
# The 21st Century Energy Greenprint for the East Bay

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# A Vision for a Local Clean Energy-Powered Bay Area

The Local Clean Energy Alliance of the East Bay envisions a future Bay Area that consumes significantly less energy yet still maintains a comfortable lifestyle and a vibrant economy. Residents actively and consciously reduce energy consumption and greenhouse gas emissions by making their homes more energy efficient, installing solar power, using alternatives to driving, and conserving and capturing water. Cities are less dependent on fossil fuels. Residents consume less energy on transportation because their cities have been configured around local and regional electrified transit systems. All development is governed by strict land use and transportation planning that requires development to be transit-oriented.

We envision a future for the Bay Area that is largely powered by renewable energy, with the majority coming from local, distributed generation that provides affordable, reliable, and clean power. The Bay Area is a clean energy leader, meeting the state-mandated 80% reduction in greenhouse gas emissions years, if not decades, before the rest of the state, providing a model for other regions and the rest of the country. We envision the Bay Area revitalizing and rebuilding its communities around public gathering places, events, and locally owned businesses, all powered largely by local clean energy. All communities share a vibrant and equitable regional economy thanks to tens of thousands of green collar jobs created by energy efficiency, local energy generation, and local green businesses. Communities source their own power and cooperatively build their renewable power infrastructure.

This is our vision. The Local Clean Energy Alliance of the East Bay seeks partners who share our passion for renewable energy and community vitality and are willing to work for change. Join us in laying the groundwork for a sustainable energy future.

# About the Local Clean Energy Alliance

The Local Clean Energy Alliance (LCEA) is a growing coalition of local nonprofits, businesses, and community leaders working for a clean energy future in the East Bay. The Alliance was founded by Bay Localize, Pacific Environment and the Sierra Club. Please see our website www.localcleanenergy.org for a complete and current list of all Alliance members. We believe the Bay Area is particularly well positioned for a transition to a local clean energy economy, perhaps more so than any other region in this country.

Our long-term goal is for the East Bay to meet 100% of its future energy needs with a balanced mix of renewable energy, improvements in efficiency, and conservation. Our interim goal is 50% renewable energy by 2017. Additional goals are to:

- *Reduce energy use through conservation and improvements in energy efficiency*
- *Maximize local renewable energy production*
- *Offer stable and affordable rates for all*
- *Create local business opportunities and green-collar jobs*

- *Facilitate local businesses and residents' ability to sell excess energy to the grid*
- *Ensure that the benefits of local clean energy accrue to all communities*

We are coordinating efforts to mobilize East Bay residents, businesses, and organizations around a regional agenda that creates green-collar jobs, reduces pollution and greenhouse gas emissions, and brings affordable, clean energy to our communities.

## Acknowledgements

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# Executive Summary

The Bay Area needs to accelerate its transition to a local clean energy economy. California leads the nation in programs and laws that promote greenhouse gas reductions and the development of clean energy solutions. Bay Area cities and agencies are currently developing their own greenhouse gas reduction and oil independence programs. In the East Bay and the greater Bay Area, our leaders acknowledge that climate change is a serious problem and that green technology and jobs are keys to reducing greenhouse gas emissions. However, when it comes to implementing the touted green tech solutions, we as a region and a state are lagging.

If California is to meet its legally mandated targets for increased use of renewable energy, it will require far greater access to and supply of renewable energy than currently exists. It will also require far more ambitious energy efficiency programs. This Greenprint charts the most effective path for the East Bay to ramp up efficiency programs and renewable energy production.

The closer the Bay Area gets to 100% green energy, the less vulnerable it will be to the rising costs and risks of using fossil fuel and nuclear energy. A study by the Community Environmental Council in Santa Barbara notes that cities face serious costs and risks by relying on current energy supplies. The study found that the cost of electricity generated by nuclear, coal, and gas is projected to rise considerably between now and 2030. For example, if current price trends continue, switching to a 100% renewable power system would save each Santa Barbara resident about $3,015 annually by 2030.[1]

Fortunately, the East Bay has immense potential for producing solar energy, and Oakland and Berkeley are already leaders in encouraging solar installations. Based on a recent case study by Bay Localize, if solar photovoltaic (PV) panels were installed throughout Berkeley, Oakland and Emeryville, they could generate up to 70% percent of the total annual electricity load (see the Appendix for detailed calculations.).[2]

Of all the policy tools available to promote energy efficiency and local renewable power, Community Choice Energy is the most effective. Other highly effective and mutually reinforcing policy tools are feed-in tariffs, Sustainable Energy Financing Districts, and community purchasing programs. Community Choice Energy could be the mechanism to implement all of these programs in the most cost-efficient manner.

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[1]Community Environmental Council, Oct 30, 2007. *A New Energy Direction: Bold Local Solutions to a Global Problem, A Blueprint for Santa Barbara County*, http://www.communityenvironmentalcouncil.org/EnergyBlueprint/CompleteBlueprint.pdf

[2]Bay Localize. *Tapping the Potential of Urban Rooftops*. http://www.baylocalize.org/?q=node/48 accessed 1/24/08.

**Community Choice Energy**

Currently, most businesses and residents in the Bay Area are unable to purchase cleaner energy through the grid. Installing solar panels is one way to have cleaner energy, but is not economically feasible for everyone. Likewise, purchasing "green credits" and carbon offsets are not the same as renewable energy delivered directly to your business or home.

Community Choice Energy gives customers a choice in their energy provider. With Community Choice Energy, cities and counties contract with a licensed energy service provider to purchase energy in bulk, build renewable energy generating facilities, and implement energy efficiency programs. This efficient public/private partnership makes it possible to get the greenest energy at the best rates. Each consumer is enrolled in the program unless they "opt out." In other words, consumers can choose to buy electricity through the community choice program or stay with the investor-owned utility (IOU). The city or county keeps prices competitive—and affordable for low-income residents—while investing in renewable energy generation and energy efficiency with full citizen oversight. The utility company continues to handle transmission and billing.

Oakland, Berkeley, and Emeryville are considering creating an East Bay Joint Powers Authority for Community Choice Energy to meet a target of 50% renewable power by 2017 and to offer stable, affordable rates. This is a considerably higher percentage of renewable energy than Pacific Gas and Electric (PG&E) is projected to offer by that date. The Local Clean Energy Alliance advocates that any East Bay Community Choice Energy program prioritize local generation of power and equitably distribute the job and wealth creation benefits of local clean energy. The alliance estimates that meeting 50% of the summer electricity demand of Oakland's commercial building sector through local solar power would create nearly 1,000 new long-term jobs and be a significant step towards Oakland Mayor Dellums' goal of creating 10,000 jobs for Oakland residents. The Alliance is supportive of local hire polices and workforce development initiatives.

A recent study explored the job creation possibilities of a San Diego Community Choice Energy program that increases electricity efficiency by 40% and installs PV systems on about 20% of its roofs and parking lots. The study found that installing PV panels and electricity efficiency improvements would create more than 123,000 direct job-years of employment over 40 years. This is 13 times more direct job-years of employment than continued dependence on and investment in fossil fuels and nuclear power.[3]

The Local Clean Energy Alliance advocates the establishment of a community advisory committee consisting of community leaders and local experts to provide oversight for Community Choice implementation and administration.

[3] Jim Bell and Dr. Heather Honea, 2007. *Electricity Supply and Price Security in San Diego County: Comparison of Strategies for the Production/Procurement of Electricity and Elimination of Greenhouse Gas Emissions*, http://www.jimbell.com/mayor/index.html.

**Energy Efficiency Programs**

It is often said that the "cleanest kilowatt is the kilowatt we don't use." The state of California recognizes that energy conservation and efficiency are the best and least expensive paths toward a clean energy grid. Making the East Bay more energy efficient will save energy, reduce emissions, lower bills, and lessen the city's consumption of natural resources. In addition, better insulated buildings improve comfort and lessen illnesses for residents and workers. Furthermore, great potential exists to stimulate economic investment and job creation by using the money saved through conservation for building efficiency improvements. Energy efficiency programs often pay for themselves quickly, which benefits the investor.

Community Choice Energy offers a dramatic opportunity to ramp up energy efficiency technology deployment due to two major factors: (1) Community Choice programs have a greater incentive to invest in energy efficiency than IOUs, and (2) there is high potential for reinvestment of "Public Goods" surcharges in the East Bay. A Community Choice Energy program in the East Bay could place the highest priority on energy efficiency improvements that reduce the need for new energy resources, power lines and substations and make living in the Bay Area more affordable for low-income households.

**Feed-in Tariffs**

Feed-in tariffs enable businesses and individuals that invest in renewable power systems to obtain a predictable and profitable payment rate for the energy they provide to the grid. A stable payment rate would create a powerful incentive for building owners to install larger renewable energy systems that could provide locally generated, clean electricity to customers in their service area. As municipalities and joint powers authorities operating Community Choice Energy programs enjoy low costs of capital and nonprofit status, they could potentially provide more renewable energy and offer attractive feed-in tariffs while still delivering rates comparable to PG&E.

**Sustainable Energy Financing Districts**

Sustainable energy financing districts, as pioneered by the city of Berkeley, will enable building owners to pay for solar panels and solar hot water systems over 20 years through a special tax on their annual property tax bill. This program overcomes a common obstacle of costly upfront investments which may take more years to recoup than the owner intends to keep the building. The owner immediately begins saving money on electricity bills without incurring the upfront cost of installing a solar system. The interest portion of the assessment may be deductible on the owner's federal income tax return.[4] When the house is sold, the solar array and the tax assessment remain with the property, passing on to the new owner.

Another option is to work with redevelopment districts to help finance solar installations and energy efficiency measures. Redevelopment districts spend local taxes in the same

[4] Tax deductibility depends on financing, IRS, and individual taxpayer circumstance.

neighborhood where they are collected to meet specific neighborhood goals. One of these goals is keeping the cost of living affordable for existing residents in the neighborhood. Decreasing the cost of utilities through energy efficiency improvements and installing solar panels can help keep the cost of living affordable. The Oakland City Council has recently granted funds to the nonprofit Grid Alternatives to install solar PV panels on several homes owned by low-income residents or a non-profit in the one of the city's redevelopment areas.

**Community Purchasing Programs**

Community purchasing programs are likely to become very popular in the coming years and will make it even more cost effective for East Bay communities to go solar. Community purchasing programs pool a neighborhood's purchases of solar photovoltaics, thermal arrays, and energy efficiency improvements. Buying in bulk, a group can save 20% or more on the individually owned installations. Participating residents can effectively manage these programs at the neighborhood level. However, larger bulk purchasing efforts administered by a Community Choice Energy program could achieve additional efficiencies and cost savings. Coupled with the federal tax deductions and state rebates, community purchasing programs can significantly lower the out-of-pocket cost of solar panels.

**Conclusion**

The East Bay has great potential to increase our energy efficiency, invest in our community, reduce greenhouse gas emissions, and secure our energy future. The economic, environmental, and social risks of not doing so are formidable. The Local Clean Energy Alliance recognizes Community Choice Energy, energy efficiency programs, feed-in tariffs, Sustainable Energy Financing Districts, and community purchasing as leading policy initiatives to increase energy efficiency and local renewable energy in the East Bay. By pursuing these complementary policies in a coordinated manner, we can increase the resilience and long term viability of our region's electrical grid, create new green-collar job opportunities, and make bold strides in cutting global warming emissions.

# The Greenprint: Local Clean Energy for the East Bay

Electricity generation is a significant source of greenhouse gas emissions in the Bay Area.[5] As such, electricity generation affords opportunities for substantially reducing greenhouse gas emissions. Furthermore, updating our energy sources offers opportunities to invest in new technology like wind and solar power, which can provide opportunities for economic growth.

As this report demonstrates, many options are available to East Bay cities for developing a clean energy system, with some already underway. The Local Clean Energy Alliance has identified the following portfolio of tools as holding the greatest promise for increasing local clean energy generation and energy efficiency in our region:

- Community Choice Energy
- Energy Efficiency Programs
- Feed-in Tariffs
- Sustainable Energy Financing Districts
- Community Purchasing Programs

Community Choice Energy could be the mechanism to implement all of these highly effective and mutually reinforcing programs in the most cost-efficient manner. Full details on each of these tools are found below, with supplemental information in the appendices. They can be reinforced by the additional mechanisms described in the "Programs, Technologies, and Economic Arrangements" section that follows.

**Community Choice Energy**

Community Choice Energy gives customers a choice in their energy provider. Currently, most businesses and residents in the Bay Area are unable to purchase cleaner energy through the grid. Installing solar panels is a way to have cleaner energy, but is not economically and physically viable for everyone. Likewise, purchasing "Green Credits" and carbon offsets is not the same as renewable energy delivered directly to your business or home.[6]

Community Choice Energy enables cities to increase the use of renewable energy. With Community Choice Energy, a city or county controls the purchasing and potentially the actual production of electricity that is distributed to local residents and businesses.

California State law AB 117 permits any city and/or county to create a bulk purchasing pool from the electric loads of residents, businesses and municipal customers to facilitate

[5]The 2008 Berkeley Climate Action estimates, based on a 2005 greenhouse gas emissions inventory, that electricity use represents 18% of all greenhouse gas emissions in Berkeley.

[6] Green credits or Renewable Energy Credits (RECs) are tradable environmental commodities in the United States which represent proof that 1 megawatt-hour (MWh) of electricity was generated from an eligible renewable energy resource. A carbon offset is a financial instrument representing the reduction of one metric ton of carbon dioxide, or its equivalent in other greenhouse gases.

the purchase and sale of electrical energy. Each consumer is automatically enrolled in the local Community Choice program, but is given the option to continue to receive power from the utility company. The city or county works to keep prices competitive while investing in renewable energy with full citizen oversight. The utility company continues to handle transmission and billing in an efficient public-private partnership. Utility companies are required to cooperate fully with any Community Choice Energy program including providing data as well as metering, billing, collection, and customer service to Community Choice Energy customers.[7]

The Local Clean Energy Alliance is excited by the job creation potential of Community Choice Energy. A recent study explored the job creation possibilities of a San Diego Community Choice Energy program that increases electricity efficiency by 40% and installs PV systems on about 20% of its roofs and parking lots. The study found that installing PV panels and electricity efficiency improvements would create more than 123,000 direct job-years of employment over 40 years. This is 13 times more direct job-years of employment than continued dependence on and investment in fossil fuels and nuclear power.[8]

A Community Choice program can issue bonds to receive tax-free financing at rates lower than those offered for commercially owned power plants (see the Appendix for more information on raising capital for clean energy programs). Since cities and joint powers authorities can raise money more cheaply than corporations and don't have to worry about profit margins, executive bonuses, or corporate taxes, Community Choice Energy is well positioned to compete with utility companies to provide cost effective service.

Community Choice Energy is projected to be able to deliver larger amounts of clean, safe, local renewable energy at the same or lower prices than what PG&E charges for its mix of natural gas, hydro, and nuclear power. According to a 2005 Feasibility Report developed by Navigant Consulting, Inc. for the Oakland City Council, a fully developed Community Choice Energy program could save Oakland $12.5 million annually, or approximately 4% of total customer electricity costs.[9] This would potentially reduce rates for Oakland ratepayers or generate income for the city. The report also found that the portion of renewable electricity in Oakland's energy mix could increase to 50% by 2017, more than doubling the renewable energy content that PG&E would provide during the same time period.

Oakland, Berkeley, and Emeryville are considering the formation of a Joint Powers Authority (JPA) to manage and administer a Community Choice Energy system for their cities, with the near term goal of 50% renewable energy by 2017. The Local Clean Energy Alliance advocates that any East Bay Community Choice Energy program

[7]See http://www.lgc.org/cca/what_is_cca.html.
[8]Jim Bell and Dr. Heather Honea, 2007. *Electricity Supply and Price Security in San Diego County: Comparison of Strategies for the Production/Procurement of Electricity and Elimination of Greenhouse Gas Emissions*, http://www.jimbell.com/mayor/index.html.
[9]City of Oakland, March 2005. *Community Choice Aggregation, Base Case Feasibility Evaluation*.

prioritize energy efficiency, local generation of power, and equitable distribution of the benefits of local clean energy. Similar to the Marin County program, an East Bay program could offer both 100% green energy and "light" green energy options.[10]

Berkeley's draft Climate Action Plan (see the "Berkeley's Measure G" section below) mentioned Community Choice Energy as a viable option for reducing greenhouse gas emissions. Oakland's Mayor Dellums' Citizen Task Forces recommended implementing Community Choice. The Oil Independent Oakland by 2020 task force recommended Community Choice Energy as a key strategy for advancing local clean energy, creating meaningful green jobs, and making the city more resilient. Also, three of the grants awarded in 2007 by the Bay Area Air Quality Management District (BAAQMD) grant program for local clean energy and energy conservation projects went to regional Community Choice Energy initiatives. See the Appendix for more on the task force recommendations and the BAAQMD grant awards for Community Choice Energy.

To ensure the equitable implementation of Community Choice Energy in the East Bay and to fairly address community concerns, the Local Clean Energy Alliance advocates the establishment of a community advisory committee consisting of community leaders and local experts to provide oversight for Community Choice implementation and administration.

**Energy Efficiency Programs**

It is often said that the "cleanest kilowatt is the kilowatt we don't use." As the state of California noted in its Energy Action Plan Loading Order, energy conservation and efficiency are the best and least expensive paths towards a clean energy grid. A study performed by Lawrence Livermore National Laboratory showed that in 1999, California wasted 56% of the energy it consumed due to inefficient electric generators, appliances, cars, and motors.[11] This wasted energy was fifty times the electric energy generated by the state's nuclear power plants. Furthermore, energy efficiency programs often pay for themselves quickly, which benefits the investor.

Making the East Bay more energy efficient will save energy, reduce emissions, lower bills, and decrease the city's consumption of natural resources. Other benefits include greater comfort and fewer illnesses for residents and workers with proper building weatherization, and encouragement of civic engagement by enlisting many stakeholders in making the East Bay more energy-efficient and independent.[12]

Furthermore, the possibilities for municipal policy to stimulate economic investment and job creation through mandating efficiency are tremendous. While potentially controversial, especially in the commercial sector, municipal programs that specify energy efficiency goals for East Bay cities and track progress would support existing

[10]*Draft Report, Marin, California: Community Choice Aggregation Business Plan, January 2008*.
[11]California Energy Flow Charts, 1999, https://eed.llnl.gov/flow/cal99.php.
[12]City of Oakland, July 2006. *City of Oakland Energy Efficiency Action Plan: An Element of the Sustainable Economic Development Strategy (Draft)* http://www.caleep.com/pilot/oakland.htm.

programs and spur new initiatives, thereby reducing the region's reliance on fossil fuel and nuclear energy.

The city of Berkeley has a mandatory weatherization program funded through federal grants and a Low-Income Energy Efficiency Program funded by the State of California. Berkeley's Residential Energy Conservation Ordinance (RECO) is designed to improve the energy and water efficiency of Berkeley's residential building stock. It establishes a mandatory minimum energy and water efficiency standard, and a range of building requirements, for every home or apartment building that is being sold, transferred or undergoing renovations totaling $50,000 or more. This program effectively ensures that the aggregate of buildings in Berkeley becomes more energy efficient over time as transactions occur. This program does not appear to place an undue burden on lower income households since it is limited to the time of sale and major renovations. The city's commercial sector fought and succeeded in preventing such a mandate for commercial properties (CECO). See the Appendix for more information on these programs and other building energy use actions.[13]

In July 2006, the city of Oakland and Navigant Consulting's "Cal-Leep" program unveiled a draft Energy Efficiency Action Plan that has yet to be adopted by Oakland's City Council.[14] The plan details how Oakland can implement city-level measures to save energy. Some of the findings of the report include the following:

- Reducing electricity use of the top 300 customers in Oakland by 10 percent would achieve the same results as 10 percent from all other customers combined.
- Existing homes, most of which were built prior to any energy efficiency mandates, offer the greatest potential savings in the residential sector.
- Home weatherization in Oakland's lower income households may be the greatest local need.

The plan details some of the steps that Oakland needs to take in order to fully implement energy efficiency, including assessing the value of energy efficiency initiatives, prioritizing energy efficiency initiatives based on criteria defined by the city, determining the resources required and how to obtain them, and monitoring and managing energy efficiency initiatives.

Community Choice Energy offers a dramatic opportunity to ramp up energy efficiency technology development. While utility companies' transmission and distribution revenues are threatened by the reduced energy sales caused by energy efficiency technologies, Community Choice Energy programs benefit when customers conserve energy. Community Choice programs are uniquely positioned to accelerate energy efficiency technology within their desired portfolios, and may finance these with bonds in much the same way that they are seeking to finance renewable energy facilities.

[13]City of Berkeley, January 2008. *Draft Climate Action Plan*.
[14]City of Oakland, July 2006. *Energy Efficiency Action Plan: An Element of the Sustainable Economic Development Strategy, Draft*.

California's Community Choice Energy law (AB 117, 2002) appears to allow Community Choice energy agencies to become administrators of energy efficiency programs, which are funded by a "public goods charge" collected from ratepayers' bills. These surcharges are mandated by the state of California to fund energy efficiency programs. The revenue from the surcharge is currently controlled by PG&E in the Bay Area. Under AB 117, Community Choice programs may apply to administer these Public Goods Charge funds within their communities. By doing so, the municipality or joint power authority will ensure that ratepayer funds are invested locally in the community. Under a Community Choice Energy program, these funds (potentially tens of millions of dollars) could be brought back to our region to be invested in local businesses and jobs. The California Public Utilities Commission, however, has yet to decide definitively on this issue and will rule on it in the future.

Oakland and Berkeley have substantial experience working with city-run and non-profit energy efficiency programs. They are currently participating as "local government partners" in programs controlled by utilities. As independent administrators, our cities could increase benefits for ratepayers along with providing more opportunities for local businesses and nonprofits to participate. Most importantly, the cities could target savings to particular areas which have been underserved by utility programs (e.g., low-income households and large commercial electricity customers), and save energy at specific points on the grid to reduce the need for more energy resources, power lines and substations. These investments would increase jobs and economic benefits for the entire community.

**Feed-in Tariffs**

The East Bay's Community Choice Energy program should include feed-in tariffs to encourage investment in local renewable energy. [15] Feed-in tariffs set a rate at which residents or businesses are paid for generating renewable energy beyond what they use.

Under the current "net metering" plan, Californians are not compensated for electricity they generate in excess of their annual consumption. Thus, most solar systems are limited in size so that they generate less electricity than consumed annually on the premises. California's electrical system needs reliable, zero emission electricity, especially at peak usage times in population centers. The 2007 California Electricity Commission Report recommends that excess solar generation delivered to the grid be compensated through a feed-in tariff based on the market price with a time-of-delivery adjustment. The report also recommends that the Energy Commission and the California Public Utilities Commission work together to establish an appropriate feed-in tariff for excess solar electricity.[16]

An effective regional or statewide feed-in tariff system will provide sufficient incentive for the local homeowner, business owner or commercial property owner to invest in renewable energy systems. The tariff should last for at least twenty years, be technology

[15]Some renewable energy experts use the term "negative metering" (i.e., "the dial spins backwards").
[16]*California Electricity Commission Report 2007*, p.198.

specific, and ensure that low-income residents are not subsidizing the solar systems of higher income residents (in other words, no regressive affects on rate payers). See the Appendix for more information on feed-in tariffs.

**Sustainable Energy Financing Districts**

Cities can also develop their own renewable energy and energy efficiency finance programs suited to their residential and commercial needs. For instance, in November 2007, the Berkeley City Council authorized staff to develop a plan to pay for the installation of solar panels and solar hot water systems for any homeowner or commercial building owner. Property owners retain ownership of the solar systems, paying back the cost over 20 years through an assessment on the annual property tax bill. This program entails little risk on the part of the city or the building owner while overcoming a common obstacle of a costly up-front investment which may take more years to recoup than the owner intends to keep the building.

Once accepted into the program, a property owner would schedule an appointment for a solar installer to determine the appropriate solar system for the property. The city would pay the homeowner for the system and its installation, minus any applicable state and federal rebates, and would add a special tax to the property owner's tax bill to pay for the system.

The building owner would immediately begin saving money on electricity bills without incurring the upfront cost of installing a solar system, and the interest portion of the assessment may be deductible on the owner's federal income tax return.[17] When the building is sold, the solar array and the tax assessment remain with the property, passing on to the new owner.

Berkeley is working out the legal and financial details and expects to start a pilot plan in 2008. The city is working with banks and credit unions to provide low interest rate financing. Since the property tax assessment will act as a lien, financiers would be first in line to collect in the event a property owner defaults. The current plan works best for owner occupied buildings or buildings where the owner pays utilities. It does not work well for buildings with renters – about 57% of Berkeley's population, according to the 2000 Census – who pay their own electricity bill.

Another option is to work with redevelopment districts to help finance solar installations and energy efficiency measures. Redevelopment districts spend local taxes in the same neighborhood where they are collected to meet specific neighborhood goals. One of these goals is keeping the cost of living affordable for existing residents in the neighborhood. For instance, it can be challenging for low-income seniors who own their homes to pay higher property taxes if the value of property in the area increases. Decreasing the cost of utilities through energy efficiency audits, upgrades, and installing solar panels can help keep the cost of living affordable for low-income residents. The Oakland City Council

[17]Tax deductibility depends on how the money is borrowed, the price of the solar system, and the structure of the deal. Homeowners should consult with an expert familiar with tax law.

has already granted funds to the nonprofit Grid Alternatives to install solar PV panels on several homes owned by low-income residents or a non-profit in the one of the city's redevelopment areas.

**Community Purchasing Programs**

Community purchasing programs are a mechanism for pooling a neighborhood's purchases of solar PVs and thermal arrays. By buying in bulk, a group can save 20% or more on the individually owned installations. Coupled with the federal and state rebates, this can considerably lower the out-of-pocket cost of solar arrays to such an extent that they are cheaper than purchasing electricity or gas from the utility. See the Appendix for more information on Community Purchasing Programs.

Solar City, a California-based solar installation company, was the first in the U.S. to implement community purchasing programs whereby homeowners enjoy volume discounts when their neighborhoods go solar. Recently, the Downtown San Jose Solar Project neighborhood group banded together to find their own solar provider through a competitive bidding process that resulted in a contract with REC Solar.[18] As of February 20, 2008, the project includes 24 San Jose homes producing 99 kW of electricity.

Rather than purchase their systems outright, 75% of the customers in the Downtown San Jose Solar Project opted for a residential Power Purchase Agreement (PPA) offered by Sun Run, a private solar company. [19] Taking advantage of the full 30% federal tax credit for commercial solar installations, the Sun Run PPA reduces the upfront cost of solar by half and fixes the cost of electricity produced by the panels at a cheaper rate than building owners would pay PG&E for a 20 year period of time. At the end of the 20-year contract, the system can be purchased for an average of $2,000, or the contract can be renewed for a rate that is 10% less than the utility company's rate at that time.

Participating residents can effectively manage community purchasing programs at the neighborhood level. However, larger bulk purchasing efforts administered by a Community Choice Energy program could achieve additional efficiencies and cost savings.

[18] See http://sanjosesolar.blogspot.com.
[19] See http://www.sunrunhome.com/.

# Resources, Technologies, and Policy Tools

This section covers resources and mechanisms that can assist cities and regions in meeting local clean energy goals. While these are not always the marquee elements of a local clean energy strategy, they are important resources that should be considered and included when economically viable. These include:

- Local Renewable Resources
- Statewide Renewable Power Supply
- Distributed Generation
- Co-generation
- Project Labor Agreements

### Local Renewable Resources

One of the goals of the Local Clean Energy Alliance of the East Bay is to maximize local renewable energy in order to create meaningful green jobs, keep dollars circulating in the region, make the region more resilient, reduce transmission loss, and reduce the need for new transmission infrastructure.[20] The following paragraphs analyze the potential for the local region to provide its own renewable energy resources.

Solar potential of East Bay rooftops estimated to meet 70% of demand

The East Bay has great potential for producing solar energy, and Oakland and Berkeley are already leaders in encouraging solar installations. In a recent case study, Bay Localize found that the residential and commercial rooftops of the 50-block East Lake neighborhood of Oakland could host 8.5 MW of solar panels, while still dedicating some neighborhood roofs to other uses such as rooftop gardens.[21] The East Lake neighborhood is relatively dense and has little shading. If these findings are extrapolated to the total land area of Oakland, Berkeley, and Emeryville assuming an average productivity of 60% of the East Lake neighborhood, rooftops of the three cities combined could potentially host 1,354 MW of solar installations. At this scale and level of productivity, local solar installations could potentially produce as much as 1.8 million MWh of electricity annually, equivalent to 70% percent of Oakland, Berkeley, and Emeryville's total annual electric energy consumption (see the Appendix for detailed calculations).[22]

[20] A highly-renewable (or 100% renewable) future requires either a) a robust transmission and distribution system capable of moving power over long distances or b) large electricity storage capacity so that we can still get electricity when there's no sunshine or wind in the Bay Area. Transmission is a major enabler for high penetration of renewable energy onto the electric grid. Some transmission investments can be averted or delayed through effective local efficiency and renewables projects, but ultimately upgrading the nation's transmission infrastructure is a must if we hope to see continuation of the current level of energy services with a highly renewable supply mix.

[21] Bay Localize, 2007. *Tapping the Potential of Urban Rooftops*. http://www.baylocalize.org/?q=node/48 accessed 1/24/08.

[22] Either large-scale batteries or fossil/hydro generation would be necessary to "firm" this generation by filling in the gaps between when the sun is shining and when electricity is needed.

A real deployment of solar power in the East Bay will, of course, also need to take cost constraints into account. While solar energy can be expensive, federal tax credits, state subsidies, local bulk purchasing and low cost financing can make this option more affordable.

Altamont Pass an Example of Local Renewable Resource

The Altamont Pass Wind Farm near Livermore serves as a good example of a local renewable resource. The wind farm, one of the earliest in the United States, is composed of over 4900 relatively small wind turbines of various types, making it at one time the largest farm in the world in terms of capacity. Spread across 50 square miles in far eastern Alameda and western Contra Costa counties, Altamont Pass Wind Farm is still the largest concentration of wind turbines in the world, producing about 125 MW on average, with a capacity for as much as 580 MW. The turbines at Altamont were installed after the 1970s energy crisis in response to favorable tax policies for investors. Because many of the windmills are not the newest and most efficient technology and many are no longer functioning there is great potential to replace older models, creating a resource for much of the region's electricity needs while protecting birds.

An agreement for repowering (replacement of old turbines) and removal of turbines from those locations most lethal to birds at Altamont was reached in early 2007. Little, however, has been done to date, chiefly because of lack of funding. Repowering of a single turbine can cost more than $1 million. The Local Clean Energy Alliance believes that a regional renewable energy financing plan, such as Community Choice Energy, could provide the necessary funds for moving this plan forward and repowering the turbines at Altamont, dramatically increasing renewable energy production while reducing bird deaths. An appropriately designed feed-in tariff may also be beneficial by attracting private or institutional investors to fund the repowering of Altamont.

Other Regional Wind Power Resources

Solano County, near Rio Vista, has robust wind farms. For instance, Shiloh Wind Farm, visible from the north slopes of Mount Diablo, has a capacity of at least 150 MW from 100 turbines.[23] San Francisco has a plan to install wind turbines inside city limits as part of its Community Choice Energy plan, and there are other potential wind sites in western Contra Costa County as well as offshore.

Biogas

Biogas from commercial and agricultural waste can be used to generate electricity and heat in decentralized combined heat and power plants (CHPs). After being specially treated in anaerobic digesters, biogas from waste can also be fed into the existing natural gas network. Transport via the natural gas network means that biogas can also be used in larger power plants for electricity and heat production. Biogas can then be used in the transport sector in the same way as natural gas. Biogas projects are already underway in California. For example, PG&E has agreed to two deals that together will produce

[23]These modern turbines have a 1.5-5 MW capacity with an average of approximately 2.5 MW, while the above mentioned 1970s era turbines at Altamont have an average capacity of 0.12 MW.

enough biogas from dairy cows to supply electricity for 150,000 homes over 10 years. As of 2007, 3700 biogas plants had been installed in Germany totaling 1.3 GW in power.

Other
Other potential sources of locally generated renewable power include geothermal, ocean wave and tidal power.[24]

**Statewide Renewable Power Supply**

Estimates vary as to how much accessible and affordable renewable energy generated outside of the nine-county San Francisco Bay Area region is available for East Bay ratepayers; however, most studies indicate it is significant.

On the more conservative side, studies sponsored by the California Energy Commission (CEC) reveal that over 7,000 MW of eligible renewable resources are economically developable statewide by 2010 in California, and a study sponsored by the California Public Utilities Commission (CPUC) indicated nearly 50,000 MW of renewable resource potential could be utilized by 2020.[25] To put this figure in perspective, 50,000 MW equates to 79% of California's 2006 total peak demand for power (65,000 MW).[26]

The majority of the resource potential identified by the CEC is located in Southern California. Examples of areas identified with large renewable resources include:

- 8,000 MW of wind power in the Tehachapi area and Riverside County by 2020[27]
- 1000 MW of utility-scale solar in the Southern California deserts
- 4200 MW of geothermal, wind, and solar in the Imperial Valley by 2020[28]

Other likely potential renewable energy sources include wind from the Pacific Northwest and British Columbia, and geothermal imports from Nevada.[29]

The National Resources Defense Council (NRDC) perceives the renewable energy potential of Southern California as bordering on limitless. NRDC estimates that the area occupied by Edwards Air Force Base near Lancaster in Los Angeles County alone could generate roughly 17% of the state electricity supply if used for solar farms.[30]

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[24]District energy systems produce steam, hot water or chilled water at a central plant and then pipe that energy out to buildings in the district for space heating, domestic hot water heating and air conditioning. Individual buildings don't need their own boilers or furnaces, chillers or air conditioners. A district energy system does that work for them. See http://www.districtenergy.org/what_is.htm.
[25] Navigant Consulting, 2007. *Marin, California Draft Community Choice Energy Business Plan*, p.37.
[26] Susanne Garfield, Carolyn Walker, Yvonne Nelson, 2007. *2007 Integrated Energy Policy Report, Committee Final Report.* California Energy Commission, Nov. 2007. p. 29.
[27] Ibid, p.132
[28] Ibid, p.133
[29] Navigant Consulting, Sep. 2007. *Marin, California Draft Community Choice Energy Business Plan*, p.40.
[30] David R Baker, 2007. "*Companies squeezing power from sun, deserts in Southern California*" in San Francisco Chronicle, Dec. 2, 2007.

Two main challenges exist in securing affordable renewable energy outside the nine-county region for East Bay ratepayers: limited transmission ability and increasing competition for renewable resources. Also, there is increasing competition for electricity transmission corridors in California's desert areas. Some environmental organizations such as the Sierra Club have expressed concern over the capacity of California's desert and wilderness to host such large-scale infrastructure. The Local Clean Energy Alliance is similarly concerned by the impact of rampant, uncontrolled energy development in southern California to satisfy the market demand in northern California.

California Renewable Energy Portfolio Standard

California's Renewable Portfolio Standard (RPS) is a law that requires power utilities to generate 20% of their electricity from renewable sources by 2010. A further goal has been established for 33% renewable energy by 2030, but this has not yet been mandated. To meet its 2010 target, PG&E will need to purchase 6.5 million MWh of the total 14 million MWh of renewable energy expected to be available by 2010 in California.

Due to a number of problems associated with long distance transmission of power and the need for meaningful employment in the Bay Area, the Local Clean Energy Alliance places a higher priority on locally generated electricity. We do, however, support the purchase of distant renewable energy to augment local sources and to provide energy while we transition to local resources.

**Distributed Generation**

The vast majority of energy that now feeds our electrical system comes from centralized, industrial-scale facilities like coal- and gas-fired power plants, nuclear reactors, and large hydropower dams. By contrast, distributed generation produces electricity from many small and dispersed energy sources such as solar PV systems, fuel cells, wind turbines, micro-hydro, and cogeneration micro-turbines. Such systems generate energy very close to where it is consumed — perhaps even in the same building — reducing the amount of energy lost when sending electricity from centralized electrical power plants over the transmission grid. Distributed electricity generation can achieve energy efficiency rates as high as 80% when heat is captured onsite, as compared to centralized power plants where most of the energy is released as heat, on average leaving only about 30 to 40% available for use as electricity.[31]

In California, the PUC's Self-Generation Incentive Program (SGIP) provides rebates for the installation of distributed energy systems of up to 5 MW.[32] In addition, some rules and regulations (e.g., interconnection rules, net metering, and exemptions from standby charges) have been changed to benefit some forms of distributed generation. To further

[31]World Alliance for Distributed Energy, "Efficiency Benefits," http://www.localpower.org/ben_efficiency.html. These are largely fossil-fuel based systems. While some biomass capacity in the state could theoretically be burned in a cogenerating setting for district heating use, the infeasibility of hauling biomass long distances due to its low energy density and worries about pollution from burning high quantities in urban areas make it somewhat unlikely this use of distributed generation will be a significant source in much of the East Bay.

[32]CA Public Utilities Commission, "Self-Generation Incentive Program," http://www.cpuc.ca.gov/PUC/energy/051005_sgip.htm

the advancement of distributed energy, the Clean Power Research group recommends that local governments:

1. Integrate bundled systems of energy efficiency and renewables into government buildings where cost-effective.
2. Eliminate biases in the tax system that favor traditional electricity supply over distributed resources.
3. Include distributed resources as part of their planning processes, particularly in the areas of disaster preparedness and economic development.[33]

Distributed generation is especially important in the East Bay given the high likelihood of a major earthquake on the Hayward fault, which could result in major, widespread power outages in a centralized system. Decentralizing electricity production could make our grid significantly more resilient and increase public health and safety in the aftermath of a major disruptive event. Given the greater efficiencies afforded by distributed generation, the Local Clean Energy Alliance sees it as a vital component to Community Choice Energy, and other local renewable energy programs.

**Co-generation**

Co-generation or co-manufacturing captures waste heat from power plants and industrial processes for domestic or industrial heating purposes either very close to the plant, or as commonly seen in Europe, for distribution through pipes to heat local housing. Consolidated Edison in New York produces 30 billion pounds of steam each year through its seven cogeneration plants (which boil water), pumping it to 100,000 buildings in Manhattan, the biggest commercial steam system in the world. Combined Heat and Power (CHP) is used at about 1,400 locations around the United Kingdom. As new mixed use development with light industrial becomes more common in the Bay Area, as called for in the Urban Villages recommendation of the Oil Independent Oakland task force, co-generation could be included to capture the waste heat and use it in another industrial process or for heating buildings as appropriate. Marin County is considering inclusion of co-generation sources (combined heat and power) in its Community Choice Energy as a way of further reducing natural gas use and carbon emissions. Cogeneration could be an important strategy in East Bay settings where natural gas is already being combusted for heat and can be retrofitted to generate electricity as well.

[33] Thomas E. Hoff, *The Benefits of Distributed Resources to Local Governments: An Introduction* (Napa: Clean Power Research, Sep. 2000), p. 2, http://www.clean-power.com/research/distributedgeneration/DGandLocalGoverments.pdf

### Project Labor Agreements

Ensuring equitable, inclusive, and efficient work arrangements for all parties involved in renewable energy and energy efficiency projects can sometimes pose a challenge, or even stand in the way of much-needed progress in meeting local, state, and national clean energy objectives.

One mechanism for forging common ground, the Project Labor Agreement (PLA), sets basic terms and conditions for everyone involved in such projects. In essence, a PLA is a pre-hire collective bargaining agreement negotiated between a project owner, construction manager or general contractor and an appropriate labor organization, usually an area or State Building and Construction Trades Council.[34] PLAs are project-specific and last only as long as the project.

A typical PLA includes no-strike and no lock-out agreements as well as procedures for quickly settling any problems or disputes that might develop. Consequently, PLAs eliminate hidden costs and cost overruns by eliminating unexpected wage demands or disputes during the life of a project. Over the past 60 years, PLAs have been used in a wide range of public projects, including the Lawrence Livermore National Lab and the Los Angeles Metro Light Rail Transit system. PLAs could be used by a Community Choice Energy program for development and maintenance of local renewable energy systems.

## Our Energy Situation in Context

This section provides the context within which new renewable energy programs in the East Bay operate. It briefly outlines the implications of two intertwined global issues, global warming and peak oil and natural gas, which provide compelling reasons for the Easy Bay to make concerted efforts to reduce its dependence on fossil fuels and advance local renewable energy. It also provides the policy context on the state and local levels, and briefly describes key renewable energy initiatives in San Francisco and Marin.

### Converging Crises: Global Warming and Peak Oil

The effects of global warming are escalating, from melting glaciers and rising waters to more frequent and intense hurricanes, tornadoes, and other storm systems. The local and regional impacts of global warming could be far-reaching. Increasing heat waves could endanger the elderly and the very young — a July 2006 heat wave claimed the lives of 75 Californians. Shifts in habitat could cause massive rates of extinction in California's diverse coastal bioregion. The state could face severe economic losses from flooding due to rising sea levels and strained levees. A more erratic water supply could result from

[34]State Building and Construction Trades Council of California, "Hot Issues: PLAs," http://www.sbctc.org/default.asp?id=188&pagetype=hotissues

diminished snowpack in the Sierra Nevada and warmer waters could eliminate cold-water fish from many of our streams. Increased wildfires could wipe out our region's signature oak trees, and higher temperatures could make the Central Valley's agricultural lands even more dependent on water diversions from the Bay Delta.

During the past decade, a growing chorus of energy analysts has warned of the approach of "Peak Oil," the time when the global rate of production of petroleum will reach its peak and begin its inevitable decline. While there is some dispute among experts as to *when* this will occur, there is little argument as to *whether* peak will occur. Today the majority of oil-producing nations are experiencing reduced output. US oil production, once the largest in the world, has been declining since 1970. Meanwhile, global rates of discovery of new oilfields have been declining since 1964. According to the Energy Information Administration (EIA), a division of the US Department of Energy, the monthly average for daily world production rates for conventional crude oil peaked at 74.2 millions of barrels per day in May 2005.[35] During the past decade, oil prices have soared from $12 per barrel to $127, reflecting growing demand and a supply that is leveling off.

Oil depletion presents a unique set of vulnerabilities and risks. While global warming is a problem that has gained increasing public awareness, "Peak Oil" is less well understood. The potential is not just that we will have less oil in the future, but also that the resulting shortages will be both disruptive and costly. Still, oil depletion and global warming are intertwined, as the solutions to oil depletion must not sacrifice efforts to reduce carbon overload in the atmosphere. Simply replacing oil with large amounts of liquefied coal or other carbon-producing products, for example, could worsen global climate change.

The peak in oil production is forecast to be followed shortly by a peak in global natural gas production, complicating a simple shift from one type of fossil fuel to another. It is fair to say that fossil fuel dependency constitutes a systemic problem of a kind and scale that no society has ever had to address before. The human community's central task for the coming decades must be the undoing of its dependence on oil, coal, and natural gas in order to deal with the twin crises of resource depletion and climate change.

**State Energy Policy Context**

California's cities enjoy a very favorable political climate for programs and laws that reduce greenhouse gases and promote the development of clean energy solutions. California has more than 75 such laws and incentive programs, which range from sweeping statewide laws impacting the major investor-owned utilities (IOUs) like PG&E to city- and county-wide incentive programs.[36] The California programs supplement the relatively weak federal incentives for renewables and efficiency, which mainly focus on tax credits, tax exemptions, and tribal energy loans.

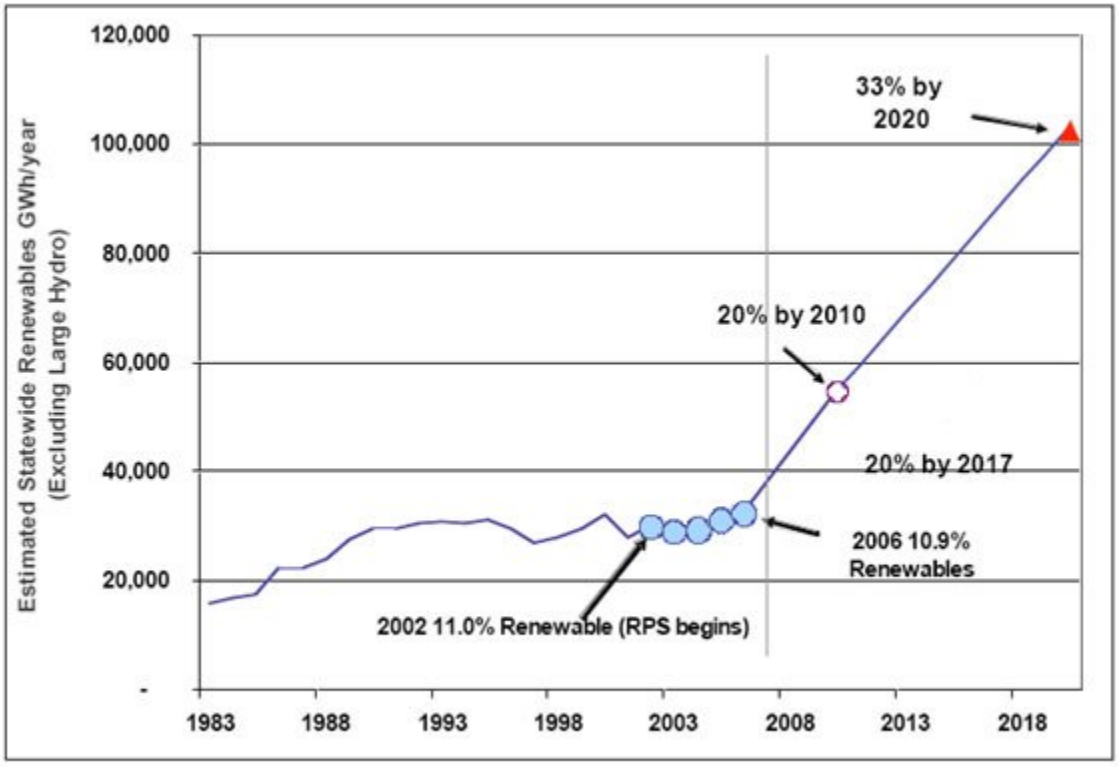
[35]Simmons, Matthew R., Another Nail in the Coffin in the Case Against Peak Oil, November 16, 2007. http://www.simmonsco-intl.com/files/Another%20Nail%20in%20the%20Coffin.pdf
[36]An active database of these is available at http://www.dsireusa.org/

Below are brief descriptions of the most important California clean energy laws and initiatives. (See the Appendix for more information on relevant federal and state policy).

The Renewable Portfolio Standard

Once considered the best renewable energy law in the nation, California's Renewable Portfolio Standard (RPS) became effective in 2003. The California Energy Commission (CEC) and Public Utilities Commission (CPUC) recently reset the Renewable Portfolio Standard goal to 20% by 2010, and hope to establish a goal of 33% by 2020.

As shown in Figure 1, little progress was made toward increasing the overall percentage of renewable energy in California's generation mix in the first four years of the RPS. Rapid development of renewable energy is needed to reach the 20% goal by 2010, which the CEC now concedes the state is "not on track" to achieve.[37]




Source: California Energy Commission, Gross System Power 1998–2005.[239]

**Figure 1: Progress towards meeting California's Renewable Portfolio Standard (RPS).**

While PG&E has announced investment in new renewable projects, it has also announced that it is unlikely to reach the 20% target by 2010, though it claims that it will reach that target two or three years later.

California Executive Order S-3-05

California Executive Order S-3-05 sets a long term greenhouse gas emission reduction

[37] California Energy Commission, 2007 Integrated Energy Policy Report, December 2007. Page 126.

target of 80% below 1990 levels by 2050.[38] Reaching this ambitious target will require that California embark on a comprehensive strategy to make aggressive reductions in greenhouse gas emissions over the next four decades.

California Solar Initiative

The California Solar Initiative commits a combined $3.2 billion in incentive funds for solar power over the next 11 years, to provide rebates for homeowners, businesses, farmers and government projects investing in rooftop solar PV panels. It aims to install 3,000 MW of solar power on buildings statewide.

In August 2006, the initiative was strengthened with the passage of SB1, the "Million Solar Roofs" law, which additionally requires solar panels to be a standard option on new homes, net metering, and municipal utilities to offer a solar program comparable to those of IOUs.[39]

While this is a laudable and bold initiative, it has weaknesses that must be overcome by additional policy measures mentioned in this report. For example, financing for solar roofs does not guarantee that they will remain installed and properly maintained, whereas incentives such as robust feed-in tariffs could help resolve this issue.

AB32 – Global Warming Solutions Act

The nation's most aggressive climate change law, AB32 rolls back greenhouse gas emissions to 1990 levels by 2020, representing a 25% reduction from today. This requires the elimination of 174 million metric tons of annual greenhouse gases by utilities, oil refineries, steel mills, and other heavy industries. Actual reductions will be required beginning in 2012.[40] The California Attorney General's office, led by Attorney General Jerry Brown, has recently begun selectively enforcing AB32 compliance in communities that adopt zoning or land use plans that do not take climate change impacts into account. The California Air Resources Board (ARB) has also begun adopting AB32 standards in its regulations and air quality guidelines.

SB 1037

Approved in September 2005, SB 1037 requires the CPUC to establish electricity efficiency savings targets based on an evaluation of all plausible cost-effective savings, and requires all utilities to meet their unmet resource needs first with energy efficiency and demand reduction resources that are cost-effective, reliable, and feasible.

**Neighboring Community Efforts**

East Bay efforts to increase local clean energy should be informed by the efforts in neighboring communities. This section covers initiatives by San Francisco and Marin.

[38]http://gov.ca.gov/executive-order/1861

[39]Environment California Fact Sheet. http://www.environmentcalifornia.org/energy/million-solar-roofs/fact-sheet

[40]Lifsher, Mark. Global Warming Plan Could Be Costly. Los Angeles Times. September 1, 2006

San Francisco Renewable Energy Initiatives

In 2001, the Sierra Club, Greenpeace and others campaigned to get San Francisco voters to overwhelmingly approve two municipal bond measures giving the city a large source of capital for renewable energy projects. Working with energy experts, the city has at last put together a detailed plan for a groundbreaking Community Choice Energy program that will create 360 megawatts of local clean energy and conservation, including the world's largest urban distributed solar network and 150 megawatts of new wind energy. The city will gain 100 new wind turbines and 15,500 new solar rooftops. Under its Community Choice Energy plan, 51% of San Francisco's electricity will come from clean, renewable sources by 2017.

San Francisco is also working out the details on a separate plan backed by Mayor Newsom to encourage more city residents and businesses to put solar panels on their roofs. Using funds generated by the sale of Hetch Hetchy power, the city would offer cash payments of between $3,000 and $10,000 to residents and businesses to "go solar." Then, city bond money would be used to finance the remaining installation costs, and customers could pay back the city over 20 years. The current language of the measure requires that applicants for the incentive program be eligible for a similar state program that is administered by PG&E and two other IOUs and is available only to their customers. City Assessor Phil Ting says he will make sure that the program is available to Community Choice customers in San Francisco as well (see the Appendix for more information on San Francisco's renewable energy programs).

Community Choice Energy in Marin

Marin County is moving ahead with Community Choice Energy plans, with 74% of Marin residents supporting the county becoming a provider of green energy in a recent poll.[41] The County recently collaborated with Navigant Consulting to create a detailed Community Choice Energy plan, which was released to the public on March 6, 2008. In October 2007, representatives of renewable-energy industries and financiers met and determined that Community Choice Energy in Marin and elsewhere will be able to purchase sufficient renewable energy to meet their customers' demands. Marin has adopted a "meet or beat" PG&E rate structure, but will also provide customers with the option of adding $5/month to their bill for 100% renewable energy ("light green" and "dark green" options).

According to Marin County officials, recent quotes from power suppliers indicate that a Marin Community Choice Energy program could procure at least 20% of its power from renewable sources from start-up in 2009 and achieve 51% renewable energy supply in about five years while remaining competitive with PG&E rates (see the Appendix for more information on Marin's plans).[42]

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[41] Godbe Research 2007. *2007 Resident Satisfaction Survey, Final Report Presented to the County of Marin December 17th, 2007.*

[42] Marin County. "Frequently Asked Questions about Community Choice Energy in Marin County." http://www.co.marin.ca.us/depts/CD/main/comdev/advance/sustainability/Energy/Community Choice Energy/Community Choice Energy.cfm, accessed 1/23/08.

**Local Context**

This section covers the local context within which East Bay efforts to forward local clean energy operate, including relevant policies and programs that may provide opportunities for collaboration, such as:

- Berkeley's Climate Action Plan
- Economic Development and Green Jobs
- Oakland's Growing Commitment to "Green-Collar" Jobs
- East Bay Green Corridor Partnership

Berkeley's Climate Action Plan

The city of Berkeley is particularly aggressive with respect to reducing carbon emissions. In November 2006, 81% of Berkeley residents voted in support of ballot Measure G, which sets a goal of reducing greenhouse gas emissions in Berkeley 80% by 2050, and empowers the mayor to develop a community-based climate action plan. The draft Climate Action Plan was released in January 2008 and consists of policies and projects that, when implemented, will put Berkeley on the path of achieving its emissions reduction target.[43] The draft report included Community Choice Energy as an option to boost renewable energy, thereby reducing greenhouse gas emissions in Berkeley.

Economic Development and Green Jobs

Cities throughout the East Bay have recognized the economic development and jobs creation potential of clean, renewable energy technologies and industries (see "East Bay Green Corridor Partnership" section). Compared to traditional fossil fuels, the renewable energy sector is relatively labor-intensive, requiring a larger number and wider variety of jobs in areas ranging from manufacturing, construction, and installation to ongoing operation and maintenance.

According to an analysis of 13 independent reports and studies of the clean energy industry by UC Berkeley's Renewable and Appropriate Energy Laboratory (RAEL), renewable energy technologies create more jobs per average megawatt (MW) of power generated, and per dollar invested in construction, manufacturing, and installation when compared to coal or natural gas.[44]

The California Energy Commission's Public Interest Energy Research program recently sponsored a study of the job creation potential of various forms of renewable energy development, and forecasted construction employment rates of 2.57 jobs per MW for wind and 7.14 jobs per MW for solar PV systems.[45] Based on the estimate for solar,

[43]Draft Climate Action Plan, City of Berkeley, January 2008.

[44]Daniel Kammen, Kamal Kapadia, and Matthias Fripp, "Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Create?" UC Berkeley: Renewable and Appropriate Energy Laboratory (RAEL), April 2004 (updated January 2006), 12, http://rael.berkeley.edu/files/2004/Kammen-Renewable-Jobs-2004.pdf

[45]Brad Heavner and Bernadette Del Chiaro, Renewable Energy and Jobs, Environment California Research and Policy Center, 2003,

meeting 50% of the demand of Oakland's commercial building sector alone would create 982 new jobs – a significant step toward achieving Mayor Ron Dellums' stated goal of creating 10,000 jobs for Oakland residents.[46]

By creating local demand for renewable energy, the programs advocated by the Local Clean Energy Alliance can spur employment, or in the case of Community Choice Energy, directly employ some of the graduates of the "Oakland Green Collar Jobs Corps" program.

Oakland's Growing Commitment to "Green-Collar" Jobs

Under the leadership of Mayor Ron Dellums, Oakland has become known for its growing commitment to "green-collar" jobs for local residents, especially those who have been left out of growing green sectors. At the 2007 U.S. Conference of Mayors in Seattle, Dellums urged the mayors to tackle the "unfinished business of America": reducing poverty and violence by investing in job-producing infrastructure and economic development that fights climate change. "While the City of Oakland has made significant strides towards climate protection, we are also facing the tough issues of poverty, crime and education," Dellums stated. "We have to find ways to further green the city, while working to turn the tide of the undereducated and underemployed" [47]

In June 2007, the Oakland City Council voted unanimously to invest $250,000 in the city's first "Green Jobs Corps," a complete job training pathway into green careers for Oakland residents with barriers to employment. Beginning in 2008, it will provide young adults with job training, support, and hands-on work experience so that they can pursue opportunities in the new energy economy.[48] Spearheaded by the Oakland Apollo Alliance and co-convened by the Ella Baker Center for Human Rights and the International Brotherhood of Electrical Workers Local 595, the Corps will offer participants three months of job readiness training, followed by six-month paid internships at local renewable energy, energy efficiency, and green construction firms.

East Bay Green Corridor Partnership

The cities of Oakland, Berkeley, Emeryville, Richmond, as well as UC Berkeley and the Lawrence Berkeley National Lab launched a regional collaboration known as the "East Bay Green Corridor Partnership" in December 2007. According to UC Berkeley Chancellor Robert Birgeneau, the goal of the partnership is to establish the region as "one

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http://www.environmentcalifornia.org/uploads/OW/aa/OWaa2RaedlfHwQOWbxKd5w/Renewable_Energy_and_Jobs.pdf

[46]City of Oakland, 2006. *Energy Efficiency Action Plan: An Element of the Sustainable Economic Development Strategy* p. 12, http://www.caleep.com/docs/pilots/oakland/Oakland-EEAP.pdf. Calculation of the number of jobs created through solar projects that would cumulatively meet 50% of Oakland's commercial sector summer electricity demand of 275 MW: (275 MW * .5) * 7.14 jobs/MW = 982

[47]Debra DeHaney-Howard, 2007. "'Green Collar Jobs'" Featured Topic at Summit's Opening Session," U.S. Conference of Mayors, November 19, 2007.
http://www.usmayors.org/uscm/us_mayor_newspaper/documents/11_19_07/pg5_green_jobs.asp

[48]Ron Leuty, "Oakland Plugs into Clean Tech as Job Generator," *San Francisco Business Times*, June 22, 2007.
http://sanfrancisco.bizjournals.com/sanfrancisco/stories/2007/06/25/story6.html

of the world's leading centers" of environmental innovation, alternative-energy research, and green industry.[49]

Toward that end, the mayors intend to combine their clout to secure federal funds and incentives for green businesses to locate in the East Bay and to train the next generation of workers for emerging green sectors. Signatories also agreed to hold an annual green economic summit; convene quarterly meetings of their economic development, workforce development, and technology-transfer offices; and coordinate a regional green job training and placement effort.

With regional commitment to green economic and workforce development growing, the time is ripe for East Bay municipalities to ramp up their local clean energy goals. Incentives to attract green industry and implement training programs would be well-complemented by a set of aggressive renewable energy development targets that these cities have within their power to achieve (see "Policies and Programs" section). Since the partnership is still a nascent effort, there may be opportunities to incorporate a range of clean energy incentives and programs that would help fulfill its admirable objective of making the East Bay the "Silicon Valley of the green economy." One factor that could limit the opportunities is that the partnership is an added responsibility for already stretched-thin staffers.

## Clean Air in Our Communities

In addition to electrifying the transit network and concentrating development around transit hubs, building a clean energy grid is key for ensuring that all East Bay communities have clean air. [50] The Local Clean Energy Alliance of the East Bay is committed to shaping a regional energy system that provides affordable electricity and business and job opportunities to all area residents while increasing the environmental quality of our communities. We believe that both the benefits and risks of our energy system should be shared equally among all residents of our region.

### The Alliance Opposes Additional Natural Gas and Nuclear Power in California

The Alliance opposes the siting of any additional natural gas and nuclear power plants in California due to the disproportionate health risks to low-income communities and communities of color located nearby. The vision of the Local Clean Energy Alliance of the East Bay is to push vigorously for increased efficiency and renewable energy to reduce California residents' total exposure to pollutants from electricity generation,

[49]Cathy Cockrell, "East Bay Announces its 'Green Corridor' Ambitions," UC Berkeley News, December 4, 2007. http://www.berkeley.edu/news/media/releases/2007/12/04_green.shtml

[50] Electrified transport would significanlty reduce air pollutants that cause asthma, bronchitis, cognitive problems in children and cancer in low-income communities of color. The cost to our economy is in the billions of dollars from missed school and work days, hospital bills, etc. Diesel exhaust from trucks and buses causes cancer and contributes to 70% of the elevated cancer risk in West Oakland (see the West Oakland Health Risk Assessment, California Air Resources Board). The health impacts due to transportation emissions are concetrated in West Oakland, East Oakland, and the I-800 corridor.

especially in low-income communities and communities of color which bear a disproportionate burden of this pollution and suffer health impacts from this pollution.

For example, CalPine and Terra Energy corporations are working to site two new natural gas power plants in Hayward, which would sell electricity to PG&E. According to the *Oakland Tribune*, the gas-fired plant would churn out more pollution than regulators consider acceptable, and the California Energy Commission would require the companies to buy industrial pollution credits from other companies or shut down polluting power plants elsewhere. Hayward residents are concerned that this credit trading system will not protect air quality in their neighborhoods. "The air quality logic that the commission uses is really a house of cards," quoted Hayward mayor Mike Sweeney in the *Tribune*. "It rests on the assumption that these paper mitigations will somehow make air quality better in the Hayward area."[51]

**Ensuring Benefits are Equally Distributed**

Public sector investment in renewable energy generation, co-generation, and energy efficiency can help stimulate our economy by providing business and job opportunities to local residents. Resulting contract opportunities need to be fully accessible to all East Bay businesses, including minority-owned businesses. The Greenlining Institute's 2003 Supplier Diversity Report Card found that only 10.9% of PG&E's contracts were with minority-owned businesses – far below Greenlining's goal of 25% – leading to a call for greater transparency and more equitable outcomes in awarding contracts.[52] Public sector investments offer the opportunity for greater citizen oversight over subcontracting procedures, which may result in more business opportunities for minority-owned businesses as well as local hire/contract policies and workforce development programs.

As mentioned in the energy efficiency section of this paper, utility companies are currently authorized by the CPUC to charge a fee on electricity bills and spend this money on behalf of the "public good." If these funds are re-invested locally, either under a Community Choice Energy program or otherwise, local cities could provide more opportunities for local contractors and minority-owned businesses.

Especially in the context of today's troubled economy, it's important that electrical service be accessible and affordable for all East Bay households. Alameda Power and Telecom provides an example of the public sector successfully administering programs that both distribute public goods and keep energy affordable for low-income households. See the Appendix for descriptions of Alameda's EAS (Energy Assistance Program) and EASE (Energy Assistance through Supportive Efforts) programs. In addition to helping financially challenged customers, both programs enable Alameda Power & Telecom to meet state mandates for expenditures of "Public Purpose" funds.

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**51** *Hayward mayor questions fairness of power plants.* Oakland Tribune, Sept 6, 2007 by Matt O'Brien.

52 *Greenlining's Annual Report Card on Supplier Diversity*, Greenlining Institute, Berkeley, CA.

As mentioned in the "Community Choice Energy" section, the Local Clean Energy Alliance advocates the establishment of a community advisory committee consisting of community leaders and local experts to provide oversight for Community Choice implementation and administration. The purpose of the committee would be to ensure that the implementation of Community Choice Energy in the East Bay is equitable and to provide a venue to address community concerns.

## Public Power Delivers Renewable Electricity at Lower Cost

Public power utilities in the Bay Area, including Alameda Power and Telecom (AP&T), Palo Alto Utilities, and Silicon Valley Power, are able to provide more renewable energy at lower rates than PG&E. AP&T's power mix already includes 57% renewable (41% geothermal, 9% biomass & waste, and 6% wind). The remaining balance is 28% large hydropower, 8% coal, and 7% natural gas. The Palo Alto Green program offers a California blend of 97.5% wind and 2.5% solar generation at an additional cost averaging less than $10 per month.[53] Silicon Valley Power's Santa Clara Green Power offers energy from wind and solar projects in Northern and Southern California for an additional $0.015 per kilowatt-hour. The table below summarizes the price differences between rates offered by these utilities and PG&E.

**Table 1. Comparison of Business Rates for PG&E, Alameda Power & Telecom, and Palo Alto Utilities**

| Basic commercial service | Energy Charge ($/kWh) | | | PG&E costs more |
|---|---|---|---|---|
| | Average | Summer | Winter | |
| Alameda Power & Telecom | $0.13634 | NA | NA | 22% |
| Palo Alto Small Commercial | NA | 0.11193 | 0.10091 | > 48% |
| Palo Alto Small Commercial Green | NA | 0.12693 | 0.11591 | > 31% |
| PG&E | 0.16594 | 0.18264 | 0.12941 | 0% |
| Sacramento Municipal Utility District | NA | 0.1117 | 0.1081 | > 19% |
| Silicon Valley Power (first 800 kWh) | 0.12836 | NA | NA | 29% |
| Santa Clara Green Power (first 800 kWh) | 0.14236 | NA | NA | 17% |

The state of California agrees that electricity from public power is cheaper than that from utility companies. According to the California Energy Commission, the levelized costs[54] for electricity generation is usually less for publicly owned utilities (POUs) than utility companies and some renewable technologies (such as wind, small scale hydro) are less expensive for POUs than natural gas generation is for investor owned utilities (IOUs).[55] As shown in Table 2, the POU cost of wind power at 6.14 cents per kWh is 9% lower

[53] 97.5% wind power does not actually mean that 97.5% of the electrons used by that specific household come from wind. The utility simply buys the amount of extra wind power for their 100% renewable customers, which then gets put into their local grid, to be used by nearby customers.
[54] The present value of the total cost of building and operating a generating plant over its economic life, converted to equal annual payments in real dollars (adjusted to remove the impact of inflation).
[55] http://www.energy.ca.gov/electricity/levelized_costs.html

than the IOU cost of wind generation and 35% lower than the IOU cost of conventional combined cycle generation.

| Table 2: Rate Differences Between Publicly and Investor Owned Utilties | | | |
|---|---|---|---|
| | | Levelized Cost of Electricity Generation (Cents per kWh – 2007 Nominal Dollars) | |
| Technology | Size (MW) | Investor Owned Utility (IOU) | Publicly Owned Utility (POU) |
| Conventional Combined Cycle (CC) | 500 | 9.45 | 8.68 |
| Hydro Small Scale | 10 | 11.81 | 8.71 |
| Solar Photovoltaic (Single Axis) | 1 | 69.56 | 46.89 |
| Wind Class 5 | 50 | 6.72 | 6.14 |

Current trends, both environmentally and economically, underscore the importance for our cities to localize power production, and to take control of power purchasing.

## The Costs of Inaction

The costs of inaction — failing to replace fossil fuel sources with renewable energy – include the potential for energy price shocks and unstable electricity rates in the future. Many Californians recall the California Energy Crisis of 2000 and 2001 as a time of rolling blackouts and soaring utility bills. The crisis was caused by the manipulation of the recently deregulated California electricity market by companies like Enron and Reliant. Community Choice (AB117) was passed to enable cities and counties to insulate themselves from the price and supply vulnerabilities inherent in being dependent on IOUs. While California has not seen the sorts of price and supply shocks that occurred at the turn of the century, there are two trends that cities should take note of as they consider their options.

The first trend is that natural gas, which we rely on to produce about 44% of our electricity supply, is subject to price spikes. According to a study conducted by the attorneys general of four midwestern states, complex trading schemes by energy companies and hedge funds played a large role in natural gas price spikes in the winter of 2005 and 2006. Iowa Attorney General Tom Miller stated, "We are finding that natural gas markets may be vulnerable to abuse and volatility, and yet the markets in which wholesale natural gas prices are set are very lightly regulated, and they lack transparency."[56] California faces similar marketplace issues, and may be subject to the same type of spikes in the price of natural gas, especially after North American supply passes its peak.

[56]Attorney General's Report: Market Fundamental Can't Account for Huge Increase in Natural Gas. Press release and report available at http://www.iowa.gov/government/ag/latest_news/releases/mar_2006/Natural_Gas.html

The second trend is that the costs of the fossil fuels that PG&E is currently using to generate electricity are expected to rise dramatically while those of renewable sources are expected to drop. As shown in Table 2 above, the price of wind power is already lower than natural gas and small-scale hydro is lower if owned by a publicly owned utility. Sooner or later, depending on a variety of factors, the price of even the more expensive renewable energy technologies such as solar PVs will drop below that of fossil fuel electricity. This trend of renewable energy becoming more price-competitive could be quickened when natural gas demand starts to outstrip supply, or when fossil fuel burning power plants are forced to pay for their emissions.

As shown in Table 3, the UC Santa Barbara Economic Forecast Project projected that the cost of electricity generated by nuclear, coal, and natural gas will rise considerably between now and 2030, while the rates for renewable sources will fall.[57] The rising cost of natural gas electricity will be compounded if California becomes dependent on Liquefied Natural Gas (LNG) from overseas, as the cost of LNG is rising due to cost overruns and increased international competition resulting from diminishing domestic supplies.[58]

Using these estimates, the Community Environmental Council found that switching to 100% renewable power will provide Santa Barbara County residents with significant cost savings. In the "business as usual" scenario (in which current price trends continue), switching to a 100% renewable power system would save residents about $830 annually in 2020 and $3,015 annually in 2030. In a "low fossil fuel cost" scenario, switching to a 100% renewable power system would save residents about $389 per person annually in 2020 and $1,487 per person in 2030. Even in a low fossil fuel price future, switching to renewable power still makes fiscal sense.[59]

[57] A New Energy Direction: Bold Local Solutions to a Global Problem, A Blueprint for Santa Barbara County, Community Environmental Council, Oct 30, 2007. http://www.communityenvironmentalcouncil.org/EnergyBlueprint/CompleteBlueprint.pdf

[58] If regulators are watchful in their implementation of SB1368, LNG users will somehow be made to account for the significant energy and emissions associated with cooling and liquefying the gas. If this is accounted for in California's GHG regulations (or future national regulations), it will further increase the cost of LNG use.

[59] A New Energy Direction: Bold Local Solutions to a Global Problem, A Blueprint for Santa Barbara County, Community Environmental Council, Oct 30, 2007. http://www.communityenvironmentalcouncil.org/EnergyBlueprint/CompleteBlueprint.pdf

**Table 3: Projected costs by energy source from 2007 – 2030 (cents per kWh).**

| Technology | Cost in 2007 | Cost in 2020 | Cost in 2030 |
|---|---|---|---|
| Biomass (landfill gas) | 4.4 | 4.4 | 4.4 |
| Geothermal | 6.6 | 5.5 | 4.5 |
| Wind (class 5) | 6.6 | 6 | 6 |
| Advanced nuclear | 7.4 | 9.3 | 11.4 |
| Baseload natural gas (combined cycle) | 9.4 | 13.22 | 17.66 |
| Coal w/ gasification | 9.6 | 10.9 | 12.1 |
| Biomass gasification | 10.7 | 7.0 | 6.0 |
| Small hydro | 11.95 | 11.95 | 11.95 |
| Concentrating solar (PV) | 18.6 | 9.01 | 6.92 |
| Concentrating solar (parabolic trough) | 21.9 | 10.6 | 8.15 |
| Solar PV | 39.6 | 9.38 | 7.21 |
| Peak natural gas (simple cycle) | 46.0 | 52.63 | 59.77 |

Source: Community Environmental Council, "Santa Barbara County Renewable Energy Blueprint"

# Conclusion

The East Bay has enormous potential for energy conservation and renewable energy. This potential can be unleashed by appropriate policies that support the purchase and installation of large amounts of renewable energy, while encouraging energy conservation. The economic risks of not making this transition are immense, because of the rising costs of fossil fuel and nuclear energy.

Many options are available to East Bay cities for developing a clean energy grid, some of which are already underway. The Local Clean Energy Alliance has identified the following portfolio of tools as the most effective mechanisms for increasing local clean energy generation and energy efficiency in our region:

- Community Choice Energy
- Energy Efficiency Programs
- Feed-in Tariffs
- Sustainable Energy Financing Districts
- Community Purchasing Programs

Overall, Community Choice Energy appears to be most the most effective. Other policy tools that appear to be effective and mutually reinforcing are feed-in tariffs, Sustainable Energy Financing Districts, and community purchasing programs. Community Choice Energy opens doors to implement all of the other programs in an effective and cost-efficient manner.

Community Choice Energy and the other policy tools can be supported and reinforced by the following additional mechanisms that can assist cities and regions in meeting local clean energy goals:

- Local Renewable Resources
- Statewide Renewable Power Supply
- Distributed Generation
- Co-generation
- Project Labor Agreements

California's cities are in a very favorable political climate for programs and laws that reduce greenhouse gases and promote the development of clean energy solutions. California has more than 75 such laws and incentive programs, which range from sweeping statewide laws impacting the major utility companies like PG&E to city- and county-wide incentive programs. The California programs supplement the relatively weak federal incentives for renewables and efficiency, which mainly focus on tax credits, tax exemptions, and tribal energy loans.

Neighboring efforts in San Francisco and Marin Counties are well aligned with the strategies outlined above. The local East Bay context includes several relevant policies and programs that may provide opportunities for collaboration including:

- Berkeley's Climate Action Plan
- Economic Development and Green Jobs
- Oakland's Growing Commitment to "Green-Collar" Jobs
- East Bay Green Corridor Partnership

While California is not at this time experiencing the kind of price and supply shocks that occurred at the turn of the century, East Bay cities should be very wary of remaining

dependent on fossil fuel electricity. The costs of the fossil fuels that PG&E is currently using to generate electricity are expected to rise dramatically while those of renewable sources are leveling out or continuing to drop. Sooner or later, depending on the specific technology, the prices of most renewable energy sources will fall below the price of fossil fuel electricity, as they already have for wind power and geothermal. The point at which other renewable energy sources become price-competitive with fossil fuel-based electricity will occur sooner if natural gas and oil demand exceed supply or fossil fuel generation is forced to pay for its greenhouse gas emissions.

Recognizing that renewable energy is cost effective now and that transitioning the energy grid will take decades, the Local Clean Energy Alliance strongly advocates that the East Bay immediately begin developing and building programs that support the local generation and use of clean, renewable energy and energy efficiency.