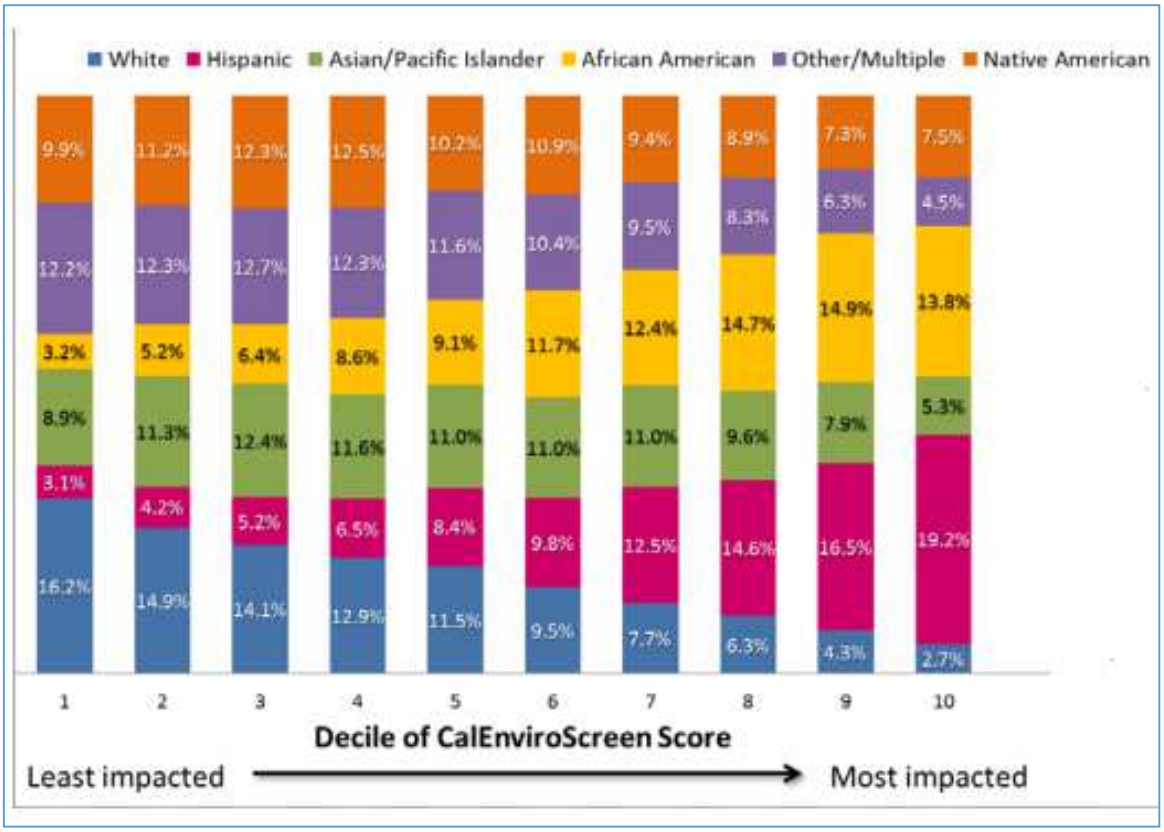


Figure 44: Proportion of Each Demographic Group's Population in Each Category of CalEnviroScreen Score. Source: (Cal EPA, 2014; Pg. 6).

Consequently, while CalEnviroScreen does not provide an official analysis based on race/ethnicity, it nevertheless represents an unprecedented tool that provides state policymakers and stakeholders with a method to scientifically identify the disproportionate environmental harms. In doing so, groups can gain a better understanding of the relationship between social vulnerability and the pollution burdens facing California communities (Cal EPA, 2014). The adoption of the CalEnviroScreen tool also represents a scientific inscription of environmental justice in California's climate governance. It provides EJ groups a basis to integrate a socio-scientific narrative of socially vulnerable communities, and influence the civic epistemology of climate change. As previously noted, civic epistemology includes a range of knowledge production processes, such as government statistics, quantitative data, and methods of reasoning that typify public decisions around environmental issues. The CalEnviroScreen tool, as a scientific inscription (producing maps, graphs, charts, and other data), affects the manner in which actors conceptualize the complexities and dynamics of socio-scientific problems, like environmental impacts. The tool has the potential to focus in on and simplify contextual data from the larger narrative of environmental justice: for example, the use of maps and charts can illustrate pollution burdens and their relationship to population characteristics.

Consequently, an essential element in translating science to policy action is the ability to use simplified representations (inscriptions) to understand and make policy decisions about the larger narrative from which the inscription was derived. In this method, an inscription, such as the CalEnviroScreen tool, can be seen as a conceptual tool for making sense of the world (Barab et al., 2007). Thus, the enrollment of this new inscription in climate governance, is supplementing technical practices to consider various socio-economic conditions when crafting policy solutions.

Section 5.7: The Ultimate Cap and Trade-Off - Enacting the CBF

> It has been noted that those who like sausages should not watch them being made. Former Governor Ronald Reagan remarked on one occasion that the same rule applies to the making of laws (Former California Senator H.L. Richardson, 1978, Pg. 45).

After Senator De Leon helped defeat Assembly Speaker Perez's bill to dissolve the city of Vernon, an entire year would pass before SB 535 was finally released from the Assembly Appropriations Committee. The CBF legislation emerged from the committee on August 16, 2012, on the condition that De Leon and co-sponsors accept substantive amendments. These amendments deleted the establishment of the "California Communities Healthy Air Revitalization Trust" fund. They instead required at least 10 percent of revenues from CARB's GHG reduction program to be earmarked for investment in "disadvantaged communities" and deposited in the newly conceived "Greenhouse Gas (GHG) Reductions Fund".

The GHG Reductions Fund was to be established by Assembly Speaker John Perez's own bill, AB 1532. To ensure Perez's bill would survive, the appropriations committee required De Leon to accept an amendment to SB 535 that kept it from taking effect unless Assembly Bill 1532 was also enacted (California Health and Safety Code, section §39723(3)). According to several Capitol sources (2013 – author interviews), Speaker Perez forced the amendments on De Leon as punishment for derailing his legislation the previous year. Rather than simply voting down SB 535 in committee, Speaker Perez permanently linked himself to the legacy of California's CBF by taking away a key provision of the CBF bill from De Leon. This form of retribution also denied De Leon from being cited as the only legislator credited for establishing the 'first-in-nation' Climate Change Community Benefits Fund.

Despite the political marksmanship between Perez and De Leon, linking the two bills fate actually strengthened support for establishing a CBF from cap-and-trade revenue.[102] The amendments adopted by the Assembly Appropriations Committee mandated that not only 10 percent of cap-and-trade revenues to be directly invested in projects located in disadvantaged communities, but a minimum of 25 percent of revenues also fund projects to provide "general" benefits to disadvantaged communities. Through AB 1532, CARB and the state Department of Finance were now mandated to develop an investment plan every three years for auction revenues through a public process, that maximizes the state's economic, environmental and public health benefits (California Health and Safety Code, section §38565).

Most notably, the newly drafted version of SB 535 explicitly fulfilled the goals established in AB 32. It provided disadvantaged communities with resources to address existing environmental health problems and to ensure that benefits from renewable energy projects would be

[102] As previously noted, on October 20, 2011, CARB formally adopted a cap-and-trade program. The first allowance auction was scheduled to take place in November 2012.

available to all residents. As described in the previous chapter, AB 32 allowed for investments "toward the most disadvantaged communities in California" and provided "small businesses, schools, affordable housing associations, and other community institutions" with the opportunity to "participate in and benefit from statewide efforts to reduce greenhouse gas emissions" (California Health and Safety Code, section §38565). SB 535 and AB 1532 secured direct investment in programs that create the following co-benefits:

1. maximizing economic, environmental and public health benefits to the state;
2. fostering job creation by promoting in-state greenhouse gas emissions reduction projects carried out by California workers and businesses;
3. complementing efforts to improve air quality;
4. directing investments toward the most disadvantaged communities and households in the state;
5. providing opportunities for businesses, public agencies, nonprofits, and other community institutions to participate in and benefit from statewide efforts to reduce greenhouse gas emissions; and
6. lessening the impacts and effects of climate change on the state's communities, economy and environment.[103]

The legislation also placed upon CARB additional mandates, such as a requirement to implement several priority funding categories, like sustainable transportation and affordable housing, for GHG reduction strategies. According to APEN, affordable housing and public transit are among low-income communities' most pressing needs, and addressing those needs in its cap-and-trade investment plan could yield even greater benefits for the state's GHG reduction efforts. Thus, by linking SB 535 and AB 1532 and requiring additional mandates, the CBF became more appealing to diverse constituencies.

Figure 45: AB 1532 and SB 535 joint Fact Sheet. Source APEN (2012a).

[103] California Health and Safety Code, section §39712(b).

Consequently, by the time SB 535 and AB 1532 came up for their respective floor votes in the Assembly and Senate, both measures had the support of three former Cal EPA secretaries, two former board chairs of CARB, and endorsements from nearly 200 public health, labor, clean tech/energy, conservation, environmental and social justice, and immigrant rights organizations.[104] Most notably, the California Latino Legislative Caucus identified both measures as "Priority Bills" and several ethnic minority chambers of commerce added their support (Figure 45). The heightened profile of the legislation ultimately led several moderate Latino legislators who previously opposed SB 535 to reverse course and vote for the new iteration of the CBF bills.

The expansive statewide support, and backing by influential members of the Latino Legislative Caucus, secured the passage of both bills, which Brown signed into law on September 30, 2012. Environmental justice groups hailed the signing of the two bills as a major victory. It validated the climate policy agenda that community advocates had spent years developing and lobbying to bring relief to polluted and economically disadvantaged neighborhoods. In an email to supporters, APEN's Mari Rose Taruc, stated that "Immigrants and refugees have wanted to advance climate solutions to solve both the environmental and economic crisis in their communities but haven't had much support to do so until now" (APEN, 2012b). In media outlets, blog posts, and press releases, the co-sponsors of SB 535 further stated that the investment from cap-and-trade proceeds would fund projects to improve air quality in polluted communities, and place more clean energy jobs into these communities.

> Our work on SB 535 began in 2009 when our [Oakland] Green Collar Jobs Campaign saw a way to ensure that Cap and Trade revenue could actually make a difference in California communities most hurt by poverty and pollution…[T]hanks to the hundreds of you who have written, called, and showed up in Sacramento to advocate for these vital bills. Together we have secured a brighter, greener future for California communities that need it the most.
> --- Blog post from the Ella Baker Center the day after Governor Brown signed SB 535 and AB 1532 into law (Ella Baker Center, 2012).

[104] At this time, CEJA withdrew its support of SB 535 and took a neutral position. As a statewide EJ organization, it did not want to endorse legislation that could be seen as validating cap-and-trade. CEJA's member organizations, APEN and PODER remained as co-sponsors and supporters of SB 535 (Parino, 2013– author interviews).

Section 5.8: The SB 535 Coalition and the Implementation Process

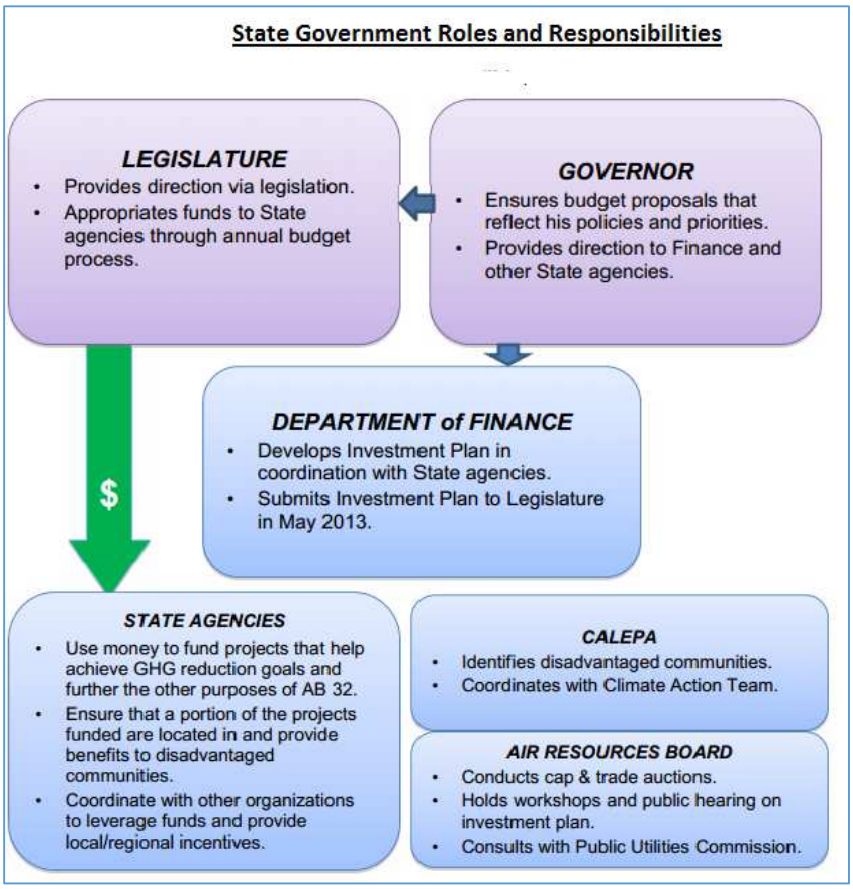


Figure 46 illustrates the roles and responsibilities of the various entities that are involved in developing the investment plan, as well as allocation and implementation of the auction proceeds. Source: CARB (2013a).

The celebration of the passage of SB 535 was purposely short-lived as the co-sponsors quickly shifted towards implementation. This phase was crucial, as the Department of Finance and CARB were required to develop a three-year investment plan to allocate the billions of dollars from the cap-and-trade program; the agencies were scheduled to release a draft of the plan for public comment in early 2013 (Figure 46). "After it was signed into law, the co-sponsors, APEN, the Coalition for Clean Air, Public Advocates and the Greenlining Institute, then said that we want to continue with implementation. So we turned our supporter list from SB 535 into an implementation coalition - the SB 535 Coalition" (EJ advocate, 2013 –author interview).[105]

[105] It is important to note that while environmental and social justice groups supported AB 1532, they did not co-sponsor that piece of legislation. Perhaps in a sign of loyalty to Senator De Leon, the first author of the CBF legislation, in advocating for the investment plan funding priorities, they only referred to themselves as the "SB 535 Coalition."

The SB 535 Coalition convened strategy meetings in October 2012 with grassroots, community-based organizations about developing a framework to secure the benefits promised to disadvantaged communities by SB 535. From those meetings, the coalition went on to conduct several webinars and regional and statewide workshops. These workshops helped facilitate engagement in CARB's public process for adopting the investment plan and aided in soliciting ideas from disadvantaged communities about potential funding opportunities. Chief among these engagement efforts was a November 2012 survey of 28 environmental justice organizations. The survey results helped the coalition better understand the needs of California's disadvantaged communities and the programs that the SB 535 Coalition should prioritize in the CARB investment plan.

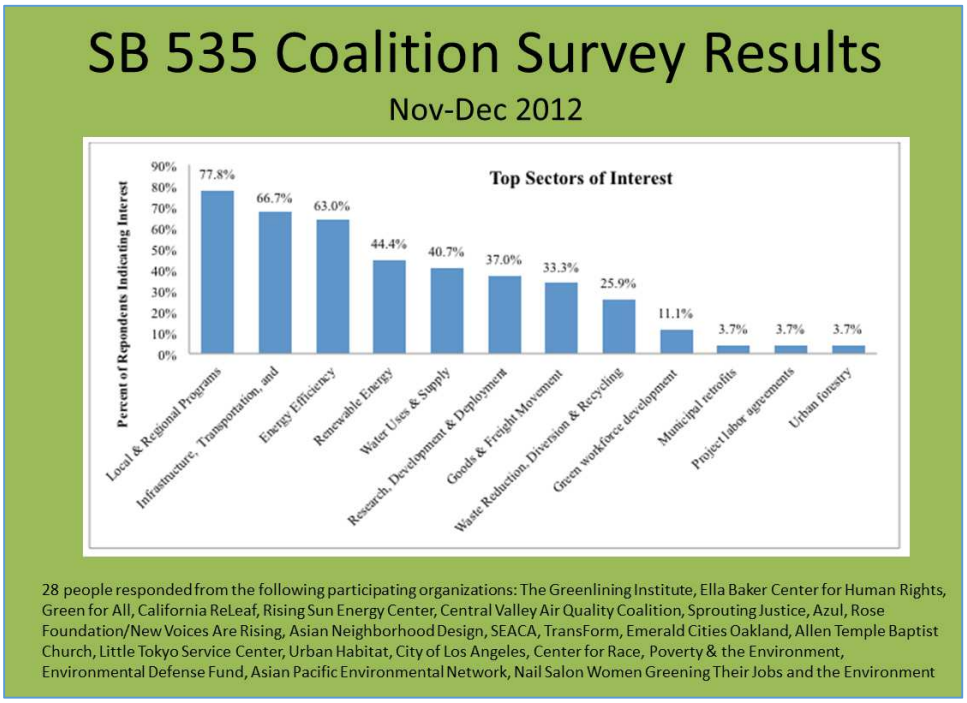


Figure 47 Source: SB 535 (2013) Coalition webinar.

The survey results identified five existing statewide programs as high priorities for near-term investments, such as affordable transportation and housing, low-income energy efficiency and renewable energy programs, and urban forestry projects. (Figure 47). These existing statewide programs were chosen because they were viewed as providing the greatest investment and health co-benefits opportunities in disadvantaged communities.

Figure 48: SB 535 Priority Funding Fact Sheet. Source: SB 535 Coalition (2013).

Throughout the winter of 2013, the SB 535 Coalition gained strong momentum for a majority of their recommendations for near-term priority projects.[106] They developed elaborate reports, fact sheets, and lobbying strategies to ensure their funding priorities were included in the investment plan (Figure 48). This included organizing the attendance of EJ and social justice leaders at CARB's Investment Plan hearings and the submission of comment letters highlighting their near-term recommendations (Mayer, 2013 – author interview).

[106] The SB 535 Coalition also identified several mid- to long-term priority areas, such as low carbon freight transportation and water efficiency programs. However they noted these areas required further analysis, stakeholder outreach, and legislative authority to implement.

However, as the coalition lobbied their priority programs, they met resistance with their proposal to fund affordable housing projects near transit as a climate mitigation solution. According to Guillermo Mayer, senior attorney with Public Advocates and SB 535 Coalition member, administration officials initially expressed doubt that affordable housing had a meaningful role to play in climate action planning. “When we first started talking on the state level about affordable housing, it wasn’t even on the radar of a lot of decision makers as a strategy…I think people weren’t seeing the links between GHG reductions and affordable housing and also the links between affordable transit and actually maintaining existing ridership” (Mayer, 2013 – author interview).

Many policymakers did not understand that constructing transit-oriented development (TOD) projects in existing high-density neighborhoods can be an effective GHG mitigation measure, but has the potential to displace low-income people, seniors, and renters as older housing stock is replaced with new market-rate units. In actuality, Mayer claimed that housing displacement from TOD projects could have the effect of undercutting GHG mitigation strategies as lower-income residents would be forced to move out to cheaper suburban locales with even fewer transit options. As a result he asserted, many individuals would be forced to buy a car to commute to work and community services, thereby increasing a region’s vehicle miles traveled (VMT) and its GHG emissions. These assertions were supported by data analysis developed by the Oakland-based transportation justice nonprofit Transform and the California Housing Partnership. Their analysis showed that a 10 percent investment of cap-and-trade revenues would create 15,000 affordable housing units near transit. This equates to nearly 2 million metric tons of GHG reductions or 105 million fewer miles driven over a 55-year estimated life of these buildings (Figure 49). Their analysis also showed that low-income households living within ½ mile of transit drive 30 percent fewer miles. This rate increases to 50 percent fewer miles traveled when these households are within ¼ mile of transit with frequent service. Conversely, higher-income households living within ¼ mile of transit drove twice as many miles as did low-income households (Transform, 2014).

Following months of lobbying and presentations of studies linking housing displacement and increased VMT, the SB 535 Coalition finally persuaded CARB officials, the Department of Finance, and the governor’s office that affordable housing near transit was a worthy climate mitigation strategy. “We were able to convince administration officials about the link…we had to point to some studies that we were able to compile together that pointed us in that direction, and we got it in [the investment] plan (Mayer, 2013 – author interview).

Figure 49: Benefits from a 10 percent cap-and-trade investment in affordable housing as a GHG mitigation strategy. Source: Transform (2014).

In May 2013, CARB finally the first investment plan for cap-and-trade proceeds for approval by the Legislature. The plan provided strategic direction for identifying priority state investments to achieve GHG reduction goals and yield valuable co-benefits at the statewide scale, and most importantly in disadvantaged communities.[107] Unlike the regulatory process for the AB 32 Scoping Plan, the investment plan included a majority of recommendations proposed and favored by environmental justice advocates. In the 2014-2015 fiscal year, the state is providing $285 million to GHG mitigation projects located within, and benefiting, disadvantaged communities (CARB, 2014b). These projects include urban forestry, low-carbon transportation, transit operations and affordable housing, energy efficiency programs and waste diversion (Figure 50). For projects to be eligible, CARB requires that they "provide direct, meaningful, and assured benefits to disadvantaged communities" (2014; pg. 1). Due in large part to the influence of the SB 535 Coalition, CARB's guidance memo for agencies administering investments places a strong emphasis on projects that create health co-benefits from reducing health harms (e.g., asthma and obesity) due to air pollutants and the built environment. The guidance also stresses a priority for projects that reduce heat-related illnesses and increase thermal comfort (CARB, 2014b).

[107] The Governor's January 2013 budget request had proposed investing $500 million from auction proceeds in accordance with the investment plan; however the governor's May 2013 Revised Budget, which was approved by the Legislature, instead provided for a one-time $500 million loan from the GHG Reduction Fund to help offset the overall state budget deficit. According to CARB officials, the delay in distributing the auction proceeds would provide state agencies additional time to design and modify existing state programs in accordance with the investment plan (CARB, 2013a).

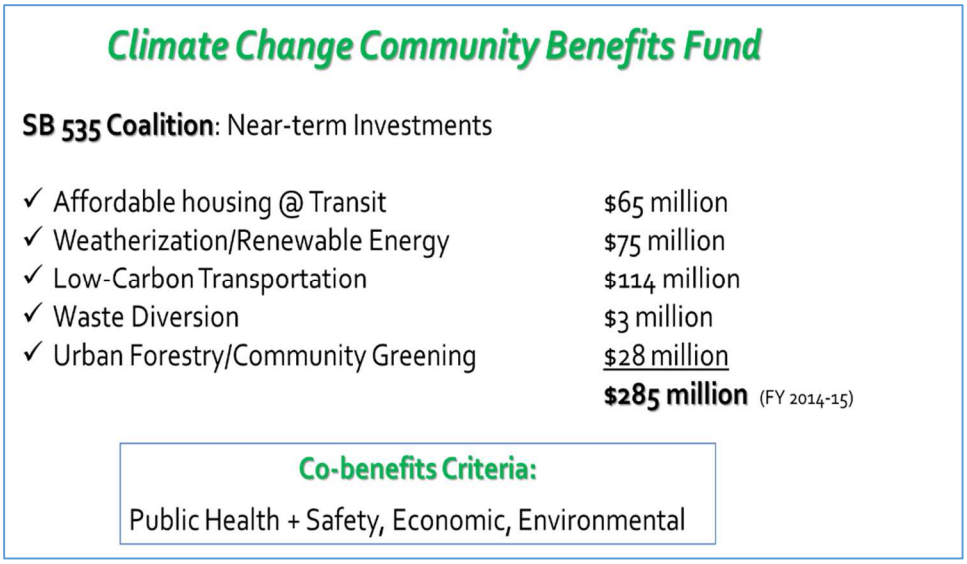


Figure 50: FY 2014-15 Cap-and-trade investments for disadvantaged communities (CARB, 2014b).

Section 5.9: Coming Full Circle on Climate Change Community Benefits Funds

> For APEN, our statewide work, our state policy work has to come back to Richmond and Oakland…***We have to be able to see those benefits come back to the communities that we are working in*** (Taruc, 2013 – author interview).

The quote above from APEN concisely summarizes the environmental justice community's civic epistemology of climate change – climate policy and initiatives must be confronted at multiple scales. It must provide real and direct benefits for local communities most impacted by the phenomena. This public way of reasoning was carried forward even after the SB 535 Coalition successfully influenced the final draft of the state's investment plan. APEN, Public Advocates and several other SB 535 Coalition members, working through the 6 Wins for Social Equity Network, strategically shifted their statewide efforts to focus on auction revenues that were specifically dedicated to regional governments.

The 6 Wins Network's[108] advocacy campaign was centered in the San Francisco Bay Area, where the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) were responsible for developing a regional blueprint required by state law (SB 375) as a condition of receiving cap-and-trade funding and state/federal transportation grants.[109] The regional blueprint (also known as the Sustainable Communities Strategy) must integrate land-use planning and transportation networks in a way that achieves passenger vehicle GHG emissions reductions while addressing housing needs and other regional planning objectives. ABAG and MTC's blueprint, called "Plan Bay Area," determines how billions in public transportation money will be spent over 28 years in the 9-county region. The plan seeks to influence how and where the region will house the 2.1 million new residents projected to live in the region by 2040 (Maracantonio, 2013).

The 6 Wins Network had worked for several years attempting to get the regional governments in the San Francisco Bay Area to commit to their equity-driven alternative regional blueprint. In 2011, it developed the Equity, Environment and Jobs (EEJ) Scenario focused on creating a more healthy, prosperous, and sustainable region for Bay Area residents of all races and incomes. However, partly due to intense lobbying by the building and real estate industry, MTC and ABAG eventually chose not to adopt the EEJ scenario or many of the local transit, affordable housing, and displacement recommendations the 6 Wins Network advocated (Maracantonio, 2013).

---

[108] The Network defined their "6 Wins for Social Equity" as follows: community power, local transit service, healthy and safe communities, economic opportunity, affordable housing, and investment without displacement.

[109] For more information on this law, commonly known as SB 375 Sustainable Communities (Steinberg, Chapter 728, Statutes of 2008), see Barbour, Elisa, and Elizabeth A. Deakin. 2012. Smart Growth Planning for Climate Protection. *Journal of the American Planning Association*, 78 (1): 70–86.

Nevertheless, bolstered by the SB 535 Coalition's recent success in Sacramento, at the final hearing on the adoption of Plan Bay Area on July 18, 2013, the 6 Wins Network secured substantive amendments incorporating several of the issues community advocates had sought throughout the Plan Bay Area process. In the words of Public Advocate's Richard Marcantonio:

> The final plan adopted last night includes decisive improvements on many of the issues low-income communities and communities of color have been fighting for over the past three years. In particular, three amendments will help protect families in these communities from displacement, improve their access to local transit service, and give them a voice in how billions of dollars in cap-and-trade revenues will benefit them (Marcantonio, 2013).

One of the key amendments referenced by Marcantonio was secured through Contra Costa County Supervisor John Gioia, who also was a recent appointee to CARB. Gioia introduced an amendment (similar to the mandates required by SB 535) that commits the San Francisco Bay Area region to an inclusive public process to set priorities for cap-and-trade revenue. Gioia's amendment to Plan Bay Area, guaranteed that at least 25% of cap and trade revenues eligible to the region would be spent to benefit disadvantaged communities.

With the adoption of the SB 535 cap-and-trade investment plan and the Gioia amendment in the Plan Bay Area, the concept of a Climate Change Community Benefits Fund had come full circle. While California's cap-and-trade program still remains controversial with some groups, EJ advocates have deepened the state's commitment to disadvantaged communities by making environmental justice a core goal of climate change policies. Moreover, the EJ advocates approach to demand that climate policies produce co-benefits remains a fundamental factor for continued support by California residents. In a 2013 statewide survey, a majority of Californians (52 percent) specified that cap-and-trade auction revenue should be used to improve environmental conditions in disadvantaged communities. Most interestingly, 65 percent of Californians also indicated that the state should act immediately to meet its climate goals, even in difficult economic times– up nine percentage points from 2012 (PPIC, 2013). In essence, the establishment of the CBF is providing opportunities to explicitly link California's climate change policies with air quality, public health, and economic goals. When fully implemented, investments will not only accelerate the reduction of global GHG emissions; they will also help improve environmental health conditions and induce revitalization in historically disadvantaged communities.

Section 5.10: Conclusion - Rescaling Climate Policy and Influencing California's Civic Epistemologies

The adoption of California's Climate Change Community Benefits Fund illustrates how and why particular governments develop linkages between climate change and population health at various scales. In California, environmental justice groups are simultaneously pressuring the state to consider both the burden of climate change (e.g., environmental injustice and uneven geographic impacts) and the benefit of mitigation policies for environmental health in practice. This chapter illustrates that environmental governance entails a variety of decision points that involve determining who makes particular policy choices, and which criteria and knowledge are used in making those decisions. From the scientific knowledge of state regulators, to the local knowledge of EJ activists, the struggles over the institutionalization of environmental expertise in governance regimes creates contentious climates.

Environmental justice groups are challenging normative issues that are bound up with scientific representations of nature. In their challenge, they are mobilizing support among diverse actors to addresses the social and economic changes needed to implement socially-robust climate change policy (Jamieson, 2001). While EJ advocates in California have made significant progress in validating their civic epistemology of climate change, they did so primarily through oppositional tactics, such as the enactment of legislation or the filing of lawsuits to effect regulatory agency behavior. By working within the confines of regulatory processes, EJ groups often have to engage in "trade-offs" or compromises to bring about social change (London et al., 2008).

While most EJ groups are philosophically opposed to market-based mechanisms, social movements like the SB 535 Coalition have had to embrace pragmatic approaches to ensure that 'compensation' via cap-and-trade revenues is directed to the communities most impacted by air pollution. It has only been through the establishment of a CBF that the goals of AB 32 to protect and invest in disadvantaged communities are starting to be fully realized. Moreover, as we have seen through these oppositional tactics and trade-offs, climate policy can only achieve public credibility and political authority when the boundaries of the relevant moral-political space are redrawn so as to accommodate the interests of all parties (Jasanoff, 1997; Pg. 242).

> These compromises have been attributed to the process of institutionalizing the goals of a social movement into a preexisting political context with often conflicting organizational dynamics and regulatory imperatives. Indeed, as issues move from social movements into policy, the meaning and methods of state and regulatory enforcement are highly contested. Understanding the dynamics of these power relations and the relative strengths and weaknesses of the parties as they intersect to form this policy arena is critical to a full analysis of environmental justice in California (London et al, 2008; Pg. 289).

Though these contestations and pragmatic trade-offs, EJ groups are revealing that climate change is not just an environmental problem that requires a singular, top-down policy solution. EJ groups have shown the utility of multiscalar approaches that tackle a global environmental problem as well as public health issues at the neighborhood level. By scaling-up community-based approaches and local knowledge, they offer an alternative conceptualization of what the phenomenon of climate change means not just in the physical sense, but what it means in different places and scales, to different peoples, and at different times. Through the case of California's Climate Change Community Benefits Fund, we have followed environmental justice actors through contentious geographies and entered into a network where climate change is simultaneously constructed as a universal and localized as a particular.

CHAPTER 6
California's Climate Beyond Borders:
Trans-local Climate Justice Movements at the Capitol

> In Acre, Brazil, the demarcation of indigenous territories is paralyzed because they want to take our lands to make profits from environmental services through programs like REDD [forest carbon offsets]. We will not and cannot trade our hunting, our fishing, and our lives for pollution. You cannot trade pollution for nature. We are for life – therefore we are against REDD.
>
> - Ninawa, president of the Federation of Huni Kui people of Acre, Brazil, in his remarks to California environmental justice leaders regarding international forest carbon offsets (2012a).

The passage of Assembly Bill 32, the Global Warming Solutions Act has made California a world leader on climate change science and policy innovation. AB 32 is considered a landmark bill that could spark other subnational governments to adopt similar programs. In recent years, California has proposed creating another international precedent, by allowing businesses that otherwise would have to reduce their emissions at home; to forgo those obligations. Instead of following state requirements, California business could opt to invest in forests in Acre, Brazil and Chiapas, Mexico by purchasing "carbon sinks" to offset the pollution they generate.

The potential use of these so-called "Reducing Emissions from Deforestation and Degradation" (REDD) carbon offsets has provoked international discontent from indigenous rights leaders in the Global South and California environmental justice advocates. This emerging trans-local climate justice movement argues that such offsets produce emissions "hot spots" where pollution continues at the point of source in California. At the same time, the burden of reducing emissions shifts to the Global South, where the commodification of tropical forests as carbon sinks results in land grabs and forced displacement of poor indigenous communities. The conflict over REDD offsets eventually led to an international delegation of indigenous leaders from Brazil, Mexico, and Ecuador to join California EJ advocates in Sacramento at a 2012 CARB hearing to oppose the state's proposed carbon offset scheme.

In this chapter, I first describe how California's attempt to make its cap-and-trade program part of a larger international carbon market has significant social implications for local communities worldwide. Second, I examine the methods California environmental justice groups are using to influence climate change policy formation and implementation within and among nation-states. Finally, this chapter concludes that the phenomenon of climate change is not configured in a single place or scale. Rather, climate change is an object of multiple natures, which is brought into being by ensembles of heterogeneous actors, techno-scientific practices, and socio-economic variables.

Section 6.1: An Overview of California's Global Climate Regime

> California as a 'nation state' is pivotal in the great struggle to transform the world economy. If we continue to pioneer and to prove that we can succeed environmentally as well as economically, other people will be able to follow. What happens here doesn't stay here. It goes all around the country and all around the world.
>
> – Governor Jerry Brown at the United Nations Climate Summit in New York City (Brown, 2014).

Figure 51

California has signed over 35 Climate Agreements with other governments. Source: CARB (2014c)

If California were a country, it would rank among the top 20 greenhouse gas emitters in the world, ahead of the nations of Spain and Italy. The state produces 1.3 percent of the total global emissions and 8.8 percent of the United States' total emissions. By comparison, Germany (2.35 percent), Australia (1.25 percent) and Italy (1.13 percent) each account for less than 5 percent of global GHG emissions (EDGAR Database, 2014; CARB 2014c). While California is only one of the nation's 50 states, it has surpassed the U.S. in the comprehensiveness and range of its overall GHG emissions reduction plan. As a subnational actor, California is engaging in the climate change policy arena on par with the world's nation-states (Mazmaian et al., 2008).

State policymakers view California as a member of the global community and envision its cap-and-trade program as part of larger domestic and international carbon markets. The state

ushered in a new era of international linkages on January 1, 2014, when California and the Canadian province of Quebec, fully integrated their cap-and-trade programs. The linkage, allowing carbon allowances from either jurisdiction to be used for both programs, is the first cross-national linked emissions trading program between two subnational jurisdictions. According to CARB (2013b), linking the two carbon markets creates a broader range of emission reduction opportunities, enhances market liquidity and reduces volatility caused by temporal events, like extreme weather or economic downturns. Linkage between the two programs reduces duplicate administrative services and overall costs (Stavins et al. 2014). In attempts to expand the state's global reach, California has also signed Memorandum of Understanding (MOU) agreements with more than 35 nation-states and subnational governments (Figure 51). These MOUs cover issues that help facilitate global climate policy transfer and cooperation on low-carbon strategies while encouraging trade and investment in clean energy technologies (CARB, 2014c).

While economists and policymakers applaud California's efforts to develop more efficient carbon markets, environmental justice advocates claim that such linkage programs may adversely affect some Californians. They argue that linkage programs not only expand the state's carbon markets but also encourage the trading of mechanisms that do not require emissions reductions within California's borders. Polluters that cannot meet their GHG emissions reduction obligations can also purchase 'alternative compliance mechanisms' that are commonly referred to as "carbon offsets." AB 32, allows these companies to apply offset credits equivalent to 8 percent of their mandated emissions cap. These credits, which are also traded on the carbon market can be generated by GHG reduction projects located anywhere in the United States and potentially the world (CARB, 2014c). The projects are operated by entities such as private landowners, non-profit organizations, and corporations not otherwise regulated under the cap-and-trade program to reduce GHG emissions in industry sectors such as forestry or farming. Each offset credit is equal to one metric ton of CO_2 (CARB, 2008) and on average is $3 cheaper than carbon allowance credits (an offset credit costs $9, versus $12 per allowance credit). CARB considers offsets as an important mechanism to encourage GHG emission reductions in a variety of sectors while decreasing compliance costs of regulated entities (EDF, 2015).

California's cap-and-trade market regulates more than 400 large utilities and manufacturing facilities that emit in excess of 25,000 metric tons of GHG annually within the state. EJ advocates argue that the expanded use of carbon offsets can pose additional burdens to residents who live near the state's refineries and power plants. Each offset credit purchased by a polluter means one less ton of GHG reduced (and its associated co-pollutants) at a California facility, or a one-metric ton increase in overall emissions. For example, in 2013 the Shell Oil Company (the U.S. subsidiary of Royal Dutch Shell), which owns two oil refineries and numerous other high-polluting facilities in California, purchased 500,000 forest offsets to meet its AB 32 obligations. These offset credits will not reduce any emissions near the company's California facilities. Instead, they will protect the environment in Michigan's pristine Upper Peninsula, where the offset credits will help sequester additional carbon dioxide from the atmosphere through the preservation of a 200,000 acre forest. The offset project is estimated

to produce more than $1.5 million in potential gross compliance cost savings for Shell (Blue Source and The Forestland Group, 2013).

The purchase of forest offsets encapsulates the conflicting civic epistemologies of climate change as the state attempts to expand its climate regime beyond its borders. In particular, there is significant contestation over the extent corporations regulated under AB 32 are responsible for lowering GHG and co-pollutants emissions in their local communities (Table 16). According to Guillermo Mayer, president of Public Advocates and member of the SB 535 Coalition, residents who are disproportionately burdened by air pollution should directly benefit from AB 32. "Instead of reducing the pollution locally through better technology upgrades or ramping down emissions, [polluters] get to buy trees in another part of the world. The residents nearby aren't helped" (Mayer, 2014b). He and other EJ advocates argue that from an equity and public policy standpoint, offsets are an inefficient method for polluters to meet a portion of their emission reduction targets (Parino, 2013; Kirsch, 2011 – author interviews).

To the contrary, mainstream environmental organizations like the Environmental Defense Fund (EDF) and the Nature Conservancy, assert that carbon offsets are a major component of California's GHG reduction strategy (Table 16). According to Emile Mazzacurati, managing director of Four Twenty Seven, a firm that advises business on carbon markets, offset credits provide polluters flexibility to search the country and potentially the globe for the most cost-effective methods to reduce GHG emissions while investing in conservation projects.

> What this program (AB 32 offsets) is supposed to achieve is a reduction in greenhouse gases. Greenhouse gases are, by their nature, global. It doesn't matter where they come from. They all go into the atmosphere (Mazzacurati, 2014).

The California Air Resources Board (CARB, 2014d) has issued nearly 17 million credits since 2011 for its five approved alternative compliance mechanisms (Figure 52).[110] The agency, however, will not release information on which polluters are purchasing offsets. According to a CARB representative, "each entity's strategy in purchasing offsets is considered market sensitive" (Halper, 2014). The lack of government transparency only emboldens environmental justice advocates' opposition to offsets (Truong; Mayer, 2013 – author interviews). The purchase of Shell's offsets was only made public through a press release from the operators of the Michigan forestry project (Blue Source and The Forestland Group, 2013).

[110] These mechanisms include Ozone Depleting Substances (ODS); Livestock; U.S. Forest; Urban Forest; and Mine and Methane Capture (MMC) projects. No offsets have been issued as of date for the Urban Forest or MMC projects. CARB is currently developing regulations for a Rice Cultivation offset projects (CARB, 2014d). Some voluntary offset projects that have been issued offset credits by approved voluntary registries for GHG reductions or removal enhancements that occurred between January 1, 2005 and December 31, 2014 may be eligible for CARB offset credits. These projects are referred to as early action offset projects (CARB, 2014d).

Table 16 Civic Epistemologies in a Global Climate Regime		
	CARB, Mainstream Environmentalists, Polluting Industries	**Environmental Justice Advocates**
Policymaking Approach	Top-down and multilaterial government agreements.	Bottom-up and Califronia community-based partnerships .
International Linkages	Facilitiates global GHG reductions and ensures the cost-effectiness of AB 32.	Expands carbon markets beyond California's borders without the consideration of EJ communities.
Offsets	(1) Limited opportunity for offset projects in California. (2) Global offsets reduce GHG emissions most cost-effectively while investing in conservation projects anywhere.	(1) For every offset credit purchased, one less ton of GHG (and associated co-pollutants) is reduced at a California facility. (2) EJ communities do not benefit from investments in environmental protection/conservation projects derived from offsets located outside California.
Public Health	AB 32 can provide both global and local health co-benefits.	Efforts to reduce GHG emissions and improve air quality should emphasize California disadvantaged communities first.
Global GHG Mitigation	Primary reduction strategy focused on the seven global GHG emissions identified under AB 32: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride.	Inclusion of short-lived climate pollutants, such as black carbon. Unlike the seven GHG emissions listed in AB 32, black carbon has a global and local public health impact.

CARB Offset Credits Issued

Project Type	ODS	Livestock	U.S. Forest	Urban Forest	MMC
Compliance	1,888,812	85,819	5,563,609	--	--
Early Action	5,461,320	706,683	3,010,796	--	--

Table includes all offset credits issued including offset credits placed in ARB's Forest Buffer Account and any offset credits that may have been invalidated.

Figure 52. Source: CARB (February 2015)

Most of the offset credits purchased in the near future, likely will not be linked to California environmental improvement projects. A review of CARB's offsets database found, a large majority of approved offset projects administered by out-of-state operators (CARB, 2015). A CARB official indicated that many projects are being developed outside of California because the state has a long track record of mandating and voluntarily pursuing a variety of environmental protection projects. At the same time, there are few eligible large-scale offset projects in the state. "California is proactive and has many regulations to protect the environment…It is a challenge to identify sources of offsets in California" (Halper, 2014). Environmental justice groups strongly discount this perspective. They claim that communities located near major polluters, historically, have failed to benefit from the state's clean-tech economy and investments in environmental protection have essentially bypassed many of the state's disadvantaged communities (Truong; Mayer, 2013 – author interviews).

> Polluters may also avoid reducing their emissions by purchasing "offsets". Offsets can be brought from a source nearly anywhere in the world and go to fund ecofriendly projects. So while trees are being planted in Canada, corporations can continue to pollute back home in California at levels equal to or even greater than they did before AB 32. [It] deprives nearby residents from the benefits of toxic, smog and particulate matter pollution reductions that would accompany many local greenhouse gas reductions. Environmental justice communities burdened by huge industrial concentrations of pollution would likely see no benefits when major polluters buy, instead of reduce their pollution.
> --Center for Race, Poverty, and the Environment (2013) explaining its position on offsets.

This trend towards outsourcing environmental benefits was recently exemplified by a report produced by a carbon trading consulting firm that estimated the state of Louisiana could raise as much as $1.6 billion from forest and coastal wetland restoration projects over the next 50 years by selling offset credits to polluting companies in California (Figure 53). Louisiana offset operators contend that the state's forest and wetlands projects could produce more than 1.8 million carbon equivalent offset tons a year, and close to 92 million carbon equivalent offset tons over 50 years (Schleifstein, 2015).

Figure 53

Trees, like these cypress and tupelo in a Tierra Resources/Entergy/St. Charles Parish pilot restoration project in Luling, Louisiana, absorb CO_2 from the air and store it in their wood. The operators of the pilot project are seeking approval under California's offset program (Schleifstein, 2015).

Consequently, the debate over the appropriate policy scale to address the phenomenon of climate change is further complicated by the state's conflicting mandates and goals. AB 32 requires the reduction of global GHG emissions while providing opportunities to improve local air quality in communities already adversely impacted by air pollution (California Health and Safety Code, section §38565). As the state's cap-and-trade program expands beyond California's borders, the capacity for the state to exert global climate leadership and simultaneously improve local air quality becomes increasingly difficult.

The next section of this chapter examines the public health implications of offset usage beyond California's borders. This is followed by the discussion of the formation of a distinct coalition between California environmental justice groups and indigenous rights organizations from the Global South. This coalition seeks to allow the use of carbon offsets to only within California's borders in an attempt to avoid human rights violations abroad, while securing direct benefits to pollution-adjacent communities in California. The last section of the chapter analyzes the efforts by EJ groups to require the state to move beyond the seven greenhouse gases regulated under AB 32 and address global short-lived climate pollutants, like black carbon, which have local public health impacts.

Section 6.2: The Conflict Between Global Carbon Offsets and Community Benefits

In an effort to further the cost effectiveness of AB 32's cap-and-trade program, CARB's 2014 update to the Scoping Plan identifies international sector-based offset programs as a key strategy to ensure sufficient offsets are available to regulated entities. The update states that the cap-and-trade program includes a "placeholder for potential international sector-based offsets from programs designed to Reduce Emissions from Deforestation and Forest Degradation (REDD) through a future rulemaking" (CARB, 2014a; Pg. 88). CARB all but endorses the 2013 recommendations developed by a technical expert committee, the REDD Offset Working Group for establishing forest offset programs in the states of Arce, Brazil and Chiapas, Mexico. The working group's recommendations were funded by regulated entities under the cap-and-trade program and advocate that international offsets would be significantly more affordable than U.S. domestic offset credits, thereby ensuring the cost-effectiveness of California's carbon market (REDD Offset Working Group, 2013).[111]

Since the adoption of its U.S. forest offset protocol, CARB (2011c) has strongly asserted that efforts to reduce deforestation are a valued method to address global climate change and promote cost-effectiveness. Specifically, they contend that preserving trees is critical because they capture and store carbon. However, when forests are burned or cut down, the carbon contained in these trees is released, and the capacity for sequestering carbon emissions is lost. Deforestation remains the second largest anthropogenic source of carbon dioxide into the atmosphere, trailing only fossil fuel combustion. "Deforestation rates have remained high, particularly in developing countries, averaging approximately 13 million hectares per year from 2000 to 2010 -- roughly an area the size of England or Arkansas each year" (Wold et al., 2013; Pg. 2). This deforestation is mainly the result of the conversion of forests to agricultural land, unsustainable logging practices, and the expansion of settlements and infrastructure (Wold et al., 2013).

Therefore, efforts like forest offset programs are seen as key to preserving forests and mitigating the impacts of climate change. In supporting the REDD Offset Working Group recommendations, mainstream environmentalists also argue that developing nations, like Mexico and Brazil, can play a major role in reducing deforestation. In particular, they argue that creating mechanisms to help developing countries to progress economically without relying on carbon intensive practices and energy sources is key to the success of a globally-linked climate reduction strategy (EDF, 2015). For these reasons, support for expanding California's carbon market to include offsets in Latin America that reduce deforestation is increasingly gaining momentum in Sacramento. International offsets are seen as consistent with AB 32, which requires the consideration of establishing linkages with other subnational governments and countries. According to section §38564 of the California Health and Safety Code, the "state board shall consult with other states…and other nations to facilitate the development of an

[111] As described later in this chapter, Governor Arnold Schwarzenegger in November 2010, signed a Memorandum of Understanding (MOU) with the states of Chiapas, Mexico and Acre, Brazil requiring the establishment of a subnational REDD Offset Working Group to develop AB 32 linkage recommendations.

integrated and cost-effective regional, national, and international greenhouse gas reduction program."

The recommendations provided by the REDD Offset Working Group, however, fail to consider the impact of international linkage programs on environmental justice in California. AB 32 requires that prior to inclusion of any market-based mechanism, the state board must: (1) design any market-based compliance mechanism to prevent increase in the emissions of toxic air contaminants or criteria air pollutants and, (2) consider the potential for direct, indirect, and cumulative emission impacts from these mechanisms, including localized impacts in communities that are already adversely impacted by air pollution (California Health and Safety Code, section §38570). The Working Group's recommendations also overlooks AB 32's "Community Empowerment" amendment, which requires public and private investment toward the most disadvantaged communities in California and provides an opportunity for community institutions to participate in and benefit from efforts to reduce GHG emissions (California Health and Safety Code, section §38565).

According to EJ advocates, international forest offsets reducing secondary benefits, such as those relating to public health and community investment, undermine a central component of AB 32: its environmental justice provisions (Taruc, 2013 – author interview). As noted by legal scholar Alan Ramo (2013), the AB 32 Scoping Plan explicitly promised Californians secondary health benefits from its GHG reduction programs. The unfettered inclusion of international offsets may make that pledge ring hollow:

> The upshot is that while CARB promised health benefits here at home from cap-and-trade, those may potentially prove illusory in exchange for the appearance of reductions elsewhere in the globe. Whether these offsets really swamp California's cap-and-trade program or simply spread the regulatory gospel around the world will be settled on the ground based upon the implementation of these programs (Ramo, 2013).

According to a study by the Union of Concerned Scientists (UCS), offsets could potentially represent a large portion of all GHG reductions in California's cap-and-trade program (Figure 54). While the quantitative limit on the use of offsets is 8 percent of the total credits required to be held by each emitter (or 8 percent of their total emissions), this cumulative usage limit (calculating all state emitters' maximum allotment) equals more than half (53 percent) of the total reductions required in California between 2013 and 2020 (Haya, 2009).

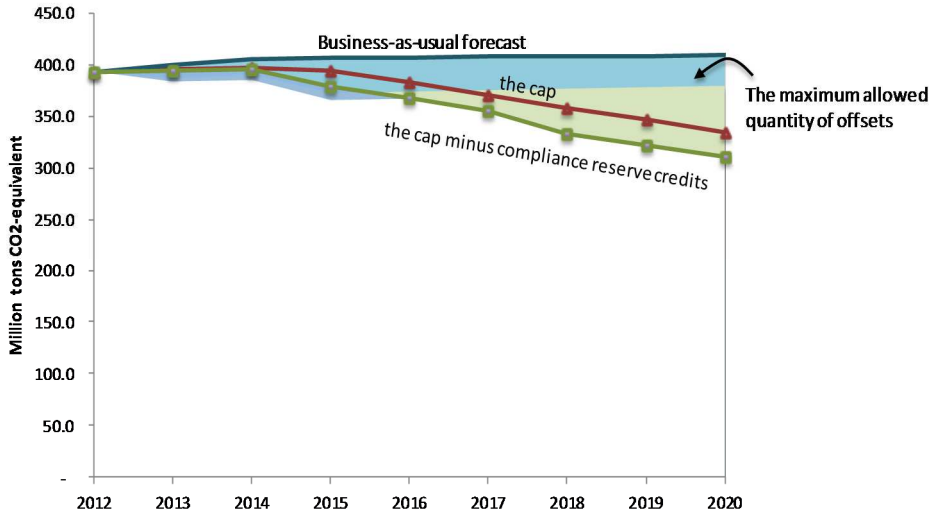


Figure 54
The maximum offsets limit amounts to 53 percent of total reductions needed under AB 32. Source: Haya (2009).

The UCS estimate represents a worst-case scenario of offsets usage in California's cap-and-trade system. Nevertheless, the implications from a high offset usage rate have raised public health concerns from other researchers. According to a study by UC Berkeley economist, David Roland-Holst (2009), a cap-and-trade program with offset credits could actually worsen criteria air pollutants in California, including total organic gases (TOG) like methane; reactive organic gases (ROG) like benzene; carbon monoxide (CO); and smog-forming pollutants such as nitrogen oxides (NO_x) and fine particulates (PM10, and PM2.5).

The blue bars in Figure 55 illustrate how criteria pollutant levels would change if half of the emissions reductions under a cap-and-trade system were achieved through offsets limited to "In-state" projects – that is, offsets based exclusively in California's nonregulated sectors, such as agriculture, landfill, and forestry. The results are mixed, with decreases in methane but increases in NO_x emissions. Methane and benzene are reduced because GHG emission reduction strategies are moved to the methane-intensive agriculture and landfill sectors. However, smog-forming NO_x pollution levels are higher because the entities buying the offsets are likely to have more NO_x-intensive operations than the entities selling them. For example, an oil refinery that purchases an offset credit continues to emit GHG and NO_x emissions, while the dairy that sold the offset credit reduces its emissions. Because the refinery has more NO_x pollution associated with every ton of GHG, total NO_x emissions increase as a result (Roland-Holst, 2009).

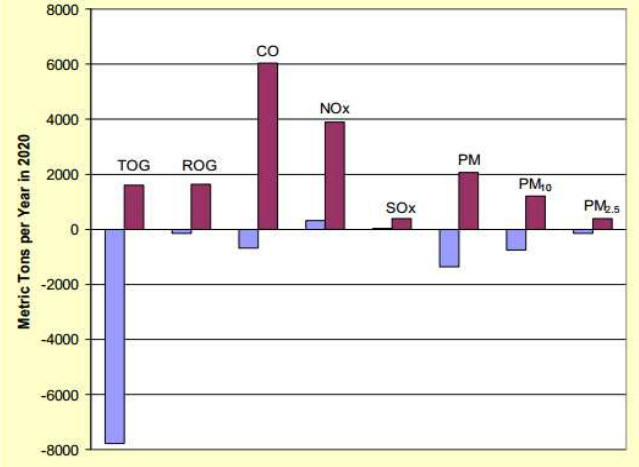


Figure 55: The Effect of Offsets on Criteria Air Pollution levels in California
Source: Roland-Holst (2009; Pg. 13)

Roland-Holst's (2009) study also illustrated a scenario in which half of the cap-and-trade emissions reductions were achieved through the use of out-of-state offsets. In this scenario, the level of each criterion air pollutant would be higher. However, if all of the cap-and-trade emissions reductions were achieved through out-of-state offsets, criteria air pollutants would significantly increase. As shown by the red bars in Figure 55, NO_x and PM would increase by nearly 4,000 metric tons and 2,000 metric tons per year, respectively, in 2020. Roland-Holst concludes that, by substituting direct emissions reductions from regulated sectors with offsets from out-of-state projects, California could effectively export air quality benefits. He cautions that offsets should be closely monitored and limited since their usage could have a significant impact on California air quality (Roland-Holst, 2009).[112]

While this research has shown that carbon offsets have the potential to reduce secondary health co-benefits, state policymakers continue to advocate for offsets within an integrated and cost-effective international climate change program. According to Virgil Welch, special assistant to CARB chair Mary Nichols, AB 32 is more than just about reducing emissions; it also intended to promote an economic imperative for investment in new clean technologies and business sectors not regulated under cap-and-trade.

> You have to understand what we're doing here in California, in the national context. It's not just about emissions reductions. What we're talking about is a permanent shift toward a less carbon-intensive economy…What we're talking about is a long-term transition, and not just the immediate emissions reduction goals…While there's an environmental imperative, there's also an economic imperative (Welch, 2010).

[112] The analysis assumes that every available GHG emissions reduction in the forestry, agriculture, and landfill sectors will be available as an offset. However, it is unlikely that every reduction can be easily and cost-effectively quantified and traded in the offset market. Therefore, co-pollutant reductions could be smaller than shown in Figure 55 (Roland-Holst, 2009).

Welch (2010) has also publicly stated that carbon offsets, like an international forestry protocol provide economic incentives under AB 32 to increase the capacity of forests to store carbon. Prior to the adoption of CARB's U.S. forest protocol, there was little monetary benefit to conserve forests. With adoption of that protocol, however, a growing market for trading forest offset credits now exists. As previously noted, landowners who conserve forests can earn carbon offset credits based on an assessment of the amount of CO_2 a forest can store and a market-driven price per ton of carbon. Landowners can sell offset credits to polluters, thereby generating revenue that provides them with an incentive to avoid cutting down trees.

State policymakers, moreover, see the inclusion of a REDD forest offset protocol under AB 32 as a new opportunity to tackle the environmental and economic imperatives of global climate change. The consideration of REDD offsets was first set in motion on November 16, 2010, when former Governor Arnold Schwarzenegger signed a Memorandum of Understanding (MOU) with the states of Chiapas, Mexico and Acre, Brazil. The agreement signed with the two foreign states outlined goals for linking a state-to-state forest offset program (Schwarzenegger, 2010b). The 2010 agreement specifically requires the establishment of a subnational REDD Offset Working Group to develop linkage recommendations to implement the world's first compliance pathway for REDD. During the signing of the MOU, Schwarzenegger emphasized the ability of regions to take immediate actions against climate change, regardless of stalled multilateral agreements.

> With or without international agreements, the green revolution is moving full-speed ahead in states, regions and provinces. I have seen the power these regional governments carry in influencing and creating the new ideas that spur clean innovation, reduce emissions and create jobs, and this summit is an incredible opportunity to build on our sub-national successes. Together, we are ushering in a cleaner, brighter and more prosperous future that we can be proud to pass on to the next generation (Schwarzenegger, 2010c).

California's MOU was seen as setting a powerful precedent for connecting subnational REDD programs in the Global South with carbon markets in industrialized states. The MOU followed Acre's adoption of a State Incentives for Ecosystems Services program approved in October 2010. The law establishes the regulatory framework to incentivize forest protection and generate and certify carbon credits to reduce deforestation. Similarly, in recent years, the Mexican state of Chiapas has instituted various REDD-type readiness programs in anticipation of linkage with California's cap-and-trade program (Sinsley and Kreindler, 2010).

Section 6.3: Trans-local Climate Justice Movements at the Capitol

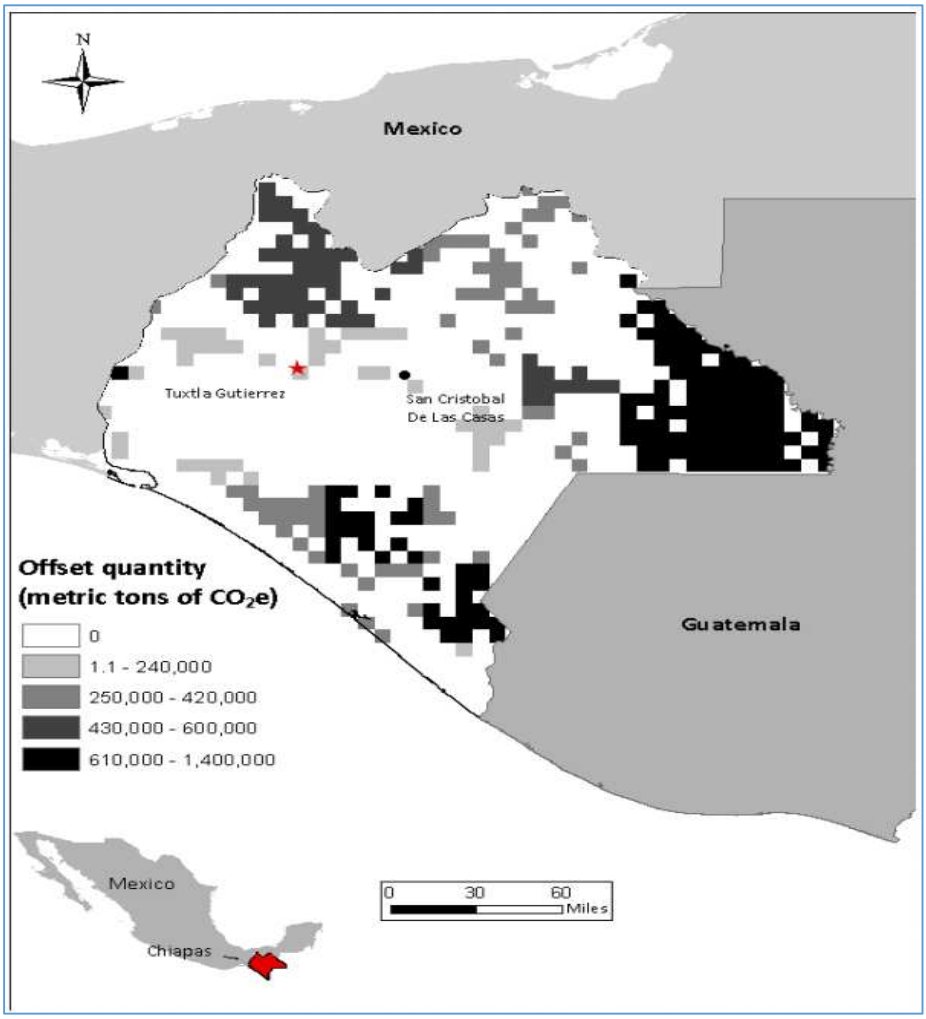


Figure 56:
Potential REDD Quantities in Chiapas, Mexico. Source RFF (2011).

While California and Global South policymakers tout REDD's benefits, indigenous groups are protesting the lack of consultation during the development of a program now targeting their lands for forest offsets (Conant, 2013 – author interview). According to Jeff Conant, an advocate with Friends of the Earth and author of *A Poetics of Resistance: The Revolutionary Public Relations of the Zapatista Insurgency*, Chiapas is the wrong place to test a new market-based mechanism from California. The southernmost of Mexico's 32 states and the birthplace of the 1994 Zapatista rebellion, Chiapas borders Guatemala and is the nation's poorest and most indigenous state (Figure 56). Chiapas has a long history of conflicts over land tenure, in particular in the Lacandon jungle area, where indigenous peoples have for centuries faced forced removal from their native territories by state actors and business interests (Conant, 2013 – author interview). The government of Chiapas' forest conservation programs in recent

years have paid landholders in the region nearly $200 USD a month to conserve forests. The programs are being implemented as an effort to delimit “natural protected areas” in order to generate offset credits that can eventually be linked to international carbon markets, like California’s cap-and-trade system (Conant, 2013 – author interview).

> What this means in practice is a mandate for those receiving the money [landholders] to cease planting their traditional crops (which are seen as harmful to the jungle), and to increase patrolling of their territory against outsiders, designated as “invaders.” Those invaders, generally speaking, are indigenous communities who have never had formal title to the land, but who have been settled in the region for hundreds, if not thousands of years (Conant, 2011).

Groups like Conant’s Friends of the Earth (FOE) and international indigenous rights organizations contend that REDD programs are creating a perverse economic imperative that could lead to new land grabs and forced displacement of poor indigenous communities in Chiapas and Acre. This conflict over extending California’s climate regime to the Global South prompted an international delegation of indigenous leaders from Brazil, Mexico, and Ecuador to travel to Sacramento to register their opposition at a CARB public hearing on October 18, 2012 (CARB, 2012a). Several California environmental justice organizations joined the delegation, among them the Center for Race, Poverty, and the Environment (CRPE), the Asian Pacific Environmental Network (APEN), and the California Environmental Justice Alliance (CEJA). California EJ advocates held that the inclusion of international forest offsets was a mechanism that would fail to reduce California’s industrial pollution and could risk the forced displacement of socially vulnerable indigenous peoples from communities outside the U.S. (Figure 57).

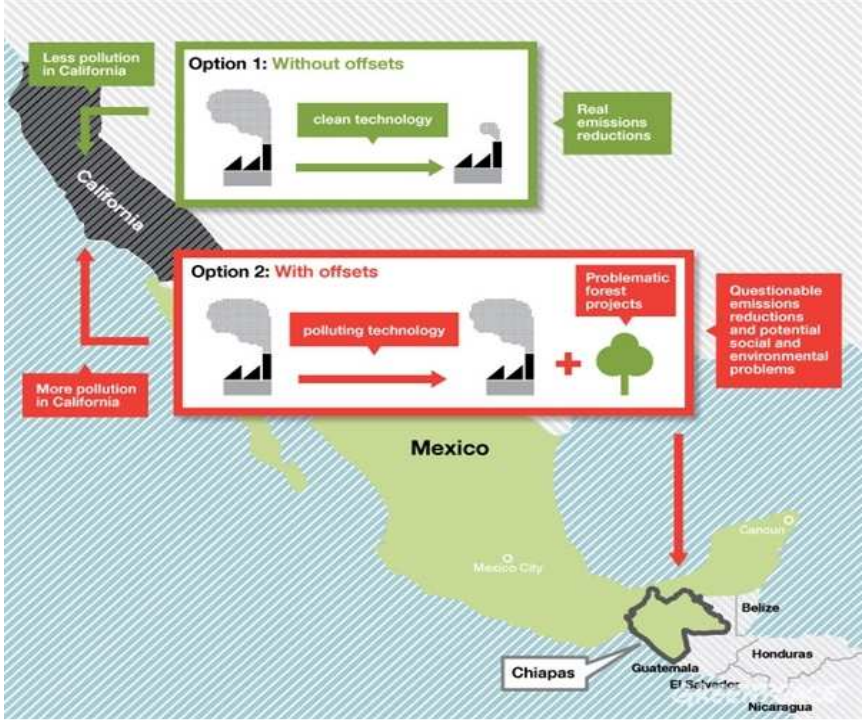
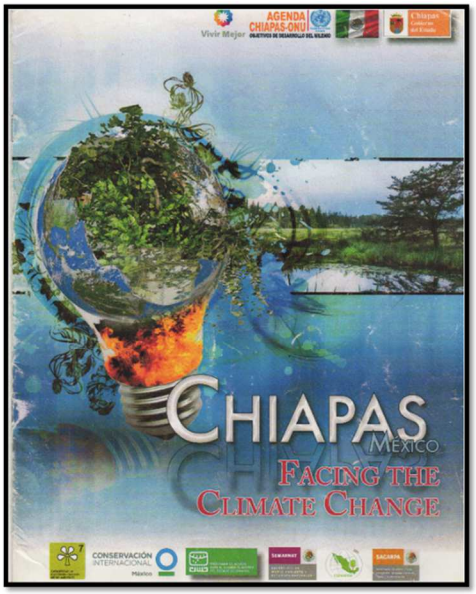


Figure 57:
Overview of Environmental Justice Groups’ Opposition to International Forest Offset projects.
Source: Brindis (2013)

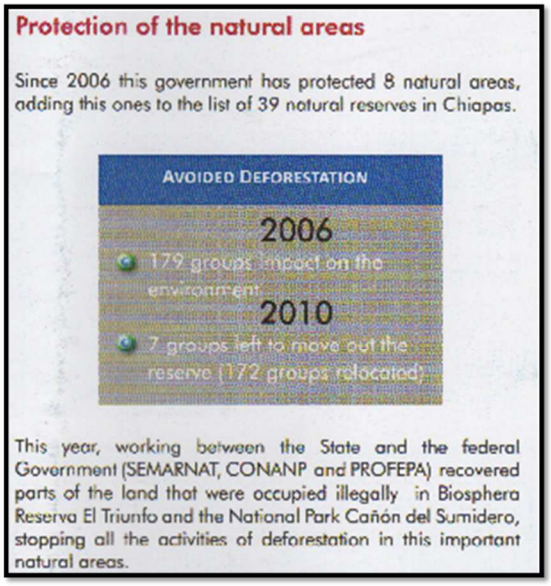
At the CARB hearing, the coalition of indigenous rights groups and California EJ advocates expressed strong support for California's efforts to reduce greenhouse gases and believed that conserving tropical forests is critical to protecting a global climate. However, they proclaimed that while no draft international forest offset protocol has been presented for public review, the MOU signed by Governor Schwarzenegger has set a precedent that is already leading to the eviction of indigenous peoples in Chiapas and Acre from lands in preparation for a California-linked REDD program. The coalition further stated that REDD readiness programs are undercutting efforts by indigenous peoples to gain formal land tenure (CARB, 2012a).

According to Rosario Aguilar, a public health worker in the indigenous communities of Chiapas, the state has a long history of profound social conflict, as well as three of the most intense agrarian land conflicts within its borders. As a result, she argued developing a REDD program would pose unacceptably high risks and should not be a part of California's climate change policies (Aguliar, 2012a). She presented CARB members with an official Chiapas state document highlighting that nearly 200 communities have been displaced for REDD readiness programs (Figure 58).

> I brought with me here today an official brochure of the state of Chiapas, Mexico that they distributed at the United Nations climate change negotiation in the Conference of the Parties (COP) #16 in Cancun, Mexico. It is a brochure about the efforts to promote and implement REDD and related avoided deforestation initiatives. This official document…clearly proves that REDD results in evictions. In fact, they brag about having evicted 172 communities to do REDD (Aguliar, 2010a).



Chiapas: Facing the Climate Challenge – Promotional brochure, UNCOP16, 2010



Detail: 172 illegal groups relocated in efforts to "avoid deforestation".

Figure 58:
Source: Aguilar (2012b) scanned copy of State of Chiapas UNCOP16, 2010 "Chiapas, Mexico, Facing the Climate Change Challenge" promotional brochure.

Aguilar further argued that while REDD has yet to be officially implemented, it is already causing social conflict and suffering within Chiapas' indigenous population. She displayed photos of communities that are resisting REDD and defending their livelihoods. Included in those photos was a portrait of Doña Juanita, one of the elders who founded the community of Amador Hernandez. Doña Juanita was described as a midwife with two legs in the photograph. However, it was noted that she recently had one of her legs amputated due to a lack of medical services. Aguilar claimed the Chiapas state government eliminated medical care to remote indigenous communities in an attempt to pressure communities to relocate so REDD projects could be implemented in those areas. (Figure 59).

> Doña Juanita no longer has one of her legs because…the government has suspended medical services to this community as one of the measures it is taking to pressure them to leave their forests, so that REDD can be done there. So indigenous communities that are living on the land are committed to saving the planet and combating climate change are suffering from the lack of medical services that the government has suspended to implement REDD (Aguilar, 2012a).

Figure 59:
Rosario Aguilar (2012c) speaking about Doña Juanita and the consequences of REDD projects.

Ninawa, the president of the Federation of the Huni Kui people of Acre, Brazil, a western state bordering Bolivia and Peru, also addressed CARB. His testimony indicated that the state of Acre along with Chiapas, is one of the few states to have signed formal agreements with California. Yet these agreements were signed with no consultation with the indigenous people who live in these regions. He referred to the United Nations Declaration of the Rights of Indigenous People, which guarantees the right to free, prior, and informed consent in the development of projects like REDD (Ninawa, 2012b). He urged CARB not to include REDD offsets in their climate program

because REDD-type programs are already restricting access to ancestral lands and impacting their livelihoods (Figure 60).

> Indigenous people are feeling the effect of REDD programs. The government has stopped the demarcation of our indigenous land. These are lands that are being included in REDD projects and large companies, operators and, landholders have had an eye on. They are restricting our way of life and our ability to have access to our traditional hunting, fishing, and gathering sites. So for this reason we are urging you not to accept REDD in your trading program (Ninawa, 2010b).

Figure 60:
Ninawa (2012c) – president of the Federation of Huni Kui people of Acre, Brazil testifying in opposition to REDD offset projects.

After several more indigenous groups provided testimony to CARB, California environmental justice advocates proceeded to proclaim their solidarity with indigenous peoples. They argued that the integrity of California's climate programs could be threatened if international offsets were included. EJ advocates strongly believed that GHG emission reductions should happen at the point of source. With direct emissions reductions, it was claimed, the public health of California communities next to polluting industries would be protected. Simultaneously, a refusal to implement REDD would prevent an onslaught of human rights violations abroad.

> We stand with our international brothers and sisters. We believe REDD programs…are bad for communities internationally that are being decimated from the program and [California] communities that are not receiving the benefit from local pollution reduction.
> -- Sofia Parino (2012), Senior Attorney with Center for Race, Poverty and the Environment.

When the CARB hearing concluded, the coalition of indigenous groups and California EJ advocates continued their lobbying efforts at the State Capitol (Figure 61). They met with senior staff from the offices of the governor and state legislative leaders, presenting them with a letter signed by more than 30 California-based organizations opposing REDD. During these lobbying meetings, the coalition informed policymakers of what they believed to be the inherent problems with REDD, as well as problems specific to the California-Chiapas-Acre context (Conant, 2013; Parino, 2013 – author interviews):

> REDD credits threaten to increase, rather than decrease global [GHG] emissions, and to delay emissions abatement in California. This can have particularly harmful effects on local communities who live around facilities that emit particulate matter, NO_x, and other carbon co-pollutants. Moreover, independent investigations into the promotion of international forest offsets have raised significant concerns with regard to the human rights of the indigenous peoples and local communities…We therefore like to ask that you not propose the use of international REDD offsets for compliance in California.
> --Trans-local climate movement letter to Governor Jerry Brown opposing REDD offsets (2012).

Following the Capitol lobby day, the coalition took strategic advantage of several other converging opportunities to organize a "No REDD Tour" throughout Northern California. The coalition, viewing California as being on the front-lines of the global REDD debate, it developed a No REDD Tour to raise awareness of the immediate impacts of REDD on indigenous peoples in the Global South and on pollution-adjacent communities in the Global North (No REDD Tour, 2012). The tour included speaking events, film screenings, and meetings between Indigenous leaders and California allies. These events coincided with meetings held by the REDD Offset Working Group and the annual Bioneers Conference.[113] Advocates saw in the effort an opportunity to assemble an important constituency in the REDD debate that could provide a platform for indigenous and EJ leaders worldwide (No REDD Tour, 2012).

[113] The national conference highlights the work of scientific and social innovators and helps support, nurture and propagate their ideas and models. Conference speakers come from interdisciplinary fields: environmental and socio-political activism. http://www.bioneers.org/what-is-bioneers/our-mission/

Figure 61:
Coalition of Indigenous and Environmental Justice Groups Lobbying at the California State Capitol in Sacramento. Source: Conant (2012).

The tour's outcome led to a larger public discussion in subsequent months on California's ability to monitor the integrity of international offsets in the face of on-going corruption in developing countries.[114] For example, Golden Gate University legal scholar, Alan Ramo (2014) noted that any international offset implemented in a developing country would be dependent upon the host country or third parties to validate the offset. Corruption at any stage of the implementation of an offset, including initial reporting, verification, and monitoring, could undermine offset programs. While corruption is a difficult problem to measure comparatively on an international scale, Ramo's (2013) comments have raised several concerns by Capitol staffers and EJ advocates. These included whether CARB has the capacity to monitor international offsets at similar levels to what it conducts for domestic offsets, and whether California should entrust countries facing high levels of perceived public sector corruption with the responsibility of validating offsets. They noted that CARB, unlike the federal government,

[114] In 2012, the Citizens Climate Lobby and Our Children's Earth Foundation also sued CARB claiming the offsets are a loophole because the projects were not new efforts to lower GHG emissions and would occur even without investments from polluters. The complaint sought a court order repealing and invalidating the offset program and prohibiting the state from using offsets as a compliance instrument in the cap and trade program. The trial court denied the petition for writ of mandate, concluding that AB 32 gave the Board vast discretion in promulgating GHG reduction measures, and that the Board's offset protocols were not arbitrary and capricious. In 2013, the court of appeal affirmed, holding that the Board did not exceed its power under AB 32. The case has been appealed to the State Supreme Court (Gullo and Doan, 2013).

lacks international authority to enforce AB 32's provisions or intervene in another country's sovereignty. In particular, senior Capitol staff members stated that California should not develop linkages where there is reason to believe that approving an international offset program may exacerbate or induce human rights violations in the developing world (Senior Capitol staff members, 2013; Parino, 2013 – author interviews).

Concerns about outsourcing pollution through out-of-state offsets were further raised in November 2014, when CARB voided 88,995 tons of offset credits. These credits were generated by Arkansas-based, Clean Harbors Inc., the nation's largest incinerator of chlorofluorocarbons (commonly known as Freon or ozone-depleting substances) and were voided because of the facility's noncompliance with federal environmental laws. On May 13, 2014 the U.S. EPA ordered Clean Harbors to pay a $581,236 penalty for improperly identifying and disposing of hazardous waste, improper storage of hazardous waste, and failure to comply with air emissions standards. California's cap-and-trade program gave CARB the power to invalidate previously-issued offsets upon determination that the relevant facility failed to comply with environmental, health, and safety (EH&S) requirements (O'Brien and Kempf, 2014). Existing regulations prohibit the incineration of chlorofluorocarbons within California, yet it is still allowed in many other states, like Arkansas, and incineration is an eligible project under CARB's Ozone Depleting Substances offset protocol (CARB, 2011e).

Clean Harbors' incinerator is located in the southern Arkansas town of El Dorado, where a one-fourth of its 18,000 residents live below the poverty line. In 2005, the town was listed as having some of the state's worst air. In the past ten years, the Clean Harbors incinerator has been citied or fined more than a dozen times. According to Arkansas attorney Sam Ledbetter, referring to Clean Harbors, "if a scofflaw is someone who has serial violations, they would fit the bill." Ledbetter sued Clean Harbors in 2005 over a fire that forced the evacuation of hundreds of socially vulnerable people; he sued again in 2012 following an incident in which a cloud of chlorine drifted over the town of El Dorado (Morain, 2014).

Clean Harbors destroys 80 percent of the nation's chlorofluorocarbons, an amount that reached 230 tons in 2011 and 300 tons in 2013 (Morain, 2014). Before CARB invalidated some of its offsets, Clean Harbors' demand to incinerate ozone-depleting substances was rising, largely in part because of California's cap-and-trade program. In 2014, it was estimated that Clean Harbors used 87 percent of the 5.5 million ozone-depleting credits CARB issued (Lusvardi, 2014). Clean Harbors recently announced plans to invest $100 million to build an additional rotary kiln incinerator, which will nearly double the El Dorado facility's hazardous waste capacity. According to a company spokesperson, this is the "first time in 30 years that a new incinerator has been built in the United States" (Arkansas Business staff, 2014).

Consequently, when CARB voided Clean Harbors' credits, it did not identify the companies purchasing the offsets, as CARB considers the information proprietary. It is estimated that nearly 20 California companies invested in the Clean Harbors incineration offsets, according to the law office of Latham & Watkins, which represents some of the polluters (Morain, 2014). CARB regulations require each company to purchase additional credits to compensate for the

now invalidated 88,995 incineration offset credits. CARB had initially issued a preliminary notice of its plans to review 1.3 million credits issued between the years 2009 and 2012, when Clean Harbors was deemed potentially non-compliant. The invalidation of credits covering this period could have potentially cost California firms up to $13 million (Lusvardi, 2014). According to Latham & Watkins, such a sweeping determination could potentially raise "compliance costs and ultimately undermine the cap-and-trade program" (O'Brien and Kempf, 2014).

Eventually, in their final determination, CARB chose to only invalidate 88,995 offset credits sold on February 2-3, 2012. CARB asserted that Clean Harbors' Feb. 2, 2012 receipt of a U.S. EPA Region 6 inspection report describing potential violations, such as not treating calcium chloride brine material generated by the facility as a hazardous waste, triggered noncompliance for the purposes of California's offset program. CARB, consequently, determined that noncompliance ended the next day, Feb. 3, 2012, when Clean Harbors stopped treating the calcium chloride brine material as nonhazardous waste (i.e., when it sent a final shipment of calcium chloride brine material for use in oil and gas production) (O'Brien and Kempf, 2014). Therefore, the agency's final determination took into account the two-day period of noncompliance, and only invalidated offset projects purchased with reporting periods covering those days (O'Brien and Kempf, 2014; O'Brien and Kempf, 2014; Lusvardi, 2014).

According to California EJ advocates, the Clean Harbors case represents the dangers of issuing offset credits instead of requiring direct pollution reductions in California. The invalidation meant 88,995 tons of GHG emissions and associated co-pollutants would not be mitigated in California's most disadvantaged communities. It also resulted in poor air quality in low-income Arkansas communities (author interviews, 2014). The EJ advocates posited that, if CARB cannot properly monitor U.S. domestic offset operators that are clearly violating environmental, health, and safety laws, how will they validate offset programs and avoid human rights violations in the Global South?

Section 6.4: The California EJ Turn Towards the Global and Short-Lived Climate Pollutants

> If all this seems arcane, it is. Without question, chlorofluorocarbons should be destroyed. But maybe there is a simpler way, like passing a law requiring their destruction. Or maybe polluters could pay to, say, scrap old diesel engines that foul the air in the Los Angeles basin and Central Valley, or make sure that every dairy in California has a digester to reduce methane emissions from California cows. Of course, that might not be quite as cool for certain businesses.
> --Dan Morain (2014), editorial page editor for *The Sacramento Bee*.

California's cap-and-trade program currently allows polluters to purchase five types of offsets located within and beyond the state's borders. One offset is used to destroy ozone-depleting substances in places like Arkansas. Two others conserve U.S. forests and urban forests, however, since 2011, CARB has not approved a single urban forest project. A third eliminates methane emissions from livestock in states like New York and Michigan. Although California has no coal mines within its borders, the state recently approved an offset that allows California polluters to mitigate methane emitted from coal mines.

Urban forest offset have been a particularly contentious issue for some EJ advocates, who noted CARB's lack of commitment in implementing them. Cities are unable to meet CARB's offset protocol largely because of the 100-year, lifetime guarantee of tree offset projects, a difficult standard to achieve in dynamic urban settings. Other barriers to urban forest offsets include the high costs of urban trees and monitoring/reporting requirements, and limited eligibility for applicants. Unlike the other offset protocols, non-governmental organizations may not administer offset projects (CARB, 2011f). These narrow requirements have even prevented wealthy coastal cities like Santa Monica from registering urban forest offset projects with CARB.

Despite these road blocks, urban trees offer great potential to reduce GHG emissions and co-pollutants throughout California's urban communities. A study of Seattle Washington, by the Green Cities Research Alliance (2012) estimated 2.1 million metric tons of CO_2e is stored and sequestered annually in the city's trees, and tree-like shrubs. These benefits are estimated at more than $11 million in annual savings from carbon storage and sequestration. Seattle's forest also removes 725 metric tons of toxic air pollutants every year, providing an annual pollution removal value of $5.6 million.

Consequently, CARB's preferential treatment of offset projects beyond California's borders eventually led State Senator Ricardo Lara, an East Los Angeles Democrat, to introduce Senate Bill (SB) 605 in February 2013. The legislation sought to limit the issuance of offsets to California; it quickly won strong support from environmental justice groups across the state. Supporters cited the opportunity to prioritize GHG reductions that reduced co-pollutants in California regions most impacted by air pollution while preventing human rights violations through REDD projects in the Global South. Breaking ranks with the larger environmental community, however, the Nature Conservancy and the Environmental Defense Fund (EDF)

opposed the legislation.[115] In the last ten years EDF and the Nature Conservancy have consulted on, or sold scores of voluntary offset projects to polluters across the globe. At an Assembly Natural Resources Committee hearing in August 2013, their representatives testified in opposition to SB 605 because they felt it would impede efforts to expand successful international offset programs and gain approval of existing voluntary offset projects under California's cap-and-trade program.

> The current version of the bill cuts off important opportunities for investments in projects that can stimulate reductions, not only in California and the United States but in other nations as well. Cutting off opportunities like international forestry leaves California outside of the realm where we can help to participate and influence in a global dialogue. Where we can start to reduce emissions...So we just cannot support a bill that keeps California outside of that conversation.
> --Tim O'Conner (2013), Environmental Defense Fund (EDF) lobbyist.

Similarly, the oil industry, the California Chamber of Commerce (Cal Chamber), the California Manufacturing and Technology Association (CMTA) and carbon trading firms, like Four Twenty-Seven Climate Consulting, all strongly opposed SB 605. They argued that SB 605 would severely narrow offset options and create upward pressure on allowance prices. Without out-of-state offsets, they claimed allowance prices would double, significantly impacting compliance strategies already in place and affecting big and small emitters alike. The opposition developed several elaborate economic models that estimated by the year 2020, CARB's Price Containment Reserve (PCR) would be fully exhausted.[116] Under such a scenario, California's carbon market would be short in its compliance mechanisms, while polluters would face increase financial burdens in having to comply with the GHG emissions cap (Four Twenty-Seven, 2013a).

> [SB 605] would cut available offset supply by 70 to 90 percent compared to current projections, worsening the expected shortage of credits available for use in the California carbon market, and escalating credit and allowance prices. While offset protocols for U.S. projects approved and under consideration are forecasted to meet between 30 and 70 percent of total demand, supply from California-based projects would likely meet no more than 6 to 16 percent of cumulative demand for credits through 2020. The offset shortage makes it very likely that prices would reach the highest tier of PCR in 2020, $82 a ton. Yet higher prices in the carbon market are unlikely to incentivize a significant number of new offset projects in California due to institutional, regulatory, and technical hurdles (Four Twenty-Seven, 2013a; Pg. 1).

[115] At the time, mainstream environmental groups, like the Sierra Club, the Planning and Conservation League (PCL), and Friends of the Earth (FOE) supported SB 605. The Natural Resources Defense Council (NRDC) supported the bill after it was later amended to instead restrict offsets only within the United States.

[116] A Price Containment Reserve (PCR) is a cost-containment account created by CARB to control prices. It is filled with a specified number of allowances removed from the overall cap at the start of the state's cap-and-trade program. At high prices, CARB stands ready to sell permits from a reserve to covered entities at specified tiered prices during quarterly auctions (limited quantities at prices of $40, $45, $50, etc.). The intent of the PCR is to prevent a scenario where allowances are too costly or unavailable to covered entities (Four Twenty-Seven, 2013b).

While Senator Lara succeeded in moving SB 605 out of the Assembly Natural Resources Committee, the onslaught of opposition was diminishing the bill's chances at passage in the legislature. This became more apparent when Lara's mentor and author of AB 32, former Assembly Speaker Fabian Núñez, now a partner at the high-powered lobbying firm Mercury Public Affairs, took an offset operator as one of his clients.[117] This was coupled with the firm's recent announcement of its intention to open a satellite office in Mexico City to help California businesses navigate the Mexican government's trade regulations (Rosenhall, 2014; Núñez, 2014). Consequently, in his support of offsets, Núñez asserted that they provide California the opportunity to clean up energy-intensive industries that are not currently regulated by cap-and-trade. He went on to assert this opportunity extended to out-of-state industries, which in turn helps California expand its sphere of influence on global climate policy.

> That's why I decided early on to support projects to trap and destroy coal mine methane. Enter my clients, mine methane capture offset project developers….Historically, mines have ventilated highly explosive gas and let it escape into the atmosphere…New technologies exist to trap and destroy the methane gas so it never reaches the atmosphere…Offsets are vital to keeping abatement costs low, and in doing so provide price certainty to business – a key goal I've embraced since authoring AB 32. By approving offsets from mine methane, CARB will deliver another win-win (Núñez, 2014).

Another complication at the time came from the revelation that California's largest Native American tribe, the Yurok, were in the process of developing forest offset projects on their reservation near Redwood National Park. CARB eventually issued the tribe more than 800,000 offset credits in one of the first forestry projects approved under cap-and-trade. Yurok officials stated that offset projects aligned with their goals to increase the tribe's land base and restore the forest near the Klamath River, which helps improve water quality and its salmon fishery (Barboza, 2014b). Under offset rules, the Yurok can harvest some timber from its offset project areas; however, they must factor logging into its carbon sequestration calculations. The tribe is using the proceeds from offsets sold to polluters to finance land acquisitions, including their 2011 purchase of more than 22,000 acres from a lumber operator. Currently, the Yurok only owns half of the land that constitutes their reservation; timber companies own the rest. Tribal leaders intend to develop additional offset projects to purchase more land in and around the reservation (Barboza, 2014b).

Consequently, by the time SB 605 reached the Assembly Appropriations Committee in August 2013, it was clear that supporters of offset projects had gained significant traction behind-the-scenes to stop the legislation. The committee placed SB 605 on the "Suspense File," which is reserved for legislation that is deemed too costly for the state to implement. The move effectively put the measure on hold until the 2014 legislative session, when Senator Lara had

[117] Lara served serval years as director of Núñez's Assembly district office in Los Angeles. The former Speaker was also an early and strong supporter of Lara's first bid for elective office (former senior Capitol staff member, 2014 – author interview).

the option to amend SB 605 to address fiscal issues and opponents' concerns or let the legislation die (Senior Capitol staff member, 2014 – author interview). Additionally, while the legislation was on hold, in December 2013, the Environmental Defense Fund (EDF) arranged for a delegation of state legislators to visit Mexico to promote REDD-type projects there and to showcase opportunities for cooperation with California. EDF even paid to bring the champion of SB 605, Senator Lara to participate in the delegation, covering his $2,363 tab (Lueders et al, 2014; Halper, 2014).[118]

In subsequent months, Senator Lara and EJ advocates took a pragmatic approach in understanding that SB 605 had a slim chance of passage as written. They deleted all provisions relating to offsets in SB 605 and took a turn towards the global. They amended the bill to require CARB to focus its attention beyond just the seven global greenhouse gases regulated under AB 32.[119] The new amendments required the agency to complete a comprehensive short-lived climate pollutant (SLCP) reduction strategy by January 1, 2016. While the updated 2014 CARB Scoping Plan aimed to develop a strategy to mitigate short-lived climate pollutants by the end of 2015, the agency was not required to meet that goal, hold public workshops, or identify new measures that offered co-benefits to California's disadvantaged communities.

With the new SB 605 amendments, Senator Lara and EJ advocates sought to legislatively mandate that California's climate policy include SCLP's, in particular, black carbon which is a global and local environmental problem.[120] In the United States, black carbon is a major byproduct of diesel engine exhaust – the black, sooty smoke that emits from the tailpipes of diesel cars and trucks (Figure 62). It is emitted directly into the atmosphere in the form of fine particles (i.e., direct PM 2.5) and remains in the atmosphere for days to weeks (Grahame et al, 2014). It is both a main contributor to climate change and a concern for public health in many disadvantaged communities.

[118] In 2012, EDF also invited Senator Kevin De Leon and Senator Lou Correa to visit REDD-type projects in Chiapas, Mexico. In 2009, De Leon's AB 1404 which would have limited the use of offsets was passed by the legislature but vetoed by the governor. Senator Correa, conversely, has been a strong proponent of offsets and used his Senate Select Committee on California-Mexico Cooperation in 2012 to promote AB 32 linkages with Chiapas (Lopez, 2013a).

[119] AB 32 defines greenhouse gases to include the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perflurocarbons, sulfur hexafluoride, and nitrogen trifluoride (California Health and Safety Code, section §38505(g)).

[120] Short-lived Climate Pollutants also include tropospheric ozone, methane, and hydrofluorocarbons (Zaelke et al, 2013).

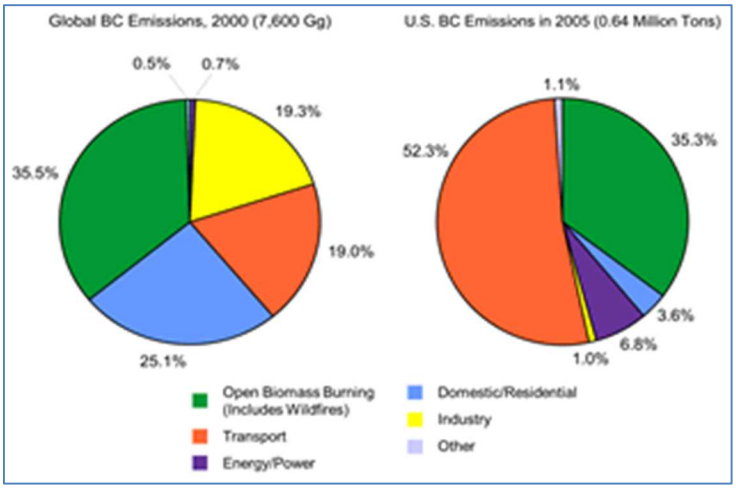


Figure 62:
Black Carbon Emissions by Major Source Category Source: US EPA (2012e)

At the global scale, black carbon has been identified as the second most important human emission contributing to climate change, after CO_2. While black carbon only exists in the atmosphere for a short period, it increases global and regional temperatures by absorbing sunlight and reducing the cooling effect of reflective surfaces such as glaciers. Black carbon also harms plants when it lands on leaves, increasing plant temperature and impeding growth. It has also been noted to reduce the amount of solar radiation reaching the earth, which can also reduce photosynthesis (Zaelke et al, 2013). According to CARB (2014a), this short-lived climate pollutant has the potential (depending upon geography, weather conditions, and time of year) to trap up to 1,700 times more heat than carbon dioxide in the atmosphere over a 100-year period and up to 6,200 times more heat over 20 years (Figure 63).

Global Warming Potential for Selected Greenhouse Gases*

Pollutant	Lifetime (years, except for BC)	Global Warming Potential (20-year)	Global Warming Potential (100-year)*
Long-Lived			
Carbon dioxide	~100**	1	1
Nitrous oxide	121	264	265
Nitrogen trifluoride	500	12,800	16,100
Sulfur hexafluoride	3,200	17,500	23,500
Perfluorocarbons	3,000–50,000	5,000–8,000	7,000–11,000
Short-Lived (<20 years)			
Black Carbon***	days to weeks	270–6,200	100–1,700
Methane	12	84	28
Hydrofluorocarbons****	(<1 to >100)	~100–11,000	~100–12,000

* The 20- and 100-year global warming potential estimates are from the IPCC 2013 Fifth Assessment Report (AR5),[26] which includes the independent scientific assessment of the black carbon radiative forcing published early this year.[27]
** CO_2 has a variable atmospheric lifetime and cannot be readily approximated as a single number.
*** BC climate effects are highly uncertain, in large part because they depend on the conditions under which they are emitted (i.e., location and time of year). This type of uncertainty does not apply to the Kyoto greenhouse gases.
**** HFCs have a wide range of lifetimes—some long, some short by this definition. Correspondingly, they have a wide range of GWPs.

Figure 63 Source: CARB, 2014a

At the local scale, the U.S EPA (2012e) notes a link between exposure to black carbon and a range of illnesses. Increases in black carbon emissions raises significant public health concerns because it is a key component of PM 2.5, fine particles that can penetrate and lodge deep inside lung tissue, causing premature mortality and cardiovascular and respiratory diseases. (Figure 64). In particular, children and older adults are the most susceptible to the negative health effects of black carbon, such as higher incidence of asthma or heart attacks. In 2012, the World Health Organization (WHO) classified diesel emissions as carcinogenic (Grahame et al, 2014). The U.S. EPA (2012e) estimates that the average public health benefit of reducing directly emitted PM 2.5 in the U.S. can range from $290,000 to $1.2 million per ton of PM 2.5 by 2030.

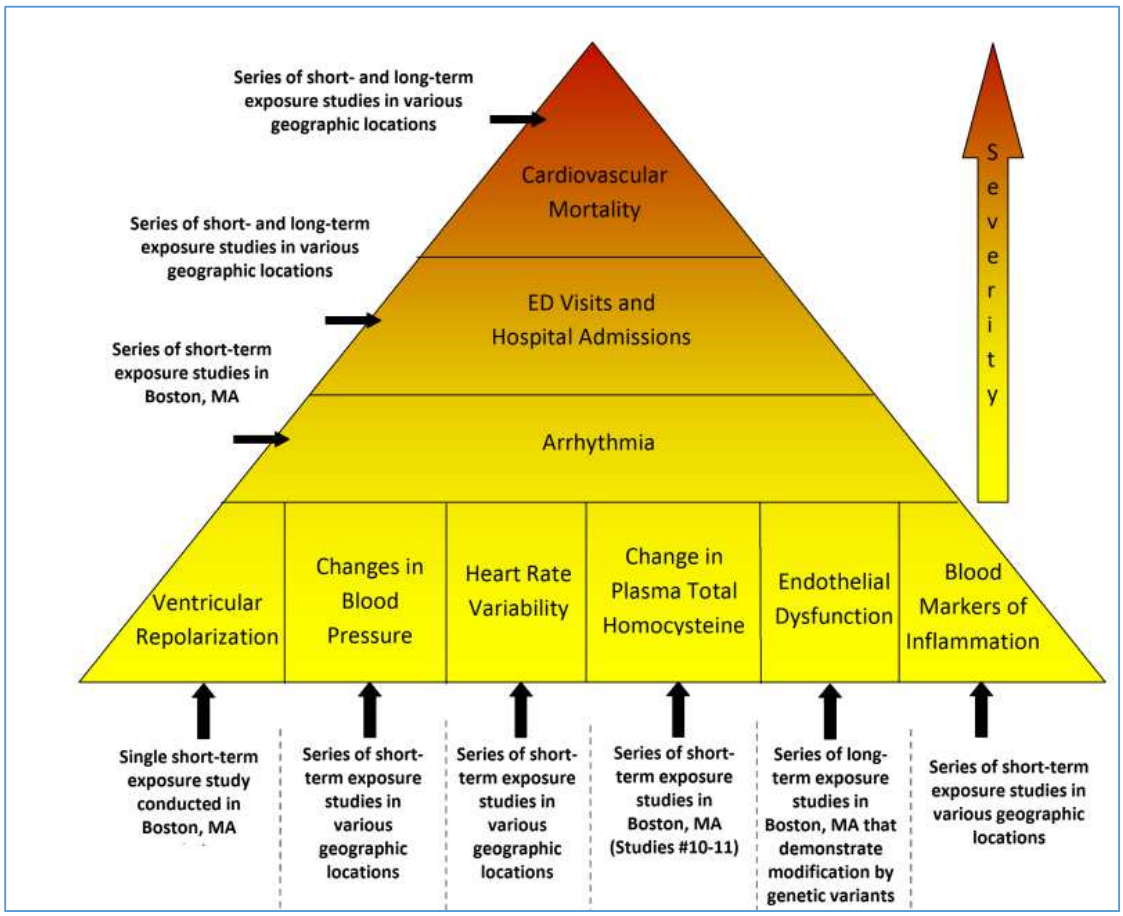


Figure 64:
U.S. EPA (2012e) Conceptual Diagram of the Epidemiological Evidence for the association of Black Carbon with the Continuum of Cardiovascular Effects, including sub-clinical effects (bottom level of the pyramid) and clinical effects, increasing in severity moving up the pyramid.

To effectively address a global and local problem, SB 605's new amendments specifically included the establishment of an SLCP inventory, the identification of research needs, data gaps, and an analysis of existing and potential new control measures to reduce SLCP emissions. It also called for increased transparency in the formulation of the SLCP strategy through public workshops, and the inclusion of the following key environmental justice provision:

> Prioritize the development of new measures for short-lived climate pollutants that offer co-benefits by improving water quality or reducing other air pollutants that impact community health and benefit disadvantaged communities (California Health and Safety code section §39730(4)).

The EJ provision, in particular, required the SLCP strategy to identify disadvantaged communities using Cal EPA's science-based, California Environmental Health Screening tool (CalEnviroScreen).[121]

It is important to note that California has been a leader in the U.S. in reducing its overall emissions of black carbon. CARB (2014a) estimates that the state's annual black carbon emissions decreased by about 70 percent between 1990 and 2010, in direct proportion to declining diesel PM emissions – a benefit of the agency's regulations on diesel fuel and engines and other technology advancements. However, California's major marine ports and their pollution-adjacent communities have not witnessed as, dramatic a reduction in black carbon emissions as compared to the state overall.

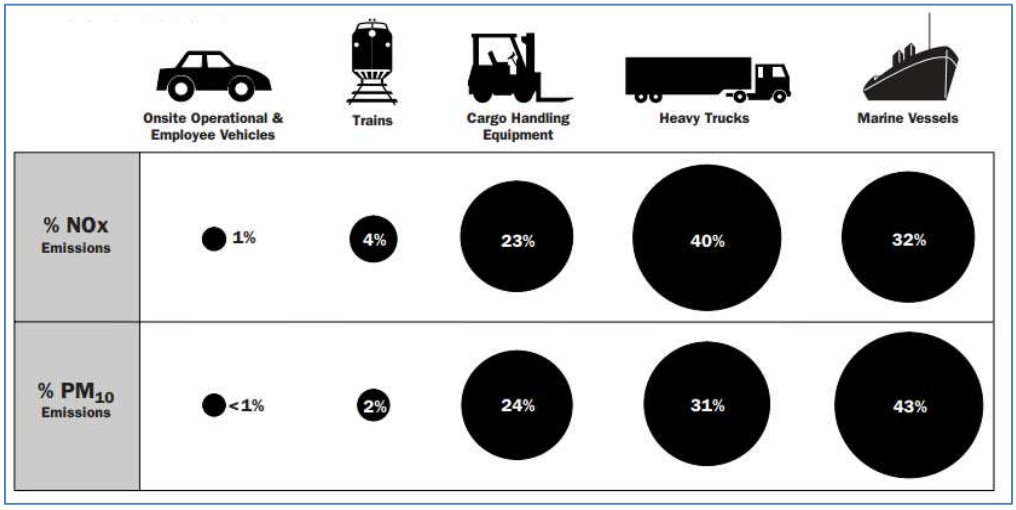


Figure 65:
Average Contributions of various Port-Related Sources to Total Nitrous Oxide (NOx) and Particulate Matter Emissions from a Container Port. Source: NRDC and the Coalition for Clean Air (2004).

[121] As previously noted in chapter 5, CalEnviroScreen was established by Senator Kevin De Leon's SB 535, which was signed into law in 2013.

Marine ports, like Los Angeles, Long Beach, and Oakland are undergoing significant expansions to accommodate even greater international cargo volumes (England-Nelson, 2015; Lopez, 2013b; Minz, 2013). The diesel engines at ports, which power ships, trucks, trains and cargo-handling equipment continues to significantly contribute to regional and global air pollution (Figures 65 and 66). A 2004 report by the Natural Resources Defense Council (NRDC) estimated that air pollution at the Port of Los Angeles exceeds cumulative pollution emitted from cars, power plants, and refineries in the Southern California region. The Port of Los Angeles draws more than 40,000 diesel trucks every day, a figure expected to triple by 2025. This means that smog-forming emissions and diesel particulate pollution could significantly increase in a region that is already adversely impacted by poor air quality (NRDC and the Coalition for Clean Air, 2004).

Figure 66:
West Oakland, California confronts multiple environmental risks from activity at the Port of Oakland. Source: Author (2013)

To address the inequities in black carbon reductions at the state's major ports, Senator Lara and EJ advocates also introduced a companion bill to SB 605. The companion bill, SB 1204, sought to create the California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology program to be administered by CARB. This new program would use cap-and-trade revenues to develop zero and near-zero emissions vehicles and equipment technologies for use at the state's major marine ports and near disadvantaged communities. Although existing programs at CARB and the California Energy Commission address both light and heavy-duty vehicle sectors, environmental justice advocates argued that additional focused efforts were needed to improve market penetration and make the purchase and use of zero and near-zero emissions

vehicles and equipment a viable, and more affordable, option for vehicle operators. The program specifically would develop early demonstration projects to explore vehicle performance and integration, followed by larger pre-commercial demonstrations to evaluate real-world performance. Once such systems were developed and tested, the EJ advocates intended to seek incentive programs to achieve full market penetration, particularly in disadvantaged communities (EJ advocates, 2014 - author interviews).

By the end of the 2014 legislative session, Senator Lara and environmental justice advocates across California could declare victory. Their pragmatic approach toward tackling global and local pollutants in SB 605 and SB 1204 gained the support of dozens of environmental groups and legislators, and more importantly, the signature of Governor Jerry Brown. Both bills were enacted into law in September 2014. As noted by the California Environmental Justice Alliance (CEJA), the EJ community had some of the biggest wins in the 2014 legislative session thanks to their strategic approach to expand the definition of global climate change pollutants in ways that created direct linkages with local air quality impacts.

> **Reducing air pollution and fighting climate change all at once**: Climate policy is finally seeing the huge win-win potential for efforts that battle global warming while improving already-existing hotspots of air pollution, which disproportionately impact low-income communities and communities of color (CEJA, 2014 – emphasis in original).

Most importantly, the end of the 2014 legislative session demonstrated the growing power of the environmental justice movement in the Capitol. EJ groups significantly influenced the conceptualization of climate change and its associated policies to include the needs and voices of low-income neighborhoods and communities of color. SB 1204 and SB 605 are strong examples of how cap-and-trade auction revenues can be used for projects that provide emission reduction benefits to California's most disadvantaged communities while addressing a global phenomenon. In sum, the strategic lobbying and advocacy efforts by California EJ groups are showing a growing number of policymakers the importance of linking health and quality of life issues with climate change policies.

Section 6.5: Conclusion - California's Climate in a Global World

> People of color are the new majority in California, and we care about the environment and climate change. These same residents are just beginning to flex their political muscle on climate and environmental issues. – California Environmental Justice Alliance (2014)

Figure 67:
Environmental Justice Press Conference outside the State Capitol in support of SB 605 and SB 1204
Source: CEJA (2014).

In recent years, California's debate over international linkages and the scope of its climate change regime has grown to include pollution-adjacent communities alongside epistemic communities of climate experts. Advocates of pollution-adjacent communities are speaking as experts in their own right, and their influence in the environmental policymaking process in Sacramento is growing. EJ groups are expanding the state's definition of global climate pollutants and challenging the spread of California's regulatory gospel to the Global South. While it still remains uncertain whether the state will ultimately pursue offsets in Chiapas, Mexico, and Acre, Brazil, environmental justice groups have raised important questions regarding California's ability to ensure reliable emissions reductions while preventing human rights violations and negative environmental consequences. Influential business groups and regulators continue to see California as playing an important international role in preserving forests as a method to decrease the cost of mitigating GHG emissions. However, California's pending decision on whether to approve REDD offsets will no longer solely depend on economic demand for such offsets or global science touting the benefits of carbon sequestration. Rather, it will depend on regulators' ability to build confidence in their capacity to develop effective and politically supported policies that address public health and social equity issues within, and beyond, California's borders.

Climate change policies have begun to empower disadvantaged communities to imagine a healthier and more sustainable future. The trans-local climate justice movement at the Capitol demonstrates just one example of how diverse peoples globally are influencing environmental

governance. EJ groups are strongly asserting that climate change policies not the property of the United Nations, California, or any government or corporation. Through such movements, we also understand that climate change is not configured within a single place or scale. Rather, climate change is an object of multiple natures in which ensembles of heterogeneous actors, techno-scientific practices, and socio-economic variables bring it into being.

Consequently, the notion of community-led climate solutions is slowly becoming part of a larger civic epistemology of climate change in California. As countries around the world are preparing for the December 2015 United Nations Climate Change Conference of the Parties (COP21), to be held in Paris, France, California organized its own pre-conference event, titled "Global Climate Negotiations: Lessons from California." The September 2014 event, held a week after SB 605 and SB 1204 were signed into law, brought together government officials, business leaders, experts, and environmental justice groups to discuss the state policies that have placed California at the forefront of addressing climate change. The symposium showcased the state's efforts to meet its overarching goal of reducing greenhouse gases worldwide, while improving the air in the state's most polluted communities.

Of particular note, was the inclusion of a key discussion panel on "Climate Solutions from the Bottom up - California Road to Paris." Panel participants included R.K. Pachauri, chair of the Intergovernmental Panel on Climate Change (IPCC), who flew in from India for the occasion; Senator Kevin De Leon (author of SB 535, the Climate Change Community Benefits Fund); former Cal EPA Secretary Terry Tamminen; and Long Beach Mayor Bob Foster (Figure 68). The panel discussed the success of AB 32 and the efforts of EJ advocates to ensure that pollution-adjacent communities were included in the movement toward a more sustainable California. For example, they discussed the guarantees in the Climate Change Community Benefits Fund that directs investments in clean energy, transportation, and green jobs to disadvantaged communities. In the 2014-2015 fiscal year, more than $200 million will be allocated towards projects that reduce pollution, while benefiting the most polluted neighborhoods. Also discussed were the new mandates requiring CARB to tackle global climate pollutants harmful to local public health, like black carbon in the short-term, a key step in achieving 2020 and 2030 emission reduction goals.

Figure 68:
Climate Change from the Bottom up Panel. From left to right, Former Cal EPA Secretary Tamminen, Senator De Leon, IPCC Chair Pachauri, and Mayor Foster. Source: CARB (2014e).

Throughout the panel, Senator De Leon stressed that UN leaders must learn from the California experience. Otherwise, they risk widening disparities that currently exist between pollution-adjacent communities and the rest of the world. Echoing these comments, IPCC chair Pachauri (2014) remarked that the state has the potential to be in the vanguard on global climate policy. "California is being watched by the rest of the world…If California sets this blazing trail, the rest of the world will have something to follow."

At the end of this historic panel session, there was optimism, that as UN leaders and climate activists gear up to advance climate change solutions in Paris, the discussion of addressing climate change could move beyond just polar bears, multilateral agreements, and global science. In sum, the panelists concluded that the California experience serves as a global model for governments and local communities to jointly create holistic solutions to climate change that safeguard and benefit populations most disadvantaged by climate pollution.

CHAPTER 7
Dissertation Conclusion:
Understanding the Civic Epistemologies of California's Climate(s)

> How do you work and communicate together in the face of conflict? You look for humanity. You seek common ground…and eventually you get in the heads of [CARB] staff – and you have an impact. It is nice to see our recommendations included in the updated AB 32 Scoping Plan. It is an improvement from the previous [2007] EJAC -- when there wasn't even a facilitator for those meetings.
> – EJAC Chair, Martha Arguello, in her concluding remarks to committee members and staff (2014).[122]

Figure 68:
The EJAC and CARB staff after finalizing the committee's recommendations for the AB 32 Scoping Plan update. Source: Author photo (2014)

In 2013, the California Air Resources Board (CARB) announced it would develop its first five-year update to the AB 32 Scoping Plan, as required by law. In turn, CARB reconvened the Environmental Justice Advisory Committee (EJAC) to advise the board on the update. Through a year-long process, the board and the EJAC collaborated in developing an updated plan that ensured environmental justice needs and concerns were fully integrated into the fabric of the state's climate change programs. This process was drastically different from 2007, when CARB released its first draft Scoping Plan to accusations of betrayal and charges that the plan's development was a *fait accompli*. When the EJAC concluded its work on April

[122] Martha Arguello also served as a member of the first EJAC, established in 2007.

11, 2014, EJ advocates and environmental regulators alike felt a sense of accomplishment and mutual respect (Figure 68). CARB would eventually go on to adopt many of the EJAC's recommendations. Some of the recommendations included placing a higher value on maximizing co-benefits; a stronger focus on short-lived climate pollutants; and ongoing assessments of the impact of climate change policies on environmental justice communities.

When CARB adopted its final Scoping Plan update in May 2014, several board members congratulated the committee for its hard work and dedication. While acknowledging that CARB did not agree with all of the EJAC's recommendations, the committee was cited as instrumental in advancing a more equitable plan for all Californians.[123] In particular, CARB member Phil Serna (one of two people of color now serving on the board)[124] stated that while the EJAC and its mission may clearly apply only to the Scoping Plan under California law, the committee should have much broader utility in practice. "We ought to think carefully as board and as staff about how we maintain the utility of having the EJAC remain very engaged on everything that this board does to implement AB 32" (Serna, 2014). Several other CARB members concurred, going even further to advocate that additional resources for public health and environmental justice research be allocated at levels equal to those provided for economic and cost-effectiveness analyses required under AB 32.

As articulations of civic epistemologies, the adoption of the 2014 Scoping Plan update and the *Climate Change from the Streets (*CCStreets) case studies, illustrate that a reciprocal and dialectical conception exists in the relationship between nature and society. Multiscalar civic epistemologies support an analysis of the ways in which science stabilizes a particular social order and in which knowledge practices can promote social change (Goldstein, 2010). Civic epistemologies suggest that knowledge and technical practice have a distinct function in sustaining and re-making society, in addition to making new discoveries and innovations. In manipulating nature through climate change governance, polities simultaneously incorporate their moral and political visions into the new nature(s) that science and policy bring forth (Jasanoff, 2011).

California is embedded in diverse sociotechnical imaginaries of climate change. Through the multiscalar case studies, we have assessed the diversification of climate change and politics, tracing how scientific facts about the world are fused with social commitments (Goldstein, 2010). Rather than simply assume that climate science and policy are shielded from competing socio-economic interests, the study of California's civic epistemologies have revealed the mutual constitution of techno-scientific arrangements and closures that are epistemic as well as normative (Curnutte and Testa, 2012).[125]

[123] For example, CARB members and staff disagreed with the EJAC over the use of carbon offsets.

[124] As previous noted in Chapter 4, when the Scoping Plan was adopted in 2008, the entire CARB board membership and executive agency staff was white. When the Supplemental FED was adopted in 2011, the racial composition slightly improved to include one African American on the board (out of nine board members) and one Asian American on the agency's executive staff (there are six executive positions).

[125] The concept of civic epistemologies, grows out of Jasanoff's (2004) earlier work on the idiom of 'co-production,' which suggests a blurring of boundaries between nature and culture.

> It provides the analytical tools to grasp how science and society do not simply allow the circulation of objects that bear the stamps of their respective authorities. They co-produce instead each other's settlements to the effect that that circulation is as much a statement about epistemic criteria or technical solutions as it is an assertion -- and at times a moment of revelation – of the norms and institutional arrangements that enabled it (Curnutte and Testa, 2012; Pg. 161).

Approaches like CCStreets, hence, are new experiments in climate governance. They disclose how the natural and social orders are co-produced together. They also emphasize the contingency of all expertise. Neither professional nor lay knowledge alone can ultimately resolve the problem of climate change. As an emerging framework, CCStreets questions institutionalized notions of expertise from the outset as well as hard demarcations between nature and society (Jasanoff, 2004).

1. What Influences the Uptake of Climate Change from the Streets?

People of color now comprise the majority of California's 38.8 million residents. Many members of the state's communities of color hold some of the strongest views about protecting the environment, public health, and acting quickly to address climate change. CCStreets approaches are increasingly seen as valid methods to address the problem of climate change and equity. The uptake of CCStreets proved successful in many instances because it changed several elements of civic epistemology (Table 17). Through CCStreets approaches, EJ groups focused their efforts on issues like air pollution and public health, linking them to new knowledges and community-based solutions. In this process, environmental justice communities are no longer merely perceived as "impacted;" they are now official "knowledge producers" in climate governance. Environmental justice groups in the case studies placed additional demands on policymakers that called attention to the relevance of the totality of their lived experience. In doing so, they connected climate governance to historical and current environmental racism, economic inequality, and other socio-cultural variables (Tesh and Williams, 1996).

TABLE 17 Key Elements Influencing the Uptake of *CCStreets*				
	Expert-Lay Engagement	**Social Movements, and 'Lived-Experience'**	**Adherence to Carbon Fundamentalism**	**Experiments in Climate Governance**
Chapter 2: Survey of Local CAPs	Low	Low	High	Low
Chapter 3: Urban Climate Change in Oakland	High	High	Low	High
Chapter 4: Statewide Carbon Pricing and Health Co-benefits	Low	Medium	High	Low
Chapter 5: Climate Change Community Benefits Fund	Medium/High	High	Medium	High
Chapter 6: International Forest Offsets and Black Carbon	Medium/High	High	Medium	Medium/High

a) Expert-lay Engagement

The CCStreets case studies elucidate how civic epistemologies across diverse geographies and scales invoke variations in knowledge production, equity, and policy outcomes in climate governance (Table 17). An analysis of California's civic epistemologies reveals that the predominant mode of climate policymaking and planning is centered on *carbon fundamentalism*. As a result, most governments framed climate change as an "environmental" or scientific problem without regard for the human and cultural dimension of the phenomenon. Policy responses increasingly emerge as an expert-driven process that emphasizes global GHG reductions as the goal and geographically-neutral economic and technological fixes as the solution. In this process, community-based strategies that integrate climate change interventions with public health outcomes are often excluded. Such

positivist approaches privileges experts as the bearers of knowledge about both the problem and the solutions.

Through an analysis of civic epistemology, we grasp the contested roles and rights of residents in regard to the production of public knowledge. Governments often strive to define environmental issues and the terms by which residents are included in relevant policy decisions. This research adds to the emerging theoretical analysis of civic epistemologies by focusing on the interaction among experts and environmental justice groups in developing strategies that integrate climate change interventions with population health at multiple scales. Through CCStreets, I have shown how various environmental justice actors gather, evaluate, and use scientific and public health knowledge in different ways when determining what impacts from climate change pose risks and require policy intervention.

The configuration of climate change in California, accordingly, depends on how knowledge is produced and the interaction between power and heterogeneous actors in society. We have seen how environmental justice groups (lay publics) are debating with experts over issues of truth and method in climate science and policy. They are specifically challenging the political use and control of expertise, by claiming to speak credibly as experts in their own right. By focusing on civic epistemologies, we can see how local knowledge emerges as supplements -- and in some cases -- alternatives to techno-scientific instruments. It can serve as a means to overcome problems of introducing *a priori* policy into various local contexts. In essence, the phenomenon of climate change in California is creating a distinct social order that is changing epistemic cultures and democratic societies. CCStreets approaches are pressuring professional experts and policymakers to give up some control over how climate change is defined and addressed, and how research is formulated and conducted. Moreover, the cases illustrate the technical ruptures that allow other ways of knowing and doing to be institutionalized into climate governance.

b) **Social Movements and 'Lived-Experience'**

Carbon fundamentalism coincides with a lack of capacity for collaborative climate planning across sectors and budget constraints from competing socio-economic initiatives. The time and resource-intensive activities already involved in positivist climate policymaking leaves little opportunity to demonstrate explicitly how strategies can reduce GHG emissions and achieve health and equity outcomes. Consequently, chapter 2 provides evidence that changing civic epistemologies to include CCStreets approaches is not easily achievable in all regions. Environmental justice groups are most effective when they expend a significant amount of social capital to organize local coalitions, develop knowledge frameworks, and build alliances with key policymakers to change the terms of political discourse of climate policy. In contrast, disorganized communities have minimal opportunities to persuade city officials to implement a CAP that integrates GHG reductions measures with public health and social equity (Table 17).

In chapter 3, however, we see that effective and well-resourced EJ social movements consist of more than a single NGO or group of activists. They form complex, decentralized networks of organizations mobilized by a collective identity and lived experience. As a movement, they produced a powerful dynamic that generated considerable political and media pressure to substantively integrate equity and health into the fabric of California's climate policies. For example, motivated by disproportionate environmental burdens in the city of Oakland, EJ groups sought ways to more explicitly link urban planning, public health, and climate change. With the formation of the Oakland Climate Action Coalition (OCAC), environmental justice groups worked alongside city officials to create a CAP that implemented an urban climate change regime with components that went beyond abstract notions of the environment. OCAC's success was due to the strength of its members, including members from throughout Oakland's diverse communities. The coalition evolved into a powerful force that provided multi-sector expertise on a variety of issues. The diverse expertise of OCAC members, which included politically influential and long-established community stakeholders, ultimately persuaded the city to let the coalition facilitate and fund a community-driven climate planning process.

Chapters 5 and 6 provide an understanding of how environmental justice social movements are not restricted by scale or locality. In chapter 5, encouraged by their early success in creating an equitable CAP in Oakland, members of the OCAC joined statewide organizing efforts to amend AB 32 and establish a Climate Change Community Benefits Fund (CBF). Local EJ groups viewed the advancement of a CBF as an opportunity to link their grassroots work on community-based climate solutions with climate change policies at the state level. Groups like the Asian Pacific Environmental Network (APEN) and the Ella Baker Center felt a responsibility to use the lessons learned and their successes at the local scale to influence larger statewide policy. They understood that many cities had CAPs with grand ideas, yet few had the resources to support implementation. Through the CBF, California is now directing cap-and-trade money to disadvantaged communities for climate action planning investments.

Chapter 6 also showed the emergence of a trans-local climate movement among indigenous rights leaders and California environmental justice advocates. This trans-local climate justice movement is allowing diverse publics to expand state definitions of global climate pollutants and challenge the spread of California's climate regime to the Global South. While the trans-local coalition has not halted the use of international carbon offset projects in Mexico and Brazil, the formation of the coalition is providing opportunities for open dialogue about how California can develop an effective and politically supported climate program that addresses health and social equity within, and beyond, California's borders.

c) Adherence to Carbon Fundamentalism

As discussed throughout the dissertation, policy based on carbon fundamentalism often ignores the negative environmental and social impacts of climate change on environmental justice communities. As climate governance becomes the realm of experts, EJ communities are disempowered to examine the issue for themselves. Consequently, without proactive and

contextual policies to address equity concerns, climate change will likely reinforce current, as well as future, health disparities in marginalized communities.

In chapter 4, I traced the strong adherence to carbon fundamentalism in the halls of the Capitol and the corridors of the state's bureaucracy. California regulators continually pushed up the scale of climate change to the 'global'-- framing climate change as an environmental problem with no direct local health consequences. This civic epistemology separates climate change from the human-local scale (Table 17). The structural conditions that have created environmental health inequities were concealed by CARB's exclusive focus on universal scientific metrics and efficient market-based mechanisms. Conversely, the EJAC's scope and scale of climate change was sharply criticized by CARB officials as beyond the intent of AB 32. CARB claimed the EJAC's scope had the potential to derail the central goal of the legislation -- the reduction of 'global' GHG emissions. On the contrary, the EJAC strongly criticized CARB for not developing robust public health analyses of the potential impacts of the cap-and-trade program. They claimed the program would disproportionately impact communities of color and low-income neighborhoods. The committee, however, was unable to produce any new data to support these claims. As a result, regulators soundly rejected the EJAC's assertions, arguing they were more grounded in emotion than science. Here, we see that environmental regulators retained legitimacy and power in climate governance because they were seen as objective and "technically disciplined." In contrast, EJ groups were framed as undisciplined, emotional, and holding biased positions (Ezrahi, 1990).

Ethnic and racial divisions provided another element influencing the adherence to carbon fundamentalism outlined in chapter 4. During the drafting of AB 32, EJ groups collaborated with legislators of color, finding common cause in a shared 'lived' experience. By comparison, CARB regulators charged with implementing AB 32 were mostly white. Through the implementation of AB 32, we see how climate policy in California still remains highly homogenous by race and class in its leadership. These variables raise significant questions about how they impact the production of knowledge, policy, and science around climate change. As AB 32 moved from the legislature to the regulatory rule-making process and the realm of scientific and policy experts at CARB, environmental justice groups found their capacity to affect the implementation of the law was greatly minimized. Chapter 4 concludes that, from the scientific knowledge of state regulators to the local knowledge of environmental justice activists, the struggles over the institutionalization of environmental expertise in governance regimes can create contentious climates.

d) **Experiments in Climate Governance**

CCStreets approaches are new experiments in climate governance. These experiments provide the methods through which to define what climate change entails and to test policy interventions. In California, we see the emergence of governance experimentation in which multiple variables influence how society addresses climate change. Through climate governance experimentation, we understand that the social and technical are heterogeneously

engineered by a range of competing actors and institutions. Hence, climate policymaking can be seen as a socio-technical process that contains a set of contingencies resulting from the co-evolution of problems and solutions.

The CCStreets case studies further reveal the importance of examining the development of new "inscriptions" (i.e., policy language, scientific metrics, scale, and maps) and how they are central to the process of gaining credibility as they stabilize climate experiments in methods that allow them to travel across space and time and in combination with other innovations (Amin and Thrift, 2002; Van House, 2001). Inscriptions have the potential to both enroll different actors into climate governance and influence the terms of debate within the policymaking process, such as determining the type of interventions to be implemented and the scale(s) at which they should take place. Thus, through experimentation we comprehend climate change as having multiple enactments, with variations in the methods governments and civil society actors choose to address the phenomenon.

For example, in Chapter 3, we see contestation over carbon fundamentalism was evident in the early stages of the Oakland CAP. The city of Oakland as a producer and consumer of climate knowledge, held an important space in the development of civic epistemologies. It initially gravitated towards global climate metrics as the only valid method to address and quantify climate change. The direct engagement of the OCAC in developing the CAP, however, represents a divergence from carbon fundamentalism. OCAC's involvement resulted in the inclusion of health co-benefits and the use of local knowledge in the CAP's development. The construction of urban climate change in Oakland is the outcome of extensive ***experimentation*** with public participation in expert-lay advisory processes. These processes create new civic epistemologies that require experts to collaborate with diverse stakeholders in society. This occurred in contrast to other methods of civic epistemologies in the United States, in which GHG quantification serves as a technology of trust and accountability or a model of control (Miller, 2005). The OCAC, as a strong social environmental movement, joined policymakers who supported EJ goals, helping transform climate change into an object that is comprehended, measured, and governed on multiple scales (Table 17).

In chapter 5, I examined the subsequent successes environmental justice advocates made in developing a new civic epistemology of climate change at the Capitol. This was primarily achieved through oppositional tactics, such as the enactment of legislation to change regulatory agency behavior and technical practice. The SB 535 Coalition enacted multiscalar policy approaches to legislatively mandate that race and equity are front and center when implementing climate change interventions. The Climate Change Community Benefits Fund redirected the geographically-neutral focus on carbon reductions to new localized approaches to address mitigation, adaptation, and health co-benefits in the most socially vulnerable communities. While many EJ groups are philosophically opposed to market-based mechanisms, social movements like the SB 535 Coalition embraced pragmatic approaches to ensure that compensation via cap-and-trade revenues are provided to the communities most impacted by air pollution. Through the establishment of the CBF, the promises of AB 32 to protect and invest in disadvantaged communities are beginning to manifest.

Chapter 5 also highlighted that through these contestations and pragmatic trade-offs, EJ groups are revealing that climate change is not simply an environmental problem requiring a singular top-down policy solution. Environmental justice groups have validated the utility of multiscalar approaches that tackle a global environmental problem as well as public health issues at the neighborhood level. By scaling-up community-based approaches and local knowledge, they are offering an alternative conceptualization of what the phenomenon of climate change means -- not just in the physical sense, but what it means in different places and scales, to different peoples, and at different times. In this chapter, environmental justice actors were followed through contentious geographies as they experimented with a new civic epistemology where climate change is simultaneously constructed as a universal and localized as a particular.

The last CCStreets case study, presented in Chapter 6, on trans-local climate justice movements, shows that the phenomenon of climate change is not configured in a single place or scale. Rather, climate change consists of a network of highly mobile actors and interrelated scales that are attached to diverse civic epistemologies. In this chapter, I describe the additional experiments environmental justice groups are using to push regulators away from carbon fundamentalism to break down policy silos. EJ groups took advantage of legislation to again create ruptures in technical practice, convincing regulators to implement multiscalar policies that jointly address GHG emissions and other localized co-pollutants, like black carbon.

In sum, the simultaneous consideration of both the burden of climate change (e.g. environmental injustice and uneven impacts) and the benefit of mitigation and adaptation policies for environmental health in practice makes the analysis of civic epistemology unique across the CCStreets case studies. As we have seen throughout this dissertation, climate governance entails a variety of decision points that involve determining who makes particular policy choices, and which criteria and knowledge is used to make those decisions. Through an analysis of California's civic epistemologies of climate change, there is a strategic understanding of how particular agendas, politics, knowledges, and expertise influence the development of climate action policies and environmental justice.

The CCStreets case studies, moreover, have demonstrated how new experiments for producing public knowledge are being linked to policy decisions at various scales. The multiple configurations of climate change policies in California represent a shifting of power and authority in environmental governance that traditionally favors elite actors. CCStreets is calling attention to the cultural and experimental dimension of climate change policy, knowledge production, and local practice. By combining technical practice with local knowledge, EJ groups are helping to create proactive and significant environmental change at multiple scales.

2. Implications for Climate Policy and Planning Practice

A broader climate agenda, like CCStreets, can help move climate governance in the direction of holistically addressing public health and equity. In California, we see climate policy emerging as a framework for social change. However, as this research has argued, the environmental justice movement must develop new skills, knowledge frameworks, strong coalitions, and work with key policymakers to change the terms of political discourse of climate policy. An assessment of California's nascent multiscalar climate policies and interviews with climate policy experts and EJ advocates, yielded, four areas in which state and local governments can incorporate CCStreets approaches in climate policies.

a) Enhanced Community Engagement Efforts

Often lost in the discussion of climate planning is the manner in which both the science and the policy are received by local residents and community groups. A community's public reasoning around climate change is an important consideration for determining how policies will unfold. As this research has shown, governements that actively engaged community-based groups had the most robust climate policies that addressed issues of social equity while integrating climate action and health on multiple scales. In the CCStreets case studies, we observed that climate policy employed a 'contextual' approach that: **(1)** acknowledges an understanding of how climate change is connected with other types of knowledge and conditions regarding the local environment; and **(2)** enables different ways of knowing to play a valid part in developing policy responses.

These types of approaches, however, have limitations and are not easily scalable in all regions of California. As is the case with local governments, community-based organizations are also constrained by limited resources; in many areas, no active organizations exist. Consequently, for under-resourced communities, the opportunities to persuade state or local governments to implement climate policies that integrate public health and social equity face additional challenges. In these cases, governments should develop proactive methods to include residents from disadvantaged communities in the climate policymaking process. The state could provide additional funding to cities through the cap-and-trade program and other initiatives, such as the California Sustainable Community Planning Grants and Incentives Program, to conduct substantive community engagement efforts.

In terms of the statewide climate policy, the Environmental Justice Advisory Committee should be established as a permanent advisory committee of CARB. The current mandate under AB 32 to only reconvene the EJAC every five years during the Scoping Plan update process, is inadequate, especially as CARB considers and develops substantive AB 32 implementation policies each month. The agency should be required to reconvene the EJAC at least biannually to provide recommendations that will further support California in safeguarding and directing investments to disadvantaged communities.

Enhancing community engagement efforts can lead to better reflection of the diversity of California's population in climate policies and goals. Communities of color have comprised a majority of the state's population for more than a decade. As this dissertation has shown, these communities will also experience health and socioeconomic disparities from climate change at higher rates than other groups. Increased resources for collaborative climate planning processes will ensure that governments prioritize the needs of disadvantaged communities and safeguard them from the current and anticipated impacts of climate change.

b) Cap-and-Trade Funding for Disadvantaged Communities

While California's climate laws do not mandate cities to develop a CAP or health analyses, funding from the cap-and-trade program is creating new opportunities to develop more holistic approaches to municipal climate planning. Senate Bill 535, which amended AB 32, requires the state to invest at least 10 percent of all cap-and-trade auction revenues in disadvantaged communities (California Health and Safety Code, section §39713). For the 2014-2015 fiscal year, the state is providing $85 million to GHG mitigation projects located within disadvantaged communities (CARB, 2014b).[126] These projects include urban forestry, low-carbon transportation and transit operations, energy efficiency programs, and waste diversion. CARB requires that eligible projects "provide direct, meaningful, and assured benefits to disadvantaged communities" (2014; pg. 1). CARB's guidance memo for agencies administering investments places a strong emphasis on projects that create health co-benefits from reducing health harms (e.g., asthma and obesity) due to air pollutants and the built environment. The guidance also urges a priority for projects that reduce heat-related illnesses and increase thermal comfort (CARB, 2014b). The California Strategic Growth Council recently announced that the Sustainable Community Planning Grants and Incentives Program will provide additional funding for cities to develop CAPs that target efforts in communities statewide that are in the top 10 percent of cumulative environmental impacts scores under CalEnviroScreen (California SGC, 2013).

The mandate for investment in disadvantaged communities, however, does not apply to the state's other landmark climate law, SB 375. This legislation provides priority transportation funding to metropolitan planning organizations (MPO) that meet regional GHG reduction targets. To ensure consistency with AB 32, the state Legislature could amend SB 375 to require MPOs to use at least 10 percent of funds provided through the bill for investment in projects located within disadvantaged communities. MPOs could also be required to provide funding for cities to develop CAPs with measures focused on health co-benefits in disadvantaged communities. Such an approach could ensure that urban planning processes prioritize investments in disadvantaged communities to increase mobility and access to jobs, while improving air quality. Approaches that do not integrate planning with larger public health outcomes will likely continue to incur higher costs to society through lost work-days and increased occurrences of physical ailments.

[126] Disadvantaged communities are identified using the CalEnviroScreen tool.

c) A More Active Role for Local Public Health Departments

The recent amendments to AB 32 are guiding California away from a singular focus on global GHG reductions. Nevertheless, the earmarking of 10 percent of cap-and-trade revenue for disadvantaged communities, pursuant to SB 535, is unlikely to cover the full costs associated with climate mitigation, particularly at the urban scale. Local governments will need additional funding to fully implement programs identified in CAPs. Cities are constrained in their resources, if city officials fail to understand the immediacy of public health, climate planning efforts will continue to overlook or ignore health co-benefits. One approach to overcome this challenge calls for a more active role for local public health departments. The state provides limited resources to the California Department of Public Health (CDPH) to develop tools and guidance documents to aid local health agencies in integrating health co-benefits in CAPs and other statewide climate policies. The CDPH currently relies largely on external grant funding to engage local governments.

CDPH recently launched the 'Building Resilience against Climate Effects' (BRACE) program through a four-year grant from the U.S. Centers for Disease Control and Prevention (CDC). Under BRACE, CDPH will select 10 county public health departments to assess health interventions that can reduce climate and health risks to vulnerable populations, while providing technical support in adaptation planning activities (CDPH, 2013). Such programs are crucial since surveys of California public health officers and practitioners have shown that they generally feel ill-prepared, both in terms of available information and resources, to respond to health threats posed by climate change (Bedsworth, 2008; 2009; 2012; Gould, 2013). A large majority of survey respondents indicated they would like more detailed information on the local risks posed by climate change, followed closely by more guidance from CDPH. In terms of resources, a majority of respondents said they would like more technical tools to prepare health impact analyses, followed by dedicated funding for climate activities (Bedsworth, 2009; 2012; Gould, 2013).

These surveys suggest the state could provide additional resources from the cap-and-trade program to fully fund the BRACE program and give local public health agencies greater capacity to play a more active role in climate planning activities. The Governor's Office of Planning and Research (OPR), which is the state's clearinghouse for urban planning tools and guidance documents, could also be required to more aggressively promote and incorporate CDPH's efforts in its municipal climate planning activities. In recent years, OPR and CDPH have collaborated on important guidance documents relating to public health and planning. These collaborations include ways to integrate public health goals in CAPs, general plans, hazard mitigation plans, and extreme heat response plans. Such integration, unfortunately, has not reached OPR's climate planning website, which lacks a section dedicated exclusively to public health. As a result, interested practitioners seeking guidance are unlikely to readily access the material. Interviews with planners revealed very few were aware such resources were available. Similarly, OPR's educational workshops and conferences, held since 2007, have not

placed the issue of health co-benefits of CAPs at the forefront. OPR can consider taking a more concerted effort to ensure that local planners understand and are aware of the value of integrating health co-benefits in climate planning activities. OPR's current climate planning education and outreach efforts continue to consider public health goals a secondary objective.

Similarly, CARB should provide additional funding to CDPH and state research universities to conduct in-depth public health analysis of AB 32 Scoping Plan updates and related implementation proposals. As CARB members noted during approval of the Scoping Plan update in May 2014, the state is not allocating resources for public health and environmental justice research at similar levels provided for economic and cost-effectiveness analyses required under AB 32. A strong need exists for institutionalizing the analysis of the health co-benefits of mitigation and adaptation strategies in CARB's policymaking process.

d) Free Streamlined Tools for Analyzing Health Co-Benefits

This research has described how credibility is essential in the validation of climate knowledge. Translating the on-the-ground experience of EJ communities requires rigorous research and scientific data to prove claims, test new approaches, and bring them to scale. This includes the ability to develop more robust economic analysis of health co-benefits and the ability to communicate such work to policymakers and regulators. As we have seen in Chapter 5, with the development of the CalEnviroScreen tool, universities and nonprofits have partnered with environmental justice groups to develop new climate knowledge and alternative solutions. However, significant gaps still exists. In the climate policymaking process, where EJ groups are continually attempting to establish broader credibility, scientific and technical support is vital.

One approach is for environmental regulators and EJ groups to collaborate on improving existing climate tools and data methods. For example, in 2011, the California Air Pollution Control Officers Association (CAPCOA) and regional air quality districts developed the California Emissions Estimator Model (CalEEMod). This free tool provides a uniform platform to quantify potential criteria pollutants and GHG emissions associated with the construction and operation from a variety of land-uses and the benefits of implementing GHG mitigation measures (CAPCOA, 2011). The air districts could work alongside CDPH, Cal EPA, and environmental justice groups to develop an updated and streamlined model that also quantifies the estimated health cost-savings of mitigation measures. This model could be similar to the analysis developed by the city of San Francisco and the U.S. EPA for San Francisco's CAP. A private sector planner stated that some planners understand the utility of health co-benefits "but they lack the economic-health benefit analysis that really bolsters the feasibility of implementation" (author interview, 2014). OPR and CDPH can take lead roles in promoting the tool to local governments and convening training workshops. A key focus can involve educating planners to interpret health and cost-benefit data.

Cal EPA can also work with CDPH, the California Natural Resources Agency (CNRA), and EJ groups to integrate the CalEnviroScreen tool with the Cal-Adapt tool. Cal-Adapt uses data sets and geographic mapping models to project local climate impacts, such as temperature, snowpack, precipitation, sea-level rise, and wildfire (CNRA, 2012). The integration of CalEnviroScreen and Cal-Adapt would ensure that cities have access to a free and easily-accessible tool that documents climate impacts to population groups, particularly communities with high levels of social vulnerability. In sum, the state has the opportunity to take a stronger leadership role in providing cities with free and streamlined tools. As one public agency planner urged, "CAPs can typically cost over $100,000 and many cities are yearning for low-cost, easy-to-use planning tools. There are opportunities to integrate EJ and public health tools with common CAP tools" (author interview, 2014). The integration of existing tools would avoid creating yet another tool or process that local governments would have to utilize and, in proprietary cases, pay for.

3) What is the Next Generation of the Trans-Local Environmental Justice Movement?

> The scale of an actor is not an absolute term but a relative one that varies with the ability to produce, capture, sum up, and interpret information about other places and times.
> -Bruno Latour (1990; Pg. 56).

In traditional environmental justice research, EJ campaigns have often been fought at the neighborhood scale. For environmental justice organizing, '*localism'* has been seen as endemic for various reasons (Brulle and Pellow, 2006; Brown, 2007; Mohai et al., 2009; Carter, 2014). Those living closest to a pollution source are most at risk of impacts. Shared observations and concerns of neighbors, such as the awareness of cancer clusters or asthma cases, have typically preceded EJ campaigns. Finally, localism often prevails because of the "siege mentality of neighborhoods that have ample grounds to believe they have been targeted" for undesirable land-uses (Carter, 2014; Pg. 11).

However, as we have seen with the CCStreets case studies, in California the environmental justice movement is gravitating towards a "relational view" that explores the reciprocal and dialectical relationships between people and place. EJ campaigns based on a relational view act as an alternative to the conventional framing of place by focusing on the mutually reinforcing relationships between "places, people, and meaning-making, on the one hand, and the political institutions and processes that shape these relationships, on the other" (Corburn, 2009; Pg. 15). As seen in the CCStreets cases, a relational view assigns greater attention to the institutional processes that shape both environmental health policy at various scales and locations. In California, it is astutely understood by EJ actors, that the environmental justice movement is situated between local scales at which the community protests unwanted pollution, and the more broad geographic scales where they are produced and can be resolved (Towers, 2000). Hence, California's EJ movement is

developing emerging campaigns beyond the "parochial" and linking community concerns to regional, statewide, and trans-local scales.

In chapter 6, we specifically see how California's planned global expansion of its market-based mechanisms is creating emerging alliances between indigenous groups in the Global South and California environmental justice groups. The case illustrates the powerful dynamic the trans-local coalition developed through its opposition of forest offsets in the Global South. The coalition raised important concerns regarding California's ability to ensure reliable emissions reductions while preventing human rights violations and negative environmental consequences within, and beyond, the state's borders. The chapter concluded, however, that it is uncertain whether the state will ultimately pursue offsets in Mexico and Brazil.

The open-ended nature of the proposed REDD offsets scheme also raises substantive questions regarding the next generation of California's EJ movement. Are the successes of the OCAC, SB 535 Coalition, and the trans-local coalition against REDD offsets all sustainable over the next several years? Will these coalitions revert to an environmental justice campaign based mainly on 'localism'?

In my dozens of conversations and interviews with California EJ advocates, I realized their strong understanding that many Global South nations face increased risks of drought, extreme weather events and disasters from climate change. Advocates further understand these same nations are least responsible for the problem and simultaneously have the lowest capacity and resources to cope with the resultant challenges. For example, in 2013, the Oakland-based Asian Pacific Environmental Network (APEN) and the California Environmental Justice Alliance (CEJA) supported Haiyan typhoon relief efforts in the Philippines as a trans-local climate justice initiative:

> CEJA stands with the Filipino people in response to the devastation caused by Super Typhoon Haiyan, considered to be the strongest tropical storm ever to hit landfall...Low-income communities around the globe are impacted first and worst by climate change. Even though poor communities, like those in the Philippines, have the smallest carbon footprint, these communities directly suffer the consequences from the energy choices made by wealthy nations and corporate polluters. We see the same pattern here in California, where low-income communities are the most impacted by polluting power plants, extreme weather events and face political inaction on their behalf (CEJA, 2013).

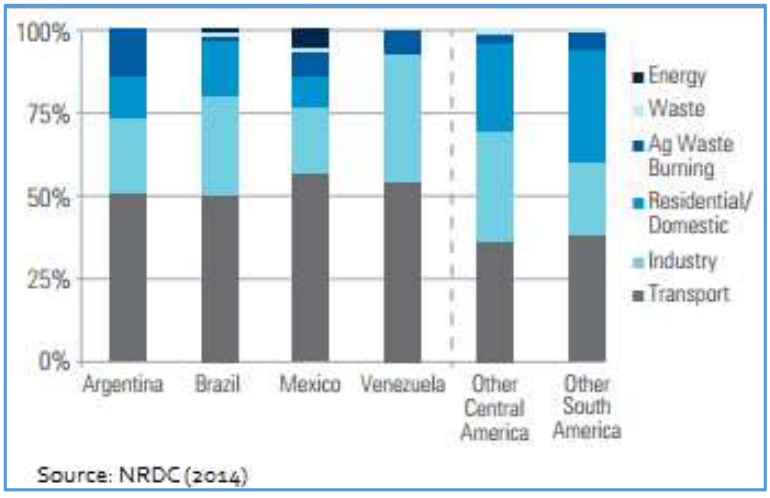
Consequently, in the same conversations with EJ leaders (in particular those working on statewide policy), I inferred that there was no real effort to develop proactive measures to link California's AB 32 to help the nations that are most socially vulnerable to the impacts of climate change. As noted in chapter 6, state policymakers view California as a member of the global community and envision its cap-and-trade program as part of larger domestic and international carbon markets. The state already ushered in a new era of international

linkages when California and the Canadian province of Quebec fully integrated their cap-and-trade programs. In attempts to expand its global reach, California has also signed MOU agreements with more than 35 nation-states and subnational governments (Figure 51). California policymakers are determined to develop AB 32 linkage programs in the Global South. Consequently, this raises significant questions of the role California's environmental justice movement will play in the expansion of California's global climate regime. Will the movement produce proactive measures to assist socially vulnerable communities globally, or will it remain a reactive movement that merely opposes international linkages and carbon offset proposals based on philosophical grounds?

The California EJ experience points to the former and the possibility of new climate experiments that produce local perspectives on global injustices. In particular, an area California EJ leaders can target is moving the state's climate policies "*beyond carbon dioxide*." Their strategic efforts through the passage of SB 605 and SB 1204 to expand the definition of global climate pollutants and create direct linkages with local air quality impacts can be a model for the Global South and a framework to expand California's global climate regime.

Recent studies by the Natural Resources Defense Council (NRDC) have shown that the health of Latin America depends on reducing black carbon. "Black carbon emissions threaten the health of millions in Latin America and contribute to climate disruption already seen in declining Andean glaciers and a drier Amazon Basin" (2014). The expanding use of diesel fuels and vehicles, along with high rates of urbanization, mean that a large proportion of people are being exposed to unhealthy levels of black carbon (Figure 69). According to the study, most countries in Latin America do not adequately monitor or try to combat black carbon. Thus, organized efforts to control black carbon would have immediate positive impacts on public health (NRDC, 2014).

Figure 69:
Anthropogenic Sources of Black Carbon Emissions
In Latin America



While globally open biomass burning is the largest global source of black carbon emissions, in Latin America the transport sector is the main anthropogenic source of black carbon (Figure 69). According to NRDC research, vehicle fleets in the 15 countries studied in the region are growing at extremely high rates, indicating that more people will be at risk of the harmful health effects of black carbon unless solutions are implemented.

The NRDC (2014) study concludes that a key black carbon strategy involves targeting centrally-fueled urban transport fleets, with a focus on retrofitting the oldest, dirtiest trucks and buses, or providing financial incentives to retire and replace them with cleaner, more fuel-efficient models. Consequently, such goals coincide directly with the mandates established pursuant to environmental justice sponsored legislation, SB 605 and SB 1204 (see chapter 6). By embracing the international linkage potential of California's AB 32, EJ groups in the state can help spur significant reductions of black carbon emissions in Latin America and beyond. Such proactive and reciprocal initiatives have the potential to provide important climate, public health, and other environmental benefits to millions of socially vulnerable people worldwide.

The California environmental justice movement has long proclaimed that if you "*care about global climate change, then fight for local air pollution*." While multiscalar strategies have succeeded in better safeguards for EJ communities within California, the success of a true trans-local climate justice movement depends on the commitment of networked EJ actors to develop new climate experiments that promote equity and public health outcomes throughout the Americas. Hence, California environmental justice leaders, policymakers, and scholars will need to collaborate across scales to identify appropriate research, policy mechanisms, and funding that can reduce local air pollution in the Americas and fight global climate change all at once. Much work still remains to be done to ensure that climate change is being addressed from the streets of Oakland to the streets of Rio.

Towards Healthy and Equitable Climate Futures

The struggles over climate knowledges and their governance regimes were central to this research analysis. How, and whose, knowledge is validated is of key importance in climate policymaking. Through the exploration of environmental justice social movements, we see that diverse publics are influencing climate change policy formation and implementation within and among nation-states. We also understand that the phenomenon of climate change is not configured in a single place or scale. Climate change becomes an object of multiple natures in which we comprehend how it is brought into being and made an issue of concern by ensembles of heterogeneous actors, techno-scientific practices, and socio-economic variables. Through the concept of civic epistemology, we further see how environmental justice groups are redrawing the scale of climate change to reveal new networks of disempowerment and empowerment. The concept elucidates more complex, situated stories of environmental change in society that expose not only cases of injustice and discrimination, but also cases of resilience, experimentation, new insights, and more healthy and equitable climate(s).

In conclusion, we can understand that climate change is occurring at every scale, from the streets of Oakland to the United Nations. Environmental justice groups, frustrated by the inability of climate governance regimes to implement equitable approaches, are now taking their call to the streets, the legislative halls of government, and regulatory bureaucracies to invoke social change. By examining the multiple ways of knowing climate change as the phenomenon is configured throughout California, we have seen how EJ groups are creating new experiments for producing climate knowledge and connecting it to public decisions. In the process, they are shifting power and authority about the environment to multiple scales. This multi-dimensional view of climate-society interaction is allowing for negotiation among diverse civil society actors and granting residents from environmental justice communities a voice in the climate policymaking process. Thus, through these experiments and ruptures in technical practice, publics are beginning to facilitate the emergence of alternative, healthier and equitable climate futures.

References

Adger, Neil, Paavola, Jouni, Huq, Saleemul and Mace, Mary Jane. (2006). *Fairness in Adaptation to Climate Change.* Cambridge, Massachusetts: MIT Press.

Adler, Ben. (2013). In New Calif. Legislature, Moderate Dems Hold Leverage. *Capitol Public Radio,* transcript. January 22, 2013.

Aguliar, Rosario. (2012a). Public health worker in the indigenous communities of Chiapas, Mexico. Public Comment period. Meeting of the California Air Resources Board, Cal Channel video archives, October 18, 2012.

Aguliar, Rosario. (2012b). Public health worker in the indigenous communities of Chiapas, Mexico. Scanned copy of State of Chiapas UNCOP16, 2010: "Chiapas, Mexico, Facing the Climate Change Challenge," promotional brochure.

Aguliar, Rosario. (2012ac). Public health worker in the indigenous communities of Chiapas, Mexico. Public Comment period. Screen shot from the meeting of the California Air Resources Board, Cal Channel video archives, October 18, 2012.

Aguilera, Rafael. (2013). Lead Organizer for the Oakland Climate Action Coalition, Ella Baker Center for Human Rights. Personal communication. June, 25, 2013.

Agyeman, J (2001) 'Ethnic minorities in Britain: short change, systematic indifference and sustainable development.' *Journal of Environmental Policy and Planning* Vol. 3 No. 1 pp 15-30.

Agyeman, J. Bullad, R.D., Evans, B. (eds). (2003). Just Sustainabilities: Development in an Unequal World. The MIT Press, Cambridge, MA

Alber, Gotelind and Kern, Kristine. (2008). Governing Climate Change in Cities: Modes of Urban Climate Governance in Multi-level Systems. *OECD Conference on Competitive Cities and Climate Change*: 9-10.

Albrecht, Cayla. (2013). The Commodification of trust and ethics: Local foods and neoliberal environmental governance. *Public Policy and Governance Review*, 5(1): pp. 51 -59.

Allen, Sam. (2011). Vernon disincorporation strains alliance between Assembly Speaker John Pérez and labor. Los Angeles Times. June 21, 2011.

Allenby, Brad. (2008). The Dangerous Rise of Carbon Fundamentalism. *Greenbiz.com,* January 26, 2008. http://www.greenbiz.com/blog/2008/01/26/dangerous-rise-carbon-fundamentalism

American Lung Association (2010). Land use, climate change and public health issue brief: Improving public health and combating climate change through sustainable land use and transportation planning. Spring 2010.

American Lung Association and EDF – Environmental Defense Fund. (2014). Driving California Forward Public Health and Societal Economic Benefits of California's AB 32 Transportation Fuel Policies. EDF, San Francisco, CA.

Amin, Ash and Thrift, Nigel. (2002). Cities: Reimaging the Urban. Polity Press. Cambridge, UK.

Andrew, Jane, Kaidonis, Mary, and Andrew, Brian. (2010). Carbon tax: Challenging neoliberal solutions to climate change. *Critical Perspectives on Accounting*, 21: pp. 611-618.

Anderson, B. (2010). Preemption, precaution, preparedness: Anticipatory action and future geographies. *Progress in Human Geography*, 34(6), 777-798.

Angotti, Tom and Sze, Julie. (2009). Environmental Justice Praxis: Lessons for the Theory And Practice of Interdisciplinary Urban Health. In Nicholas Freudenberg, Susan Klitzman, and Susan Saegert (Eds). *Interdisciplinary Urban Health Research and Practice*, pp. 19-41, Jossey- Bass

Anguelovskik, Isabelle and Carmin, JoAnn. (2011). Something borrowed, everything new: innovation and institutionalization in urban climate governance. *Current Opinion in Environmental Sustainability*,3: pgs. 169-175.

Arguello, Martha. (2014). EJAC Chair, comments at the April 11, 2014 EJAC meeting, Sacramento, CA.

Arkansas Business Staff. (2014). Clean Harbors to Expand in El Dorado, Add 120 jobs. Arkansas Business.com, September 23, 2014.

Asian Pacific Environmental Network (APEN). (2011). SB 535 Fact Sheet.

Asian Pacific Environmental Network (APEN). (2012a). SAB 1532 and SB 535 Fact Sheet.

Asian Pacific Environmental Network (APEN). (2012b). Climate Investments To Provide Economic Opportunity To All Californians. Press Release, October 1, 2012.

Astronaut photograph ISS038-E-32446. (2014). ISS Crew Earth Observations Facility and the Earth Science and Remote Sensing Unit, Johnson Space Center. The image was taken on January 17, 2014 by the Expedition 38 crew. It has been cropped and enhanced to improve contrast, and lens artifacts have been removed. http://eol.jsc.nasa.gov/SearchPhotos/photo.pl?mission=ISS038&roll=E&frame=32446

Bailey I. (2007) Market environmentalism, new environmental policy instruments, and climate policy in the United Kingdom and Germany. *Annals of the Association of American Geographers* 97(3): 530-550

Bakker K. (2005) Neoliberalizing nature? Market environmentalism in water supply in England and Wales. *Annals of the Association of American Geographers* 95(3): 542-565.

Baldwin, R., Cave, M., Lodge, M. (2011). *Understanding Regulation: Theory, Strategy and Practice*. 2nd ed. Oxford: Oxford University Press.

Barab, Sasha, Sadler Troy, Heiselt, Conan, Hickey, Daniel Hickey and Zuiker, Steven. (2007). *Journal of Science Education and Technology*, 16 (1): pp 59-82.

Barboza, Tony. (2014a). Heat, drought worsen smog in California, stalling decades of progress. *Los Angeles Times,* November 14, 2014.

Barboza, Tony. (2014b). Yurok tribe hopes California's cap-and-trade can save a way of life. Los Angeles Times, December 16, 2014.

BARHII, Bay Area Health Inequities Initiative. (2013). Climate Change: What's Public Health Got to do with it? *BARHII*, Guide (01).

Barrett, Sam. (2013). The necessity of a multiscalar analysis of climate justice. *Progress in Human Geography*, 37(2): pp. 215-233.

Barugh, Hannah and Glass, Dan. (2010). Environment, Climate Change and popular education. *Concept: The Journal of Contemporary Community Education Practice Theory*. Vol.1 No.3 winter 2010

Baum, F. (2009). Envisioning a healthy and sustainable future: essential to closing the gap in a generation. *Global Health Promotion*, 16(1); pp. 271-277.

Bautista, Nidia. (2013). Legislative Advocate for the Coalition for Clean Air (CCA). Personal Communication. June 20, 2013.

Beck, S. (2011). The challenges of building cosmopolitan climate expertise: the case of Germany. Wiley Interdisciplinary Reviews: *Climate Change*

Bedsworth, Louise. (2008). Climate change and California's local public Health Agencies. *Public Policy Institute of California*. February 2008.

Bedsworth, Louise. (2009). Preparing for climate change: a perspective from local health officers in California. *Environmental Health Perspective*, 117, pp: 617-623.

Bedsworth, Louise. (2012). California's local health agencies and the state's climate adaptation strategy. Climate Change, 111 (1), pp. 119-133.

Berke, P.R. and Conroy, M.M. (2000). Are we planning for sustainable development? An evaluation of 30 comprehensive plans. Journal of the American Planning Association, 66, pp. 21-33.

Bernstein, Sharon. (2013). California Democrats likely to stay moderate course despite majority. Reuters, September 13, 2013.

Beveridge, Brian. (2013). Co- Director, West Oakland Environmental Indicators Project. Personal communication. June 3, 2013.

Bijker, W. and Pinch, T. (1987). *The Social Construction of technological systems: New directions in the sociology and history of technology*. Cambridge, Massachusetts: MIT Press.

Blue Source and The Forestland Group. (2013). Blue Source, The Forestland Group And Shell Complete 500,000 Tonne California Carbon Offset Transaction: Forestry Offset Deal Signifies Growing Confidence in California's Cap and Trade System, March 15, 2013.
http://bluesource.com/news/view/Blue-Source-The-Forestland-Group-and-Shell-Complete-500-000-Tonne-California-Carbon-Offset-Transaction#sthash.CHhkkC2P.dpuf

Bolin B (1994) Science and policy making. *Ambio* 23(1):25–29

Boswell, Michael R., Adrienne I. Greve, and Tammy L. Seale. 2010. "An Assessment of the Link Between Greenhouse Gas Emissions Inventories and Climate Action Plans". *Journal of American Planning Association* 76 (4): 451 – 462.

Bowels (2006). Assembly Speaker Fabian Núñez puts Global Warming into a Public Health Context. *The Press Enterprise.*

Boyce, James. (2009). Memo to Economic Allocation Advisory Committee. Investment in Disadvantaged Communities. State of California, October 5, 2009.

Boyce, James, and Pastor, Manuel. (2013). Clearing the air: incorporating air quality and environmental justice into climate policy. *Climate Change*, 120(4): pp. 801-814.

Brace, C. and Geoghegan, H. (2010). Human geographies of climate change: landscape, temporality, and lay knowledges. *Progress in Human Geography*, 35(5): 284-302.

Braveman, P.A., Monitoring equity in health and healthcare: a conceptual framework. *Journal of health, population, and nutrition*, 2003. 21(3): p. 181

Brenner, Neil. 1997. State territorial restructuring and the production of spatial scale: Urban and regional planning in the Federal Republic of Germany, 1960-1990. Political Geography, 16: pp. 27-306.

Brindis, Daniel. (2013). Why California should not be allowed to outsource hot air. *Green Peace*, May 2014.

Brown, Jerry. (2014). United Nations Climate Summit in New York City, quoted in CARB, "California's Major International and Regional Agreements on Climate Change, Energy and the Environment.

Brown, D.G., and Polsky, Colin et al. (2014). Chapter 13: Land Use and Land Cover Change. *Climate Change Impacts in the United States: The Third National Climate Assessment*. Melillo, J.M., Richmond T.C., and Yohe, G.W. (Eds.). U.S. Global Change Research Program.

Brown, P. (2007). *Toxic exposure, contested illness and the environmental health movement*. New York: Columbia University Press.

Brulle, R.J. and Pellow, D.N. (2006) Environmental justice: human health and environmental inequalities. *Annual Review of Public Health,* 27: pp. 103-124.

Bryant, Bunyan. (1995). Issues and potential policies and solutions for environmental justice: An overview. In Bryant, Bunyan (Ed.), *Environmental Justice: Issues, Policies, and Solutions*, pgs. 8-34. Island Press. Washington, D.C.

Bulkeley, Harriet, Carmin, JoAnn, Castan Broto, Vanesa, Edwards, Gareth. (2013). Climate justice and global cities: Mapping the emerging discourses. *Global Environmental Change*, 23, pp 914-925.

Burrell, Jenna. (2009). The Fieldsite as a Network: a strategy for locating ethnographic research. *Field Methods*, 21(2).

Burayidi, M. (2000). *Urban Planning in a Multicultural Society*. Westport CT: Praeger.

Burtraw, Dallas and Toman, Michael. (2000). Ancillary Benefits of Greenhouse Gas Mitigation Policies. Climate Change Issues Brief (7), Resources for the Future. Washington D.C.
Ancillary Benefits of Greenhouse Gas Mitigation Policies. Climate Change Issues Brief

California Air Pollution Control Officers Association (CAPCOA). (2011). California Emissions Estimator Model – CalEEMod. http://www.capcoa.org/caleemod/

California Air Pollution Control Officer's Association (CAPCOA). (2014). California's progress toward clean air. http://www.capcoa.org/wp-content/uploads/2014/04/CA_Progress_Toward_Clean_Air_Report_2014.pdf

California Air Resources Board (CARB). (2008). AB 32 Scoping Plan.
http://arb.ca.gov/cc/scopingplan/scopingplan.htm

California Air Resources Board. 2009. Quantified Health Impacts of Air Pollution Exposure.
http://www.arb.ca.gov/research/health/qhe/qhe.htm

California Air Resources Board (CARB). (2010). Draft California Communities Environmental Health Screening Tool. State of California.

California Air Resources Board (CARB). (2011a). Supplement to the AB 32 Scoping Plan Functional Equivalent Document
http://www.arb.ca.gov/cc/scopingplan/fed.htm

California Air Resources Board (CARB). (2011b). Adaptive Management Plan.
http://www.arb.ca.gov/cc/capandtrade/adaptivemanagement/adaptivemanagement.htm

California Air Resources Board (CARB). (2011c). Compliance Offset Protocol U.S. Forest Offset Projects Adopted October 20, 2011.
http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2011.htm

California Air Resources Board. (2011d). Resolution adopting Cap-and-Trade, October 20, 2011.
http://www.arb.ca.gov/regact/2010/capandtrade10/res11-32.pdf

California Air Resources Board. (2011e). Compliance Offset Protocol Ozone Depleting Substances (ODS) Projects. Adopted 10/20/2011.
http://www.arb.ca.gov/cc/capandtrade/protocols/ods/ods.htm

California Air Resources Board. (2011f). Compliance Offset Protocol Urban Forest Projects. Adopted October 20, 2011. http://www.arb.ca.gov/regact/2010/capandtrade10/copurbanforestfin.pdf

California Air Resources Board. (2012a). Public Comment period. Meeting of the California Air Resources Board, Cal Channel video archives, October 18, 2012.

California Air Resources Board (2013a). Cap-and-Trade Auction Proceeds Investment Plan: Fiscal Years 2013-14 through 2015-16. State of California, May 14, 2013.

California Air Resources Board (2013b). Linkage: Linkage Readiness Report.
http://www.arb.ca.gov/cc/capandtrade/linkage/linkage.htm

California Air Resources Board (CARB). (2014a). AB 32 Scoping Plan Update.
http://arb.ca.gov/cc/scopingplan/scopingplan.htm

California Air Resources Board (CARB). (2014b). Investments to Benefit Disadvantaged Communities Senate Bill 535 (De León, Chapter 830, Statutes of 2012) Cap-and-Trade Auction Proceeds: Interim Guidance to Agencies Administering Greenhouse Gas Reduction Fund Monies. State of California. September 18, 2014.

California Air Resources Board (CARB). (2014c). California's major international and regional agreements on climate change, energy and the environment.

California Air Resources Board (CARB). (2014d). Compliance Offset Program. Accessed February 2015.
http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm

California Air Resources Board. (2014e). Climate Change from the Bottom up Panel. Photo posted by CARB to Twitter account.

California Air Resources Board (CARB). (2015). ARB Offset Credit Issuance. Accessed February 2015.
http://www.arb.ca.gov/cc/capandtrade/offsets/issuance/issuance.htm

California Chamber of Commerce (2006). 2006 Legislative Session Job Killer Bills. http://www.calchamber.com/governmentrelations/pages/jobkillers.aspx

California Chamber of Commerce (2013). Job Killer Bills. http://www.calchamber.com/GovernmentRelations/Pages/Job-Killers-2013.aspx

California Climate Action Team (CAT). (2006). Climate Action Team Report to Governor Schwarzenegger and the California Legislature. Sacramento.

California Climate Change Assessment. (2012). State of California, Natural Resources Agency.

California Department of Justice (DOJ). (2013) California Environmental Quality Act (CEQA). State of California. http://oag.ca.gov/environment/ceqa

California Department of Public Health (CDPH). (2010). Health impact assessment of a cap-and-trade framework . December 2010.

California Department of Public Health (CDPH). (2012). Climate Action for Health: Integrating Public Health into Climate Action Planning.

California Energy Commission (CEC). (2012). *Community-based Climate Adaptation Planning: Case Study of Oakland, California*. A White Paper. Pacific Institute and Oakland Climate Action Coalition.

California Environmental Justice Alliance (CEJA). (2012). Comment letter to the Office of Environmental Health Hazard and Assessment regarding the draft CalEnviroScreen tool. October 16, 2012.

California Environmental Justice Alliance (CEJA). (2013). Supporting Haiyan relief is part of our fight for climate justice. http://caleja.org/2014/01/1144/

California Environmental Justice Alliance (CEJA). (2014). Environmental Justice Scorecard, 2014. http://caleja.org/wp-content/uploads/2015/01/CEJA_scorecard2014.pdf

California Environmental Protection Agency (CAL EPA). (2013). Environmental Justice Small Grants http://www.calepa.ca.gov/EnvJustice/Funding/

California Environmental Protection Agency (Cal EPA). (2014). Draft California Communities Environmental Health Screening Tool (CalEnviroScreen). *State of California.*

California Manufacturing and Technology Association (CMTA). (2002). Legislative Weekly. June 14, 2002. http://www.cmta.net/legweekly/061402.php

California Manufacturing and Technology Association (CMTA). (2010). Cap-and-trade auction revenue bill moves to Senate floor. August 27, 2010. http://www.cmta.net/page/legupdate-article.php?legupdate_id=1765

California Natural Resources Agency (CNRA). (2012). Cal-Adapt Tool. http://cal-adapt.org/tools/

California Strategic Growth Council – SGC. (2013). Sustainable communities planning grant and incentives program. *Grant Guidelines and application.* State of California.

Canadian Centre for Policy Alternatives (CCPA). (2008). Is BC's Carbon Tax Fair? An Impact Analysis for Different Income Levels. CCPA, October 2008.

Canadian Centre for Policy Alternative (CCPA) and BC Sierra Club. (2011). Fair and Effective Carbon Pricing: Lessons from BC. CCPA and BC Sierra Club, February 2011.

Carmin, JoAnn and Dodman, David. (2013). Engaging science and managing scientific uncertainity in urban climate adaptation planning. In Moser, Susanne and Boykoff, Maxwell (Eds). *Successful adaptation to climate change: linking science and policy in a rapidly changing world.* Routledge.

Carter, Eric. (2014). Environmental justice 2.0: new Latino environmentalism in Los Angeles. *Local Environment*.

Cartwright, A, Parnell, S., Oelofse, G., and Ward, S. (2012) *Climate Change at the City Scale: Impacts, mitigation and adaptation in Cape Town*. Earthscan from Routledge.

Castree N. (2006) From neoliberalism to neoliberalization: Consolations, confusions, and necessary illusions. *Environment and Planning A* 38(1): 1-6.

Castree N. (2008) Neoliberalising nature: Processes, effects, and evaluations . *Environment and Planning A* 40: 153-173.

Castro, Tony. (2013). Latinos and the environmental movement: Change is afoot. *Voxxi news.*

Center for Race, Poverty, and the Environment (CRPE). (2013). California's Cap and Trade Program
Fighting for just climate change policy.
http://www.crpe-ej.org/crpe/index.php/component/content/article/253

Chinn, Lily. (1999). Can the Market Be Fair and Efficient? An Environmental Justice Critique of Emissions Trading, Ecology Law Quarterly, 26(1): pp. 80-83.

City of Oakland. (2011). Climate Action Plan.
http://www2.oaklandnet.com/Government/o/PWA/s/SO/OAK025294

City of Lodi. (2014). Climate Action Plan.
https://www.lodi.gov/community_development/pdf/CAPdocNegDec.pdf

City of Sacramento. (2012). Climate Action Plan.
http://portal.cityofsacramento.org/Community-Development/Resources/Online-Library/Sustainability

City of Stockton. (2014). Climate Action Plan.
http://www.stocktongov.com/government/boardCom/clim.html

Clark, J. and Murdoch, J. 1997 Local Knowledge and the Precarious Extension of Scientific Networks: A Reflection on Three Case Studies. *Sociologia Ruralis,* 37(1): pp. 38-60.

Clegern, Dave. (2013). Will California's Cap and Trade be Fair? *The Nation,* April 8, 2013.

Coalition for Clean Air. (2009). AB 1405 Fact Sheet.

Coalition for Clean Air. (2012). AB 535 Fact Sheet.

Conant, Jeff. (2013). Photo of coalition of indigenous and environmental justice groups lobbying at the California state Capitol in Sacramento.

Conant, Jeff. (2013). Policy advocate with Friends of the Earth. Personal communication. July 19, 2013.

Corburn, Jason. (2003). Bringing local knowledge in environmental decision-making: Improving urban planning for communities at risk. *Journal of Planning Education and Research*, 22: 420

Corburn, Jason. (2005). *Street Science: Community Knowledge and Environmental Health Justice*. MIT Press. Cambridge, Massachusetts.

Corburn, Jason. (2007). Community Knowledge in Environmental Health Science: Co-producing Policy Expertise. *Environmental Science & Policy*, 10, pp. 150-161.

Corburn, Jason. (2009). Cities, Climate Change and Urban Heat Island Mitigation: Localising Global Environmental Science. *Urban Studies*, 46(2): pgs. 413-427.

Creswell, John. (2007). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. Sage, Thousand Oaks, CA.

Cuff, Daniel. (2015). Record-tying streak of spare the air alert ends on Tuesday in Bay Area. *Contra Costa Times*, January 12, 2015.

Cummins, Steven, Curtis, Sarah, Diez-Roux, Ana, and Macintyre, Sally. (2007). Understanding and representing 'place' in health research: A relational approach. *Social Science & Medicine*, 65 (2007) 1825–1838

Curtis, S.E. & Oven, K.J. (2011). Geographies of health and climate change. *Progress in Human Geography*. 1-13.

Curnutte, M., & Testa, G. (2012). Consuming genomes: scientific and social innovation in direct-to-consumer genetic testing. *New Genetics and Society*, 31(2), 159-181.

Cutter, Suan, et al (2009). Social Vulnerability to Climate Variability Hazards: A Review of the Literature. Oxfam America.

De la Cruz, Alegria. (2011). "Cap and Trade Will Fail": An Interview with Alegria de la Cruz of the Center on Race, Poverty, and the Environment, Climate Connections and Global Justice Ecology Project.

Dietz, Matthias and Garrets, Heiko. (2014). *Routledge handbook of the climate change movement*. New York, New York: Routledge.

Dessai, S., Hulme, M., Lempert, R., & Pielke Jr, R. (2009). Climate prediction: a limit to adaptation. In *Adapting to climate change: thresholds, values, governance*, 64-78.

Diffenbaugh, Noah, Swaina, Daniel, and Danielle Touma. (2015). Anthropogenic warming has increased drought risk in California. *CrossMark: Proceedings of the National Academy of Sciences of the United States of America*, 112(12): pp. 3931-3936.

Doerr, John. (2006). GUEST COLUMN: John Doerr Why smart businesses stand behind global warming law. Environmental Defense Fund Newsletter, 37(5), November-December 2006.

Douglas, Ellen M., Paul H. Kirshen, Michael Paolisso, Chris Watson, Jack Wiggin, Ashley Enrici, and Matthias Ruth. 2012. Coastal flooding, climate change, and environmental justice: identifying obstacles and incentives for adaptation in two metropolitan Boston Massachusetts communities. *Mitigation and Adaptation Strategies for Global Change* 17: 537-562.

Drury, Richard, Belliveau, Michael, Khun, J. Scott, and Bansal, Shipra. (1999). Pollution trading and environmental justice: Los Angeles failed experiment in air quality policy. *Duke Environmental Law and Policy Forum,* 9: pp. 231-289.

Economic and Allocation Advisory Committee (EAAC). (2010). Allocating Emissions Allowances Under a California Cap-and-Trade Program: Recommendations to the California Air Resources Board and California Environmental Protection Agency. State of California, Final Report March 2010

Economic and Technology Advancement Advisory Committee (ETAAC). (2008). Final Report: Technologies and Policies to Consider for Reducing Greenhouse Gas Emissions in California. A Report to the California Air Resources Board. State of California, February 11, 2008.

Egelko, Bob. (2011). California cap-and-trade suffers legal setback. San Francisco Chronicle, March, 21, 2011.

England-Nelson, Jordan. (2015). Long Beach joins environmental coalition in opposition to BNSF's railyard project. Daily Breeze, March 3, 2015.

EJ Matters, 2008. http://www.ejmatters.org

Ella Baker Center for Human Rights (2012). A Win for California! Blog post, October 1, 2012.

Emissions Database for Global Atmospheric Research (EDGAR). (2014). Trends in global CO_2 emissions, 2014 report. http://edgar.jrc.ec.europa.eu/news_docs/jrc-2014-trends-in-global-co2-emissions-2014-report-93171.pdf

Environmental Defense Fund (EDF). (2012). California's Clean Cars Law: Renewed hope for protective tailpipe standards to cut global warming pollution. Assessed via internet. http://www.edf.org/transportation/policy/california-clean-cars-law

Environmental Defense Fund (EDF). (2014). Carbon Market California: A Comprehensive Analysis of the Golden State's Cap-and-Trade Program, Year one: 2013. EDF, San Francisco, CA.

Environmental Defense Fund (EDF). (2015). Carbon Market California: A Comprehensive analysis of the golden state's cap-and-trade program: Year two: 2014.

Environmental Justice Advisory Committee (EJAC). (2008). Recommendations for AB 32 Scoping Plan. Report to the California Air Resources Board (CARB).

Environmental Law News ELN. (2007). Global Warming I: Developing Cap and Trade Programs to Reduce Greenhouse Gas Emissions . *Environmental Law News*, 16(1): pp. 34-43.

Ezrahi, Y. (1990). *The descent of Icarus: Science and the transformation of contemporary democracy*. Cambridge, MA: Harvard University Press.

Faber, Daniel and McCarthy, Deborah. (2001). Green of Another Color: Building Effective Partnerships Between Foundations and the Environmental Justice Movement. Northeastern University, Philanthropy and Environmental Justice Research Project.

Falzon, Mark-Anthony (2009). *Multi-sited ethnography: Theory, praxis and locality in contemporary research*. Ashgate; Surrey, England.

Fann, N., Lamson, A. D., Anenberg, S. C., Wesson, K., Risley, D. and Hubbell, B. J. (2012), Estimating the National Public Health Burden Associated with Exposure to Ambient PM2.5 and Ozone. *Risk Analysis*, 32: 81–86.

Farber, Dan. (2013). The Rhetoric of Cap and Trade: Different ways of framing the concept of cap and trade help drive the public debate. *Legal Planet: Insight & Analysis: Environmental Law and Policy*. Berkeley Law and UCLA Law, November 14, 2013.

Few, Roger, Brown, Katrina, and Tompkins, Emma. (2007). Public participation and climate change adaptation: avoiding the illusion of inclusion. *Climate Policy*, 7: pgs. 46-59.

Finn, Donovan and Lynn McCormick. 2011. "Urban Climate Change Plans: How Holistic?" *Local Environment* 16 (4): 397 – 416.

Firpo, Eric. (2009). A climate change for Tracy growth. Tracy Press June 26, 2009.

Four Twenty-Seven. (2013a). Analysis of the impact of SB 605 on the California carbon market. July 30, 2013. http://427mt.com/wp-content/uploads/2013/07/Market-Impact-of-SB-605.pdf

Four Twenty-Seven. (2013b). Price Containment in California's Carbon Market: a Difficult ARBitrage. http://427mt.com/2013/07/price-containment-in-californias-carbon-market-a-difficult-arbitrage/

Franco, Guido, Cayan, Dan and Luers, Amy. (2008). Linking climate change science with policy in California. Climate Change , 84; S7-S20.

Fitzgerald, Garrett. (2011). Sustainability Manger, City Oakland. *Personal Communication*. November 16, 2011.

Fitzgerald, Garrett. (2012). In Oakland Climate Action Coalition: Toolkit to create climate action in your community. Ella Baker Center, Oakland California.

Freire, Paolo. (1973). *Pedagogy of the oppressed*. Seabury Press, New York.

Garzon, Catalina. (2013). Director, Pacific Institute's Community Strategies for Sustainability and Justice Program. Personal communication. June, 13, 2013.

Goldsmith, Ernest. (2011). Association of Irritated Residents et al v. California Air Resources Board et al., No. CPF-09-509562, California Superior Court, Mar. 18, 2011.

Goldstein, B. E. (2010). The Weakness of Tight Ties: Why Scientists Almost Destroyed the Coachella Valley Multispecies Habitat Conservation Plan in Order to Save it. Environmental Management 46 (2): 268-284, 46(2), 268-284.

Gonzalez, Erualdo, Lejano, Raul, Vidales, Guadalupe, et al. (2007). Participatory Action Research for Environmental Health: Encountering Freire in the Urban Barrio. *Journal of Urban Affairs*, 29 (1): 77-100.

Gould, Solange. (2013). Assessing Public Health Knowledge of Climate Change and Role in Climate Action. Public presentation to the Climate Action Team Public Health Working Group, State of California. September 26, 2013 meeting, Sacramento.

Graham, S., & Healy, P. (1999). Relational concepts of space and place: Issues for planning theory and practice. European Planning Studies, 7, 623–646.

Grahame, Thomas, Klemm, Rebecca, and Schlesinger, Richard. (2014). Public health and components of particularte matter: The changing assessment of black carbon. *Journal of the Air and Waste Management Association*, Critical Review, 64(6): pp. 620-660.

Green Cities Research Alliance. (2012). Seattle's forest ecosystem values: Analysis of the structure, function, and economic benefits. August 2012.

Grimes, Kathy. (2012). Anti-democracy bill guts California open-government laws. Cal Watchdog. October 12, 2012.
Hallengate, S. et al. (2011). Designing Climate Change Adaptation Policies: An economic framework. *World bank Policy Research Working Paper*, 5568, Washington, DC.

Grover-White, Robin. (2008). Review Symposium. In Ezrahi, Y. (Ed). Controlling biotechnology: science, democracy and 'civic epistemology'. *Metascience*, 17(2), 177-198.

Gullo, Karen and Doan, Lynn. (2013). California Defeats Lawsuit Against Cap-and-Trade Program. Bloomberg News, January 28, 2013.

Gupta, A. and Ferguson, J. (1997). *Beyond "culture": Space, identity, and the politics of difference*. Duke University Press, Durham, NC.
Haas, P. (2004). When does power listen to truth? A constructivist approach to the policy process. *Journal of European public policy, 11(4), 569-592.*

Halper, Evan. (2014). Activists say California fighting pollution globally but not locally. Los Angeles Times, June 29, 2014.

Hara, Chieko. (2014). Bad air quality not going away. *Portville Recorder*, January 9, 2014.

Hanemann, M., 2008. California's new greenhouse gas laws. *Review of Environmental Economics and Policy* 2 (1) 114–129.

Haraway, Donna. (1998). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 14 (3); 575-599.

Harrison, J.L., 2011. *Pesticide Drift and the Pursuit of Environmental Justice*. MIT Press, Cambridge, MA.
Hartmann, B. (2010). Rethinking climate refugees and climate conflict: Rhetoric, reality and the politics of policy discourse. *Journal of International Development*, 22(2); pp. 233–246.

Haya, Barbara. (2009). California's Carbon Offsets Program - The Offsets Limit Explained There has been a lot of confusion about what the 8% limit on the use of offsets under California's cap-and-trade program means. http://bhaya.berkeley.edu/

Hecht, Sean. (2011). Reflections on Environmental Justice and AB 32's Emissions Program. Legal Planet: The Environmental Law and Policy Blog.

Hecht, Sean. (2009). California Environmental Justice Advocates sue Air Resources Board over Climate Scoping Plan., In: http://legalplanet.wordpress.com/2009/06/10/california-environmental-justice-advocates-sue-air-resources-board-over-climate-scoping-plan/.

Hess, Jeremy, et al. (2008). Climate change: The importance of place. *American Journal of Preventive Medicine*, 35(5); 468-478.

Heynen N, McCarthy J, Prudham WS, and Robbins P (eds) (2007) *Neoliberal Environments: False Promises and Unnatural Consequences*. New York: Routledge.

Heynen N. and Robbins P. (2005) The neoliberalization of nature: Governance, privatization, enclosure and valuation. *Capitalism, Nature, Socialism* 16(1): 5-8.

Holifield, Ryan B. (2004). Neoliberalism and environmental justice in the United States environmental protection agency: Translating policy into managerial practice in hazardous waste remediation. *Geoforum* 35(3): pp. 285-297.

Holifield, Ryan B. (2007). Neoliberalism and environmental justice policy. In Ed. Heynen, N., McCarthy, J., Prudham, S., and Robbins, P., *Neoliberal Environments: False Promises and Unnatural Consequences.* Routledge, London, England.

Holmes-Gen. (2010). Calif. Bill Could Generate Billions to Help Cope With Climate Change. New America Media, New Report. September 29, 2010.

Hull, R. Bruce. (2006). *Infinite Nature*. Chicago, Illinois; Chicago University Press.

Hughes, Sara. (2013). Justice in Urban Climate Change Adaptation: Criteria and Application to Delhi. *Ecology and Society* 18(4): 48.

Hulme, M. (2007). Boundary Crossings: Geographical work at the boundaries of climate change. *Journal compilation © Royal Geographical Society, 1-11.*

Hulme, M. (2010). Problems with making and governing global kinds of knowledge. Global Environmental Change, 20(4), 558-564.

Hulme, M., & Mahony, M. (2010). Climate change: What do we know about the IPCC?. *Progress in Physical Geography*, 34(5), 705-718.

ICELI. (2009). The Mitigation-Adaptation Connection: Milestones, Synergies and Contradictions http://www.icleiusa.org/action-center/planning/The%20Mitigation-Adaptation%20Connection.pdf

ICELI (2012). What is a Sustainability Plan? http://www.icleiusa.org/action-center/planning/ICLEI_What%20Is%20a%20Sustainability%20Plan.pdf.

Illes, Alistair. (2007). Identifying environmental health risks in consumer products: non-governmental organizations and civic epistemologies. *Public Understanding of Science*, 16; 371-391.

Inside Cal EPA. (2002). Panel advances weakened bill establishing equity grant program. InsideEPA.com, April 19, 2002.

Inside Cal EPA. (2009a). ARB advisers favor carbon revenues for clean-energy projects. InsideEPA.com, July 17, 2009.

Inside Cal EPA. (2009b). Carbon revenue bill sets stage for future policy, budget debates. InsideEPA.com, October 9, 2009.

Inside Cal EPA. (2010). California community fund bill may boost press for GHG auctions. InsideEPA.com, September 2, 2010.

Inside Cal EPA. (2011). Contentious bill to earmark California GHG funds for poor advances. InsideEPA.com, June 30, 2011.

Inside Cal EPA. (2012). Activists, industry at odds over California EPA's cumulative impacts tool. InsideEPA.com, August 31, 2012.

IPCC. (2014). Climate Change 2014 Synthesis Report Summary for Policymakers. *Intergovernmental Panel on Climate Change. http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf*

Irwin, Alan (1995). *Citizen Science: A study of people, expertise and sustainable development*. Routledge, London.

Jasanoff S and Wynne B (1998) Science and decisionmaking. Human choice and climate change. In: Rayner S, Malone EL (eds) *Human choice and climate change 1: the societal framework*. Batelle Press, Columbus Ohio, pp 1–87

Jasanoff, Shelia. (2004). Ordering Knowledge, Ordering Society. In Jasanoff (ed.), *States of Knowledge: The Co-production of Science and Social Order,* 13-45. Routledge.

Jasanoff, Shelia. (2005). *Designs on Nature: Science and Democracy in Europe and the United States*. Princeton University Press.

Jasanoff, Shelia (2008). Review Symposium. In Ezrahi, Y. (Ed). Controlling biotechnology: science, democracy and 'civic epistemology'. *Metascience*, 17(2), 177-198.

Jasanoff, S. (2010). A new climate for society. *Theory, Culture & Society*, 27(2-3), 233-253.

Jasnaoff, Shelia. (2011). Cosmopolitan Knowledge: climate Science and Global Civic Epistemology. In Dryzek, J. S., Norgaard, R. B., & Schlosberg, D. (Eds.). (2011). The Oxford Handbook of Climate Change and Society. Pg 129-143. OUP Oxford.

Jasanoff, Shelia and Martello, Marybeth Long. (2004). Introduction: Globalization and Environmental Governance. In Jasanoff, Shelia and Martello, Marybeth Long (Eds.), *Earthly Politics: Local and Global in Environmental Governance,* pgs. 1-29. MIT Press. Cambridge, MA.

Jepson, E.J., (2004). The adoption of sustainable development policies and techniques in U.S. cities: How wide, how deep, and what role for planners? *Journal of Planning Education and Research*, 23, pp. 229-241.

Jessop, Bob. (2002). Liberalism, Neoliberalism, and Urban Governance: A State Theoretical Perspective. *Antipode,* 34: pp. 452-472.

Jochem, Eberhard and Madlener, Reinhard (2003). The Forgotten Benefits of Climate Change Mitigation: Innovation, Technological Leapfrogging, Employment, and Sustainable Development. Working Party on Global and Structural Policies – *OECD Workshop on the Benefits of Climate Policy: Improving Information for Policymakers.*

Jonas, A. (1994). The scale politics of spatiality. *Environment and Planning D: Society and Space* 12(3) 257 – 264.

Jones, K. T. (1998). Scale as epistemology. *Political Geography*, 17, pp: 25-28.

Kaswan, A. (2008). Environmental justice and domestic climate change policy. *Environmental Law Reporter,* 38, 10287.

Kaswan, A. (2010). Reconciling justice and efficiency: Integrating environmental justice into domestic cap-and-trade programs for controlling greenhouse gases. In Arnold, Dennis (Ed.), *The Ethics of Global Climate Change*, pp. 232-254. Cambridge University Press.

Kaswan, A. (2012). Climate change, the Clean Air Act, and Industrial Pollution. *UCLA Journal of Environmental Law and Policy*, 30(1), pp. 51-120.

Kirsch, Emily. (2011). Lead Organizer for the Oakland Climate Action Coalition, Ella Baker Center for Human Rights. *Personal communication*. October, 26, 2011.

Krauss, Werner. (2009). Localizing Climate Change: A Multi-sited Approach. In Falzon, Mark-Anthony (Ed.), *Multi-sited ethnography: Theory, praxis and locality in contemporary research*. Ashgate; Surrey, England.

Kurtz, H. E. (2003). Scale frames and counter-scale frames: Constructing the problem of environmental injustice. *Political Geography*, 22: pp. 887-916.

Latour, Bruno. (1987). Science in Action: How to follow scientists and engineers through society. Harvard University Press. Cambridge, MA.

Latour, Bruno. (1990). Drawing things together. In M. Lynch & S. Woolgar (Eds.), R*epresentation in scientific practice;* pp. 19-68. Boston: MIT Press.

Latour, B. (1996). On actor-network theory—a few clarifications. Soziale Welt-Zeitschrift fur Sozialwissenschaftliche forschung und praxis, 47(4), 369

Lehmer, Aaron. (2011). Campaigns Director, Bay Localize. *Personal Communication*. November, 4, 2011.

Lejano, Raul and Hirose, Rei. (2005). Testing the assumptions behind emissions trading in non-market goods: the RECLAIM program in Southern California. *Environmental Science and Policy*, 8: pp. 367-377.

Lemos, Maria Carmen and Morehouse, Barbara. (2005). The co-production of science and policy in integrated climate assessments. *Global Environmental Change*, 15: pgs. 57-68.

Lerza, C., 2011. Lessons From The Defeat Of Proposition 23. Prepared by for *Funders Network for Transforming the Global Economy* (FNTG).

Leung, Wendy. (2010). Residents protest proposed railyard air pollution plan: More than 100 residents from rail adjacent communities protested. San Bernardino Sun. June 20, 2010.

Li, J. C. (2002), Including the Feedback of Local Health Improvement in Assessing Costs and Benefits of GHG Reduction. *Review of Urban & Regional Development Studies*, 14: pp. 282–304.

Lievanos, R. (2012). Certainty, fairness, and balance: state resonance and environmental justice policy implementation. *Sociological Forum,* 27 (2).

Liverman, Diana. (2004). Who governs, at what scale and at what price? Geography, environmental governance, and the commodification of nature. *Annals of the Association of American Geographers*, 94(4): pp. 734-738.

Liverman, Diana and Vilas, Silvina. (2006). Neoliberalism and the Environment in Latin America. *Annual Review Environmental Resources*, 32: pp. 327-63

Lollis, Chastity. (2014). *Bad air quality not going away*. Portville Recorder, January 9, 2014.

London, Jonathan, Karner, Alex, Sze, Julie. (2013). Racing climate change: Collaboration and conflict in California's global climate change policy arena. *Global Environmental Change*, 23: pp. 791-799.

Lopez, Pia. (2013a). Crossing borders: California tries to cultivate green roots with Chiapas. The Sacramento Bee, March 10, 2013.

Lopez, Ricardo. (2013). Port upgrades urged to keep pace with Panama Canal expansion. Los Angeles Times, February 13, 2013.

Lubell, Mark, Feiock, Richard, and Handy, Susan. (2009). City adoption of environmentally sustainable policies in California's Central Valley. *Journal of the American Planning Associatio*n, 75(3), pp. 293-308.

Lueders, Jess, et al. (2014). The California REDD+ Experience: The Ongoing Political History of California's Initiative to Include Jurisdictional REDD+ Offsets within Its Cap-and-Trade System. Center for Global Development, November 2014. http://www.cgdev.org/sites/default/files/CGD-Climate-Forest-Paper-Series-13-Lueders-Horowitz-et-al-California-REDD.pdf

Lusvardi, Wayne. (2014). CA air board may invalidate 1.3 million pollution-offset credits. Cal Watch Dog, June 9, 2014.

Maddaus, Gene. (2011). City of Vernon in Fight to Death with Assembly Speaker John Perez. L.A. Weekly. May 26, 2011.

Maibach et al. (2010). Reframing climate change as a public health issue. *BMC Public Health* 10(299).

Maibach et al. (2011). Conveying the human implications of climate change: A climate change primer for public health professionals. *George Mason University Center for Climate Change Communication.*

Maracantonio, Richard. (2013). Public Advocates and our 6 Wins for Social Equity Network members and allies had a great night last night, the final hearing on the adoption on Plan Bay Area – Blog Post. July 19. 2013.

Marcus, G. (1998). Ethnography in/of the World System: The Emergence of Multi-Sited Ethnography. *Ethnography through Thick and Thin*. Princeton University Press.

Marcus, G. and Fischer, J. (1986*). Anthropology as cultural critique. An experimental moment in the human sciences*. University of Chicago Press, Chicago.

Market Advisory Committee MAC. (2007). Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California. Recommendations of the Market Advisory Committee to the California Air Resources Board.

Martello, Marybeth Long. (2001). A Paradox of Virtue?: "Other" Knowledges and Environment-Development Politics*. Global Environmental Politics*, 1(3); 114-141.

Martello, M. L. (2008). Arctic indigenous peoples as representations and representatives of climate change. *Social Studies of Science*, 38(3), 351-376.

Martin, Mark. (2006). Sacramento: Núñez slams governor on emission law. *San Francisco Chronicle*, October 17, 2006.

Martinez-Alier, J., Munda, G., O'Neill, J., 1998. Weak comparability of values as a foundation for ecological economics. *Ecological Economics* 26, pp: 277–286.

Massey, D. (1999). *Power geometries and the politics of timespace*. Heidelberg: Heidelberg University.

Mayer, Guillermo. (2013). Senior Counsel and Statewide Advocate, Public Advocates. Personal communication. July 15, 2013.

Mayer, Steven (2014a). Red alert: The color purple declared as poor air impacts schools. *The Bakersfield Californian*, January 13, 2014.

Mayer, Guillermo. (2014b). Activists say California fighting pollution globally but not locally. Los Angeles Times, June 29, 2014.

Mazmanian, D., Jurewitz, J., and Nelson, H. (2008). California's Climate Change Policy: The Case of a Subnational State Actor Tackling a Global Challenge. *Journal of Environment and Development*, 17(4): pp. 401-423.

Mazzacurati, Emile. (2014). Activists say California fighting pollution globally but not locally. Los Angeles Times, June 29, 2014.

McCarthy J. and Prudham S. (2004) Neoliberal natures and the nature of neoliberalism. *Geoforum,* 35: pp. 275-283.

McFarlane, Collier. (2011). Assemblage and critical urbanism. *City,* 15(2), 204-224.

Medina, Alfredo. (2013). Former Legislative Aide to Senator Kevin De Leon. Personal communication. July 11, 2013.

Mezaros, Angela Johnson and Williams, Jane. (2008). Letter to Chair of California Air Resources Board, Mary Nichols. EJAC.

Millard-Ball, Adam (2012). The Limits to Planning: Causal Impacts of City Climate Action Plans. *Journal of Planning Education and Research*, XX(X), 1-15.

Miller, Clark and Edwards, Paul. (2001). *Changing the Atmosphere: Expert Knowledge and Environmental Governance.* Cambridge, Massachusetts: MIT Press.

Miller, Clark (2005). New Civic Epistemologies of Quantification: Making Sense of Indicators of Local and Global Sustainability. *Science Technology Human Values* 30 (3): 403-432

Miller, C. A. (2008). Civic epistemologies: constituting knowledge and order in political communities. *Sociology Compass*, 2(6), 1896-1919.

Minkler, Meredith and Wallerstein, Nina. (2008). *Community-Based Participatory Research for Health: From Process to Outcome*. San Francisco, CA: Jossey-Bass.

Minkler, Meredith, Gonzalez, Priscilla, et al. (2011). Community-based Participatory Research and Policy Advocacy to Reduce Diesel Exposure in West Oakland, California. *American Journal of Public Health*, 101 (1): S166-S175.

Mintz, Charlie. (2013). Oakland officials withhold air pollution plan: Regulators for county, regional, and state agencies say the city and the developer of the Oakland Army Base have yet to reeal plans for how they will control toxic emissions. Eastbay Express, May 15, 2013.

Mohai, P., Pellow, D., and Roberts, J.T. (2009). Environmental justice. *Annual Review of Environment and Resources*, 34: pp. 4050 430.

Morain, Dan. (2014). Cool bid for state's pollution program is lost on Arkansas incinerator. The Sacramento Bee, June 28, 2014.

Morello-Frosch, Rachel, Shonkoff, Seth, , Pastor, Manuel, and Sadd, James. (2009). Environmental Health and Equity Impacts from Climate Change and Mitigation Policies in California: A review of the Literature. California Climate Change Center, *California Air Resources Board*. Sacramento, CA.

Morello-Frosch, R., Kersten, E., Pastor, M., and Ramos, M. (2012). *Facing the Climate Gap: How Environmental Justice Communities are Leading the Way to a More Sustainable and Equitable California*. University of California and University of California, Berkeley joint report.

Moser, Susanne, and Dilling, Lisa. (2007). *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*. Cambridge, UK: Cambridge University Press.

Myers, T., Nisbet, M. Maibach, E & Leiserowitz, A (2012) A public health frame arouses hopeful emotions about climate change. *Climatic Change*.

Nadel, Nancy. (2012). Quoted in Oakland Climate Action Coalition: Toolkit to create climate action in your community.
http://ellabakercenter.org/sites/default/files/downloads/OCAC-Toolkit.pdf

Natural Resources Defense Council and Coalition for Clean Air. (2004). Harboring pollution: The dirty truth about U.S. ports. March 2004. https://www.nrdc.org/air/pollution/ports1/ports.pdf

Natural Resources Defense Council (NRDC). (2008). Boosting the Benefits: Improving air quality and health by reducing global warming pollution in California. NRDC Issue Paper, June 2008.

Natural Resources Defense Council (NRDC). (2014). Dumping dirty diesels in Latin America: Reducing black carbon and air pollution from diesel engines in Latin American Countries.

Nemet, G.F., Holloway, T. and Meier, P. (2010). Implications of incorporating air-quality co-benefits into climate change policymaking. Environmental Research Letters, (5) 014007, pp. 1-9.

Newtown, Mark. (2009). LAO's Critique of the AB 32 Scoping Plan Economic Analysis. Report presented to the Assembly Natural Resources Committee. March 9, 2009.

Niemeier, Deb, Beamish, Tom, Kendall, Alicia, Grattet, Ryken, London, Jonathan, de la Pena, Carolyn, Sze, Julie (2012). Characterizing the Impacts of Uncertainty in the Policy Process: Climate Science, Policy Construction, and Local Governance Decisions. In Geerlings, Harry, Sfhiftan, Yoram, and Stead, Dominic (Eds), *Transition Towards Sustainable Mobility: The Role of Instruments, Individuals and Institutions.* UK: Ashgate, 2012.

Ninawa, president of the Federation of Huni Kui people (2012a). Indigenous people speak out against California's carbon offsets scheme: "You cannot trade pollution for nature." No Redd Monitor, blog post by Lang, Chris, October 19, 2012.

Ninawa, president of the Federation of Huni Kui people (2012b).Public Comment period. Meeting of the California Air Resources Board, Cal Channel video archives, October 18, 2012.

Ninawa, president of the Federation of Huni Kui people (2012c).Public Comment period. Screen shot from the meeting of the California Air Resources Board, Cal Channel video archives, October 18, 2012.

No REDD Tour. (2012). Indigenous people confront false solutions to climate change.
https://noreddtour.wordpress.com/

Northridge, M., Stover, G., Rosenthal, J., & Sherard, D. (2003). Environmental equity and health: Understanding complexity and moving forward. American Journal of Public Health, 93(2), 209–214.

NRDC E2 – Natural Resources Defense Council. (2006). Environmental Entrepreneurs Making A Difference (E2 and AB 32). October 2006.

Núñez, Fabian. (2006). Connecting the Dots Between Global Warming Bill and Health of Those Exposed to Carbon-Based Gases. The California Progress Report, published September 11, 2006.

Núñez, Fabian. (2012). Cap-and-Trade: Investing in California's Future. Sacramento Bee, September 27, 2012.

Núñez, Fabian. (2012). Cap-and-Trade: Investing in California's Future. Fox and Hounds News blog. Published September 27, 2012.
http://www.foxandhoundsdaily.com/2012/09/cap-and-trade-investing-in-californias-future/

Núñez, Fabian. (2014). Viewpoints: Combating climate change and keeping energy costs low. The Sacramento Bee, April 23, 2014.

Oakland Climate Action Coalition (OCAC). (2009). Media content distributed at public hearings and community events.

Oakland Climate Action Coalition (OCAC). (2010). Media content distributed at public hearings and community events.

Oakland Climate Action Coalition (OCAC). (2012). OCAC: Toolkit to create climate action in your community.

O'Brien, Karen, Eriksen, Siri, Nygaard, Lynn, Schjolden, Ane. (2007). Why different interpretations of vulnerability matter in climate change discourses. *Climate Policy*, 7; pp. 73-88.

O'Brien, Claudia and Kempf, Bart. (2014). CARB invalidates offsets for facility's alleged RCRA noncomplicance. Latham and Watkins, LLP: Clean Energy Law Report. November 19, 2014.

O'Connor, Tim. (2011). EDF's Take on AB 32 Scoping Plan Lawsuit. California Dream 2.0 Environmental Defense Fund, February 4, 2011.

O'Conner, Tim. (2013). Environmental Defense Fund lobbyists. Assembly Natural Resources Committee hearing, August 13, 2013. Cal Channel video archives.

OECD. (2001). Glossary of Statistical Terms. Command-and-Control Policy.
http://stats.oecd.org/glossary/detail.asp?ID=383

Office of Environmental Health Hazard Assessment (OEHHA). (2012). Draft California communities environmental health screening tool. http://oehha.ca.gov/ej/cipa073012.html

O'Neill SJ and Nicholson-Cole S. (2009). Fear won't do it: Promoting positive engagement with climate change through imagery and icons. *Science Communication*, 30: 355–379.

OPR – Governor's Office of Planning and Research. (2011). CEQA and Climate Change. State of California.
http://www.opr.ca.gov/s_ceqaandclimatechange.php

OPR – Governor's Office of Planning and Research. (2012). 2012 Annual Planning Survey Results. State of California. http://opr.ca.gov/docs/2012_Annual_Planning_Survey_fullreport.pdf

Ottinger, Gwen. (2010). Buckets of resistance: Standards and the effectiveness of citizen science. *Science, Technology & Human Values*, 35(2): pgs. 244-270.

Ottinger, Gwen and Cohen, Benjamin. (2011). Introduction: Environmental Justice and the Transformation of Science and Engineering. In Ottinger, Gwen and Cohen, Benjamin (Eds.), *Technoscience and Environmental Justice: Expert Cultures in a Grassroots Movemen*t, pgs. 1-18. MIT Press. Cambridge, MA.

Pacific Institute and OCAC. (2013) Climate Change Games and Fact Sheets.
http://pacinst.org/publication/pacific-institute-and-partners-release-climate-change-survivor-workbook-with-games/

Pachauri, R.K. (2014). Gov. Jerry Brown: What Happens Here, Doesn't Stay Here. Quoted in blog post by Tom Hayden, The Peace and Justice Resource Center, September 9, 2014. http://tomhayden.com/home/gov-jerry-brown-what-happens-here-doesnt-stay-here.html

Paredes, Dana Ginn. (2011). Climate Change is the Greatest Public Health Challenge. http://ellabakercenter.org/blog/2011/03/climate-change-is-the-greatest-public-health-challenge

Parino, Sofia. (2013). Senior Attorney, Race, Poverty, and the Environment. Public Comment period. Meeting of the California Air Resources Board, Cal Channel video archives, October 18, 2012.

Parino, Sofia. (2013). Senior Attorney, Race, Poverty, and the Environment. Personal communication. July 11, 2013.

Park, Angela. (2009). Everybody's Movement: Environmental Justice and Climate Change. *The Environmental Support Center.*

Pastor, Manuel, Shonokoff, Seth, Morello-Frosch, Rachel Sadd, Jim. (2009). Minding the Climate Gap: Implications of Environmental Health Inequities for Mitigation Policies in California *Environmental Justice*, vol. 2, no. 4, 2009. Pearsall, Hamill and Joseph Pierce. 2010. "Urban Sustainability and Environmental Justice: Evaluating Linkages in Public Planning/ Policy Discourse." *Local Environment* 15(6): 569-580.

Pastor, Manuel and Boyce, James. (2012). *Cooling the Planet, Clearing the Air: Should climate policies give extra credit for maximizing short-term health benefits?* Political Economy Research Institute at the University of Massachusetts, and the Program for Environmental and Regional Equity at the University of Southern California.

Pastor, Manuel, Morello-Frosch, Rachel, Sadd, James, and Scoggins, Justin. (2013). Risky Business: Cap-and-Trade, Public Health, and Environmental Justice. In C.G. Boone and M. Fragkias (eds.), *Urbanization and Sustainability: Linking Urban Ecology, Environmental Justice and Global Environmental Change*, Human-Environment Interactions 3.

Pearsall, Hamill and Joseph Pierce. 2010. "Urban Sustainability and Environmental Justice: Evaluating Linkages in Public Planning/ Policy Discourse." *Local Environment* 15(6): 569-580.

Peck, J. and Tickell, A. (2002). Neoliberalizing Space. *Antipode*, 32: pp. 380-404.

Perea, Henry. (2012). LAO says cap-and-trade 100 percent free allowance auction could benefit business and environment. Press Release, Sacramento California, August 23, 2012.

Perez, Patricia and Gutierrez, Marce. (2013). Latino Caucus: Conflicts of interest slow environmental progress. *Mercury News*. http://www.mercurynews.com/opinion/ci_24427293/latino-caucus-conflicts-interest-slow-environmental-progress

Pitt, D., & Randolph, J. (2009). Identifying obstacles to community climate protection planning. *Environment and Planning C: Government and Policy*, 27(5), 841-857.

Pitt, Damian. (2010a). Harnessing community energy: the keys to climate mitigation policy adoption in US municipalities. *Local Environment* 15(8); pp. 717-729.

Pitt, Damian. (2010b). The impact of internal and external characteristics on the adoption of climate mitigation policies by US municipalities. *Environment and Planning C: Government and Policy*, 28, pp. 851-871.

Pittel, Karen and Rubbelke, Dirk. (2008). Climate Policy and Ancillary Benefits: A Survey and Investigation into the Modeling of International Negotiations on Climate Change. Ecological Economics (68), 210-222.

Pollak, Stuart. (2012). Association of Irritated Residents et al v. California Air Resources Board et al., A132165, slip op. at 17 (First Appellate Court, Cal. June. 19, 2012)

Porter, Theodore. (1995). *Trust in Numbers: The pursuit of objectivity in science and public life*. Princeton University Press.

PPIC, Public Policy Institute of California. (2013). Statewide Survey: Californians and the Environment. *PPIC*, July 31, 2013.

Prasad S. and Carmichael T. (2008). AB 32 community benefit fund to reduce cumulative and disproportionate impacts. Coalition for Clean Air, Sacramento, March 2008.

Prasad, Shankar. (2013). Former Deputy Secretary for Science and Environmental Justice at Cal EPA. Personal communication. July 1, 2013.

Principles of Environmental Justice. (1991).
http://www.webofcreation.org/Manuals/krause/principles.html

Rabe, Barry. (2007). Governing the Climate from Sacramento. In Goldsmith, Stephen and Kettl, Donald (Eds.), *Unlocking the Power of Networks: Keys to High-performance Government*, pp. 34-61.

Ramo, Alan. (2013). Comments on the REDD Offset Working Group's draft recommendations on partnering to reduce emissions from tropical deforestation – California, Acre and Chiapas. April 22, 2013.

REDD Offset Working Group. (2013). California, Acre and Chiapas Partnering to Reduce Emissions from Tropical Deforestation: Partnering to Reduce Emissions from Tropical Deforestation. Recommendations to Conserve Tropical Rainforests, Protect Local Communities and Reduce State-Wide Greenhouse Gas Emissions.

Resources for the Future (RFF). (2011). Importing climate mitigation: The potential and challenges of international forest offsets in California climate policy. Issue Brief 11-12, September 2011.

Resources for the Future RFF. (2012). Considering a U.S. Carbon Tax: Frequently Asked Questions. December 2012. http://www.rff.org/centers/climate_and_electricity_policy/Pages/Carbon_Tax_FAQs.aspx

Revi, Aromar, and Satterthwaite, David et al. (2014). Urban Areas. Chapter 8 in Climate Change 2014: Impacts, Adaptation, and Vulnerability. Vol. 1: Global and Sectoral Aspects. Contribution of Working Group II to the *Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK and NYC: Cambridge University Press.

Richardson, H.L. Senator (retired). (1978). *What Makes You Think We Read the Bills?* Green Hill. Springfield, Virginia.

Ringquist, Evan. (2011). Trading Equity for Efficiency in Environmental Protection? Environmental Justice Effects from the SO2 Allowance Trading Program. *Social Science Quarterly*, 92(2): pp. 297-323.

Rodriquez, Matt. (2012). Senate Rules Committee Confirmation Hearing of Cal EPA Secretary, Matt Rodriquez. Senate Television archives. February 12, 2012.

Rogers, Paul. (2011). California's global warming law takes a hit. San Jose Mercury News, March 21, 2011

Roland-Holst, David. (2006). Economic Growth and Greenhouse Gas Mitigation in California. *UC Berkeley Report*, August, 2006.

Roland-Holst, David. (2009). Carbon Emission Offsets and Criteria Pollutants: A California Assessment. UC Berkeley, March, 2009.

Romley, Jon, Hackbarth, Andrew, and Goldman Dana. (2010). The impact of air quality on hospital spending. *The Rand Corporation*. Technical report sponsored by the William and Flora Hewlett Foundation.

Rosenhall, Laurel. (2014). Mercury lobbying firm working to open office in Mexico. The Sacramento Bee, August 7, 2014.

Rosenthal, Joyce and Breechwald. (2013). Climate adaptive planning for preventing heat-related health impacts in New York City. *Climate Change Governance: Climate Change Management,* pp 205-225.

Rosenzweig, Cynthia, Solecki, William, Hammer, Stephen, and Mehrotra, Hammer (2010a). Cities lead the way in climate-change action. *Nature*, 467: pgs. 909-911.

Sadd, James et al. (2011). Playing It Safe: Assessing Cumulative Impact and Social Vulnerability through an Environmental Justice Screening Method in the South Coast Air Basin, California. *International Journal of Environmental Research and Public Health*, 8(5): pp. 1441–1459.

Saha, D., and Paterson, R.G. (2008). Local government efforts to promote the "Three Es" of sustainable development. *Journal of Planning Education and Research*, 28, 21-37,

San Diego, City of. (2014) Draft Climate Action Plan. City of San Diego, California.

SB 535 Coalition. (SB 535). Media documents and lobbying artifacts.

Schatzki, Todd and Stavins, Robert. (2009). Addressing environmental justice concerns in the design of California's climate policy. *The Analysis Group: Economic, Financial, and Strategy Consultants*.

Schwarzenegger, Arnold. (2006). Executive Order S-20-06. State of California, Office of the Governor.

Schwarzenegger, Arnold Governor. (2009). Letter to AB 32 Economic and Allocation Advisory Committee, May 22, 2009.

Schwarzenegger, Arnold. (2010a). Veto of Assembly Bill 1405. http://www.leginfo.ca.gov/cgibin/postquery?bill_number=ab_1405&sess=0910&house=B&author=de_leon

Schwarzenegger, Arnold. (2010b). Memorandum of understanding on environmental cooperation between the state of Acre of the Federative Republic of Brazil, the state of Chiapas of the United Mexican States, and the state of California of the United States of America. November 2010.

Schwarzenegger, Arnold. (2010c). State-level Climate Change Action: California, Chiapas, Acre Get REDD-y. HumanNature: Conservation International blog, November 18, 2010.

Schleifstein, Mark. (2015). Carbon credits could generate $1.6 billion for Louisiana coastal restoration, study says. The Times-Picayune, March 5, 2015.

Scott, James C. (1998). *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press. New Haven, Conn.

Senate Television. (2012). Senate Rules Committee Confirmation Hearing of Cal EPA Secretary, Matt Rodriquez. Senate Television archives. February 12, 2012.

Seku-Amen, Malaki. (2013). Former California NAACP Policy Director. Personal Communication. June 30, 2013.

Serna, Phil. (2014). California Air Resources Board meeting, May 22, 2014. Cal Channel video archives.

SFDPH - San Francisco Department of Public Health. (2010). *Assessing the Health Co-benefits of San Francisco's Climate Action Plan*. Program on Health, Equity and Sustainability.

Shapin, S. (2004). Placing the view from nowhere: historical and sociological problems in the location of science. *Transactions of the Institute of British Geographers*, 23(1), 5-12.

Sheppard, Kate. (2008). Environmental Justice v. Cap-and-trade. February 28, 2008. https://prospect.org/article/environmental-justice-v-cap-and-trade

Shonkoff, Seth, Morello-Frosch, Rachel, Pastor, Manuel, and Sadd, James. (2009). Environmental Health and Equity Impacts from Climate Change and Mitigation Policies in California: A review of the Literature. California Climate Change Center, *California Air Resources Board*. Sacramento, CA.

Shonkoff, Seth, Morello-Frosch, Rachel, Pastor, Manuel, and Sadd, James. (2011). The climate gap: environmental health and equity implications of climate change and mitigation policies in California—a review of the literature. *Climate Change*, 109 (Supp 1); S485–S503.

Sinsley, Lori and Kreindler, Tony. (2010). Tropical forests protection pact hailed for protecting climate. Environmental Defense Fund, November 16, 2010.

Slocum, Rachel. (2004). Consumer citizens and the Cities for Climate Protection campaign. *Environment and Planning*, 36:pgs. 763-782.

Smith, K., Woodward, A., et al. (2014). Human Health: Impacts, Adaptation, and Co-benefits. Chapter 11 in Climate change 2014: Impacts, adaptation, and vulnerability. Vol 1: Global and Sectoral Aspects. Contribution on Working Group II to the *Fifth Assessment Report of the Intergovernmental Panel on Climate Chang*e. Cambridge, UK and NYC: Cambridge University Press.

State of California, Leg Info. (2002). Assembly Bill 2312. http://www.leginfo.ca.gov/pub/01-02/bill/asm/ab_2301-2350/ab_2312_bill_20020927_chaptered.html

State of California, Leg Info. (2009). Assembly Bill 1405. http://www.leginfo.ca.gov/cgi-bin/postquery?bill_number=ab_1405&sess=0910&house=B&author=de_leon

State of California, Leg Info. (2014). Assembly Bill 69. http://leginfo.ca.gov/cgi-bin/postquery?bill_number=ab_69&sess=PREV&house=B&author=perea_%3Cperea%3E

State of California, Leg Info. (2010). Assembly Bill 2529 http://leginfo.ca.gov/pub/09-10/bill/asm/ab_2501-2550/ab_2529_cfa_20100624_190621_sen_comm.html

Strategic Growth Council – SGC. (2013). Sustainable communities planning grant and incentives program. Grant Guidelines and application. State of California.

Stavins, Robert. (2011). Why the environmental justice lawsuit against California's climate law is misguided . Grist.org, Climate Policy.

Stehr, Nico and von Storch, Hans. (2005). Introduction to papers on mitigation and adaptation strategies for climate change: protecting nature from society or protecting society from nature? *Editorial / Environmental Science & Policy*, 8: pp. 537–540.

Stone, Daniel. (2012). Can California save the planet? *National Geographic News*.

Szasz, A., and Meuser, M. (1997. Environmental inequalities: literature review and proposals for new directions in research and theory. *Current Sociology*, 45(3), pp. 99-120.

Sze, Julie, Gambirazzio, Gerardo, London, Jonathan. (2009). Best in Show? Climate and Environmental Justice Policy in California. *Environmental Justice*, 2(4); pp. 179-184.

Sze, Julie, London, Jonathan, Shilling, Fraser, Gambirazzio, Gerardo, Filan, Trina, and Cadenasso, Mary. (2010). Defining and contesting environmental justice: Socio-natures and the politics of scale in the Delta. In Holifield, Ryan, Porter, Michael, and Walker, Gordon (Eds.), *Spaces of Environmental Justice*. Wiley-Blackwell,

Taruc, Mari Rose. (2013). State Organizing Director – Asian Pacific Environmental Network (APEN). Personal communication. July 2, 2013.

Tasci, Canan. (2012). Chino council Oks general plan with climate action plan. Daily Bulletin News July 6, 2012.

Taylor, Mac. (2012). Evaluating the Policy trade-offs in ARB's cap-and-trade program. Legislative Analyst Office, Sacramento, CA. February 9, 2012.

Tesh, Sylvia and Williams, Bruce. (1996). Identity Politics, Disinterested Politics, and Environmental Justice. Polity, 28(3): 285-305

Thompson, Tammy, Rausch, Sebastian, Saari, Rebecca, and Selin, Noelle. (2014). A systems approach to evaluating the air quality co-benefits of US carbon policies. *Nature Climate Change*, August 2014.

Towers, G. (2000). Applying the political geography of scale: Grassroots strategies and environmental justice. *Professional Geographer*, 52, pp: 23-36.

Transform and California Housing Partnership Corporation. (2014). Why creating and preserving affordable homes near transit is a highly effective climate protection strategy. May 2014.

Trans-local Climate Movement. (2012). Letter to Governor Jerry Brown. Climate Change Policy – International forest offsets in California's cap-and-trade program. July 10, 2012.

Trumbull, Todd and San Francisco Chronicle. (2012). Cap and trade - how it works. http://www.sfgate.com/green/article/Cap-and-trade-how-it-works-4027020.php

Truong, Vien. (2013). Environmental Equity Director, The Greenlining Institute. Personal communication, December 18, 2013.

UC Berkeley New. (2006). Top economists support greenhouse gas reductions. http://www.berkeley.edu/news/media/releases/2006/06/26_hanemannmemo.shtml

Umemoto, Karen. 2001. "Walking in Another's Shoes: Epistemological Challenges in Participatory Planning." *Journal of Planning Education and Research,* 21: pp. 17-31.

Union of Concerned Scientists (UCS). (2012). Global Warming Science: Why does CO2 get most of the attention when there are so many other heat-trapping gases (greenhouse gases)? http://www.ucsusa.org/global_warming/science_and_impacts/science/CO2-and-global-warming-faq.html#.VT51ICFVhBc

United Nations Framework on the Convention of Climate Change. (UNFCCC). (2014). Kyoto Protocol History. http://unfccc.int/kyoto_protocol/items/2830.php

U.S. Environmental Protection Agency EPA (2012a). Environmental Justice Definition. Retrieved March 2012. http://www.epa.gov/environmentaljustice/

U.S. Environmental Protection Agency EPA (2012b). Evaluation of the air quality co-benefits of local greenhouse gas reduction measures: A case study of San Francisco. U.S. EPA, Region 9.

U.S. Environmental Protection Agency EPA (2012c). *Fine Particle (PM 2.5) Designations*, Office of Air and Radiation.

U.S. Environmental Protection Agency EPA (2012d). Evaluation of the air quality co-benefits of local greenhouse gas reduction measures: A case study of San Francisco. U.S. EPA, Region 9.

U.S. Environmental Protection Agency EPA (2012e). Chapter 3: Black carbon effects on public health and the environment. Report to Congress on Black Carbon, March 2012. http://www.epa.gov/blackcarbon/2012report/fullreport.pdf

U.S. Department of Health and Human Services. (2009). *Healthy People 2020* Draft. U.S. Government Printing Office.

Van House, Nancy (2001). Actor-Network Theory, Knowledge Work and Digital Libraries. http://people.ischool.berkeley.edu/~vanhouse/bridge.html

Vanderwarker, Amy. (2013). Legislative Advocate, California Environmental Justice Alliance (CEJA). Personal communication. July 19, 2013.

Walters, Dan. (2014). California politicians jostling over how to spend cap-and-trade money. Sacramento Bee, April 28, 2014.

Watts, M. (1999). Collective wish images: Geographical imaginaries and the crisis of development. In J. Allen, & D. Massey (Eds.), *Human geography today* (pp. 85–107). Cambridge: Polity Press.

Welch, Virgil. (2010). Quoted in "Outsourcing Global Warming Solutions." Center for Race, Poverty and the Environment, 18(1) by Conant, Jeff.

Western Climate Initiative, Inc. (2013). Design Recommendations for the WCI Regional Cap-and-Trade Program - Complete Report with Appendices . http://www.westernclimateinitiative.org/the-wci-cap-and-trade-program/design-recommendations

Wheeler, Stephen. (2008). State and Municipal Climate Change Plans: The First Generation. *Journal of the American Planning Association*, 74(4), pp. 481-496.

Wold, Chris, Hunter, David and Powers, Melissa. (2013). *Climate Change and the Law*. Chapter 8 Land-use and Forestry.

Wright, L., Kemp, S., and Williams, I. (2011). 'Carbon footprinting': towards a universally accepted definition. *Carbon Management*, 2 (1): pp. 61–72.

Wynne, B. (1992). Misunderstood misunderstanding: social identities and public uptake of science. *Public understanding of science*, 1(3), 281-304.

Wysham D. (2008). Carbon market fundamentalism, *Multinational Monitor*; November–December 2008:23–26.

WDHS –Wisconsin Department of Health Services (2013). Chemical Fact Sheet – Carbon Dioxide (CO2). http://www.dhs.wisconsin.gov/eh/ChemFS/fs/CarbonDioxide.htm

Williams, R. W. (1999). Environmental injustice in America and its politics of scale. *Political Geography*, 18, pp: 49-73.

Yin, RK. (2003). *Case study research design and methods*. 3rd edition, Sage. Thousand Oaks.

Young, I. M. (2002). *Inclusion and democracy*. New York: Oxford University Press.

Zaelke, Durwood and Borgford-Parnell, Nathan. (2013). Primer on short-lived climate pollutants: Slowing the rate of global warming over the near term by cutting short-lived climate pollutants to complement carbon dioxide reductions for the long term. *Institute for Governance and Sustainable Development*. November 2013.