

Efficacy of Climate Action Plan Development in Richmond, California

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ABSTRACT

One of the biggest problems countries face as they develop and grow in size is global climate change from increasing greenhouse gas (GHG) emissions. A climate action plan (CAP) is a document written to help local jurisdictions reduce greenhouse gas emissions and energy use. In this study, I made recommendations for Richmond, California regarding the efficacy of a CAP, given its environmental justice concerns, which includes a large point source emitter that is harming the surrounding community. By reviewing other cities' CAP documents and Richmond's current policies, I compiled methods for reducing point source emissions from industry. I also conducted interviews with CAP planners and Richmond affiliates to analyze the best practices, challenges, and successes from CAPs and translate these findings to Richmond's situation. My document review revealed that 95 jurisdictions in California have adopted CAPs, and 108 more are planning. Point source GHG emissions have not been systematically addressed in any municipality studied. I found similarities across CAPs in challenges (staffing, funding and resources), and elements necessary for a CAP to hold power (mandatory wording and community support). Differences arose within departments responsible for implementing CAP measures, as well as with each city's largest pollution sources. While Richmond currently has no CAP, organizations within Richmond are moving ahead with sustainability efforts. Richmond may be able to accomplish the same sustainability work typically addressed in a CAP without actually passing the document, thereby avoiding the challenges inherent in the process.

KEYWORDS

environmental justice, greenhouse gas emissions, environmental policy, point source polluters, sustainability

INTRODUCTION

As countries and urban centers continue to expand in both population and infrastructure, the main challenges they will face into the 21st century in sustainable growth are climate change and global warming (Bassett and Shandas 2010). The Intergovernmental Panel on Climate Change (IPCC) attributes global climate change to increased greenhouse gas (GHG) emissions from anthropogenic sources (Parry et al. 2007). Worldwide, more than 70% of total GHG emissions come from urban sources. (Hoornweg et al. 2011). International governing bodies have attempted to fight against climate change with increasing frequency; however, it is a relatively recent advancement that governing bodies are initiating policy regarding climate change at a local level (Grover 2010, Hunt and Watkiss 2011). As urbanization continues at increasing rates, cities need to significantly lower GHG emissions to sustain populations (Hoornweg et al. 2011). Global agreements and protocols can encourage measures to reduce GHG emissions; however, large-scale country-level governments have little jurisdiction over local actions (Lindseth 2004). In many cities, local agencies control local development, transport, energy, and solid waste disposal – components that cannot be managed on a national scale. Therefore, cities have identified the increasing importance of developing local climate change policy (Lindseth 2004, Hoornweg et al. 2011). In recent years, hundreds of cities across the United States have recognized this need and responded by developing climate action plans (CAPs) specific to their city or county (CA OPR 2012).

A CAP, if successfully passed and implemented, can help cities facilitate climate change policy. CAPs detail reasons why energy and climate issues must be addressed, the city's current energy status, and goals for future energy usage. CAPs are typically broken up into sectors of energy use and GHG emissions, such as transportation, solid waste, building energy use, agriculture and land use (CA OPR 2012). Although there is currently no legislation mandating any municipality to develop a CAP (Bassett and Shandas 2010), the California state government has urged local governments in legislation to pursue CAP development (CARB 2008). Several prominent cities in the Bay Area, including San Francisco and Oakland, have passed CAPs in the past few years (City of San Francisco 2004, City of Oakland 2011). However, CAPs suffer from both a lack of standardization

(Bassett and Shandas 2010), as well as a lack of legal enforceability (Drummond 2010). For example, the San Francisco CAP may say that the city has to move toward greater public transit use (City of San Francisco 2004), but unless the city can legally require people to use public transit and not drive vehicles, this measure of the CAP remains a mere recommendation. CAPs are important vehicles for affecting local climate change policy, but only if they are enforceable or offer incentives for people to act and able to address the needs of its community.

CAPs can also be used to address the environmental justice needs of a community through a variety of techniques, including community input and leadership involvement. The term “environmental justice” refers to the concept that no demographic group should bear a disproportionate amount of negative environmental consequences due to operations or policies (Bullard 1999), and “environmental justice communities” refer to those areas that face this type of injustice. One method that has been used in CAPs to promote environmental justice is the use of community-based participatory research (CBPR) in planning (Minkler 2008), which involves obtaining opinions of community members and those detrimentally affected by the environmental pollutants. However, even if an environmentally-just CAP is passed through participatory measures, CAPs often have no tangible effects, as communities have little power to enforce them. Successful implementation requires human and financial resources and power, which come from the involvement of elected officials and policy makers (Hunt and Watkiss 2011, Westerhoff 2011). An examination of CAPs previously implemented in various cities can help determine the extent to which community and official involvement took place, as well as their impact on the process. These examination results can then be applied to a CAP for Richmond, California.

Richmond, California is a community afflicted with many environmental justice issues; Urban Habitat, a non-profit in neighboring Oakland, has identified its need for a CAP (Leffall 2012). Low-income and minority residents living in Richmond face an increased risk for developing pollution-induced asthma and other health hazards associated with point-source emissions and related pollutants from industrial facilities and refineries (Brody et al. 2009, Cohen et al. 2012). Whereas CAPs in other communities have addressed GHG emission reduction in sectors such as transportation, agriculture, and land use (City of

Oakland 2011), none have specifically addressed point-source emissions from industrial sources. Richmond needs a CAP that will mitigate the effects of climate change and specifically target point-source pollutants to address unequal distributions of environmental pollution hazards.

In this study, I will make recommendations for Richmond, California regarding the efficacy of a CAP, given the city's environmental justice concerns. Using a document review of past CAPs, current city policies, scientific review articles and periodical articles, I will compile available methods for reducing point source emissions from industry. Using primary-source interviews, I will analyze the best practices, advantages, disadvantages, challenges and successes from CAPs of other communities in both development and implementation. I will translate these findings to fit Richmond's particular situation. Richmond has recently received a large volume of negative media coverage for suffering a large urban fire resulting from a point-source pollutant (Reddell 2012, White and La Ganga 2012). Given these unique circumstances, I will also assess the logistical feasibility of establishing a CAP in Richmond, California.

METHODS

Study site and history

Richmond, California is a city afflicted by a rich history of environmental injustice; as such, it could benefit from a CAP that will address these environmental justice issues while mitigating GHG emissions. Richmond is located at GPS coordinates - N 37° 56' 8.7318", W 122° 20' 51.1908". As of 2010, there are 103,701 residents of the city, around 68% of whom are members of racial minorities. The poverty level is at 16.7% (from 2006-2010), as compared to a California statewide average of 13.7% for the same period (US Census Bureau 2010). In addition, Richmond's per capita income (\$24,847) is significantly lower than the state average (\$29,188). Richmond faces substantial social and economic inequality, driving the need for city policy that addresses environmental injustice concerns.

The patterns of change in Richmond's industry have shaped city demographics throughout the last century. Richmond was incorporated in 1905. However, just a couple

years earlier, Standard Oil Company had already opened their first refinery in the area. Through the first part of the 1900s, the city continued to grow as industrial activities (e.g., dredging, terminal construction, and the Ford Assembly plant) moved into the area. In the middle of the century, the country was preparing for World War II, and Richmond's shipyard operations for the war began in 1941. During and shortly after the war, a huge population boom occurred and new housing sprung up across the city, including near the refinery. After hitting a peak in 1947, the population began to steadily drop. In the 1970s, as the city's industrial base continued to decline, those in the affluent majority flocked out of the area, leaving the low-income minority populations that currently reside in the area to suffer from the refinery's negative health impacts.

Throughout its history, Point Richmond's oil refinery, owned by Chevron, has been an integral part of the city's development. Except for a brief period during WWII when the shipyards overtook the city, Chevron has always been Richmond's single largest revenue generating enterprise. Today, Richmond's Chevron continues to employ over 3,000 employees (Chevron 2013). Despite its environmental justice concerns, Richmond also needs Chevron to boost its economy because of the large numbers of residents Richmond employs as well as Chevron's large tax base. Nevertheless, several large environmental advocacy organizations have made their presence known in Richmond. One of the most prominent is a non-profit called Communities for a Better Environment (CBE), who has been fighting for pollution reduction and prevention, particularly in vulnerable communities, since its founding in 1978.

Richmond today is governed by a progressive-leaning city council whose political climate will inform policy-making. Three green party members or supporters currently sit on the city council; they have been inclined in the past to vote for green legislation. However, there are also several council members who are heavily funded by companies like Chevron, who are fighting against green policies. These political and historical factors make for a complex landscape that could precariously swing either way in terms of developing a useful CAP for Richmond.

Data collection

Document review

I examined the practices and policies of similar environmental justice communities. I performed a document review looking at other communities that face similar environmental justice issues, specifically those communities facing point-source emissions. This review included extensive readings of past CAPs of other cities, Richmond's current city policies, scientific review articles surrounding the production of CAPs and government and organization websites. For these environmental justice communities, I drew a comparison using population demographics, sources of point source emissions and specific CAP sections.

Interviews

To hear firsthand the experience of CAP planning, I also conducted interviews with representatives from five of these jurisdictions. These jurisdictions include Contra Costa County, Martinez, Alameda, Emeryville, and Oakland. I determined the sample for these interviews through both convenience and snowball sampling. I did not use purely random snowballing, but I started with contacts that Urban Habitat had already established with CAP planners from nearby cities and counties, including Oakland and Contra Costa County. I then went through the list of jurisdictions from the California Office of Planning and Research to find more contacts. I started by emailing contacts from jurisdictions that were either other environmental justice communities, or else municipalities in the bay area. From there, I was able to contact other CAP planners and organizers from names I had obtained within the interviews. I conducted these interviews both on the phone and in person, based on the availability and physical proximity of the interviewee. I conducted these interviews with a mix of CAP planners for other municipalities, as well as community based organization staff and city staff in Richmond.

To address the process, I used interview questions about the CAP process, especially the challenges, in passing and implementing a CAP (Table 1). I addressed elements in

general that made for an effective CAP, as well as specific solutions for point source emissions, which held more direct relevance for Richmond.

Table 1. Questions asked to CAP planners from other municipalities

1. What was your role in the planning of the CAP for [municipality]?
2. What are the biggest sources of pollution in [municipality]?
 - a. Are there large point-source polluters in [municipality]?
 - b. If so, how, if at all, were these pollution sources addressed in the CAP?
3. What methods did [municipality] use to gather information and feedback in developing the CAP?
4. What were the greatest challenges in passing a CAP for [municipality]?
5. Are any parts of the CAP modeled after AB 32?
6. What are the main objectives of this [municipality's] CAP?
7. How has the CAP been implemented since its passage?
8. What department of the city/county is responsible for monitoring or administration?
9. What have been some challenges in plan implementation? And if not, what challenges have kept you from implementing the CAP?
10. What elements of a CAP are necessary so that it actually holds power in a community?
11. Did you work, or are you working, in conjunction with CAP planners in any other municipalities during the process and to what extent was there cooperation?

I altered the questions in interviewing Richmond affiliates to gauge the current sustainability initiatives already taking place within the city. The questions I asked to Richmond affiliates focused more on what would be ideal in a Richmond CAP (Table 2).

Table 2. Questions asked to Richmond affiliates

1. Can you first tell me a little bit about [community organization], your history, and the work that you are doing?
2. What is your role specifically within the organization?
3. What do you feel Richmond is currently focused on in terms of sustainability efforts? What should they be focusing on?
4. Do you work in collaboration with other organizations on these issues?
5. If Richmond were to work on a CAP, what measures would you like to see included?
6. What elements of a CAP are necessary so that it actually holds power in a community?

Data analysis

Document review analysis

To analyze the documents pertaining to environmental justice communities, I set up an analysis framework to look for common elements. I compared other cities' demographics against Richmond in population size. I matched up these cities with Richmond based on the pollutants and hazards present, such as metric tons of CO₂ emitted. I then examined if there had been a CAP in these cities. If there has been a CAP, I counted specific sections of the CAP to see if anything has been written up to address point-source emitters. If there had been no CAP, I looked at what has been done to address the problem policy-wise in terms of methods, objectives and implementation. I assessed the implications for Richmond using these policies in other cities. I compared the aforementioned data characteristics with parallel characteristics in Richmond and assessed which policies have worked and which ones have not by seeing if the measures adopted that were designed to limit emissions have actually been implemented.

Interview analysis

I analyzed the interview responses to compile the necessary elements of an effective and implementable CAP. After several interviews, I started seeing common responses to many of the questions, so I symbolized each different potential response for each question. For example, in asking the biggest challenges in passing a CAP, common responses fell into several categories: finances, bureaucracy, community pushback, and lack of mandating power. I then went through each interview and quantified interviewee responses according to categories for each question. I calculated descriptive statistics for these responses, including means and standard deviation, as well as the percentages of successes of CAPs in the interviewee's municipalities. I also recorded any additional quotes, unique elements or direct Richmond connections found in the interviews.

Then, within the context of Richmond's current political climate, I looked at what work Richmond was doing surrounding these necessary elements. For example, if in my interviews I found that an effective CAP needs community involvement, I looked at whether or not Richmond had the resources to fulfill these criteria. In this way, I was able to accurately assess how Richmond could successfully plan for a CAP.

RESULTS

Data collection results

My document review revealed that ninety-five jurisdictions in California have adopted CAPs as of 2012, and 108 more are in the planning process. I conducted interviews with representatives from five of these cities overall. Seven of my interviewees were involved in the planning and implementation of CAPs in these cities. The other six interviewees consisted of community and non-profit leaders or government officials within Richmond (Table 3).

Table 3. Interview Participant Information

Municipality	Date of Interview	Interviewee Role
Contra Costa County	10/26/2012	Public Health Analyst
	11/16/2012	Dpt. Of Conservation Board
Martinez	10/26/2012	CAP Project Manager
Alameda	12/3/2012	Task Force Head
Emeryville	3/1/2013	City Public Works Dpt. Environmental Programs Analyst
Oakland	3/4/2013	TransformCA representative on Oakland Climate Action Coalition
	3/13/2013	City of Oakland Sustainability Coordinator
BAAQMD	11/2/2012	Principal Environmental Planner
Richmond City Government	2/2/2013	City Manager's Sustainability Associate
Richmond Non-profit	2/28/2013	Richmond Progressive Alliance (RPA) Steering Committee Member
Richmond Non-profit	3/8/2013	Asian Pacific Environmental Network (APEN) Campaign and Organizing Director
Richmond Non-profit	3/8/2013	Communities for a Better Environment (CBE) Planning Commissioner and Organizer
Richmond Non-profit	3/8/2013	West County Toxics Coalition (WCTC) Executive Director

Document review results

I found that many of the environmental justice cities’ CAPs included similar components, regardless of the areas’ demographics (Table 4a). I surveyed all the available CAPs for each of the nine cities in California that house large-scale oil refineries. Four of these nine cities have no CAPs planned, passed or in progress. Two of them (including Richmond), have completed an emissions inventory but have not yet passed a CAP. In Richmond’s case, there is currently no CAP planned, but Torrance is in the planning stages. Bakersfield is somewhere in the early stages of the CAP planning process. The remaining two cities have passed CAPs that are available for public viewing. A typical CAP included an emissions inventory of current emissions in the city or county, and the current state of conditions in that region. A CAP typically includes several different sections. Each of these sections detailed specific strategies for emissions reduction and some common sections included transportation, building energy use, solid waste and water management and climate adaptation (Table 4b).

Table 4a. Community and CAP comparison between environmental justice communities. Demographics for the nine cities listed below are those that house large scale oil refineries in California.

City	Population	Industrial Emissions (metric tons CO ₂ /year)	Point Source Pollution	CAP Status
Benicia	27,207	4,906,194	Valero	Yes - passed
Martinez	36,392	7,910,356	Shell, Tesoro	Yes - passed
Torrance	146,493	12,927,716	ExxonMobil	Emissions inventory completed, CAP in planning
Richmond	105,380	20,384,231	Chevron	Emissions inventory completed, no CAP planned
Bakersfield	352,428	14,726,669	Big West of CA, Kern	In early stages of CAP planning
Carson	92,376	6,993,366	Tesoro	None planned or passed
El Segundo	16,775	22,921,625	Chevron	None planned or passed
Rodeo	8,679	2,391,033	ConocoPhillips	None planned or passed
Wilmington	53,815	19,634,298	Shell, CP, Valero	None planned or passed

Table 4b. CAP section comparison between environmental justice communities. Specific comparisons of sections present within the CAPs for the two environmental justice communities that have passed CAPs.

	Transportation	Land Use	Buildings	Energy	Solid Waste	Water	Industrial/Commerce	Climate Adaptation	Carbon Sequestration	Parks/Open Space
Benicia	x	x	x	x	x	x	x			x
Martinez	x		x		x	x		x	x	

Of the nine environmental justice communities in California housing point source polluters, only Benicia mentioned industrial emissions as a source of pollution in its completed CAP. In fact, commercial and industrial sources, including the Valero refinery, were the largest contributors to Benicia’s total GHG emissions in 2000 and 2005 (City of Benicia, 2009). The main measure used to address the Valero refinery was to encourage the refinery to continue to reduce emissions, but it does not list anything that would actually force the refinery to reduce any of their emissions. It even states that the refinery is largely regulated by state and federal authorities, thereby shedding the responsibility for its right to regulation as a local government.

Integration with AB 32 legislation

Since 2008, the goals in the large majority of CAPs have been set according to AB 32 legislation. AB 32 is an assembly bill approved by the California government in 2006 to set emissions goals for the state. The government later came out with a Scoping Plan in 2008, detailing exact mechanisms for reaching a goal of 1990 level emissions by the year 2020. This scoping plan encouraged local governments to create CAPs in order for the state to reach greenhouse gas emissions by 2020. Within the San Francisco Bay Area, the Bay Area Air Quality Management District has set standards for a “qualifying CAP”. A CAP that falls under this category enjoys certain benefits under the California Environmental Quality Act (CEQA). These benefits state that if a CAP is “qualifying”, then new infrastructure that is built within that municipality follows a streamlined process for getting environmental planning approval because it is already sure to fall under certain emissions targets in order to be in line with the CAP.

One result of AB 32 is that when setting their reduction targets, some cities and counties decide their reduction targets with the assumption that the state will already be taking care of emissions reductions to AB 32 levels. However, the legislation says that the state needs local jurisdictions to take action and provide localized assistance in order to meet AB 32 targets. This means that many CAPs are actually overestimating, or double-counting, the amount by which GHG emissions that will be reduced if all of their measures are successfully implemented.

CAP planner interview results – CAP process

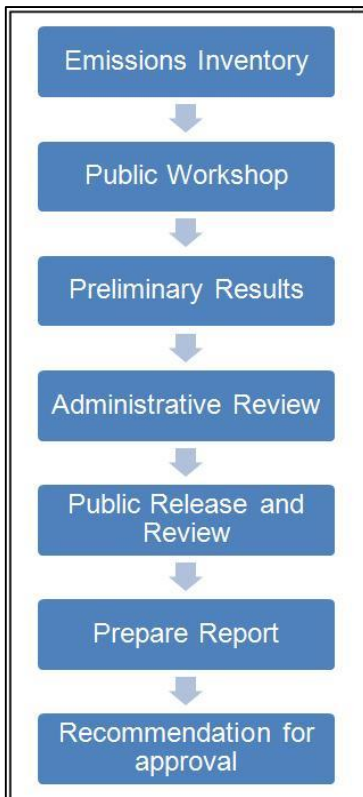


Fig. 1. Typical CAP process.

I found that all of the cities followed the same general pattern and process for getting the CAP passed, although the elements were performed to differing degrees by municipality (Figure 1). The CAP process typically started with an emissions inventory, so the municipality can have a starting point from which they can set goals. They usually held public workshops or forums of some sort throughout the process, although municipalities did this to varying degrees. For example, Alameda had open public meetings every month, whereas the Contra Costa County representative said the few public workshops that were held were not constructive. For example, members of the Tea Party often showed up at the Contra Costa County meetings to disrupt the meeting, videotaping the process and yelling loudly. Oakland even formed a climate action coalition comprised of representatives from different non-profits and advocacy groups from across the city. This coalition met regularly to try to put their sustainability agendas and address environmental justice concerns onto the CAP. After these public meetings, preliminary results are produced, which are then put under review, both within the administration and publicly. A report is then prepared and put up for recommendation and approval to be voted on by the city, town, or county board.

CAP planner interview results – similarities

I received many similar responses from CAP planners for various aspects of the CAP. Many cities experienced similar challenges in CAP passage and implementation, as well as similar elements allowing a CAP to actually hold power. A majority of the municipalities indicated that their biggest challenges came from staffing and funding issues. Staffing issues came both internally and externally, meaning there were disagreements within the planning staff when they were producing the CAP of which measures to prioritize, as well as staffing shortages in not having sufficient manpower to actually implement and monitor measures. CAP planners also faced similar challenges in funding. Both the planning process as well as measure implementation suffered from a lack of funding. Martinez and Emeryville both indicated that because they were trying to implement measures during the depth of the recession, they were more confined to comparatively smaller scale actions, such as revamping street lights with LEDs.

I received similar responses from interviewees when I asked them what elements were necessary in a CAP so that it would actually have sway or power in future municipal actions. Over 70% indicated that specific actions that are mandatory and worded in such a way that it is not an optional action is absolutely necessary (Table 5). An example of this is the “qualifying CAP” mentioned above; in order for a city to earn an approved streamlined CEQA process, they must follow these qualifying guidelines. Many cities put measures into their CAPs that “suggest” or “recommend” that residents or businesses perform a certain action. However, this kind of wording holds no weight and can be easily ignored. For example, the Contra Costa County CAP pursues promoting voluntary trip reduction services and says to “consider targeted low-income and multilingual outreach programs” (Contra Costa County 2012). This is a measure that is low-regret, meaning that there are no negative consequences or costs associated with enacting it because it is not mandatory in any way. It is also not aggressive enough and leaves it completely up to the residents whether or not they want to even think about alternative modes of transportation.

I found that over 70% also indicated that public support is crucial for a CAP that holds power (Table 5). This support comes in the form of public meetings and forums, which also serve to publicize these emission reduction efforts; it can also come by getting

the community involved in implementation. The Alameda representative specifically mentioned support through public education efforts and involving the kids in schools because kids have influence over their parents’ opinions as well.

A large majority of the interviewees also indicated that resources are necessary for successful implementation (Table 5). Funding determines what actions can actually be implemented, but it also limits what measures can be placed into the CAP in the first place, based on what is fiscally feasible to accomplish.

Table 5. Similarities from interviews with CAP planners from different municipalities

Similarity Topic	Similarity Specifics	Municipalities	Percentage (Decimal)
Challenges in passage and implementation	<ul style="list-style-type: none"> Staffing Funding and resources 	Contra Costa County, Martinez, Emeryville, Oakland	0.857
Elements for CAP to hold power	<ul style="list-style-type: none"> Mandatory wording 	Contra Costa County, Martinez, Emeryville, Oakland	0.714
Public support	<ul style="list-style-type: none"> Public meetings Involving community 	Contra Costa County, Alameda, Emeryville, Oakland	0.714

CAP planner interview results – differences

There were, however, some differences by city, primarily with respect to responsibility for implementation and monitoring, as well as the emissions challenges faced by the municipality (Table 6). The interviewees indicated different departments both within and outside of the city government that were responsible for the implementation and monitoring of CAP actions. Contra Costa County and Martinez cited the Department of Conservation and Development and the City Manager’s Office, respectively, as the responsible party. Alameda is using an external organization for monitoring, but they have also tied actions to specific city departments. For example, one of the initiatives in the Alameda CAP is trying to reduce energy use by providing “technical assistance for energy efficiency and track progress through recognition programs” (City of Alameda 2008). The

document then specifies that the Alameda County Environmental Services Department will be responsible for implementing this program. There is little consensus among municipalities who is responsible for implementation and monitoring because cities vary in governmental department structure and responsibility chains.

The cities I interviewed also faced varying prominent sources of pollution. Some cities did not face any point source emissions, which contrasts from Richmond’s primary sources of emissions. For example, Martinez did have a large oil refinery, but only 5% of it was on officially incorporated Martinez land, so they were able to largely ignore these emissions within their CAP. Alameda was largely residential and had almost no point source emissions to take into account. Different cities had different largest sources of pollution, which affects the focus of CAP actions. For example, Emeryville is a largely commercial city, so most of their measures come from reductions in commercial sector emissions, whereas Alameda is largely residential, so the bulk of specific actions are geared toward individual households.

Table 6. Differences from interviews with CAP planners from different municipalities

Difference Topic	Difference Specifics	Municipality
Responsible department	Department of Conservation and Development	Contra Costa County
	City Manager’s Office	Martinez
	Department of Public Works	Emeryville, Oakland
	Outside organization	Alameda
	Tied to specific departments	Alameda
Main pollution sources	Power plants, refineries	Contra Costa County, Martinez
	Transportation	Martinez, Alameda, Emeryville, Oakland
	Building energy use	Martinez, Emeryville, Oakland
	Manufacturing	Oakland

Interview results – Richmond affiliates

I received responses assessing the current status of sustainability practices and culture of political will in Richmond. The interviewed parties indicted that Richmond

currently has several different foci for sustainability efforts. The city staff and representatives from four community organizations listed different foci for sustainability efforts in Richmond (Table 7). Solarization is happening at increasing levels in conjunction with creating green jobs, with many organizations trying to train young people in how to install solar panels. The city has also reached an agreement with Pacific General and Electric as well as Marin Clean Energy, so that starting in July 2013, residential buildings will be using electricity from clean energy sources. There will be different renewable levels and ratios available for which residents can choose to pay. In addition, the city is trying to create a biking culture and develop the land in ways that would make biking to work and play a more viable option than it currently is. Sustainability efforts in Richmond are primarily focused on several areas, including solarization, investing in renewable energy, urban transit, urban agriculture, and local green jobs.

Table 7. Richmond organizations’ summary chart. Sustainability efforts as well as what elements must a CAP contain so that it holds power in the community.

Organization	Sustainability efforts current focused on:	Effective in CAP
City of Richmond	Urban greening, urban transit, waste services, green jobs	actions tied to departments, clear organization and implementation, tied with increasing economy
RPA	Renewable energy, benefits from Chevron	strict time frames, informed electorate
CBE	Urban agriculture, urban transit, solarization	direct development of measures
APEN	Solarization, local jobs, renewable energy	physical means to implement measures
WCTC	Local jobs, renewable energy	can’t perpetuate environmental injustice

Even though none of the other municipalities had effective ways to combat point source emissions, Richmond affiliates did list some “ideal situations” that would reduce emissions from these sources. Chevron and neighboring Richmond point source polluters emit a total of 20,384,231 metric tons of CO₂ every year (CARB 2012). Even if these emissions cannot be completely eliminated, interviewees from RPA and WCTC indicated

that ideally, Chevron would be limited from processing heavier and dirtier crude oil. The heavier the crude oil, the higher the sulfur content in the oil, which takes more processing power to filter out before the crude is usable as fuel. Chevron can also be held accountable for making sure they actually act on their company promise to invest in more renewable energy for their own operations. Interviewees indicated that Chevron has also been long embroiled in a tax battle in trying to have their land assessed for less than it is worth. Ensuring that they are paying their fair share of taxes for the property value would allow resources to be paid to the surrounding community. In addition, Chevron needs to be prosecuted for negligent management to ensure maintenance and up-to-date repairs, as efficient equipment leads to a reduction of GHG emissions. Chevron is looking to initiate a new Energy and Hydrogen Renewal project. One way to address the negative economic impacts of this environmental justice community is to make use of the environmental impact report for this new project. Using the Occupational Safety and Health Administration (OSHA) and Chemical Safety Board (CSB) citations against Chevron from the fire in August of 2012, Chevron can be forced into a community benefits agreement that would keep resources flowing back to the community.

I also found similar responses from Richmond affiliates regarding elements that allow the CAP to hold power compared to the responses of other CAP planners. While adequate resources and funding was still a large factor in how a CAP could be effective, getting the community involved and holding elected officials accountable appeared in around half of the interviewee responses.

DISCUSSION

Introduction

My findings have important implications for how Richmond should move forward with a CAP fit to address its environmental justice concerns. Key findings indicate that point source greenhouse gas emissions have not been systematically addressed in any of the municipalities studied. While Richmond currently has no formal CAP, organizations and government agencies are moving ahead with sustainability efforts. This brings up a

discussion on whether or not Richmond should even be moving forward with a CAP, or if the same sustainability work can be accomplished without a formal CAP, thereby avoiding the challenges inherent in the process.

Key findings regarding CAPs

Analysis of existing documents, CAPs, and interviews with CAP planners from several municipalities revealed that climate change measures generally keep in line with the current environmental state of communities; any measures that are taken are small and those in power in the community continue to hold it. This is to say that those of high economic or political status in the community dominate the political landscape, and they will often not enact environmental policies, as these policies go against their own economic interests. None of the environmental justice communities studied have been able to come up with a way to adequately address point source emissions (CARB 2012). California's state scoping plan approved cap-and-trade legislation, which puts a hard limit on the aggregate state GHG emissions from large sources (CARB 2008). Large polluters must give up one "allowance" for every unit of GHG pollution they produce. In order to reach emissions reduction targets, the total number of allowances will decrease by year (Eberhard 2011). However, this program can be viewed as a way for large industries to purchase extra allowances and buy their way out of being held accountable for the emissions they produce, particularly in low income or impoverished areas (Ostrander 2013). In these areas, not only is there is much higher concentration of point source polluters, but these communities do not have the resources necessary to fight pollution's negative effects (Cohen et al. 2012). In Richmond, 87% of emissions come from point source emitters (J. Ly, personal communication). A large majority of these emissions come from the Chevron refinery. This point source must be addressed because if it is not, even if all other emissions in the city were to be completely eliminated, the difference would be nowhere near AB 32 reduction targets.

One proposed improvement on this legislation is a return-to-source proposition that would take the money that is paid for allowances in cap-and-trade transactions and invest it back to the communities that are most negatively affected by these polluters (W. Dominie, personal communication). This kind of proposition would have to take place on a regional

level, or higher, in order to prevent leakage, or companies moving out of the area to avoid having to abide by these laws (CARB 2008). In the Bay Area, this would likely be enacted by enforceable codes put out by BAAQMD. While this would not initially reduce the amount of emissions, it would provide the affected communities with the resources to combat the negative effects of over-pollution. Over time, with decreasing total cap allowances, emissions would also decrease while keeping resources flowing back into the community to address environmental hazards and promote the local economy through initiatives such as green jobs (Cohen et al. 2012). Return-to-source is not a perfect solution by any means, but it does temporarily combat some of the environmental justice problems associated with AB 32's cap-and-trade program.

Findings indicate that within CAPs, only small scale, incremental changes have actually been implemented, which suggest that transformational changes within CAPs face significant challenges. Pursuing no or low regret policies seem to be the norm, as there has not been the willpower to push beyond very conservative policy changes regarding climate change (Bierbaum et al. 2013). In addition, in terms of actual GHG emissions level reductions, measures are not aggressive enough to be making significant tangible differences. Generally, although CAP emission changes are measurable, they will need to be greatly increased for any future impact (Drummond 2010).

Several themes emerged within CAPs that can be generalized to any municipality looking to initiate a CAP as a way to reduce GHG emissions. The typical structure, content sections, and process for a CAP are detailed in the results above (Dawsey et al. 2011). This process neglects to mention, however, how labor-intensive and time-consuming this process can be. Each of the cities undertook a drafting and editing process for at least a couple of years from start to finish before they put the CAP up for city council approval. Momentum to push forward through several years of work cannot be met without the necessary resources and staffing. Studies have shown that work towards reducing GHG emissions is not being done quickly enough to make a sizeable impact (Drummond 2010, Bierbaum et al. 2013). In the CAP process, some cities chose to use a complex modeling program to help them see the impact of certain reduction measures; however, the time and resource-intensive program did not end up aiding them in choosing which measures to put into the CAP (G. Fitzgerald, personal communication). This is just one example of a large amount of

resources that was spent on the CAP writing process. It is worth considering that these types of resources that cities are using to push the CAP through to legislation could potentially be used toward actually lowering GHG emissions during that time rather than toward writing up and perfecting a document.

However, within the context of CAP development, several trends emerged. The clear benefits of working in conjunction with ICLEI (Local Governments for Sustainability) on a city or county CAP did surface several times (Stilts 2009). Not only does ICLEI provide resources that walk a municipality through the climate action planning process, it also provides cities with a network of other municipalities who have also experienced the same CAP process. ICLEI even has a system of five milestones for sustainability that they recommend communities follow to pledge and act on reducing GHG emissions across a community (ICLEI USA 2013). This process mirrors the results from my interviewees and calls for first making a commitment before conducting an emissions inventory and setting a target or a goal. From there, a local climate plan is established and implemented and its progress is consistently monitored and evaluated.

I found that public engagement is a necessary component to a successful CAP, and this is especially true within Richmond. Not only does the general public need to get involved, but they have to be engaged to the point of exerting influence over the decision makers and stakeholders within the community (Bassett and Shades 2010, Loins et al. 2007). Each city looking to move forward on climate action plan initiatives is working within a unique body of political, economic, and social actors that needs to be specifically assessed (Pollack et al. 2011). For Richmond, there is considerable political backing for climate change initiatives, and many involved citizens, but there are also large opposing stakeholders who unfortunately, hold a lot of the city's fiscal resources. If a CAP is to be effective at all, measures need to have mandatory wording, as well as resources to ensure enforceability. Many of the measures rely on the action of the general residential populace, which necessitates adequate incentives on a level that will trigger action. This might even go as far as including economic incentives for participating in CAP actions to combat climate change (Young and Karkoski 2000). Without economic incentive, the efforts of just the few people who intrinsically care for the issues will not be enough to combat the growing threats of inaction.

Implications for Richmond

The future state of Richmond's sustainability initiatives relies on the ability of its unique body of actors – its policy stakeholders, advocacy and representatives from community emitters – to come together in collaboration. The process that Richmond should follow falls closely in line with the generalized CAP planning process discussed above (Dawsey et al. 2011). However, Richmond benefits from a host of community organizations and advocacy groups, comprised largely of deeply invested local residents and members. This fact can be a big strength because these organizations have already collaborated to enact crucial measures in Richmond, but it can also present a challenge when thinking about writing a CAP. In the same manner, Oakland also had a strong community input base, which resulted ultimately in a significant amount of extra work (G. Fitzgerald, personal communication). More organizations mean that there are more potential measures on the table that must be sifted through and prioritized, which only prolongs the CAP process and exacerbates the need for more staffing and resources.

Interviews with Richmond officials and advocacy organization members indicate that Richmond is moving forward with several sustainable initiatives despite the absence of a formal CAP. This includes various non-profit organizations, as well as the sustainability branch of the city manager's office. Actors in Richmond seem to have realized that taking substantial steps forward in reducing GHG emissions and holding PS emitters accountable can be made even without the backing of a formalized CAP. Some studies have indicated that indication that using a CAP may be too slow of an action. While a CAP can raise awareness, actions need to take place now rather than just awareness (Tang et al. 2010). The only added benefit of actually formalizing the actions in a plan is that the city would have a physical document to show when applying for funding or more resources (G. Fitzgerald, personal communication). Otherwise, many of the actions that would appear in a CAP can also be accomplished without the official documentation that comes in a CAP.

While it is unrealistic to expect that the point source emissions can be eliminated or reduced immediately, at least before a large scale overhaul of oil dependence occurs, the results do indicate several “ideal situations” regarding these emitters. These situations reveal that ways to hold large point source emitters accountable even if dependence on their

products cannot be entirely weaned do exist. Even ideal situations must take into account the realities that point source emitters do hold considerable economic power within Richmond, and that residents' reliance on fossil fuels will not cease without the presence of powerful economic incentives (Young and Karkoski 2000).

Recommendations for Richmond

Richmond is at a crossroads in sustainability legislation, and both options have their respective pros and cons. They need to first decide whether or not a CAP is something that is worth the investment of time and other resources given the work that Richmond employees and stakeholders are already doing in its absence. If the city decides to move forward with a CAP, it would be important to follow the process laid out above. Sustainable measures need to be kept at the forefront of the city's policies and they need to be incorporated into other legislation. This can be only be accomplished if there is a someone at a high level within the city government who will continue to be accountable for, and continue to push forward with, the actions outlined in the CAP. This CAP must also contain mandatory measures, enforceable and incentivized actions, such as following BAAQMD's guidelines for a qualifying cap for CEQA benefits.

However, Richmond may also decide that the intensive investment in the CAP process is not worthwhile. In this case, I recommend that community organizations join forces with the city government and the sustainability efforts being enacted there for greater collaboration. One of the major foci of these efforts should be to address the point source emitters at their source and work to hold them accountable for making repairs, keeping equipment up to code, staving off dirtier crude oil and decreasing dependence on fossil fuels. While other initiatives with Richmond are useful, only this work will get at the 87% of city emissions emitted from point sources on a daily basis.

Limitations and future directions

The limitations in my study came from both external and internal sources – both the approach as well as the actual documents analyzed had problems. Analyzing CAPs incur

implicit limitations. One of the challenges that emerged was the inability to use information productively when certain CAP sections were unique to only one or two CAPs, because no opportunities for comparison arose. A typical CAP uses a GHG emissions inventory for its emissions baseline estimates. These GHG inventories may be embedded with implicit assumptions about carbon use and pollution. Due to these assumptions, reduction targets based off of these inventories often fall far shy of international targets needed to drastically reduce GHG emissions (Boswell et al. 2010). In addition, plans based off of these inventories may do a poor job of addressing the uncertainty inherent in forecasting emissions (Boswell et al. 2010). Furthermore, the labeling of these CAPs can be contentious. There are several other types of plans, such as city sustainability plans, that can have significant effects on the efforts of a region to reduce GHG emissions, but may not be included in any analysis (Stults 2009). Evidently, the premise of analyzing a CAP is challenged in several ways.

My experimental design may not have adequately addressed my research questions for Richmond in some ways as well. First, no formulaic way of coding CAPs exists. Studies analyzing CAPs have had a broad range of techniques (Boswell 2010, Drummond 2010, Bierbaum 2012), and so adequately capturing all the components of a CAP was difficult. Pinpointing which elements of the interviews with CAP planners and Richmond officials were actually important was also complicated and challenging. My recommendations were catered specifically toward the body of actors playing out in Richmond at this time. Because it was a study specific to Richmond, some of the findings cannot be generalized to other cities. The question of a CAPs worth for a particular city is definitely applicable to all places, but Richmond was unique in its body of organizations, as well as its specific point source emissions and subsequent environmental justice concerns.

My findings suggest that a similar interview process is appropriate for conducting an analogous investigation in another city looking to develop a CAP for its jurisdiction. It is important to speak specifically with the organizations, stakeholders, and policy makers present in each community to assess the practicality and efficacy of a CAP on an individual basis because no two communities are exactly alike in what legislation will be passed or supported at any given time.

Conclusions

These recommendations for a Richmond CAP need to be looked at within the larger context of the district, state, country and even world. Richmond is taking steps to reduce emissions – drafting, planning, and executing a CAP would be a useful tool only if it is enforceable and a collaborative effort. However, regardless of the presence or absence of a CAP, progressive measures need to be implemented, and at a relatively rapid pace. Richmond is only one small city working toward maintaining an equitable and just community that is environmentally sustainable in the long term. CAPs have been an important key player in reducing GHG emissions, or at least raising awareness for its need (Hoorweg et al. 2011). These kinds of local initiatives must continue to accelerate in swiftness and scope. As more and more cities join in on efforts to enact sustainable measures, they must lead swiftly to regional, national, and global policies to adequately combat the impending climate change effects.

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