

# California

## Analysis and Summary

California has the scale of many national governments. Commonly cited statistics mention that if it were an independent country, its economy would be roughly the sixth, seventh, or tenth largest in the world, depending on the year and metrics that are used. It also has a strong innovation culture and broad public support for environmental policies. As a result, it has innovated in many areas of general environmental policy. The state does not have the strong and concentrated economic development policies found in Ohio and Michigan, nor does it have the concentrated clean-energy innovation apparatus as in Massachusetts. Nevertheless, California has many noteworthy innovations for state-government green jobs and green business policies, among which are the following:

- Strong public benefits funds with over \$60 million per year for research and development.
- Goals for in-state production of biofuels.
- Plans for building codes that target net zero emissions for new buildings.
- Leadership in models for community choice, clean-energy revenue bonds, PACE bonds, and feed-in tariffs.
- Strong state-government support for green-jobs training programs, with programs available for persons with employment barriers.
- State government support for research and development in the public university system, including dedicated clean-energy research institutes, and among firms.
- Industrial clusters in all of the industries covered in this report.

At the city level, California cities have often broken new ground in urban policies. In some cases, the green-transition policies appear to be driven more by business elites and city-government leaders, but in other cases there is substantial involvement from grassroots groups. We identified the following urban-level policies with respect to green jobs and green business development as especially noteworthy.

- In cities such as Sacramento, San Diego, San José, concentrated efforts by city governments to support and develop clean-tech industries through the development of new funding mechanisms, business associations, incubators, and training programs.
- An experimental “clean tech corridor” in Los Angeles, which may help foster cluster development through proximity, and a clean-up of the city’s port.
- In San Diego, a local purchasing policy to assist green businesses.
- In cities such as Oakland and Los Angeles, close partnerships with neighborhood, advocacy, and other civil society organizations to connect green jobs creation with broader community development goals.

## General Background Policy

The state has a history of air quality and water management issues that have led to bipartisan support for green policy initiatives. Because it was the only state to have an air quality regulatory agency before the federal law was established, it was permitted to keep the agency, whereas other states were required to follow either California or federal law. Through the California Air Resources Board (CARB), the state has established some emissions and air quality standards that are higher than those of the federal government, thereby encouraging innovation.

***Energy Goals.*** In 2002 the state set a goal of 20 percent electricity from renewable energy by 2017, and in 2010 it accelerated the goal to 20 percent by 2010 (SB 107). The renewable portfolio standard builds on previous initiatives dating back to the 1980s. A subsequent executive order in 2008 (S-14-08) increased the renewable electricity standard to 33 percent of the load for retail sellers by 2020.

Under the 2006 Global Warming Solutions Act (AB 32), the state government established a timetable for bringing greenhouse gas emissions to 1990 levels and charged the CARB with preparing plans for its implementation. In 2010 an opposition ballot measure was floated that would required the suspension of AB 32 until the unemployment rate is below 5.5 percent for one year. It was called the “California Jobs Initiative,” but even though an official report by CARB indicated that AB 32 would create jobs. Governor Schwarzenegger blasted the ballot initiative as the work of “greedy” Texas oil companies (Carey 2010).

California is also a participant in the Western Climate Initiative. It will join with other Western states and some Canadian provinces to implement a cap-and-trade system for greenhouse gas emissions that is scheduled to begin in 2012. The initiative will aim for a 15 percent reduction in greenhouse gas emissions levels from 2005 by 2020.

The state’s energy-efficiency goals have resulted in 4 percent electricity reduction for the state’s three largest investor-owned utilities (American Council for an Energy Efficient Economy 2010).

***Other Energy Policies of Note.*** The State of California has broken policy ground in a number of areas, among which the most notable are electricity decoupling, community choice, and feed-in tariffs. In 1982 California became the first state to introduce electricity decoupling, a policy that maintains the revenues of a utility at a steady rate by adjusting prices up or down. The policy is intended to overcome a hurdle to energy conservation measures, and although it passes on increases in rate increases to customers, the customers also save by having greater support for energy conservation. Some groups believe that a better approach is to have an energy-efficiency utility or other public entity that encourages conservation measures. California’s decoupling policy contributed to the state’s relatively flat per capita electricity consumption, whereas other states have seen increases.

In 2002 California became one of the few states to approve community choice legislation. The legislation allows cities or other local government districts to aggregate electricity customers, with an opt-out provision, then bargain with electricity service providers over rates

and energy mix. In San Francisco, community-choice legislation went to the next level, when it was combined with a revenue bond to enable the construction of 350 megawatts of renewable electricity generation, distributed energy, and energy conservation projects. Other cities are pursuing the combination of community choice with revenue bonds. About forty cities in the state have pursued community choice aggregation, some with a renewable electricity standard of 51 percent by 2017. In 2010 Pacific Gas and Electric floated a ballot proposition against community choice called the “Taxpayers Right to Vote Act.” The proposition would have required local governments to obtain a two-thirds vote before using taxpayer funds to start a public power agency or expand to new customers. Although the utility spend tens of millions of dollars on the ballot proposition, voters defeated it in June 2010 (Hansen 2010).

A third innovative energy policy is the state’s feed-in tariff. Although the policy instrument has been used with success in Germany, Spain, and other countries to support the solar industry, it has been infrequently used in North America. Feed-in tariffs guarantee access to the grid for renewable energy generators such as residences and businesses, and they pay a long-term rate based on the cost of generation. California has used a “standard offer contract” since the 1980s at a price that supported wind energy but not the more expensive solar photovoltaic electricity. In 2008 the state directed the investor-owned utilities to offer a feed-in tariff, but again the price was not high enough to attract rooftop solar energy. In 2009 new legislation required utilities to pay customers for excess solar energy fed back into the grid (AB 920) and to establish a feed-in tariff (SB 32). The Renewable Energy and Economic Stimulus Act may solve some of the problems of the previous generations of feed-in tariffs (Wei and Kammen 2010).

**Public Benefits Funds.** California’s public benefits funds support the California Energy Commission at a rate of about \$65.5 million per year for renewable energy and \$62.5 million per year for research under the Public Interest Energy Research Program of the Research and Development Division of the California Energy Commission. In addition, there is \$228 million per year for energy efficiency that is administered by the utilities and supervised by the California Public Utilities Commission (California Energy Commission 2009, DSIRE 2010).

**Green-Buildings Policy.** An executive order by Governor Schwarzenegger of California in 2004 (S-20-04) required that all new and renovated state government buildings with state-government funding meet the silver certification level of the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) rating system. In the same year the state legislature approved the Governor’s Million Solar Roofs Initiative (SB 1). The legislation built on a much longer history of initiatives in support of solar-energy production in the state. Implemented by the California Public Utilities Commission as under California Solar Initiative, in cooperation with the California Energy Commission, the initiative had a budget of \$2.167 billion from 2007 to 2016 (Go Solar California 2010).

In 2009 the California Public Utilities Commission approved a \$3 billion plan for 2010-2012 for the state’s regulated utilities to support energy-efficiency improvements in the state’s residential and commercial buildings. The plan was the largest ever by a state for energy efficiency, and the commission claimed that it would 15,000 to 18,000 skilled jobs. The implementation included a target of 120,000 homes for retrofit as well as grants to local

governments for retrofits of public buildings. The plan also includes a goal of net zero energy for new residential homes by 2020 and for commercial buildings by 2030 (California Public Utilities Commission 2008, 2009).

In 2008 the state government approved AB 811, which allowed cities to fund solar rooftop that is paid for by a line on the property owner's tax bill. Originally developed in Berkeley, PACE became available statewide with the passage of the legislation. In 2010 the state approved the Property Assessed Clean Energy (PACE) Bond Reserve Fund (SB 77), which assists local governments in efforts to develop the financing for PACE programs.

**Green Jobs Training.** California has also shown leadership in legislation and programs that support green jobs training. The Green Collar Jobs Act of 2008 authorized a Green Jobs Council to assess training and resource needs for the state, develop public-private partnerships, and establish guidelines for green jobs training programs. In 2009 California announced two green jobs programs. The California Green Corps, funded with \$10 million federal stimulus money and matching funds from public-private partnerships, offered 20-month training sessions for green-collar jobs for 1,500 at-risk youth and was administered via ten regional green corps centers operated by colleges, local governments, and workforce training centers (State of California 2009a, 2009b). Later that year the state announced a second, much larger program: the \$75 million California Clean Energy Workforce Training Program, which was planned to train 20,000 people for green jobs (Willon 2009). A report by the California Community Colleges projected that the most jobs will be in service industries such as solar installation technicians, wind turbine technicians, and in the green building occupations, rather than in manufacturing (Centers of Excellence 2008). In addition to the state programs, many California cities have an independent, local "conservation corps" that provides education, community services, and conservation work opportunities for at-risk youth. Increasingly, those organizations have developed more specific green jobs training programs. In addition to the state-sponsored green jobs corps and the local conservation corps, there are several unique city green jobs programs that will be described below. The Employment Development Department received \$6 million in ARRA funding in 2010 for green jobs training.

## **Clean-Energy Industry Development**

**General Background.** Because of the size of its economy and high concern with environmental issues, California leads the nation in clean-tech businesses (10,209 in 2007) and was far ahead of second-place Texas (4,802) and third-place Florida (3,831; Pew Charitable Trusts 2009). The state's position in clean energy also derives from the spill-over effects of the entrepreneurialism of Silicon Valley and the southern California cities. California leads the country in number of leading venture capitalists, level of investments, and patents (Burtis et al. 2004, Pew Charitable Trusts 2009). The trend was also upward for California, which received 34% of venture capital investment in 2005, 56% of in 2008, and 60% in 2009 (Cleantech Group and E2 2009; Cleantech Group 2009b).

California has a strong venture capital industry that has invested in biofuels, solar energy, smart-grid technologies, and other clean-energy technologies. As a result, the need for state-government support of early-stage companies is lower than in other states. Nevertheless, the state

has supported early-stage companies in the green-tech industries through a few programs. Under the Green Wave Initiative of the California state treasurer in partnership with CalPERS and Cal STRS in 2004, the public pension funds pledged to invest \$450 million in private equity and venture capital for clean-tech companies (State of California 2005). The California Clean Energy Fund (2009) launched in 2004 as a nonprofit corporation with \$30 million in settlements from the PG&E bankruptcy, also supported new companies in partnership with three venture capital funds: Nth Power, Element Partners, and VantagePoint Venture Partners. Until 2010, the California Resources Board had a small program (about \$1 million per year) that awarded funds for demonstration projects through the California Innovative Clean Air Technologies (ICAT) program.

California does not have a concentrated clean-tech business development program such as Massachusetts, but the state government has various programs that provide support for clean-energy businesses. One major source is the California Energy Commission's annual research budget, a portion of which goes to businesses for new technology development. In 2010 the California Energy Commission announced the merger of two programs under the Clean Energy Manufacturing Program. The Clean Energy Business Financing Program uses ARRA funds to support a \$30.6 million revolving loan program for clean-energy businesses that improve manufacturing facilities located in the state. The second program, Alternative and Renewable Fuel and Vehicle Technology Program provides support for companies in the biofuels (\$40.5 million) and vehicle and component manufacturing (\$19 million) industries. The intention of both programs is to rebuild in-state manufacturing and refining jobs (Sustainable Business 2010). In 2010 state legislation (SB 71) added to the efforts by providing a sales tax exemption for purchases of green manufacturing equipment. Another significant source of funds is through the California Industrial Development Financing Advisory Commission, which offered \$100 million per year of industrial bonds to businesses in 2007 and 2008 before declining in 2009. The program also supported businesses that engaged in clean manufacturing that created jobs.

The state government has contributed significantly to the clean-energy research infrastructure, at least up until the budget crises of 2008 and after. The Energy Institute of the University of California links together energy-related research of the system's campuses, and it also connects research with government and industry. In 2000 the state provided \$100 million to start the California Institutes of Science and Innovation, which are located on various campuses of the state university system. Although those institutes were not specifically focused on green technology, there were spill-over effects. Furthermore, in 2006 the state provided \$30 million to support the Helios Laboratory at the Lawrence Berkeley National Laboratory, a research center that studies energy-storage technologies associated with solar energy (State of California 2006).

There are also considerable resources in the private universities. For example, in 2002 Stanford University launched the Global Climate and Energy Project (2009) with pledges from ExxonMobil, General Electric, Schlumberger, and Toyota for up to \$225 million over a decade. The project links researchers at Stanford and across the world who are engaging in research on solar, biomass, hydrogen, carbon sequestration, and other topics. In 2006 Stanford launched the Precourt Energy Efficiency Center, which will explore buildings, vehicles, electricity storage, and smart-grid technologies. The TomKat Center for Sustainable Energy will focus on materials and energy conversion problems such as photovoltaics, fuel cells, batteries, and grid conversion.

the Precourt Institute for Energy at Stanford was launched with initial pledges of \$100 million. The institute will include three centers, two of which are pre-existing.

**Biofuels.** California has the highest number of headquarters of leading biofuels firms, with over 30 percent of fifty of the world's "hottest" bioenergy firms in *Biofuels Digest* for 2009-2010. The strength in the area is due to spill-over from Silicon Valley entrepreneurialism and the San Diego biotechnology cluster, but the state government has also supported the industry. For example, in 2006 Governor Schwarzenegger announced a target of producing 40 percent of the state's biofuels within the state and 20 percent of the state's renewable electricity from biomass produced within the state, both with a 2020 target date (California Energy Commission 2006). In 2007 he announced an executive order (S-01-07) for the country's first low-carbon fuel standard, which sets a goal of a 10 percent reduction in carbon emissions from passenger fuel vehicles by 2020. At UC Davis there is a center for biofuels research supported by a \$25 million grant from Chevron. The state also promised \$40 million in matching funds for the Energy Biosciences Institute, which was supported with \$500 million from British Petroleum, in partnership with the Lawrence Berkeley National Laboratory and the University of Illinois at Urbana-Champaign (Sanders 2007). Lawrence Livermore Laboratories, in collaboration with the University of California at Berkeley, University of California at Davis, and Stanford University, also was designated one of the three centers to receive a portion of the \$375 million allotted by the U.S. Department of Energy for cellulosic ethanol research (Childs 2007). In San Diego there is a cluster of academic researchers and firms specialized in algae-based biofuels who have formed the San Diego Center for Algae-Based biofuels, which links five local research institutes: Scripps Research Institute, UC San Diego, Scripps Institution of Oceanography, the Salk Institute and San Diego State University. In 2009 ExxonMobil announced a \$600 million partnership with Synthetic Genomics, a biotechnology company founded by Craig Ventner and located in La Jolla (Bigelow 2009, Filkes 2009).

**Smart-Grid and Building Technologies.** California also has leadership in the smart-grid and buildings systems industry, and it also received over \$400 million in awards from the U.S. Department of Energy in 2009 for smart-grid development (Chong 2009). The state is distinguished from other states because it also has become the country's center of smart-grid companies. Both Cisco and Google have entered the smart meter market in addition to smaller companies such as Silver Spring Networks and SynapSense, and the company eMeter has received some prominent contracts (see Ritch 2009).

**Solar.** California has the country's highest number of headquarters of solar-energy manufacturing firms. The industry is located throughout the state, but there is a concentration of manufacturing firms in the San Francisco Bay area. In 2009 the University of California system funded the California Advanced Solar Technologies Institute at three of the state universities, and in the same year the California Energy Commission helped to form the California Solar Energy Collaborative to identify roadmaps for solar energy research and policy. California has also done well at capturing the large grants (generally at \$15-\$20 million over five years) from the U.S. Department of Energy (2009) for the Energy Frontier Research Centers. Grants for solar energy-related research went to Cal Tech, Stanford, UC Santa Barbara, UCLA, and the University of Southern California.

**Transportation and Energy Storage.** The state government has consistently created a regulatory climate that favored the use of the state for technological innovation. In the late 1990s the state established a zero-emission vehicle mandate, which led to the production of electric vehicles. The automotive industry fought the mandate and eventually brought about a reversal of the mandate from the CARB. However, interest in electric vehicles continued in the state, and it is currently home to several electric vehicle manufacturers, including Tesla. There are institutes for transportation studies at U.C. Berkeley and U.C. Davis, as well as the Plug-In Hybrid Electric Vehicle Center at U.C. Davis, which provide the institutional home for a wide range of research projects from engineering to policy.

With respect to fuel cells, in 2004 Governor Schwarzenegger announced the “hydrogen highway” for California (S-07-04). The hydrogen highway did not appear as completely as anticipated, with only thirty-one stations completed out of a target of 100 by 2010 (King 2010). In retrospect the support at the federal government level for hydrogen vehicles was linked to automotive industry’s concern with the growing popularity of electric vehicles. When the Obama administration came into power, federal government support shifted to back electric and hybrid-electric vehicles with biofuels. Although hydrogen-fueled vehicles have turned out to be expensive and only feasible in the long term, the fuel-cell industry, which is based on a wider array of technologies than hydrogen, has achieved more traction. In 1998, U.C. Irvine launched the National Fuel Cell Research Center, which was funded by the Department of Energy and California Energy Commission. The organization researches fuel cells for vehicles as well as residential uses. In 2001 the state founded the California Stationary Fuel Cell Collaborative, which has led to installations across the state. The California Fuel Cell Partnership was formed in 2009 as a partnership between government agencies and industry to support the continued growth of hydrogen fuel-cell vehicles. However, fuel-cell vehicles have increasingly lost ground to electric and plug-in electric vehicles, and while California remains a center for the testing of fuel-cell vehicles, the potential for commercialization in the short term may be limited. The state is home to some fuel-cell manufacturers, including Bloom Energy, ClearEdge Power, Jadoo Power, Oorja Protonics, Polyfuel, and UltraCell Corporation.

**Wind.** California also has a wind industry that dates back to the early twentieth century, when wind mills were used to power wells on the state’s farms. Given the state’s demand-side policies and large population, it is not surprising that it has one of the highest levels of installed wind generation in the country. The state also includes some prominent wind manufacturing companies, including the General Electric facility in Tehachapi, Clipper, Continental Wind, Mitsubishi Power Systems, and a variety of suppliers (Sterzinger and Svrcek 2004). However, other states have aggressively recruited wind manufacturers, and they also have major research and testing facilities.

## California Cities

We focused on four cities in the state (Los Angeles, Oakland, San Francisco, and San Diego), for which Gresh conducted interviews and site visits. We also include brief discussions of Sacramento and San José based on publicly available sources.

### Los Angeles

As the fourteenth largest economy in the world, Los Angeles has the potential to make a significant impact by developing in a sustainable way. In comparison with other California cities, Los Angeles has an inclusive model of growth that incorporates low-income, disadvantaged residents within regulatory structures like the Green Building Retrofit Ordinance and future renewable energy plans. The city has strong sustainability leadership through Mayor Antonio Villaraigosa and the Mayor's Office, as demonstrated by Green LA plan. The Green LA plan establishes carbon emissions targets at 35 percent below 1990 levels (a goal that exceeds the Kyoto Protocol agreement). The publicly owned utilities and assets (such as the Los Angeles Department of Water and Power (LADWP), Los Angeles World Airports (LAWA), and the Port of Los Angeles) have given the city government more control over some of its greening initiatives than in cities that lack such large, publicly controlled institutions.

***Sustainability Plans.*** With 2004 carbon dioxide emissions produced at the level of Sweden, and forming part of the fourteenth largest economy in the world with over four million residents spanning 469 square miles, Mayor Antonio Villaraigosa has sought to transform LA as a major contributor of global climate change to a model of urban sustainability. The goal is to make LA the “cleanest and greenest big city in America” (City of Los Angeles 2007: 2). As part of the growing awareness of the negative environmental impacts of global climate change on the city and its residents, the city produced a climate action plan in May of 2007 called “Green LA: An Action Plan to Lead the Nation in Fighting Global Warming.” The document goes beyond existing city conservation strategies by setting a goal to reduce carbon dioxide emissions to 35 percent below 1990 levels by the year 2030. The vision in the Green LA plan is to meet the reduction goal by elaborating on the city's direct role, capacities, and community influence to grow a green economy as well as to produce a greener and cleaner city. It focuses on transforming city operations and employee practices, greening city buildings, and promoting sustainable practices for residents and businesses. The plan makes use of LA's direct influence over its publicly owned assets—Los Angeles Department of Water and Power (LADWP), Los Angeles World Airports (LAWA), and the Port of Los Angeles—to lower greenhouse gas emissions and stimulate market demand for green technologies, products, and services. Additionally, it calls for leveraging city resources to promote private investment as well as green business clusters and for the participation of disadvantaged communities through green workforce development. The Green LA plan creates 50 action items with a focus in the following areas: energy, water, transportation, land use, waste, port, airport, green spaces, and green economy (City of Los Angeles 2007).

A year later in 2008 the city adopted the implementation program for Green LA called “Climate LA: Municipal Program Implementing the GreenLA Climate Action Plan.” The

implementation program provides more detail and context to each action item by identifying the leading actors, providing calculations of impacts where possible, as well as developing a timeline for each item identified in the Green LA plan. The plan targets energy through greening LADWP, greening private and public buildings, and helping residents conserve energy. Other initiatives such as greening the city vehicle fleet, reducing water consumption, and offering rebates for energy-efficient appliances were included (City of Los Angeles 2008a). To promote sustainable practices within city operations, in July of 2007 the mayor issued Executive Directive 10, which establishes departmental sustainability plans as well as mandating green building practices.

Following its sustainability plans, the City of Los Angeles has also pursued plans to invest in renewable-energy pathways such as geothermal, biomass, wind power, and especially solar. In November of 2008, Mayor Villaraigosa announced Solar LA, a plan designed to leverage LADWP in the development of 1.3 gigawatts of solar energy by 2020 via rooftop solar, local projects owned by the department, and large-scale projects outside the city. According to the document, between 200 and 400 new jobs are potentially created with every 10 megawatts of solar energy in the areas of research and development, manufacturing, installation, maintenance and repair (City of Los Angeles 2008b). However, in 2009 the voters defeated Measure B, the ballot initiative that would have implemented a component of the plan by installing 400 megawatts of solar panels throughout the city. According to the document, between 200 and 400 new jobs are potentially created with every ten megawatts of solar energy in the areas of research and development, manufacturing, installation, maintenance, and repair (City of Los Angeles 2008b). A setback in the solar plan occurred with the 2009 voter defeat of Measure B, known as the Los Angeles Green Energy and Good Jobs for Los Angeles Initiative. This measure would have implemented a component of the larger plan to install 400 megawatts of solar panels on LA city buildings. However, opponents charged that rates would rise and without the public's knowledge would put the city council in the driver's seat (LA Times Editorial Board 2009). Currently, the city is engaged in alternative ways to go forward with the 400 megawatts installation.

Despite the defeat of Measure B, there is still interest within the city to harness the potential of solar energy. In March, 2010, the mayor proposed a carbon reduction surcharge that raises average monthly utility rates by less than \$2.50 per month, creates a solar feed-in tariff, and includes a Renewable Energy and Efficiency Trust Fund for investment in energy efficiency. The energy-efficiency component creates partnerships with the Los Angeles Community College District, Community Development Department, and the Joint Training Institute for entry-level workforce training in energy audits and retrofits. The establishment of a solar feed-in tariff makes it possible for in-basin solar facilities to sell back electricity to the grid through a twenty-year purchase-power agreement. The intent is to promote energy efficiency while creating jobs within this solar industry as well as grid administration and upgrades. With regard to wind power, Los Angeles has also completed the first municipally owned 8,000 acre wind farm, "Pine Tree," which produces enough wind power for 56,000 homes (City of Los Angeles 2010a; City of Los Angeles 2010b).

Los Angeles is not unlike other cities in our report that have had to reorganize city budgets in the face of the economic crisis while still providing necessary services and functions.

Effective in June 2010, the city eliminated the Environmental Affairs Department (EAD) and shifted key functions and staff to the Bureau of Sanitation, Department of Transportation, and Department of Building and Safety. Dispersing staff throughout these departments is also part of a larger intention to distribute environmentalism while preserving core programs. As a result, the mayor expanded his Energy and Environment Office to include sustainability. Now called the Office of Energy, Environment, and Sustainability, this reorganization “reflects the necessary interrelationship of energy, environmental and sustainability policy,” while also coordinating and overseeing these efforts (Mayor’s Office 2010a). This restructuring also replaced the Environmental Affairs Commission with the Environmental Advisory Council, which includes a cross-section of the city’s central environmental, academic, labor, community, environmental justice, and business leaders. Currently, the sustainability program is creating a framework for a communitywide sustainability plan for 4.4 million LA residents. Working with the public, UCLA, and U.C. Irvine, the plan’s completion is expected by the end of 2011 (Mayor’s Office 2010a).

Efforts to create regional climate action and adaptation plans are also underway through a collaboration created with seed funding provided by the organization NextTen (Mayor’s Office 2010a). The collaboration is composed of members from the city and county governments including the Metropolitan Transit Agency, local Councils of Government, watershed management groups, environmental organizations, and others. Created with the understanding that the region’s eighty-eight cities, the county, and the city all share the same watershed and airshed, one of the objectives for this collaboration is to put climate action and sustainability on a unidirectional pathway through shared goals. Such a plan would reduce federal and state costs while at the same time provide regional autonomy with regard to project management and grant distribution.

In a recent request on Capitol Hill in May, Mayor Villaraigosa asked the federal government to partner with the City to help raise funds for local sustainable transit projects. While the government has already pledged funding for twelve major projects over the course of thirty years, Villaraigosa is asking for financing to help the city complete projects in ten years. Calling for the government to create a national bank or I-Fund for development projects, he cited the recent half-cent transportation tax (Measure R) that was approved by Los Angeles citizens in November of 2008 that created a revenue stream for the improvement of the police force as well as the expansion and improvement of transportation systems such as high-speed rail. Villaraigosa has argued that this local-federal partnership, or 30/10 Transit Initiative, helps create “green jobs, reduces dependence on foreign oil, and cleans our air.” According to the 2010-2011 budget summary, the initiative is projected to create approximately 170,000 construction jobs over the next ten years (City of Los Angeles 2010c; City of Los Angeles 2010d).

***Green-Building Initiatives.*** Working within the Green LA framework, one of the ways in which the city has stimulated the local green economy and an inclusive model of sustainable development is through its support and collaboration with the city’s Apollo Alliance. Driven by local labor, environment, and community-based organizations, the Apollo Alliance introduced and helped the city to draft the Green Building Retrofits Ordinance, which was passed in April, 2009. The ordinance mandates a rating of LEED silver or higher for existing city buildings over 7500 square feet or buildings constructed prior to 1978. Significantly, the ordinance connects

green-building retrofits to local poverty alleviation by requiring the city to hire local residents for the retrofit of its 1,000 municipal buildings. The ordinance also supports the development of workforce training programs that are currently underway. Formalizing the commitment to invest in the physical landscape of communities hit hard by the Great Recession and the longer-term economic distress of deindustrialization, the ordinance also establishes a program goal to retrofit at least 50 percent of city buildings that are located in areas with high levels of poverty and unemployment.

To oversee these goals and create shared governance between the city and civil society groups, the ordinance established an advisory council, composed of representatives from environmental, labor, and community organizations, among others. The council makes recommendations to the Green Retrofit Development Interdepartmental Task Force and its Program Director, who is part of the Mayor's Office of Energy, Environment, and Sustainability. Of the city's \$37 million received in Energy Efficiency Block Grants, the city allocated \$16 million to the Green Retrofit and Workforce Program, the largest sum awarded out of a dozen city projects. (The city received \$37 million in EEBG funds and divided it up according to twelve or thirteen areas of focus. This program—retrofitting existing buildings—received the most of the dozen program areas.) Currently, the program is working on pilot projects that experiment with green-building practices and come online in September, 2010. As a model for green sustainable development nationwide, what began as a community-driven effort has become institutionalized as part of the city's framework for poverty alleviation that simultaneously addresses the environmental crisis by greening existing city buildings (City of Los Angeles 2009a; Delp, Stewart, and Applebaum 2009; Mayor's Office 2010a, 2010b).

The city also approved a green building ordinance for the private sector in April of 2008. The ordinance mandated LEED certification for all new private-sector projects at or greater than 50,000 square feet or 50 units. As an incentive, for those projects going beyond the general LEED certification, applications will be expedited through the Planning and Public Works Departments (City of Los Angeles 2008c; Environment News Service 2008). To encourage greening of private-sector buildings, the city also has a Green Business Certification Program that certifies businesses in compliance with program standards for resource conservation, pollution prevention, and minimizing waste. The green hotels component is the first area of focus for the city, and the city recently oversaw the certification for LA's largest hotel, the Westin's Bonaventure Hotel & Suites. The Green Hotels program works with the non-profit organization Green Seal to complete certification. A local community college is the contractor for the city, which provides training for business audits and expertise for the certification process. With the \$20,000 in upfront investment, the hotel is said to have saved about \$225,000 per year. According to the mayor's office, this program has been successful and currently has applications in process (City of Los Angeles 2009b; Mayor's Office 2010a).

For the private sector (both residential and commercial users), the LADWP also offers several options to power their homes or businesses with solar energy. Under the SB1 California Solar Initiative signed into law in 2006, the LADWP offers the Residential Solar Power Incentive, which provides a financial incentive for those who pay for and install their own solar power systems. The city also has AB 8-11, the local implementation of the PACE program, that will focus on financing energy retrofits for homeowners. As part of AB 8-11, the program will

also ensure adequate sizing of solar systems so consumers do not overpay for their systems, and UCLA is currently working on adaptation modeling that looks at in-basin energy generation potential (Mayor's Office 2010a). The PACE program is currently on-hold pending a lawsuit in California and federal policy negotiations.

For those without the ability to install private systems, customers may invest in solar energy through the Green Power Program by paying an extra 3 cents per kilowatt-hour for renewable energy sources (City of Los Angeles 2008b). Also in the pipeline is the SunShares program, which allows customers to purchase a share of the LADWP solar power plant in exchange for monthly dividends that act as credits to their power bill (City of Los Angeles 2008b; LADWP 2007). Although the focus of AB 8-11 is homeowners, the city is also collaborating with the Clinton Climate Initiative to create a commercial financing program for energy retrofits. The hope is to implement a model that is financed through the commercial market, rather than selling bonds (Mayor's Office 2010a).

***Green Jobs Training.*** Los Angeles has been a leader in green job development since 1986, when the Los Angeles Conservation Corps was founded. Billed as the nation's largest program of its kind, the organization provides job training for at-risk youth who work on environmental and service projects. Community colleges, such as Long Beach City College and Los Angeles Community College District, were also recipients of one of the state's eleven grants for its California Green Jobs Corps training programs for at-risk youth (State of California 2009a). In the last six months, further federal and state funding has gone to workforce training, targeting low-income, unemployed, and under-skilled people for green jobs. In January of 2010, the Los Angeles Community College District was awarded funds from the ARRA block grant under the Pathways out of Poverty initiative, which supports green jobs initiatives, many of which work in areas with poverty rates at 15 percent. They were given \$4 million for communities such as Watts and Willowbrook for workforce training, including services such as recruitment and referrals, occupational skills, and other resources (Hsu 2010). Veterans are also targeted recipients of recent employment grants through the State's Workforce Investment Act (WIA), which prepares veterans for high-wage clean-energy employment and other industries. \$12.7 million was distributed to organizations such as Community Career Development and Managed Care Solutions, Inc. among others, and is projected to help 2,200 veterans (California Employment Development Department 2010). Private-public partnerships such as the \$1 million green jobs initiative between Southern California Edison and California Community Colleges have helped to fund the Los Angeles Southwest College's new associate degree program in environmental science and technology (Rivera 2010).

***Green Business Initiatives.*** Although the Green LA Action Plan did not directly address green jobs, Mayor Villaraigosa vigorously supported clean-tech industrial development in the city. In 2009 he announced the Clean Tech Los Angeles initiative, which involved a partnership among the city, the LADWP, the major universities, and the business community. According to sources from the Mayor's Office (2010a, 2010c), the idea is to create a model of sustainable development by transforming LA's historic industrial land in downtown area into a green business cluster called the Clean Tech Corridor. The mayor's plan includes a twenty-acre Clean Tech Manufacturing Center, which houses clean-tech companies and manufacturers that adhere to mandated wage and living-wage requirements, as well as a Clean Innovations Research

Center, which contains both a clean technology business incubator and clean technology research center. The goal of the business incubator is to foster the development of clean-tech startup companies by providing mentorship opportunities such as city-partnered demonstration projects that are linked up with interested investors, as well as provide clean tech resources through the research center. The research center will bring experts from the University of Southern California, UCLA, CalTech, and the LADWP together to work on energy and climate-change projects. In this way, the initiative will encourage and support the formation of clean-tech start-up companies, but it will also assist in recruiting new companies to the area in addition to working on climate change and energy problems (City of Los Angeles 2009c; Los Angeles Community Redevelopment Agency; Mayor's Office 2010a, 2010c). The incubator associated with CalTech, called "Entretec," has already produced and supported many companies in the clean-energy sector.

With regard to the creation of manufacturing jobs, the city is currently looking for a tenant at the manufacturing site after which a deal with the Italian manufacturing company AnsaldoBreda fell through in 2009. The company planned a factory that would build rail cars for the city's light-rail system and move its corporate headquarters to the city. Together the factory and headquarters were planned to create 661 direct jobs and generate over 2000 jobs through indirect and induced effects (Freeman, Cooper, and Poghosyan 2009). However, the Los Angeles County Metropolitan Transit Authority (MTA) refused to sign the deal. The company was alleged to have failed to meet quality standards on its previous contract (Los Angeles Times 2009). Since then the city has also considered a few solar companies; however, producers were not willing to share the risk with the city. Instead, they expected the city to purchase all output within a five-to-ten year time frame (Mayor's Office 2010c).

In April 2010, Mayor Villaraigosa enlisted the help of the Urban Land Institute (ULI) for expert advice on how to develop the clean-tech corridor into "the global capital of clean technology...that will create good-paying green jobs" (City of Los Angeles 2010e). This came after the Chinese hybrid-electric vehicle producer, BYD Co. (Build Your Dreams), announced plans to locate its headquarters in downtown LA near the Staples Center (Lopez 2010). The decision by the Chinese company to locate downtown coincides with the expansion of the State Enterprise Zone approved in May 2010. First Deputy Mayor Austin Beutner states that "the LAX approval, combined with BYD's arrival and the Valley area expansion, sets the stage to potentially create more than 25,000 jobs in Los Angeles in the near future" (City of Los Angeles 2010f).

In December 2009 Mayor Villagairoso announced another major new initiative: the Southern California Regional Plug-In Electric Vehicle Plan. He promised that the collaboration among cities in the Los Angeles area with utilities and automakers would make the area the nation's electric vehicle capital. Cities pledged to develop infrastructure, alter zoning codes where necessary, change fleet purchasing priorities, and educate consumers about electric vehicles. The plan also included incentives for early adopters, off-peak hour charging rates, and high-occupancy vehicle lanes for users of plug-in electric vehicles (City of Los Angeles 2009d). The hydrogen community is also working with the city as regional collaborator for the hydrogen fuel-cell working group. Mercedes-Benz is coming out with a car in October 2010 and will be

investing in hydrogen infrastructure in LA. This pilot program also has the potential to create green jobs and make LA a training hub for the development and maintenance of these vehicles.

In an effort to reduce emissions at the Port of Long Beach and Los Angeles, the city created the Technology Advancement Program (TAP) to support innovative green businesses by acting as an investor. Through the program, the city provided funding for entrepreneur Balwinder Samra, the owner of Balqon Corporation, to develop a heavy-duty port drayage vehicle. Due to Port's support, Balqon has located manufacturing there, and the Port currently receives \$1,000 for each vehicle Balqon sells or leases (City of Los Angeles 2010g). In addition to electric drayage vehicles, the Clean Trucks Program implemented as part of the Port's Clean Air Action Program has also generated over \$600 million in private investment for the purchase and leasing of low-emission trucks, of which 600 are natural gas vehicles. Since the 2008 ban on approximately 10,000 heavier polluting trucks at the ports, the rate of emissions declined 70 percent compared to the average emissions in 2007 (Port of Los Angeles). The city has also recently applied for a state grant to train mechanics at the port for maintaining alternative fuel vehicles (Port of Los Angeles 2010).

***Civil Society Organizations and Policy.*** In 2006, a unique group of twenty-four labor, environmental, and community organizations formed the Apollo Alliance. The alliance is convened by SCOPE, a community-based organization in South Los Angeles. Creating a green jobs campaign, the LA Apollo Alliance focuses on the creation of green pathways out of poverty for low-income, disadvantaged populations through localized job creation. The organization also actively engages in an inclusive model of sustainable economic development for all people at all levels on the skill ladder. The LA Apollo Alliance pushes for green jobs that have benefits and worker protections, are safe, and provide pathways into career advancement.

After thorough research and planning, in 2006 the LA Apollo Alliance proposed their draft Green Building Plan to the city, which later became the Green Building Retrofit Ordinance adopted in 2009. Through this Ordinance, the Apollo Alliance linked a workforce strategy and inner city development with the city's need to reduce climate change and stimulate businesses and good jobs. Currently, experts and members of civil society organizations active in the effort serve on the Advisory Council to the Director of Green Retrofit and Workforce Programs and are engaging with the city in pilot projects for greening the inner city as well as citywide buildings (LA Apollo Alliance 2009; Lee 2010). The work of the LA Apollo Alliance serves as a national model for community engagement and democratic participation in the making of a new green economy.

## **Oakland and the East Bay**

The East Bay (including Oakland, Berkeley, Richmond, and other cities) has been an incubator for innovative solutions such as PACE, direct install, and retrocommissioning. Oakland has a strong sustainability program, and the city collaborates with civil society organizations such as the Ella Baker Center and the Apollo Alliance to create a more inclusive and sustainable path to development. Oakland also received five out of the twelve awarded California State Energy Program grants on account of its collaborations organizations throughout the region.

***Sustainability Plans.*** Oakland was ranked within the top ten U.S. green cities eight times in four years preceding 2010 (City of Oakland 2009a, 2009b). What is now the Sustainable Oakland Program first started in 1997 with the Sustainable Community Development Initiative (SDCI), which began in the planning department but whose framework has increasingly informed everyday thinking within city departments (Fitzgerald 2010; Lautze 2010; Wentworth 2010). Sustainable Oakland unites “economic prosperity, social equity, and environmental quality” (the “Three E’s”) into an overall development framework that forges new relationships among the city, businesses, and civil society groups. This larger umbrella that guides the city’s activities is positioned as a corrective to serious challenges such as high poverty and crime rates (City of Oakland 1998).

The city of Oakland launched the SDCI, shortly before Mayor Jerry Brown took office. During his term the city supported various greening initiatives, including a civic green building ordinance and guidelines, transit-oriented development, and solar rooftop construction. However, according to Van Jones (2006), Brown failed to deliver fully on his campaign promises to green the city. Furthermore, Brown’s urban redevelopment plans drew criticism for encouraging gentrification rather than addressing urban poverty and housing needs. Nevertheless, Oakland has consistently received recognition on various sustainable city rankings. Under the leadership of Mayor Ron Dellums, who succeeded Brown as mayor in 2007, green economic development in Oakland has been more formally linked with green job creation. The report of the Task Force on Economic Development included suggestions for the creation of a green jobs corps and plans to green the Oakland army base and port (City of Oakland 2007).

In 2005 under the leadership of Mayor Jerry Brown, the city of Oakland signed the UN Urban Environmental Accords on United Nations World Environment Day, which committed the city to take twenty-one action steps in seven main areas: “energy, waste, urban design, transportation, environmental health, and water” (City of Oakland 2006a). Since 2009 the city has been developing an Energy and Climate Action Plan (ECAP), which incorporates a sustainable development strategy to reduce both energy consumption and greenhouse gas emissions by 36 percent as well as create green jobs. The draft ECAP is a ten-year plan that includes over 150 actions that reduces Oakland’s greenhouse gases by focusing on three major sources: transportation and land use, building energy use, and material consumption and waste. Two additional target areas—community engagement, and climate adaptation and increasing resilience—are also central areas identified in the initial Three Year Priority Implementation Plan. The ECAP anticipates that the overall plan will create demand for a green workforce in the areas of building construction and retrofits, solar installation, the creation of bikeways, and growing local food (City of Oakland 2010b).

Although the topic of waste is not directly a clean-energy issue, it is significant to note that the ECAP also incorporated its 2006 policy on zero waste, which calls for reducing the amount of waste that is sent to the landfill by 90 percent. Already an important hub for recycling industries, the zero waste plan improves existing efforts by restructuring the city’s solid waste management system to recycle more and reduce waste, capture and expand more materials for reuse, recycling, and composting during the construction and demolition process, encourage waste reduction practices at community events by lending collection containers for recycling,

and create new requirements for recycling (City of Oakland 2010b). Such policies are also projected to simulate the creation of local green-collar living wage jobs (Dowdakin 2010).

According to the Sustainability Coordinator Garrett Fitzgerald, the sustainable development strategy uses policy to create demand for green services that drive green business growth and the need for a green workforce. Part of the puzzle is financing, and the recent stimulus money from the State Energy Program awarded to Oakland and its regional partners will help to bring these proposed plans into reality. Totalling more than \$40 million, five stimulus grants were awarded that included PACE and energy retrofit programs for residential, commercial, municipal, and affordable housing projects (Fitzgerald 2010).

***Green-Buildings Initiatives.*** Oakland was recently ranked second only to San Francisco as a top market for green building possibilities, a key area of opportunity for green job creation (Cushman and Wakefield 2010). Since the late 1980s, the city has prioritized and begun the process of performing energy-efficiency upgrades on its largest 140 buildings, of which 120 have been completed. Interestingly, services that are now part of Pacific Gas and Electric's core energy-efficiency programs—direct install (free energy audits with some free follow-up installations) and retrocommissioning (for public and private buildings)—were pioneered by teams like the Oakland Energy Partnership that emerged out of the California energy crisis in the early part of the decade. This partnership was funded by the California Public Utilities Commission (CPUC) and combined efforts from the Mayor's office, city energy staff, and researchers from Lawrence Berkeley National Lab and Quantum Consulting (Lawrence Berkeley National Laboratory 2003; Wentworth 2010).

In addition, in 2005 Oakland developed the Civic Green Building Ordinance that requires LEED silver for new civic buildings and major retrofits after 2005. This ordinance further promotes green-building techniques such as the use of sustainable wood products; reduction, reuse, and recycling of waste that is generated during demolition and construction; and the modification of heating, ventilation, and air-conditioning systems to provide energy efficiency and improved indoor air (City of Oakland 2005). The city is also in the process of developing a Green Building Ordinance for private development. If adopted, the ordinance will require all commercial and residential buildings and retrofits to meet green performance criteria as well (Fitzgerald 2010).

Because energy retrofits and solar installation are costly improvements and require upfront capital for investment, the financing of green-building initiatives is also focus for policymakers. Bordering Oakland in the East Bay, the city of Berkeley pioneered a unique program called BerkeleyFIRST for financing rooftop solar systems, which created the concept of property assessed clean-energy (PACE) financing. As originally conceived in Berkeley, a "Sustainable Energy Financing District" sells bonds through a financing company to socially responsible investors, then loans the money out to homeowners who install solar panels. With utility rebates and rebates from the state and federal governments, homeowners end up paying the district a price that approximates the cost of buying electricity from the grid. Furthermore, if the owners need to sell the house, the bill stays with the house as part of the property tax. Two obstacles to investments in rooftop solar—the high cost of borrowing and the liquidity risk of not recouping the long-term investment if the owner moves—are surmounted. The original Berkeley

model was implemented in a pilot program of thirty-eight homeowners (City of Berkeley 2009; Jenkins 2009).

Inspired by BerkeleyFirst, the statewide program CaliforniaFirst is being developed. The statewide program is expected to expand property-based financing to include energy retrofits and solar, and to expand eligible property owners to include homes and businesses. The programs are made possible by Assembly Bill 811, adopted in November of 2008, which allowed local government to adopt PACE programs (StopWaste.Org). As of July 2010, the programs were on hold pending federal policy decisions and, in California, state-level litigation.

The City of Oakland, in partnership with Quantum Energy Services and Technologies and the Community Energy Services Corporation, is also using \$4.8 million recently awarded by the State Energy Program to offer new support and incentives for commercial businesses to perform energy retrofits of existing buildings (emphasizing older buildings) and locate to downtown Oakland. This program will cover approximately 120 blocks of the downtown area and seek to reduce energy consumption and costs, create jobs, foster demand for green technologies, and further enhance Oakland's "Smart Growth" downtown (Lautze 2009). Another hidden incentive is Oakland's existing recycling market. That Oakland already has approximately thirty-five recycling and reuse companies in the area makes it easier for the adoption of green building practices, especially with regard to demolition and debris (Lautze 2010). Local businesses can also take advantage of energy efficiency through the East Bay Energy Watch, which offers services such as lighting upgrades and evaluations of building energy systems as a subcontractor to Pacific Gas and Electric (Fitzgerald 2009b; Wentworth 2010).

For low and moderate-income homeowners, the city of Oakland has also used \$2 million in Community Development Block Grant (CDBG) funds to create the Weatherization and Energy Retrofit Loan Program (WERLP) that rolled out in January of 2010. In this program homeowners can borrow up to \$30,000 for energy retrofitting (not including solar) and home rehabilitation. These loans have no interest, no periodic payments, and are paid back when the property is sold. This program also provides incentives for contractors to seek local employment and connects contractors with the Oakland Green Jobs Corps. Through this program, 108 jobs are anticipated (Green For All 2010).

The city has also received awards for its high number of installed solar-energy installations, including on city buildings, the Municipal Service Center, the downtown ice rink, the port, and on the rooftops of large businesses (City of Oakland 2009a).

**Green Jobs Training.** Oakland and its partners throughout the broader East Bay region have pioneered green workforce training programs that serve as inclusive models to sustainable development by creating pathways out of poverty that target low-income and disadvantaged communities. One such model is the Oakland Green Jobs Corps (OGJC), originally conceived by the Ella Baker Center (a local nonprofit organization co-founded by Van Jones that served as the incubator for Green For All) and the Apollo Alliance. In 2008 the Ella Baker Center partnered with the Mayor's Office to secure \$250,000 in seed funding for the project, which has since received over \$600,000 in additional support from the State of California and the Yahoo

Foundation (Ella Baker Center 2010a; Fitzgerald 2009a, 2010). This workforce development model is informed by professor Raquel Pinderhughes' work, which helped to identify and define green collar jobs as an effective strategy in serving communities with barriers to employment (2007).

Administered by the Peralta Community College District, the OGJC is led by three partners, each of which plays a role in workforce training and ongoing social support services: Laney Community College, the Cypress Mandela Training Center, and Growth Sector (Ella Baker Center 2010a). The program is uniquely designed to meet the specific needs of local employers and consists of three phases. In the first phase, students gain training in pre-apprenticeship construction and trade skills through a hands-on approach. The next phase follows with academic training on eco-literacy, solar installation, and energy efficiency, among other topics. In the last phase students are provided with paid on the job internships, which provide green-collar career paths (Fitzgerald 2009a). In June 2009, the Oakland Green Jobs Corps graduated its first class of forty students, who received jobs in solar and construction companies (Bender 2009).

The broader East Bay region features additional green jobs training programs that have gained broad attention. In Richmond, a city known for its poverty and environmental justice concerns associated with the refinery of the oil company Chevron, the city has also achieved strong leadership on green issues under Mayor Gayle McLaughlin. In 2007 the Richmond BUILD program was launched to provide employment opportunities for residents and reduce the area's violence. The program has been granted several awards, including the Conservation Champion Award given by Senator Barbara Boxer, and has also received national recognition (City of Richmond 2010a). The program offers a ten-week training curriculum that develops skills for pre-apprentice construction and solar installation. Students also have several days of on-the-job training by completing a live solar installation. The program operates with support from the city in partnership with nonprofit organizations, local unions, and local colleges such as Contra Costa College. Funding has also come from the federal government as well as corporate sponsors such as Chevron, Mechanics Bank, Home Depot, and others. In terms of placement rates and wages for their eleven graduates, thus far the program has been successful. According to Richmond BUILD, the program has achieved a 91 percent placement rate at an average wage of \$18.33 per hour. Part of the course is led by the nonprofit organization Solar Richmond, which trains students in solar energy installation (City of Richmond 2010b; Solar Richmond 2010). Their future work is focused on expanding the length of the solar program and solar certifications, as well incorporating youth into a Career Ladder for Energy Efficiency training (City of Richmond 2010b).

The Rising Sun Energy Center also offers green workforce training to adults and youth, but it is perhaps better known for its California Youth Energy Services Program (CYES). Initially started in 2000 though a residential energy workshop at Berkeley High School, the summer program now operates in ten cities in the Bay Area and includes youth ranging from ages fifteen to twenty-two. The program lasts seven weeks and trains youth as Energy Specialists to perform green house calls. These green house calls identify simple energy inefficiencies in the home such as lighting and plumbing, provide free solutions such as the installation of lighting and clotheslines, and offer further energy-efficiency measures. The

program targets renters, non-English speakers, and moderate-income households. According to the CYES, they have trained more than 550 youth and adults and provided services to more than 12,000 homes (Rising Sun Energy Center 2010).

***Green Business Initiatives.*** Since 2007, Oakland has been working on two major initiatives to enroll and retain green businesses in Oakland: the Oakland Partnership Green Tech Cluster and the East Bay Green Corridor Partnership. Both of the initiatives generate partnerships between the public and private sectors that target green technology as a key growth industry sector in both Oakland and regionally. The cluster is composed of government, business, education, labor, and community organizations. It is currently working on several initiatives such as the Green Jobs Corps and the Green Workforce Academy. Other supporting policies include access to capital through the Oakland Business Development Corporation's Bay Area Green Business Loan Fund, as well as green certification for small businesses called the Bay Area Green Business Program (2010), which is coordinated through the Association of Bay Area Governments (Fitzgerald 2009b; Lautze 2009). In the last three years the city has chronicled and promoted the development of green businesses in Oakland by publishing a special insert in the *San Francisco Business Times* called "Oakland: Building Greening Business." The publication increases awareness of Oakland's green economy and opportunities for development (Fitzgerald 2010). In addition to attracting new businesses, Oakland promotes existing green businesses through the "Oakland Green Map." Brought online in March 2010, the map identifies green buildings and businesses as well as resources like recycling centers and community gardens (City of Oakland 2010b). In April, 2010, the city also hosted the Oakland Earth Expo, which brought together local green businesses, community and activist organizations, artists, and governmental agencies (City of Oakland 2010c).

The city is also part of the East Bay Green Corridor Partnership, which is a regional collaboration working to create a green economy by making use of academic clusters, government resources, and targeting green business development in the East Bay. Oakland has already been identified as a target for green development, and the city is currently home to 150 companies that have an inherently green product or service. The partnership has grown to encompass eight cities in the region and a total of thirteen partners, and it has recently brought on a staff person to lead the project. Part of the strategy is to nurture businesses "cradle to scale," which means to attract venture capital, accommodate and keep startups, foster the growth of existing green businesses, and work on expanding green supply chains (Lautze 2010). According to Fitzgerald (2009b) the partnership's second year will focus on collaboration with the private sector such as venture capitalists, brokers, and developers, as well as green entrepreneurs. In 2009 the group released a report that summarized focus group meetings with five green sectors (solar/alternative energy, green building, environmental consulting, recycling, and HVAC/home performance), and established goals for clean-tech business development in the region (Redman 2009). In addition, the partnership has also created the Green Academy Workforce Initiative to build a broad green labor market that provides green pathways for both entry-level positions as well as advanced level careers in both the private and public sectors. It also seeks to deepen green education by beginning curriculum in grades K-12 (Oakland Partnership 2007).

AC Transit, the public transit agency that serves Oakland and the East Bay, has also fostered private partnerships with Van Hool, UTC Power, and ISE Corporation to develop fuel-

cell technology for the region (AC Transit 2010). In 2005 Oakland had three hydrogen buses—the most of any city in the nation at the time—that have become part of Oakland’s city bus fleet. A flagship project in its infancy, as of 2008 it was projected to grow to nine buses in 2009 (Murdoch 2008). The City of Oakland has also partnered with AC Transit to develop hydrogen energy fueling stations and has worked with U.C. Berkeley, Humboldt State University, and Chabot Space and Science Center in Oakland to develop a public education center called the HyRoad Learning Center (City of Oakland 2006c).

Oakland is also home to Sirona Fuels, a biodiesel manufacturer that uses waste oil and grease from restaurants and other sources to make diesel fuel for local trucks, boats, and buses that emits much lower levels of particulates, sulfur dioxide, and greenhouse gases than conventional fuel. In addition to Sirona, the East Bay Municipal Utility District (the regional water and wastewater utility) is developing another biodiesel production facility, based on its interest in using the plentiful glycerine byproduct of that process which EBMUD will feed into its surplus industrial scale methane digester capacity to produce electricity, which will be supplied to the local grid (Lautze 2010).

Many green jobs can also be found in Oakland’s approximately thirty-five recycling based businesses, which collectively employ approximately 1,000 people. The city has placed a priority on recycling-related green economic development through the creation of its Recycling Market Development Zone and Zero Waste Strategic Plan (Fitzgerald 2010).

***Civil Society and Policy.*** Civil society groups have played a significant role in Oakland’s policy landscape since the election of Mayor Ronald Dellums, infusing green politics with a redistributive framework. Both the Ella Baker Center and the Apollo Alliance have worked with the city and Oakland residents to foster a green collar jobs campaign in an effort to make sustainable development inclusive and democratic. Recent efforts to influence the policy process have converged over the development of Oakland’s ECAP. The Oakland Climate Action Coalition was forged at the Ella Baker Center and hosts a coalition of community-based organizations, environmental experts and advocates, labor unions, and green businesses (Ella Baker Center 2010b, 2010c). The coalition rallied on March 30th at Oakland City Hall, and various city council members spoke. For example, council members Nancy Nadel and Rebecca Kaplan spoke about the importance of ongoing civil support to drive the shift from “killing guns” to “caulking guns” (ECAP Rally 2010a, 2010b).

Many of the coalition’s policy recommendations were included in the draft ECAP. The coalition has also taken a stance on recent energy policy, calling for Oakland to exercise authority granted under California’s Community Choice Aggregation law to form a Joint Powers Authority (JPA) to maximize the use of clean renewable energy delivered to Oakland residents and businesses via the grid and meet local energy needs. They argue the change will increase local hiring, create compliance with prevailing wage and project labor agreements for large-scale contracts, hire minority owned and union contractors, and create local manufacturing, monitoring, and reporting to the city and the public (Ella Baker Center 2010c).

## Sacramento

***Sustainability Plans.*** In 2007 the city developed the Sustainability Master Plan, which included goals for energy, air, urban design, nutrition and health, water, and open spaces (City of Sacramento 2007). It set a goal for 2030 of having city government electricity and vehicles “fossil free” and of reducing overall per capita energy consumption by 25 percent. It also set a target of adding 25,000 new jobs to the “renewable/clean-energy sector” by 2015. Although the goals are lofty, the city has the advantage of having a publicly controlled electricity utility (SMUD, or the Sacramento Area Municipal District), which is one of the greenest public power agencies in the country. In 2009 the city developed a 2030 General Plan, and in 2010 the city followed with the implementation plan of its Sustainability Master Plan, which documented achievements in 2009 and set goals for the next years. Sacramento County (2009) has developed a climate action plan, and the city is in the process of developing one as well (City of Sacramento 2010a). All of the plans focus on demand-side environmental issues such as programs to reduce greenhouse-gas emissions, but they do not explore the supply-side problems of developing a green business sector and green jobs. Even the economic development portion of the 2030 General Plan is not attuned to the issues. However, the focus shifted in 2010 under the green business initiatives of Mayor Kevin Johnson.

***Green-Building Initiatives.*** The 2007 master plan set a target of LEED silver for all new city government buildings. It also set goals of having LEED-type ratings for all new and retrofit buildings, including commercial and residential, and of having 80 percent of all new construction be LEED certified (City of Sacramento 2007). The city also participates in a regional consortium, the Sacramento Regional Energy Alliance, that works on energy efficiency and retrofitting of the area’s buildings. The Business Environmental Resource Center (2010) also provides assistance to area businesses for greening of their operations and environmental compliance, and it also offers certification through the Sustainable Business Program.

***Green Jobs Training.*** The Sacramento Area Employment Agency administers one of the California Green Jobs Corps programs (State of California 2009). California State University at Sacramento received a \$1 million grant for smart-grid job training, and the university has other programs oriented toward green-job training (Sacramento State University 2010). Likewise, the community colleges in the area have put together a strong suite of green jobs educational programs (Los Rios Community Colleges 2010).

***Green Business Initiatives.*** In the state of the city address in 2010, Mayor Kevin Johnson announced his goal of making Sacramento a national hub for green businesses. In May, he launched his green initiative plans to transform the region into “Emerald Valley,” or a green version of Silicon Valley. The initiative will move forward based on monthly meetings of policy groups that are open to public participation (Hannon 2010). In concert with the initiative, U.S. Congresswoman Doris Matsui hosted a clean-tech forum at Sacramento State University in June (Lee 2010). The region has research facilities at U.C. Davis and Sacramento State University, the very environmentally oriented public power agency SMUD, and the state government. As a result, there are already many clean-energy businesses in the general region near Sacramento, and the city has held a leadership position within the state in green-job growth.

To support clean-energy businesses, the Sacramento Area Trade and Commerce Organization (2010) has partnered with the McClelland Technology Incubator to help clean-tech entrepreneurs. By 2010 the organization had assisted twenty-five companies and created 1,000 clean-tech jobs.

Although the state of California is strong in all of the green industries tracked in this study, the industry that the Sacramento region is poised to achieve a strong presence in is smart-grid technology manufacturing and production. The smart-grid company SynapSense is located in nearby Folsom, and in 2009 a group of Sacramento organizations (SMUD, Sacramento State University, Los Rios Community Colleges, and the state government's Department of General Services) received \$127 million in ARRA funding for a smart-grid project. Sacramento State also hosts the California Smart Grid Center, which develops curriculum and studies technology integration.

In summary, unlike some other cities across the country, Sacramento has substantial potential to develop its green businesses and create green jobs. The proximity to the Bay Area and state government, combined with lower real estate prices, make the region an especially strong candidate. The initiatives in green jobs are coming mostly from the business community, educational institutions, and city government, rather than grassroots and labor organizations. As a result, in contrast with Los Angeles and Oakland, the focus of green jobs is less on weatherization and installation and more on clean-tech. However, Mayor Johnson's planning process under the green initiative is open to all and was only getting started in mid 2010.

## **San Diego**

***Sustainability Plans.*** In 2007, San Diego was rated as the second largest city in California, with a population 1.7 million people and an area of 342 square miles (City of San Diego 2008a). In early 2002, the city council began the process of addressing climate change in their planning by adopting the San Diego Sustainable Community Program. This program approves San Diego's participation in the Cities for Climate Protection Campaign, which is administered through the International Council for Local Environmental Initiatives (ICLEI). The ICLEI requires participating cities to identify and inventory greenhouse gas emissions within their locality in the areas of energy use, transportation, and waste management, as well as create an action plan. Like many cities in California, the program also included the benchmark of a 15 percent reduction in greenhouse gases based on 1990 levels by 2010. In 2005, following suggestions of an *Ad Hoc* Advisory Committee, the City established their Climate Protection Action Plan, comparing sustainability across the three broad categories of transportation, energy, and waste. Interestingly, based on 1990 emissions levels, the report found that city operations contributed only 0.2 million tons of emissions out of the 15.5 million tons generated each year. Thus, the major sectors contributing to greenhouse gas production are communitywide – both the business community and residents. The climate plan also identified the transportation sector (followed by energy and waste) as a key agent in the production of greenhouse gases. The plan targets the following areas: transportation, energy, waste, ozone production, and environmentally preferable purchasing (City of San Diego 2005).

Although the city expressed that it can do more on its own part, the plan called on the larger community to aid in the reduction of carbon emissions: “If the largest one-hundred companies in San Diego put forward the same level of commitment, actively working to reduce the greenhouse gas emissions associated with their energy, water, and transportation operations, we would be much closer to reaching the 2010 target for the community” (2005: 10). The focus on the private sector creates challenges for the City of San Diego. Unlike cities like Los Angeles that own large facilities like the ports, airport, and utilities and thus have direct regulatory power to influence greenhouse gas reductions, the City of San Diego does not have similar publicly controlled institutions and thus relies upon communitywide participation to achieve its goals.

In March of 2008 the city adopted its General Plan but also included the local greenhouse gas emissions strategies in the general document. In this way the General Plan is consistent with Climate Protection Action Plan goals. First, the “Conservation Element” of the plan addresses sustainable development by focusing on the way growth happens. Part of this strategy is to redesign development for mobility on foot, bicycle, and transit by creating denser, mixed-use spaces connected to the transit system. Second, because buildings are also major contributors to greenhouse gases from design to use, buildings are targets for improvement through resource conservation, sustainable building practices, energy efficiency, and the use of clean technologies. Although the General Plan does not include language on green jobs, clean technology as a mechanism for achieving a new industry for businesses, employment, and technological innovation is recognized (City of San Diego 2008a, 2008b). The city adopted its Action Plan in 2009 for the General Plan and has since received \$250,000 for an updated Climate Action Plan, which is currently in process (City of San Diego 2009a, EHC 2010).

***Green-Buildings Initiatives.*** The General Plan emphasizes the role of redesigning buildings for greenhouse gas reductions, but voluntary legislation for LEED began in 2002 (Jackson 2002). In 2002 the city encouraged the use of LEED silver for new city buildings, and the standard became mandatory under the 2008 Green Building Policy. According to this policy, all new City projects and major renovations over 5,000 square feet must be to LEED silver standards. Some notable city projects have been completed to LEED silver standards such as Fire Station 47 and Nobel Athletic Park and Recreation Center, as well as LEED gold such as George L. Stevens Senior Center, and Fire Station 29 (City of San Diego 2010a).

Although the measures pave the way for new City buildings and large renovations, there are some limitations. For instance, much of new development has significantly slowed down due to the Great Recession. Therefore, new green building regulations might not impact greenhouse gas reductions for years to come. Instead, retrofitting existing buildings will have a greater impact in the short-term.

For the private sector, the 2008 Ordinance is voluntary and offers as an incentive a program to expedite permitting. In addition, the Centre City Development Corporation has been working on a plan for private development in the downtown that widens the range of incentives and is building a framework that ideally is transferable to the region. Called the Centre City Green, the plan is a voluntary program that makes use of two incentive mechanisms for encouraging sustainable building practices. The first path a business can take is called the performance path, which incentivizes standards that go above and beyond existing State

regulations, such as Cal Green Tiers 1 and 2 as well as LEED silver or gold. A second option is the prescriptive path that prescribes high-energy yield green building measures such as high efficiency plumbing fixtures and on-site photovoltaics that the business owner can then choose according to the logic of their project. According to Sachin Kalbag (2010), the Senior Urban Planner/Urban Designer at the Centre City Development Corporation, working with the private sector is central to sustainable growth, especially in a climate where local governments have to cut back on resources. The logic is that with an already stringent California Green Building Code coming out in January 2011, an incentive-based approach that builds upon the code will create an even playing field for bringing more sustainable development into the city. It can also provide a framework for the region that supports measures like AB 32 and AB 375, which target suburbanization.

San Diego has also been pushing the terrain for rooftop solar. San Diego established a goal of fifty megawatts of solar energy production within the city's limits by 2013, and as a result of its incentive programs it became the leading city in California for solar energy installations (City of San Diego 2009b). In 2009, San Diego had more rooftop solar than any other California cities, with an installation level of 2,300 solar roofs that produce enough energy for 12,000 homes (Cavanaugh and Crook 2009). However, a single focus on solar would be misunderstanding the capacity to reduce greenhouse gas emissions. Retrofitting all existing buildings (including homes) has the ability to generate more reductions in greenhouse gases in comparison with solar photovoltaics or new construction. In addition, retrofits and solar installations are not mutually exclusive but go hand in hand (Energy Policy Initiatives Center 2010).

The city has also sought to encourage energy efficiency by making it more affordable for businesses and homeowners. In 2008, Mayor Sanders announced the Clean Generation Program that will be administered by the California Center for Sustainable Energy and uses PACE bonds (currently stalled at the state and federal level) to provide affordable financing to property owners for energy retrofits and renewable energy installations. While the city does not refer to this initiative as creating "green" jobs, Mayor Sanders states that it will boost the clean-energy technology sector in San Diego, as well as creation of jobs in product development, sales, and installation (City of San Diego 2008c). For small businesses, the city also partnered with San Diego Gas & Electric as well as CleanTECH San Diego for a mechanism called on-bill financing, which offers no-interest energy-efficiency upgrades that is repaid through a customer's energy bill (City of San Diego 2010c).

***Green Jobs Training.*** Like many cities in California, San Diego is also invested in training the workforce in preparation for demand-side policies that make residential energy-efficiency improvements affordable. This affordability is intended to create the demand necessary to bring a new green industry into being. However, because it is a burgeoning field, much work needs to be done in the way of training, from home energy audits to jobs that involve communicating rebates and incentives to homeowners, to construction, coursework, and on-the-job training and internships. According to the San Diego-based California Center for Sustainable Energy, two gap areas they encounter for employment that are also consistent with the Centers of Excellence green industry findings are as follows: those with sales backgrounds that can explain

to customers how solar systems work, and home performance contracting that includes those with a systems approach to residential energy efficiency (Watkins 2010).

Currently, there are grants for the formation and support of programs coming down the pipeline for green jobs training. For instance, in 2010 the Grossmont-Cuyamaca Community College District in partnership with the San Diego Green Building Training Collaborative was awarded a \$1 million dollar grant from the Employment Development Department, California Clean Energy Commission, and the California Workforce Board targeting those with previous construction experience. Called the Clean Energy Workforce Training Program, the District will develop six green training programs in the green construction industry such as the certified green building professional, home energy rater, solar photovoltaic installer and solar thermal installer, water auditor, and building analyst professional. San Diego County is also creating the Residential Retrofit Program, which will provide training for the Building Performance Institute's Building Analyst as well as on-the-job training and internships for those enrolled. Among many employment opportunities, these programs will help to fill in gaps for Building Performance Institute's certified professionals needed for San Diego Gas and Electric's Whole House Program and the proposed HOME STAR program, two key industry drivers identified by the California Center for Sustainable Energy (California Energy Commission 2009; Watkins 2010). For those without previous construction experience, and also specifically for veterans, out-of-school youth, and un- and under-employed adults, the San Diego Workforce Partnership with the San Diego and Imperial Counties Regional Community College Consortium received \$700,000 for workforce training for five occupations in high demand: HVAC mechanics, technicians, or installers; building performance or retrofitting specialists; building controls systems technicians; energy auditors or home energy raters; and solar photovoltaic installers. The training program provides classes and hands-on experience as well as employee soft skills (California Energy Commission 2009).

The creation of curriculum for training programs is also in the works. For instance, the Department of Energy indicated a gap between the number of quality instructors for solar classes and the numbers of students desiring them. The California Center for Sustainable Energy, California Community Colleges, and Labor Management Cooperation Committee partnered together for the Solar Market Transformation Grant funded by the U.S. Department of Energy to create the availability and quality of instruction, which will increase the number of trained community college instructors for photovoltaic and solar heating and cooling systems. The program will also develop a standard solar curriculum to be used statewide (Watkins 2010).

At the same time, while much training has necessarily gone to workforce development and continues to do so, more jobs are needed. As Watkins from the California Center for Sustainable Energy has indicated, the demand for green jobs is overwhelming and has shaped their creation of the Green Career Network, a website that brings together green job seekers and employers ([greencareernetwork.org](http://greencareernetwork.org)). As the Manager of Education and Training programs, in her experience these job-seekers "are perfect employees because they are willing to go out and get educated and trained on their own time and commit to this" (Watkins 2010). However, the "buzz" around green jobs overstates their supply, which places ever more pressure on policymakers to ensure the creation of demand, especially financing mechanisms like PACE, and their translation into actual jobs.

***Green Business Initiatives.*** In August of 2008, Mayor Jerry Sanders announced San Diego's enrollment in the Solar America Cities Program, which granted San Diego \$200,000 to integrate solar power into city infrastructure, planning, and zoning (City of San Diego 2008d). Mayor Jerry Sanders has also furthered solar development through public-private partnerships. As part his stated goal of generating five megawatts of solar power on city buildings by 2013 to offset energy demand from the utility grid, the city has thus far entered into two agreements with SunEdison, North America's largest solar energy provider. In 2007, a 1.1 megawatt solar capacity installation went online at the Alvarado water treatment plant in San Diego. More recently in April of 2010, a second installation was located at the Otay Mesa water facility plant, providing 945 kilowatts of solar energy. For the Otay Mesa plant, no upfront costs were necessary, and the city agreed to purchase solar power for the next twenty years from SunEdison and their solar infrastructure. This capacity is said to power 2,600 average U.S. homes for about a year and over a twenty-year period is equivalent to taking 2,800 cars off the road (City of San Diego 2010d). With regard to city benefits, SunEdison states that providing solar power provides "no upfront costs, create[s] green jobs, and stimulate[s] local economies" (SunEdison 2010). The next solar power project will take place at the Miramar water treatment plant as well as other planned facilities.

With strong demand policies in place, the city has a growing solar installation industry, but it is not clear whether jobs created are linked to local photovoltaic manufacturing. One positive sign with respect to green manufacturing jobs is the decision in 2010 by Kyocera to open a solar manufacturing plant in San Diego. The creation of the plant is to serve the rising demand for clean technologies, and has a current global production capacity of one gigawatt per year. Its initial production target for its first year in San Diego is thirty megawatts (Kyocera 2010).

Although the business development programs for clean-energy companies in San Diego are not as extensive as those of Los Angeles, in 2007 the city launched the San Diego Cleantech Initiative and issued a report of the potential for the industry in the region (GlobalConnect 2007). This initiative is a strategy to promote economic growth in the region as well as to advance the cause of environmental sustainability through the creation of a clean-technology cluster that puts San Diego on the map as a center for clean-tech research and development. Comprised of entrepreneurs, educators, researchers, environmentalists, investors, and others, the goal of the initiative is to create businesses that focus on clean energy, transportation, and managing water. To help spark this transition, San Diego has proposed a clean-energy incentives fund and has partnered with green industry leaders globally through the Cleantech Venture Network (City of San Diego 2010b, 2010c).

In addition, the San Diego Clean Tech Alliance was formed in 2007 to promote the industrial sector. The city has supported the clean-tech industry with its Environmentally Preferable Purchasing Program, \$150 million in federal clean-energy bonds (to fund solar energy), and a clean technology program manager. In addition to the solar installation industry, the city has become home to biofuels research and development as the city's biotechnology cluster has slowly diversified. In San Diego there is a cluster of academic researchers and firms specialized in algae-based biofuels who have formed the San Diego Center for Algae-Based biofuels, which links to five local research institutes: Scripps Research Institute, UC San Diego, Scripps Institution of Oceanography, the Salk Institute and San Diego State University. Synthetic Genomics, a biotechnology company founded by Craig Ventner and located in La Jolla, received \$600 million from Exxon-Mobil (Bigelow 2009, Filkes 2009).

In 2008 the Biofuels Initiative was formed to bring together an array of public and private institutions to promote the development of an alternative fuel industry: CleanTECH San Diego, the BIOCUM Institute, the San Diego Regional EDC, San Diego Center for Algae Biotechnology, San Diego Workforce Partnership, and MiraCosta Community College. Recently in 2010 this partnership was just awarded \$4 million in grant money from the California Department of Labor for workforce training and job placement. Targeting unemployed and dislocated workers from San Diego and the Imperial Valley, the goal is to provide necessary knowledge and skills for career pathways in the growing biofuels industry (Forbes 2010).

*Civil Society and Policy.* Some critics charge that inequality still shapes the green economy that is emerging, and they push for a more democratic and inclusive vision of green jobs. A focus on clean-technology, while necessary for a sustainable world, can take access to resources like education and income for granted. The Environmental Health Coalition (EHC) is one of the groups in San Diego committed to an inclusive vision of the green economy by advocating jobs for everyone, regardless of skill, as well as jobs that are local and lift people out of poverty. In the context of the green economy, their goal is to expand the city's green jobs focus to include the less glamorous home retrofits, and to provide job training for those already disadvantaged by the gray economy, that is, people in poor neighborhoods and with low incomes.

The recent Energy Efficiency and Conservation Block Grant (EECBG) funds that cities receive is an opportunity for groups to intervene at the city level and push for inclusive green policies. For instance, spearheaded by the Environmental Health Coalition, a coalition of community, environmental, and labor organizations called the Green Energy and Good Jobs Alliance pushed the City of San Diego to create a public committee (EECBG Committee) to determine the best use of the twelve million EECBG dollars. In addition to the city's initial plan of retrofitting Balboa Park, the city also adopted the Committee's suggestions to jumpstart a green industry that includes low-income residents. San Diego City Council adopted the following from the Committee: \$250,000 for an updated Climate Action Plan, \$3 million for a low-income home retrofit program with required audits, education, and upgrades, \$1.5 million for a home retrofit program with no income requirements, \$2.5 million for a revolving loan fund for energy projects, \$2 million to retrofit City street lights, and \$2 million for energy-efficiency upgrades to Balboa Park buildings (EHC 2010: 6).

From the viewpoint of the Environmental Health Coalition, providing energy efficiency for low-income residents also gets into more complex issue of making energy efficiency (not just solar) available to renters as well. Because many low-income people do not own their own homes, the EHC is using knowledge from their existing work to make homes lead-free in order to draw landlords into retrofitting their apartments. This will not only increase the value of the property for landlords but will also translate into energy savings for low-income people who already spend a greater portion of their income on utilities. As the Environmental Health Coalition's Nicole Capretz (2010) has also discussed, the retrofits will also render buildings more healthy and safe by creating better indoor air quality—a concern for those living in disadvantaged communities that suffer more health risks as a result of living next to freeways, the port, and industry. In another way, retrofitting apartments in low-income communities also invests badly needed resources into neighborhoods.

In sum, a more inclusive vision of the green economy encompasses everyone: homeowners, low-income renters, and clean-technology and home retrofits. Such a view creates more participation from everyone in the efforts to create as well as benefit from a more sustainable society.

## San Francisco

***Sustainability Plans.*** In the last two decades San Francisco (SF) has created numerous initiatives and plans that address both environmental and social problems. In 1996, the Department of Environment (now known as SF Environment) was created along with the first sustainability plan. The sustainability plan is the outcome of a four-year long process that incorporates over four hundred people from environmental advocacy groups, city agencies, businesses, academia, and the public. It is a visionary document that includes over a dozen topics such as air, climate, energy, environmental justice, waste, water, and toxics. Notably, the report also includes social justice as a key component to sustainability. According to the report, a society best positioned to maintain balance with natural systems is one whose overall wealth is equitably distributed (SF Environment 2006a).

In 2002 the city began to focus on the issue of climate change. That year the city passed the Greenhouse Gas Emissions Reduction Resolution in solidarity with the Kyoto Protocol, pledging to reduce greenhouse gases to 20 percent below 1990 levels by 2012. In 2004 the city also joined the International Cities for Climate Protection (ICCP) campaign and followed with a Climate Action Plan (CAP) that targets emissions reductions in the following areas: transportation, buildings, power plants, waste production, and consumption. Among some of the measures proposed, the city identifies stricter green building standards for all buildings, waste recycling, renewable energy investments, the adoption of fuel-efficient vehicles, and alternative forms of transportation (SF Environment 2004). Notably, in 2005 San Francisco also hosted the United Nations World Environment Day, and participated in the formation of the Urban Environmental Accords, which addresses issues of sustainable development (SF Environment 2010a).

Building on these previous initiatives in 2008, Mayor Gavin Newsom released San Francisco's environmental plan, which is called SForward. SF Environment followed with a strategic plan in 2009, which is a three-year strategy for 2010-2012 whose basis is the environmental plan and covers the following areas: "climate action; energy; clean air transportation; green building; urban forest; zero waste; toxics reduction; environmental justice; environmental education; and public outreach" (SF Environment 2008a, 2009a). The 2008 document updates actions to reduce greenhouse gases to its 20 percent goal. Interestingly, from 2004-2008 only small reductions were made despite the \$32 million in energy-efficiency program investments. Like many cities, vehicles remain the leading source of emissions. However, Mayor Newsom recently stated that San Francisco has achieved the target set by the Kyoto Protocol. While the overall goal of 20 percent in reductions is far off, based on data up through 2008 San Francisco is currently 7 percent below 1990 levels (Sherbert 2010a).

The city has also created innovative pathways in the area of alternative fuels and clean transportation. For instance, the city is working on its Alternative Fuel program, which crafts partnerships to create infrastructure to serve the plug-in hybrid car (SF Environment 2009a). It has also converted all of its 1500 city diesel vehicles to B20 biodiesel (a mixture of 20 percent soy-based biofuel and 80 percent petroleum-based fuel) through its SFGreasecycle program (SF Environment 2008a). Starting in 2007 and administered by the San Francisco Public Utilities Commission (SFPUC), the city collects fats, oils, and grease from restaurants and residents, which is then recycled into the B20 fuel for the city's fleet (2010a). It has also regulated the taxicab industry, and over half of the fleet is using hybrids or runs on compressed natural gas (SF Environment 2008a; Sherbert 2010a). Lastly, the city is also exploring its wind opportunities. In July of 2008, Mayor Newsom and former Supervisor Tom Ammiano enacted the Urban Wind Power Task Force to investigate small-scale wind power and recommendations for policy (SF Environment 2009b).

Other innovative goals in the plan address carbon production specifically. For instance, a component of the overall proposal is a "carbon neutrality" plan, which sets the city's net emissions product to zero percent. Techniques such as carbon sequestration and mechanisms such as purchasing credits are ways to achieve this goal. In addition, the plan calls for the consideration of a carbon tax that charges companies on the basis of their greenhouse gas emissions that could "serve as an alternative to San Francisco business payroll taxes." The plan also calls for a San Francisco Carbon Fund to finance local carbon offset projects (SF Environment 2008a).

Although all plans discussed above are interested in merging job creation with solutions to environmental problems, the latest environment and strategic plans specifically use the language of "green job" promotion and/or creation. The environment plan targets the fields of renewable energy, energy efficiency, and clean-technology development as mechanisms to create "green jobs." The strategic plan also includes education and outreach by supporting city and non-profit workforce development agencies as well as the SF Environment Now! jobs training program. Other areas of job creation are in the areas of municipal and commercial waste diversion, and in the city's southeastern communities (SF Environment 2008a, 2009a).

***Green-Buildings Initiatives.*** San Francisco has developed a national reputation with regard to its green buildings initiatives. In 2008 Mayor Newsom spoke at the House Climate Change Committee, where he advocated mandating green building requirements for commercial businesses and argued that such regulations are welcome by the business community due to their cost savings (SF Environment 2008b). San Francisco's green building policies began with the 1999 Resource Efficient Building Ordinance, which created the Resource Efficient Building Task Force and required green building standards for new municipal construction. In 2004 the ordinance expanded to require all new municipal construction and major renovations over 5,000 square feet to be certified LEED silver. In 2008 the city included the residential and commercial sector as well, requiring all new construction and certain large renovations to meet LEED, GreenPoint (certified by Build It Green), or equivalent standards. In the process, projects must also meet elevated requirements for energy and water efficiency, recycling, pollution control, and others (San Francisco Department of Building Inspection 2010a, 2010b; SF Environment

2009a). These standards will increase over the next five years, ultimately requiring projects applying for entitlement in 2012 to achieve LEED Gold (Hooper 2010).

The city also has incentives to encourage efficiencies above and beyond existing regulations. Those projects seeking LEED Gold certification can go through the city's expedited permit process, and small businesses can apply for fee reductions and earn development bonuses. At the House Committee meeting, Mayor Newsom said that such regulations have created new growth (SF Environment 2008b). In 2008, there were forty-three municipal projects seeking LEED certification. San Francisco's flagship project, the California Academy of Sciences (CAS) building was completed in 2008 and is the first municipal LEED platinum building in the U.S. Among many efficiency measures, it has a living roof, integrated pest management, and diversion of 90 percent of its building construction materials from the landfill (CAS 2010). Future legislation currently under consideration includes mandates for new San Francisco municipal buildings to LEED gold standards by 2012, as well as requiring commercial buildings to receive energy audits and publicly report an annual energy score, or benchmark (Hooper 2010; SF Environment 2009a).

Mayor Newsom has also promoted the use of solar in creating energy efficiency and renewable energy, and this year the city will be given awards by the Northern California Solar Energy Association. Among large cities in the Bay Area, San Francisco ranked first in 2009 for the total number of systems installed and first for its overall progress since 2007 (Northern California Energy Association 2010). In 2008 San Francisco also entered a partnership with Recurrent Energy to implement the Sunset Reservoir Solar Project. The project goal is to install 25,000 solar PV panels on the reservoir roof whose scope spans twelve football fields and has a five megawatt capacity. The energy will be supplied to the General Hospital, SFO Airport, and public infrastructure. According to Recurrent Energy, this project creates seventy-one green collar jobs (Recurrent Energy 2010).

As part of the larger project to create jobs and promote environmental sustainability, San Francisco created GoSolarSF. This program began in 2008 and provides financial incentives to encourage non-profits, businesses, and homeowners to install solar systems. Since 2008 the program has more than doubled the number of solar installations in the city, owing in large part to a sizeable \$6,000 incentive offered (City and County of San Francisco 2010a). However, the city found that participation rates for low-income residents were lower and has since restructured the incentive program for fiscal years 2010-2011. Offered through the San Francisco Public Utilities Commission (SFPUC), the incentive structure includes a base and supplemental incentive level. For instance, a low-income resident may qualify for a \$7,000 supplemental incentive that is in addition to a \$2,000-\$3,000 base incentive. In total, the program offers \$5 million for all residents including commercial, and \$2 million is a set-aside for low-income residents (SFPUC 2010). If PACE legislation at the federal level goes through, property owners can also qualify for financing through the GreenFinanceSF program. This program allows homeowners to receive upfront financing for efficiency upgrades and solar panels, which is then paid off through property tax bills (Baker 2010). The overarching goal the GoSolarSF program is to create environmental sustainability by creating a local solar economy. The plan is part of the larger framework of job creation designed to stimulate demand in the green industry.

**Green Jobs Training.** In line with the city's environment plan, which encourages sustainable growth but also pushes green job creation, the city's workforce development department launched a green collar jobs training and placement program in 2010 called TrainGreenSF (previously called the Green Skills Academy). Funded in part by federal stimulus dollars, the program is operated by Goodwill Industries and also includes nonprofits and local community colleges such as SF Clean City Coalition, Global Exchange, and the City College of San Francisco. The TrainGreenSF provides vocational training for positions in energy efficiency and solar, recycling, transportation, and non-installation positions such as clerical and administrative employment in green-industry firms (San Francisco Office of Economic and Workforce Development 2010).

Importantly, while the GoSolarSF translates into demand and business creation, the TrainGreenSF program offers a workforce training model that translates into employment with family supporting wages. For instance, all contractors who wish to participate in the GoSolarSF incentives must also participate in TrainGreenSF. Because the workforce development program serves low-income and disadvantaged individuals, the underserved communities receive employment opportunities. Beginning August 31, 2010, the program also calls for the hiring of one solar installer and one non-solar installer as a base requirement for compliance. In addition these jobs must be at least \$15 per hour, workers have to be performing skilled work or engaged in on the job training, paid the same wages as those in the existing classification, and employed at least 80 percent of the time. In addition, the workforce development program offers an On-the-Job Training incentive for contractors. From July through December 2010, contractors can receive a \$3,000 wage subsidy that goes toward on-the-job training for both installation and non-installation positions. The goal is to encourage employers to hire and train workers from the TrainGreenSF academy. Thus far the program has created thirty jobs, and brought seventy-five jobs overall to the industry.

City College of San Francisco also administers one of the state's Green Jobs Corps programs. In 2009, the city also launched the Green Skills Academy in 2009 to provide training programs in green buildings, alternative fuel vehicles, environmental remediation, and renewable energy. The programs utilize stimulus funds and involve partnerships between the city's Office of Economic and Workforce Development and local colleges, labor unions, and nonprofit organizations (City of San Francisco 2009).

San Francisco also has other jobs initiatives. In February 2010, San Francisco received \$19 million to fund energy-efficiency projects. Of the \$19.2 million in funding, \$11.5 million is used to fund the Energy Watch program in collaboration with Pacific Gas and Electric, which creates green jobs by employing people to make free-onsite assessments of energy savings as well as weatherizing homes. According to this partnership, there are 175 jobs in the field. The funding package will also support the Davies Symphony Hall retrofit project, which provides jobs to twenty-two efficiency workers. Energy-efficiency projects will create local jobs by employing people from the JobsNow program, which has helped more than 1700 workers, some of which are green jobs (City and County of San Francisco 2010b).

**Green Business Initiatives.** By invitation, San Francisco joined the World Expo in China from May 1 through October 30, 2010. It is the only city in the U.S. that is officially represented.

Attesting to its long-term connections with Shanghai as well as its well-known progressive green politics, San Francisco green technology and sustainability companies will have the opportunity to showcase their products for the global market (Macheel 2010).

Building on previous initiatives to attract biotechnology firms (Pernick and Mokower 2005), in 2005 San Francisco announced its efforts to build a clean technology cluster. In 2005 Mayor Gavin Newsom established the Clean Technology Advisory Council (CTAC) to attract clean-technology industries. The goal of the cluster is to grow green industries, create highly skilled and well-paid jobs for San Francisco residents within these industries, and create independence from fossil fuels (City and Council of San Francisco 2005). San Francisco has deployed the strategy of education and outreach to incite innovation. For instance, in 2006 CTAC hosted and provided support for the California Clean Tech Open, which was a competition designed to bring together innovators in the clean technology sector (SF Environment 2006b). The city has also created relationships with banks and investors in San Francisco to finance green businesses and green building projects (City and Council of San Francisco 2006). The city hosts conferences in clean technology, such as the upcoming CleanTech Forum in March of 2011 (Cleantech Group LLC 2010).

The city also uses demand-side policies and incentives to spur market development. For instance, businesses that go above and beyond existing environmental criteria can earn certification through San Francisco Green Business Program (2010). Those certified can take advantage of payroll tax exclusions (SF Environment 2010b). Another example is the partnership among the San Francisco Public Utilities Commission, BlackGold Biofuels, and the URS Corporation to create biofuels collected through the city's SFGreasecycle program (SF Environment 2009c). Through the Biodiesel Task Force, the city is working to broaden the biofuels market by making them publicly available at city gas stations (SF Environment 2010c). Other areas that the city currently has market incentives for are solar power, tidal and wave power, and green buildings (SF Environment 2010d). Finally, the city is also working with the Energy Watch Program (a partnership with Pacific Gas and Electric) that provides energy-efficiency retrofits for the commercial and residential sectors, and the city has entered into the \$11.5 million second phase of the program (City and County of San Francisco 2010b).

San Francisco is also part of additional green business initiatives. The Business Council on Climate Change (BC3) formed in 2005 through a partnership between SF Environment, the Bay Area Council, and the UN Global Compact (SF Environment 2010e). The goal is to reduce greenhouse emissions in the commercial sector by providing the necessary tools and encouraging business leadership (Business Council on Climate Change 2010).

***Civil Society Organizations and Policy.*** Civil society is actively part of shaping San Francisco's policies on sustainability. One notable area is the environmental justice movement. Not unlike the cities of Los Angeles, Oakland, and San Diego, San Francisco has environmental problems created by reliance on fossil fuels at the ports, power plants, and sites like the shipyard. The community advocacy group Literacy for Environmental Justice (LEJ) is actively involved in these issues in San Francisco. As they argue, the health risks created by these toxic sites are disproportionately located in their community. For instance, Bayview Hunter's Point is a low-income ethnic and minority community that has over three hundred and twenty five toxic sites

within six square miles. This community is also home to the Hunter's Point Naval Shipyard, which is a Federal superfund site that is located within three miles of schools and childcare facilities. LEJ helped close the Hunter's Point Power Plant in 2006 and spearhead the restoration of the area that is now called Heron's Head Park (Literacy for Environmental Justice 2010a)..

LEJ's goal is to provide community leadership in environmental justice by training youth from BVHP in "environmental health research, education, and advocacy, and environmental conservation, restoration, and horticulture" (Literacy for Environmental Justice 2010). One of their major projects has been the Heron's Head Project, a brownfield site formally known as Pier 98. The Heron's Head Project includes restoration of this area as well as the creation of an EcoCenter that is located near the former site of the Pacific Gas and Electric Hunter's Point Power Plant. After years of community advocacy, the power plant was eventually closed in 2006. The EcoCenter has generated city attention, including Mayor Gavin Newsom. This 1500-square foot building is the first building in the Southeastern area of San Francisco that is off the grid. Among some of the features of this building are solar panels and a wind turbine, as well as its own wastewater treatment system, and a green living roof. More than four hundred students participated in its design, which will serve as an educational facility that teaches the public about environmental justice (Literacy for Environmental Justice 2010b).

## **San José**

***Sustainability Plans.*** The nation's tenth largest city, the largest city in northern California, and the capital of Silicon Valley has increasingly become a center for clean-tech industry. Shortly after taking office in 2007, Mayor Chuck Reed announced the Green Vision Plan (Reed 2007). The plan is noteworthy as an example of a second-generation urban sustainability plan that incorporates green jobs and business development goals along with general urban design, environmental, and emissions and energy-efficiency goals. It is also noteworthy in its use of performance metrics and annual reports akin to those of New York City. Unlike some of the other California cities that we have opted to discuss in more detail, the greening of the city appears to be driven mostly by a partnership of the city government and business community. Participation from grassroots organizations is less visible than in Los Angeles, Oakland, and San Francisco.

Building on some of the achievements of the city during past administrations, the plan set ten ambitious new goals for the fifteen-year period beginning in 2007. The goals included the following: create 25,000 new jobs to make San José the world center of clean tech innovation, reduce per capita energy usage by 50 percent, source 100 percent of electricity from renewable energy, achieve zero waste for municipal solid waste, have a city fleet that is 100 percent run on alternative fuels, and build 100 miles of trails. The city claims to have the country's most aggressive urban greenhouse gas emissions reduction targets, with a goal of 50 percent reduction by 2030 (City of San José 2010).

***Green-Building Initiatives.*** San José's Green Vision Plan includes a goal to build or retrofit 50 million square feet of green buildings. Since 2007 city buildings over 10,000 square feet must be certified as LEED-silver buildings. In January 2009 the policy was extended to

include commercial and residential buildings, with a sliding scale of certification depending on the size of the project. At the upper end, commercial buildings of over 25,000 square feet must be certified at the equivalent of LEED silver (City of San Jose 2009). The city does not have the transparency regulations for private-sector buildings found in some other cities, such as Austin, New York, and Seattle, but San José has pursued a green buildings strategy through incentives and federal funds. For example, the city received \$8.8 million in Energy Efficiency Block Grants to support the greening of buildings and other energy-efficiency and distributed renewable-energy measures. The city has a suite of energy-related programs for building efficiency, both for the government and for commercial and residential buildings. In 2010 the city also engaged in a stakeholder process to determine how to implement a policy for the greening of renovations and retrofits (City of San Jose 2010).

***Green Jobs Training.*** The Workforce Institute of San José Evergreen Community College District administers various green jobs training programs, including one of the California Green Jobs Corps programs and a program for 500 unemployed workers funded by the California Economic Development Department (Gomez 2010). Within the city's Office of Economic Development, the Work2Future program connects job seekers and employers, and it provides links to training programs. The program includes training for unemployed youth in various green jobs categories, and it has used about \$13 million in ARRA funds (City of San Jose 2010). In addition, there are programs at area universities, including San Jose State University and Santa Clara University as well as nearby Stanford and the University of California at Santa Cruz.

***Green Business Initiatives.*** At the heart of Silicon Valley, San José was rated by BusinessWeek as the leading place in the country to start a clean-tech business (Westervelt 2009). The city brought in the second Underwriters Laboratory in the country, and in 2007 it also launched a \$3 million venture fund, the Economic Development Catalyst fund, to invest in clean tech (Pacific Community Ventures 2007). The city is home to the Environmental Business Cluster, a clean-tech incubator, and the Clean Tech Open, the largest annual clean tech business competition in the country (which is run in partnership with a nonprofit organization located in nearby Palo Alto). The city also applied to the federal Economic Development Agency to have funds to set up a demonstration center for clean-tech businesses in the region, and it also has applied to the state government for designation as an Innovation Hub. San José also has an international strategy that assists businesses in marketing to Europe, and it attempts to attract direct investment from Europe (City of San José 2010).

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