
# Appendix: The 21st Century Energy Greenprint for the East Bay

**April 2008**

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# Raising Capital for Clean Energy Programs

The goal of transitioning to a green energy grid will in all likelihood save East Bay cities money in the long run. But many of these projects require significant start-up capital which many cities and residents don't have available. Fortunately, East Bay cities have a range of options for ways to raise capital for energy efficiency and renewable energy projects.[1]

Bond Financing

Cities can leverage their good bond ratings to get financing at rates lower than that offered to investor owned power utilities (IOUs), and as such will generate cost savings opportunities that could result in cheaper bills for ratepayers. The benefits of public financing are significant. According to Navigant's Berkeley Feasibility Study, during the first year of generation plant operation, the city using low-cost bond financing can produce energy at a cost that is nearly 40% lower than what an investor owned utility would incur if it owned the identical resource.[2]

Public bonds take many forms, but the most common are revenue bonds and general obligation bonds. These bonds are sold to individuals, investors, pension funds and corporations who provide up-front investment money in exchange for a guaranteed rate of return on that investment. Issuing bonds allows governments to fund or loan out money for large-scale renewable and efficient energy projects without raising taxes. Revenue bonds are public bonds that incorporate a specific payback mechanism into their design. Often they are paid off through fees or income generated through the project funded without any actual outlay of city funds. To provide an example, San Francisco's approved Community Choice Energy plan is funded through $100 million in revenue bonds, approved by the voters via ballot in 2004 with repayment being integrated into ratepayers electric bills over 15-20 years ensuring no significant rate increase.

General obligation bonds are bonds without a specific payback mechanism. These bonds leverage a city's credit rating to secure low-interest financing for public projects and are paid off over time through tax revenues.

Pension Funds

Cities can invest a small percent of their city employees' pension funds in efficiency and renewable projects with good returns — often better returns than these funds would get from the stock market. One emerging approach is investing pension money into energy efficiency and renewable energy programs for government-owned infrastructure. Energy savings resulting from these infrastructure upgrades are then used to repay the capital costs of the programs, plus an investment fee to the pension funds. Once the program has been paid off, the state receives revenue in the form of decreased energy costs.

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[1] Apollo Strategy Center, New Energy: Energy Saving and Job Creation Policies for Local Governments, Apollo Alliance, p. 42–45, 2006.

[2] Community Choice Energy Base Case Feasibility Evaluation City of Berkeley (Navigant Consulting, April 2005) P. 4.

The only existing pension fund investment in clean energy is at the state level: California's Green Wave program. The program directs California's two largest pension funds, the California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRS) to invest roughly $1.5 billion into the clean energy industry, including $200 million in investments for Real Estate audits and energy efficiency retrofitting. These investments should save an estimated $40 million dollars annually in the aggregate, equating to an Internal Rate of Return (IRR) of 14% which equates to a 5-year payback.

Energy Savings Performance Contracts

Energy Savings Performance Contracts enable governments, industrial firms and property managers to contract with companies specializing in energy efficiency, called Energy Service Companies (ESCO). ESCOs provide customers with detailed assessments of guaranteed energy savings. ESCOs then perform the efficiency retrofits requiring no up-front costs and assuming all risks; they recoup these costs through energy savings. If energy savings goals fall short, the ESCO will provide the customer with a check for the difference, although savings typically exceed projected amounts within two to ten years.

## Community Purchasing Programs

Community purchasing programs are a mechanism for aggregating a community's purchases of solar photovoltaics and thermal arrays. By pooling their purchasing dollars and buying in bulk, people can save 20% or more on their installation. In this arrangement, individuals own their solar arrays. 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 when the time value of money is taken into account.

Solar City - a solar installation company – was the first in the U.S. to implement community purchase programs whereby homeowners get volume discounts when their neighborhoods go solar and continues to use this as their primary business model. In October 2006, Solar City aggregated a Portola Valley neighborhood's purchasing power to receive bulk purchase discounts on a total of 343kW of photovoltaics. The threshold for receiving the bulk discount was 175kW. The solar panels were installed on 78 homes within four months with an average residential installation of 4.3kW. The savings for the community aggregating their orders was 20-30% per array installed. After the bulk discounts as well as the CSI incentives and Federal tax credits, the fully amortized monthly cost of these installed systems is less than their previous utility bills. Such programs can be controversial since the "discounts" are being offered by one company in a non-competitive bid situation.

Recently, a neighborhood group - the Downtown San Jose Solar Project - banded together to purchase solar in bulk and find their own solar installer through a competitive bidding situation. They put their collective requirements for three solar systems out to bid by several solar companies to get the best price, quality, etc. As of February 20, 2008, the

project includes 24 San Jose homes producing 99kW of electricity. The 24 systems in San Jose will produce 3,560,000 kWh over the systems' lifetime and will eliminate, according to today's current fuel mix, about 5,055,861 pounds of carbon dioxide. The community group wants to see this program spread across the Bay Area and hopes the training will inspire people interested in setting up their own community discount programs.

Eight people from San Jose's District 3 have been working consistently outside of the regular jobs for 3-4 months. The first thing they did was contact their city council person. The District 3 council member Sam Liccardo was very supportive from the start. His staff arranged meeting logistics and a designated staffer attended all the group's meetings. The meetings were mostly promoted through email lists including the Liccardo's e-newsletter and several articles in local media.

The largest amount of the group's effort - about 3 and a half months - was selecting a vendor among those that bid upon the job to install solar voltaics on the first three homes in the project. Following the lead of Marni Kamzam, who writes RFPs for living, they put together an extensive RFP with weighted attributes (e.g., cost is important and therefore rates 5 on a scale from 1-5). Kent Haliburton of REC Solar, the eventual winner of the installation work, said the community group's RFP was as extensive and professional as any commercial job.

The individuals in the group had the choice of buying their solar system outright or signing onto residential Power Purchase Agreement (PPA) whereby a financing company purchases the equipment, monitors and maintains it, and sells the customer the electricity generated. 75% of the Downtown San Jose Solar Project customers have chosen a residential PPA model from a private solar company called Sun Run, specialists in financing and tax structuring.

Sun Run offers a residential PPA that can be used in cooperative purchasing agreements. It reduces the upfront cost of solar by half and fixes the cost of electricity produced by the panels at a cheaper rate than the customers would pay currently from 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 baseline from PG&E at this time. Other companies are scrambling to build this business model (which is very complicated on the backend) and there will be competition in this arena within the next 12-18 months.

Sun Run is able to offer a lower overall price with less money upfront than the householder could get on their own because businesses receive the full 30% federal solar tax credit whereas homeowners are capped at $2000 and those that file the Alternative Minimum Tax can't participate at all. To increase their margins, Sun Run accelerates the depreciation of the system and does additional proprietary financial wizardry.

After the group selected REC Solar as the installer with the Sun Run residential PPA as a financing option, the group started a 60 day period for District 3 residents to sign up.

They deliberated on whether to allow residents from outside District 3 to participate. In the end, they did not market the program outside the District and handled requests from outside the District on a case by case basis.

This effort provides a good model for organizing cooperative buying of solar photovoltaics in the neighborhood context. From the example numbers provided by Sun Run, participants got a "community discount" on average of about $2000 or 10%. It appears that the process is relatively pain free and short (60 days or less) if you already have the installation partner selected.

## East Lake Neighborhood Energy Analysis

**These are the assumptions and figures used to calculate the solar photovoltaic potential for Berkeley, Oakland, and Emeryville.**
Projected Oakland annual load (2006) = 1,940,218,087 kwh[3]
Projected Berkeley annual load (2006) = 526,287,039 kwh[4]
Projected Emeryville annual load (2006) = 205,696,487 kwh[5]
Projected Total annual load (2006) = 2,672,201,613 kwh

East Lake size (miles$^2$) = ¼
Oakland land area (miles$^2$) = 56.1
Berkeley land area (miles$^2$) = 10.5
Emeryville land area (miles$^2$) = 1.2
Total land area = 67.8

East Lake generating capacity (MW) = 8.5
Annual East Lake electricity generation = 11,609,024 kwh [6]
Annual total generation = 1,889,020,385kwh (scaled to account for land area at 60% relative productivity)

Total generating capacity = 1,354 MW (scaled to account for land area at 60% relative productivity)

Percent of annual total electricity generation supplied by solar = 70% (scaled to account for population density at 60% productivity of East lake)

## Feed in Tariffs

One of the main mechanisms to encourage green businesses and individuals to invest in renewable energy facilities is to offer "feed-in tariffs" (or simply, "feed-in tariffs.") With

[3] Community Choice Aggregation, Base Case Feasibility Evaluation, City of Oakland, March 2005.
[4] Community Choice Aggregation, Base Case Feasibility Evaluation, City of Berkeley, March 2005.
[5] Community Choice Aggregation, Base Case Feasibility Evaluation, City of Emeryville, March 2005.
[6] Bay Localize, Design Community and Environment, and Holmes Culley. 2007. *Tapping the Potential of Urban Rooftops*. To download a free copy see www.baylocalize.org.

a feed-in tariff, 100% of a system's production is "fed into the grid" and purchased by mandate by a utility. In contrast, the current "net metering" law until recently did not compensate for excess energy supplied to the grid.[7] Neither did it mandate that the utility purchase excess generated electricity. This has led most Californians to size their solar systems so that they are not providing excess electricity. It is hoped that a feed-in tariff will encourage property owners to maximize their renewable energy production and increase the amount of renewable energy in the energy mix overall. This would also help towards accomplishing the goals set forth by AB32 of reducing GHG emissions by 80%.

The need for a feed-in tariff is not limited to the East Bay. For instance, the 2007 California Electricity Commission Report recommends that excess solar generation delivered to the grid should be compensated through a statewide feed-in tariff. The price paid for each kWh delivered to the grid should be based on the "RPS market price referent that includes 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[8].

When designed effectively, Feed-in Tariffs are proven to:

- Reduce CO2 emissions by replacing fossil fuel-based power production with clean, renewable sources of energy
- Create jobs - for example, the German renewables industry employs around 234,000 people, almost 60% of which were employed as a direct result of the German feed-in tariffs law encouraging investment in renewable energy.
- Help secure domestic energy supply - enabling California to stop relying on imported fossil fuels
- Guarantee investment security for renewable energy investors
- Drive technological innovation, and
- Provide fair market conditions for renewables that without this system, could not compete with heavily subsidized conventional energy.

<u>Without a Feed in Tariff, Renewable Energy Generation is Dominated by Large Investors</u>

California has seen an increase in the amount of renewable energy generated since the 2001 energy crisis. However, it appears the biggest part of this increase is occurring because of capital investments made by large, well-financed investors (such as companies like BrightSource Energy of Oakland, Ausra of Silicon Valley and Solel of Israel.) For small business and homeowners, on the other hand, a large (> 50 KW) solar array or wind turbine is out of reach because of such systems are expensive, and, without a Feed in Tariff, there is no compensation for excess power. In Berkeley, for instance, the average price for a home solar array - which produces on average 4-5 kWh of electricity per day[9]

[7] Tom Kelly, Kyoto USA: Just to be clear: the utility pays you for the **value** of the electricity you produce and charges you the **value** of the electricity you use. Because of varying time-of-day adjustments to the value of electricity, it is possible to use more electricity than you produce, and still break even under net metering.

[8] California Electricity Commission Report 2007, p.198

[9] http://parents.berkeley.edu/recommend/home/solarpower.html

- costs between $15,000 and $20,000. The average monthly savings may only amount to $30-50. So, from a purely financial perspective, it can take anywhere from 10-20 years for the initial investment to pay off. Although it is true that financial incentives are not the only reasons people invest in renewable energy, the average small-scale investor will not be as eager to cover their roofs with solar panels, or invest in a wind turbine, given this reality.

With the "business as usual" approach, then, the renewable energy market will likely become dominated by large investors, who in turn favor large-scale facilities – for instance, huge solar collectors in the Mojave Desert. Despite the cost advantages of large renewable energy facilities such as these, the scenario of "energy in the desert" will be accompanied by certain undesirable side effects, for instance:

- Renewable energy sources will be far removed from the end-users
- More power is lost through transmission (it is estimated that approximately 9% of transmitted power is lost due to "line loss"[10])
- Desert wilderness areas may be degraded by a sea of power lines.

With a certain amount of tweaking by an effect feed-in tariffs law, however, the small-scale investor can be more actively encouraged to invest in "green energy."

How an Effective Feed-in Tariff *Can* Encourage Small Scale Generation

A more effective feed-in tariff system should provide more incentives for the ***local*** homeowner, business owner or commercial property owner to consider investing in renewable energy systems. Such a tariff would need to be structured to promote "distributed generation" – that is, generation of electricity on a smaller, more distributed, scale. The idea is that many individual property owners could combine their smaller generation capability to form a "grid" capable to supplying electricity for the entire community. To make such a scenario possible, a Feed-in Tariff would need to include:

- **A guaranteed payment period not less than 15 years**. Experience has shown that tariffs (or prices) should be guaranteed for a reasonably long period of time, not less than 15 years[11]. Otherwise, investment security is hampered. As a rule of thumb, the tariff (or price) should be paid for 20 years, since this period converges with the average life-time of many renewable electricity plants and long-term loans commonly cover this time period.
- **Payment rates that decrease over time.** Borrowing from the European feed-in tariffs laws, a feed-in tariffs designed for the California / East bay market should feature a "step down" effect. That means, that for every year, the rate paid for solar electricity – assuming it is more than the market price referent – should be lowered by a fixed annual percent (in Germany it is approximately 5% decrease per year). This will encourage innovation and a lowering of the generation cost for the particular kind of renewable energy being subsidized by the feed-in tariffs.
- **Payment rates specific to the technology being used**. Fossil-based fuel sources are currently priced cheaper than the cheapest renewable energy eligible for RPS

[10] Robert Freehling, Localpower.org
[11] Policy Action on Climate Toolkit (PACT) - onlinepact.org. See "Financial and Economic Measures."

– generally acknowledged to be wind power. Therefore, an effective rate of payment for wind, which compensates the producer for his / her investment, should be geared to this level. Solar / PV installations are estimated to cost approximately twice as much as wind. Paying producers the same feed-in tariffs rate for wind power vs. PV / solar will result in fewer small-scale solar installations being built.

- **Guaranteed access to the grid**. This means energy companies are obliged to "hook up" producers to the grid, and then also are obliged to buy the renewable energy produced (thus allowing RPS producers to "feed-in" to the electricity grid). Exceptions may be considered, for instance in cases of extreme wind events, where wind turbines suddenly produce energy at 100% capacity instead of the average capacity utilization of 17-20%[12].
- **An incentive to build on sites with good renewable resources.** Such an incentive may be created, for instance, when the renewable energy producer is charged for grid access (the cost of equipment to connect his / her facility to the grid). Under this scenario, a producer will try to locate their facility near the existing grid, except in cases where the renewable energy is so abundant that the cost associated with longer distance hook-up to the grid, will be outweighed by the profit of producing the renewable energy[13].
- **An effective method of cost sharing**. Costs of hook-up to the grid, maintaining the grid, subsidizing renewable energy investment, and purchasing the RPS energy must be shared among utilities, producers and consumers in such a way that all parties can continue to participate in a system that favors increased investment in renewable sources and ensures that low income residents are not compensating for the solar electric systems of more affluent people.

European Experience with Feed-in Tariffs

In Europe, feed-in tariffs typically offer a fixed, long-term price for renewable energy based on specific technologies. In a number of European countries, the tariff levels are set to cover the cost of each eligible renewable technology plus a profit. The tariff can be designed to favor early actors, with generators coming on line in later years receiving a lower price. The tariff also can be varied by technology. Germany's tariffs are designed to favor both early actors and specific technologies. This approach has benefits compared to California's ad hoc contract-by-contract subsidy decisions. However, Germany's costs are shared among all customers, who pay a higher price for electricity than we do so that their solar and wind industries can be subsidized.

Arguments Against Replicating the European System

[12] According to a March, 2004 report in the German magazine *Der Spiegel*, the average wind turbine in Germany produces electricity at 17% capacity. In cases of extreme weather events, for instance North Sea Storms, it has been necessary for the electric utilities to temporarily shut wind turbines off the grid.
[13] From Policy Action of Climate Toolkit (PACT) - onlinepact.org. See "Ensuring connection to the grid."

The two chief arguments we have heard against trying to replicate the European / German Feed in Tariff laws have been:

1) Feed-in tariffs like those in place in Germany may in effect be a "regressive tax" on the poorest Americans, if their electricity rates are increased as a result of the utility's new expenses in administering a feed in tariff. In the German system, for instance, the feed in tariff costs are directly passed on by the utility to all its consumers, regardless of income level[14]. This would not be acceptable in the case where the poorest residents in Oakland wind up paying more for renewable energy, which the wealthiest residents generate on their rooftops.
2) The renewable electricity subsidized by a feed-in tariffs such as Germany's is too expensive, due to the lack of incentives encouraging energy production at the time and place where demand is highest (for instance in the late afternoon, in relative proximity to a major metropolitan area). A feed-in tariff without a market mechanism for encouraging supply when demand is greatest is fundamentally flawed.

In response, we would like to offer the following remedies for a local Feed In Tariff:

1) **A Feed in Tariff structured for the local market should not attempt to use electricity payments by the poorest ratepayers to subsidize renewable energy for the rich**. An "equitable" Feed-in Tariff should have as one of its mandates that utilities may not raise electricity rates for the poorest customers in order to recuperate their costs of administering or paying for electricity procured according to the Feed-In Tariff.
2) **A local Feed-in Tariff should try to offer market-based incentives like a tariff tied to peak demand**. In fact, this is what we have seen in the Feed-in Tariff recently approved by the California Public Utilities Commission[15]. Also, the feed-in tariffs should be structured so that the subsidy decreases over time, forcing the renewable energy producer to become more efficient and deliver the same number of Kilowatts for a lower subsidy "price."

<u>Financing Options</u>

A feed-in tariff needs to be funded by some mechanism. A Community Choice Energy program, for example, would have to find funds to pay the difference between the feed-in tariff rate and the average amount paid for a specific type of utility scale renewable energy. Below are some potential approaches to finance feed-in tariffs:

1. **100% Green Energy Option –** Polls have indicated in some areas that residential customers would be willing to pay up to 10% more for their energy if they knew it was from 100% renewable sources[16]. The 100% renewable PaloAltoGreen program adds about $10 per month to the average residential bill. We would

[14] Based on conversation with Helmut Cramer, electric utilities manager at Stadtwerke Norden, Norden, Germany, Oct., 2007

[15] "California Approves Feed-in Tariffs, Rewards Energy Efficiency," Feb. 6, 2008, http://desertusa.com/desertblog/?p=2078

[16] "Promoting all-green power for county", Marin Independent, Jan. 5th, 2008. http://www.marinij.com/marin/ci_7893850

favor offering this option to East Bay customers, and allowing the proceeds to help pay for feed-in tariffs.

2. **Local Carbon Offsets –** Feed-in tariffs could be partially funded by selling carbon offsets like San Francisco's emerging plan.
3. **Tax –** A local carbon, gasoline, or other tax could be levied with funds going to fund feed-in tariffs.
4. **Direct Financing –** A municipality could issue a municipal bond or create a parcel tax to finance this program. Similar measures already passed by local voters in recent years include Oakland's Measure G Parcel Tax – 2008 for education, violence prevention (Measure Y - 2004), and the East Bay Regional Parks (Measure AA - 1988).

Conclusion

Using a "smart" Feed-in Tariff policy incorporating the recommendations found above, California and the East Bay could offer small-scale renewable energy producers, homeowners, business owners and commercial property owners in the East Bay the needed incentive to invest in renewable energy systems. An effective feed-in tariffs which features:

- a guaranteed payment period not less than 15 years
- innovative financing options
- a social equity charge or mandate to avoid charging low-income consumers extra for renewable energy produced at a site not in their immediate proximity
- payment rates that decrease over time
- payment rates specific to the technology being used
- guaranteed access to the grid
- Well-thought out and documented financing plans

# Solar (and other sustainability) projects in Redevelopment Project Areas

**Memo to: Oakland City Council**
**From: Aaron Reaven, PAC member of Broadway/MacArthur/San Pablo Redevelopment Project Area**
**April 22, 2008**

**The Seed**

Before you today is a project proposal unanimously recommended by the Broadway/San Pablo/MacArthur Project Advisory Committee. It involves granting up to $20,000 of Redevelopment funds to a non-profit organization (Grid Alternatives) to facilitate the installation of two solar electric systems in the B/S/M project area. The properties selected for these systems will either be owned by low-income homeowners or owned by a non-profit entity.

This proposal supports the goals of Redevelopment because it increases the affordability of low-income housing by lowering the utility bills of residents and/or owners. As the oil and energy crises of our time intensify in coming years, it is likely that these renewable sources of electricity will provide ever-more-valuable economic benefit to the low-income residents using them.

**The Logic of Expanding**

The very same logic that allows us to support and help preserve existing low-income housing by reducing and stabilizing the utility bills of residents leads naturally to the potential for other utility- and resource-based projects to achieve the same purpose.

The price of (non-renewable) natural gas threatens to rise just as steeply as the price of electricity in coming years. Thus, solar how water heaters make the same sense as solar electric panels for low-income properties in redevelopment project areas. Further, almost all energy experts agree that energy efficiency and conservation are the most cost-effective ways to reduce and stabilize the energy costs of households. While there are some existing programs to assist with the easiest steps toward energy efficiency - like water heater blankets, weatherstripping and compact flourescent light bulbs - there may not be strong enough current programs to assist low-income residents with attic, wall and floor insulation. These are valuable measures even where there is not sufficient solar exposure to justify solar electric or solar thermal systems.

Finally, the reduction and stabilization of *water* usage by low-income residents would enhance the affordability of their homes in the same way as the energy projects described above. To my knowledge, EBMUD has no program that offers financial assistance to low-income households for the installation of water conservation or efficiency measures.

All of the above projects would be justified in receiving funding support from Redevelopment as enhancements to affordable housing.

**A Question of Implementation**

Redevelopment Agency staff have indicated that the implementation of projects like the ones described above could not be accomplished by existing staff. In the pilot project before you today, the great advantage of partnering with Grid Alternatives is that G.A. is dedicated to shepherding its projects from start to finish. This includes identification and selection of eligible properties, system installation, and help with paperwork afterwards. (Grid Alternatives does not install solar thermal or water conservation measures, only solar electric systems.)

**A Perfect Marriage of Organizations?**

This memo is intended to suggest to City Council that ***the Oakland Green Jobs Corps*** (now in development) - or something like it - could serve as a natural partner for

Redevelopment to carry out the installation of sustainable resource measures within Redevelopment project areas.

The youth training aspect of the Green Jobs Corps would provide a double benefit to Redevelopment areas if used in this way. Just recently, Redevelopment areas were called upon to use their funding stream to hire police officers (under a different name) who are promised to be locally-based "beat" officers. It would complement that crime-*suppression* strategy to use the same Redevelopment funding stream in a crime-*prevention* strategy to support the job skill training of young people who might otherwise lack opportunities for their future.

Such a partnership between Redevelopment and an Oakland Green Jobs Corps would bring Oakland more deeply into the profound national effort to develop green-collar jobs for all; and highlight the urgent link between wise economic development and environmental sustainability.

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## PG&E's Transmission Plans

PG&E has plans in place to invest up to $3 billion in new transmission infrastructure over the next decade, and has identified numerous major transmission projects specifically designed to expand access to renewable resources, including transmission lines to the high renewable energy potential areas in Southern California, including the Tehachapi Pass. These projects are projected to come on-line between 2008 and 2010. Transmission lines at an earlier "under investigation" phase include those connecting Northern California to energy sources in British Columbia and the Pacific Northwest, and access to wind farms.[17]

## Federal Policy Context

The federal Energy Policy Act of 2005 (H.R. 6, Sec. 1335) established a 30% tax credit up to $2,000 for the purchase and installation of residential solar electric and solar water heating systems. An individual can take both a 30% credit up to the $2,000 cap for a photovoltaic system and a 30% credit up to a separate $2,000 cap for a solar water heating system. Currently, people who pay the Alternative Minimum Tax (AMT) cannot claim this tax credit.

Similarly, a federal business tax credit is set at 30% of expenditures (without a cap) for solar technologies, fuel cells and solar hybrid lighting. Both personal and business tax credits were extended through December 31, 2008, by Section 206 of the Tax Relief and Health Care Act of 2006 (H.R. 6111).

[17] Marin, California Draft Community Choice Energy Business Plan (Navigant Consulting, Sep. 2007) p.40.

The Solar industry would like to see the Federal Income Tax Credits extended beyond 2008 and increased. The industry also wants the provision that exempts people who pay the Alternative Minimum Tax (AMT) to be waived. Both of these provisions were in the latest provisions of the latest energy bill until they were stripped.

# State Policy Context

Below are some of the more prominent California clean energy laws and initiatives.

### The Renewable Portfolio Standard

Generally considered the best renewable energy law in the nation, California's Renewable Portfolio Standard (RPS) became effective in 2003. As originally written, the RPS required retail sellers of electricity to increase the amount of renewable energy they procure each year by one percent such that the renewable energy content of their electricity portfolios would equal 20 percent by 2017. Because of perceived progress towards this goal, the California Energy Commission (CEC) and Public Utilities Commission (CPUC) recently accelerated the 20% goal to 2010, and added a goal of 33% by 2020.[18]

Eligible renewables include biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, and tidal current.

Should the state meet its 33% goal, renewable sources will provide the state with about 33,000 gigawatt hours (GWh) of additional generation. That is about the equivalent of the projected increase in natural gas demand over the same time period.[19]

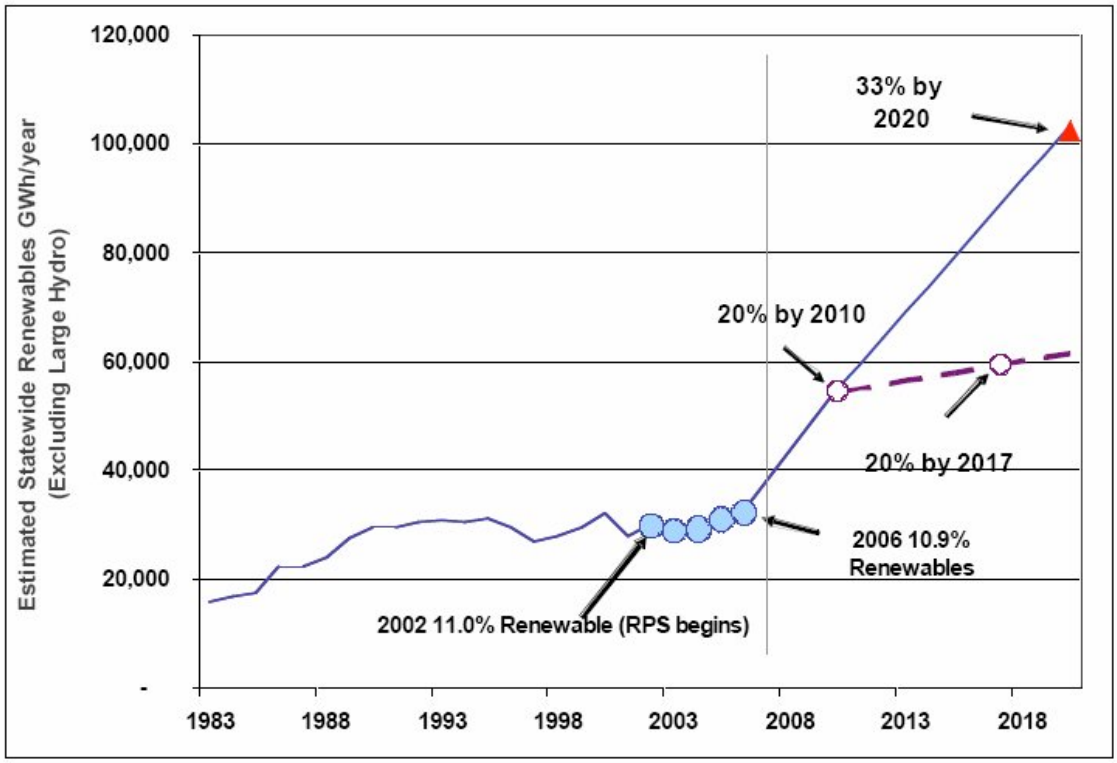
Progress, however, toward the goals of the RPS is not on target to meet the requirements of the law. As of March 2007, for example, PG&E had an RPS of about 12 percent, which is the same percentage the company recorded in 2003, when the RPS took effect.[20] In its

[18] http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=CA25R&state=CA&CurrentPageID=1&RE=1&EE=1

[19] Hunt, Tam; Chan, Allison; Phillips, Jenny. *Does California Need Liquefied Natural Gas?* Community Environmental Council. April 2006.

[20] Renewable Energy Access – *PG&E Increases Renewable Energy Resources and Request Offers*. March 20, 2007. http://www.renewableenergyaccess.com/rea/news/story?id=47814

February 2008 billing inserts, PG&E is projecting 14% for their 2008 power mix.




Source: California Energy Commission, Gross System Power 1998–2005.[219]

The graph above demonstrates the rapid development of renewable energy needed to hit the 20% by 2010 target, which the California Energy Commission now concedes the state is "not on track" to achieve.[21] While PG&E has announced investment in new renewable projects, they have also announced that are unlikely to reach the 20% target by 2010, though they claim that they will reach that target shortly thereafter. The California Energy Commission attributes difficulties with the RPS to a lack of transparency in the bidding processes for renewable projects, the complexity of administering the program, and an uneven application of RPS targets to retail energy sellers (i.e., the utilities).[22]

**Executive Order S-3-05**

California Executive Order S-3-05[23] sets a long term greenhouse gas emission reduction target of 80% below 1990 levels by 2050. 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. The order also sets intermediate targets to reduce GHG emissions to 2000 levels by 2010 and to reduce GHG emissions to 1990 levels by 2020.

[21] California Energy Commission, 2007 Integrated Energy Policy Report, December 2007. Page 126.
[22] California Energy Commission. *2005 Integrated Energy Policy Report.* November, 2005. Page 110.
[23] http://gov.ca.gov/executive-order/1861

**The California Energy Action Plan Loading Order**

In 2003, California's energy agencies produced a road map for energy planning called the Energy Action Plan (EAP) which was updated in 2005 with the EAP II. The EAP includes the "loading order" which describes the priority by which the state should meet new energy demands. The loading order's first priority is energy efficiency and demand response as a preferred means to meet energy needs. The second priority is renewable sources of power and distributed generation, such as combined heat and power applications. And to the extent that efficiency and renewables cannot meet demand, the last priority is the use of what the state calls "clean and efficient fossil fuel generation."[24] The loading order and the Energy Action Plan are non-binding and not codified into law, and a proposed law to do so was vetoed by Governor Schwarzenegger in 2006. They do, however, reflect the political popularity of clean energy in California.

**California Solar Initiative**

In January, 2006, the CPUC approved the California Solar Initiative (CSI), committing a combined $3.2 billion in incentive funds for solar power over the next 11 years. The initiative provides rebates for homeowners, businesses, farmers and government projects investing in rooftop solar photovoltaics. 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 as a Standard Option: At a minimum, all new homes built in California must include solar panels as a standard option for homebuyers. This would be similar to the way marble or tile countertops have become standard options.
- Net Metering: A key financial driver for consumers is the ability to get a credit on monthly electric bills for excess power generated by a solar system sold back to the energy grid. The law lifts the previous cap on net metering to offer a further incentive for rooftop solar.
- Municipal Participation: Locally-controlled municipal utilities, such as Los Angeles Department of Water and Power and Sacramento Municipal Utility District, supply more than 20% of California's electricity. Given the important role that these utilities play, they are required to offer a solar program that is at least on par with that of the investor owned utilities of PG&E, Edison and San Diego Gas & Electric.[25]

**Public Utilities Code section 2827(h)(3)**

This "net metering" legislation[26] allows residential, commercial, and industrial customers to offset part or all of their own electrical requirements by generating solar or wind

[24] California Energy Commission and California Public Utilities Commission. *Energy Action Plan II: Implementation Roadmap for Energy Policies.* 2005. Page 2.

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

[26] http://www.energy.ca.gov/distgen/notices/2002-11-18_forum/PUC_CODE_SECTION_2827.PDF

electricity on their premises and feeding it back on to the grid. Customers can offset up to the total amount of the energy used in their facilities over a 12 month period. Any excess electricity over the 12 month period is retained by the electric utility.

**Renewable Energy Transmission Initiative**

The Renewable Energy Transmission Initiative (RETI) is a statewide initiative to help identify the transmission projects needed to accommodate the state's renewable energy goals, support future energy policy, and facilitate transmission corridor designation and transmission and generation siting and permitting. RETI will be an open and transparent collaborative process in which all interested parties are encouraged to participate.[27]

RETI will assess all competitive renewable energy zones in California and possibly also in neighboring states that can provide significant electricity to California consumers by the year 2020. RETI also will identify those zones that can be developed in the most cost effective and environmentally benign manner and will prepare detailed transmission plans for those zones identified for development.

**California Green Building Initiative**

In December 2004, Governor Schwarzenegger signed an executive order mandating energy efficiency measures. The order has a goal of reducing energy use in state-owned buildings by 20 percent by 2015 (from a 2003 baseline) and encourages the private commercial sector to set the same goal.[28] According to the order, the goal will be accomplished by adhering to the standards of the United States Green Building Council (USGBC), which uses building design, lighting, heating and cooling, and solar panels to minimize outside energy usage. The energy saved in state buildings alone will amount to 1,935 GWh by 2015, or about 1 percent of the total amount of electricity used by the state in 2005. This does not account for commercial buildings.[29]

**Natural Gas Reduction Efficiency Measures**

The CPUC has set, and achieved, aggressive goals of reducing natural gas usage. Since 2000, California's use of natural gas has declined by about 9 percent. The state has a stated goal of doubling the annual gas savings by 2008, and tripling them by 2013.[30]

**AB32 – Global Warming Solutions Act**

This law was approved by the California legislature and was signed by Governor Schwarzenegger in September 2006. The law caps greenhouse gas emissions at 1990

[27] http://www.energy.ca.gov/reti/index.html
[28] California Energy Commission, Green Building Initiative webpage. http://www.energy.ca.gov/greenbuilding/index.html
[29] Hunt, Tam; Chan, Allison; Phillips, Jenny. *Does California Need Liquefied Natural Gas?* Community Environmental Council. 2006.
[30] California Energy Commission and California Public Utilities Commission. *Integrated Energy Policy Report.* 2005. Available at http://www.energy.ca.gov

levels by 2020, representing a 25% reduction. This requires the elimination of 174 million metric tons of greenhouse gases by utilities, oil refineries, steel mills, and other heavy industries. The law requires the Air Resources Board to adopt regulations to meet the goal. Actual reductions will be required beginning in 2012. [31]

While this law makes California a national leader in the reduction of greenhouse gas emissions, it is only a beginning. Mark Hertsgaard writes in *The Nation*, "Talk about an inconvenient truth! Returning California's greenhouse emissions to 1990 levels by 2020 is even less ambitious than the Kyoto Protocol, which requires industrial nations to lower emissions approximately 5 percent below 1990 levels by 2012. And Kyoto's targets are only a tiny step toward the cuts that are truly necessary."[32] Assemblyperson Fran Pavley, author of the bill, has herself expressed caution about overestimating the actual benefits of the bill. "Is this bill enough to really address global warming? Absolutely not," she says. "But it's an important first step. The real idea behind the bill is to get other states to follow our lead. And we will build on this."[33]

**SB1368: Greenhouse Gas Emissions Performance Standard**

In February of 2006, the five members of the CPUC unanimously adopted a resolution calling for, among other things, utilities to only procure electricity from sources that emit the equivalent or less than what is produced by a combined-cycle natural gas turbine.[34] These turbines are widely considered as state-of-the-art, in terms of efficient use of natural gas and the emissions they produce. The language of this proceeding is echoed in a law - SB1368 - that took effect in 2007.

A companion bill to AB32, SB1368 requires that all new base load electricity generation be at least as clean as a modern combined cycle natural gas plant. Under this standard, integrated gasification coal plants using carbon sequestration are the only coal plants that could potentially qualify, though even this is questionable. If the technology can be made commercially viable, it is likely to significantly increase the price of electricity from coal.[35]

The intent is to reduce greenhouse gases by limiting investment in heavily polluting new fossil fuel projects. The law applies to both in-state and out-of-state energy production, and is specifically targeted at the push for new coal-fired power plant development in the Western states that will largely serve California.[36] In order to truly reduce greenhouse

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[31] Lifsher, Mark. *Global Warming Plan Could Be Costly.* Los Angeles Times. September 1, 2006
[32] Hertsgaard, Mark. *CA Leads on Climate.* The Nation. October 2, 2006.
[33] Ibid.
[34] California Public Utilities Commission. *Order Institute Rulemaking 06-04-009 to Implement the Commission's Procurement Incentive framework and to Examine the Integration of Greenhouse Gas Emissions Standards into Procurement Policies.* www.cpuc.ca.gov . April 2006.
[35] Community Environmental Council. "Santa Barbara County Renewable Energy Blueprint." 2007. Available at www.fossilfreeby2033.org. Page 115.
[36] Union of Concerned Scientists. *SB1368 Fact Sheet: Greenhouse Gas Emissions Performance Standard for Major Power Plant Investments.* http://www.ucsusa.org/assets/documents/global_warming/SB-1368-Fact-Sheet.pdf#search=%22sb%201368%22

gases, the law should also apply to Liquefied Natural Gas import projects, as the LNG supply chain adds up to 25% more greenhouse gases into the atmosphere than what comes from domestic natural gas.[37] As the Emissions Performance Standard of the law is currently written, however, the law does not cover the lifecycle emissions of power generation, only what is emitted from a power facility.

## Bay Area Air Quality Management District

Several regional agencies are collaborating with the Air Resources Board in the implementation of AB32, as well as implementing their own climate change policies that promote local clean energy and conservation. The Bay Area Air Quality Management District (BAAQMD), which historically regulates point source air pollution in the Bay Area, has initiated a grant program to help fund local clean energy and energy conservation projects implemented by local governments and nonprofits. As shown in the table below, in 2007, three of the major grant awards fund Community Choice Energy implementation.

| **Selected 2007 Recipients of BAAQMD $3 Million Grant Program** | | |
|---|---|---|
| City of Berkeley | Sustainable energy financing districts for solar | $ 75,000 |
| City of El Cerrito | Seed-funding for Municipal Energy Officer | $ 75,000 |
| Climate Protection Campaign | Explore getting Sonoma to join Marin's **Community Choice Energy** | $ 75,000 |
| Marin County | **Community Choice Energy** to promote renewable energy | $ 75,000 |
| City of Richmond | Integrate climate protection into general plan | $ 74,987 |
| Water Planet Alliance | Technical support for **Community Choice Energy** region-wide | $ 74,438 |
| City of Fremont | Integrate climate protection into general plan | $ 70,962 |
| Cities of Albany and Piedmont | Develop local climate action plan for 2 cities | $ 55,000 |
| City of Berkeley | Community-based approach to implement climate plan | $ 40,000 |
| City of Hayward | Develop climate action plan | $ 40,000 |
| City of Oakland | Develop municipal energy action plan | $ 40,000 |
| Contra Costa County | Develop climate action plan | $ 40,000 |

# San Francisco Renewable Energy Initiatives

### Community Choice Energy

In 2001 the Sierra Club, Greenpeace and others campaigned to get San Francisco voters to overwhelmingly approve a municipal bond measure giving the city a large source of

[37] Coequyt, John and Albrecht, Katie. *Liquid Natural Gas: A Roadblock to a Clean Energy Future*. Page 4. Greenpeace. 2004.

capital for renewable energy projects. Working with energy experts, the city has at last put together a detailed plan for a ground-breaking Community Choice Energy (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 the Community Choice Energy, 51% of San Francisco's electricity will come from clean, renewable sources by 2017.

With San Francisco's Community Choice plan PG&E will continue to handle billing, metering, and transmission (for a nominal fee), while the new Electric Service Provider will handle procurement on behalf of the City. In addition, the City will issue approximately $600 million in revenue bonds ("H Bonds") to the Electric Service Provider to finance local clean energy generation capacity – initially 72 Megawatts of renewable distributed generation and at least 31 MW of solar photovoltaic, 107 MW of demand response, efficiency and conservation technologies, and a 150 MW wind farm. At the end of the contract with the Electric Service Provider – upon the repayment of the bonds – the city will own the new generation capacity, and may transfer ownership to residents and businesses that choose to purchase and own systems based on a monthly charge.[38]

If all goes well, San Francisco will make history in the fall of 2008, installing the first solar panels in what will be the largest urban solar network in the world.

Solar Financing

San Francisco wants 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 that 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 plan is controversial since it locks the recipients of the payments into Pacific Gas and Electric Co. The current language of the measure requires that applicants for the incentive program be eligible for a similar state program − but that state program is administered by PG&E and two other private utilities and is available only to their customers. City Assessor Phil Ting told the *Guardian* that he'll make sure the language is fixed to make the program available to all. Some believe the benefits should go to city customers, and they should be tailored as incentives for residents and businesses to stick with san Francisco's Community Choice Energy.

The bond money is also controversial. As it stands, landlords could pass along half of the costs of that money to tenants, many of whom don't pay their own electric bills anyway and thus would get no benefits. Sup. Gerardo Sandoval has suggested San Francisco pursue a similar to Berkeley financing plan (described later in this report).

[38] Community Choice Energy Program Description, Revenue Bond Plan and Draft Implementation Plan: City and County of San Francisco, Local Power Inc. (localpower.com), June, 2007.

**Hetch Hetchy and the Raker Act**

PG&E is engaged in a "wheeling" arrangement with the City and County of San Francisco (SF). SF owns Hetch Hetchy Water and Power, which provides water from the Tuolumne River to the city and its residents. The federal Raker Act (1913) permitted SF to dam the Tuolumne River, build a 167-mile aqueduct, and construct powerhouses and transmission lines below Hetch Hetchy Reservoir for generation, sale, and distribution of electric energy. The energy is used primarily to meet SF's municipal load. In return, as the *SF Bay Guardian* has noted repeatedly, The Raker Act requires that San Francisco form a public power company to sell Hetch Hetchy power.[39]

SF, however, needs PG&E to provide the transmission across the bay and into the city, and it needs PG&E for the local distribution of the power to the municipal facilities. Over the years, SF and PG&E negotiated a federally approved Interconnection Agreement that identifies the terms and conditions under which PG&E will transport and distribute SF's Hetch Hetchy power to the city's municipal locations.[40]

**San Francisco Solar Power Expansion**

Prior to 2006, statute only allowed the utilities to offset energy provided at the site of the usage. To accommodate SF's unique Hetch Hetchy circumstance, San Francisco AB 2573 required PG&E to engage in a special arrangement with the Hetch Hetchy solar generation facilities and SF. AB 2573 requires PG&E to compensate the city for solar power generated at one municipal site with equivalent power consumed at another municipal site at the same time of use.[41]

Prior to this bill, the city had the option to generate solar power at sites that consume large amounts of electricity, such as Moscone Center or the Southeast Wastewater Treatment Plant. But if the city wanted to generate power on a remote site that consumes little power – such as a reservoir, a parking structure or on an open space – the surplus power and annual revenue previously would be given to PG&E.

**Local Carbon Offsets**

In December 2007, Mayor Gavin Newsom announced that San Francisco will create its own carbon offset program, saying it will be the first-ever city-based carbon offset program that funds only local green activities.[42]

The city will initially pay $80 to one of three local renewable energy nonprofits for every ton of carbon dioxide produced whenever a city employee takes a work-related flight, according to Environment Director Jared Blumenfeld. He said the program could be

[39] http://www.sfmuseum.org/hetch/hetchy10.html
[40] http://info.sen.ca.gov/pub/07-08/bill/sen/sb_1001-1050/sb_1017_cfa_20070622_131659_asm_comm.html
[41] Ibid
[42] http://www.examiner.com/a-1113160~The_City_will_sell_carbon_offsets.html

expanded to include car travel. Offsets that can be bought on the Internet for as little as $8 a ton were described by Blumenfeld as scams.

The city aims to call for proposals in one year from other groups hoping to receive funding through the program, and it will begin selling carbon offsets to local businesses and residents, according to Blumenfeld.

San Francisco nonprofits expected to initially receive funding through the carbon offset program include GRID Alternatives and San Francisco Biodiesel Cooperative, as well as Ecology Action, which is based in Santa Cruz.

Ecology Action is a Santa Cruz-based group that has helped hundreds of San Francisco businesses reduce their energy use, according to Ecology Action Vice President Mahlon Aldridge. Aldridge said the extra money could be used to provide new rebates on energy-saving devices.

## Community Choice Energy in Marin

Marin County is moving ahead with innovative Community Choice Energy plans with 74% of Marin residents supporting the county becoming a provider of green energy in a recent poll.[43] Marin County is planning for a Community Choice Energy among its cities, and the County recently collaborated with the energy experts at Navigant Consulting to create a detailed plan, which should be released to the public by early 2008. This past October, representatives of renewable-energy industries and financiers met and determined that the Community Choice Energy programs in Marin and elsewhere will have plenty of available renewable energy to purchase and sell back to residents. 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 to speed up the transition to greater amounts of renewable power.

Amid this steady stream of encouraging news from Marin, the environmental groups have been working to ensure that Marin's Community Choice Energy will be as environmentally strong as possible, focusing on carbon-reduction goals (which can be expected to surpass PG&E's carbon reduction targets) and using co-generation and other clean technologies to accompany any fossil fuels used. The Sierra Club is also working to gain greater support among city officials, in particular those from Novato and San Rafael, two of Marin's largest power consumers.

According to Marin County officials, recent quotes from power suppliers indicate that a Marin Community Choice Energy (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. The county would achieve this goal by "entering into a full requirements contract

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

for energy supply and operational services with an experienced, financially stable energy supplier in the short term, and using lower-cost public financing to invest in renewable power supply with private and public power partners in the long-term."[44]

To expedite the achievement of this aggressive goal, the Marin Communities have proposed an alternative implementation strategy for their Community Choice Energy Program in which 100% of total energy requirements would be procured from renewable energy sources, internally owned renewable generating resources, or potentially renewable energy certificates (RECs) from day one of program operations (proposed to commence in January 2009). An implementation strategy such as this would require a rate premium ranging from 5% to 10% above rates charged by the incumbent utility, PG&E. Consultants estimate that the 100% renewable option will actually become cheaper than PG&E over the long haul. (source?)

Under the base-case energy supply alternative, which utilizes approximately 51% renewable energy supply, the Marin communities would reduce total greenhouse gas emissions from all sectors (including transportation) within their jurisdictions by approximately 5.6% to 10%. By pursuing a 100% renewable energy supply alternative, the county could achieve greenhouse gas emission reductions ranging from 14.5% to 25.6% of the Marin communities' current total.

As shown in the table below, a consultant has reported that Marin's longer-term potential for locally generated renewable power –solar, wind, geothermal, tidal, biomass – is enough to eventually cover most or all of Marin's entire electricity needs. In 2005, Marin County used 1,421 GWh of electricity and 82 million therms largely from natural gas. The consultant noted that many local solar initiatives (including neighborhood solar trusts, buying cooperatives, assessment districts, local bank loans) could be facilitated, expanded and accelerated under Community Choice Energy.[45]

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

[45] Jody London Consulting. *Increasing Renewable Energy Resources in the County of Marin*. Prepared for the County of Marin, Community Development Agency November 11th, 2007.

| Technology | Rated MW[1] | GWh/yr[2] | Million Therms/yr |
|---|---|---|---|
| Solar | 220 | 316 | 6.7 |
| Small Wind | 11 | 20 | NA |
| Large Wind | 182 | 280 | NA |
| Off-Shore Wind | 260 | 400 | NA |
| Methane Capture (Landfill gas, dairies) | 6.5 | 49 | NA |
| Biomass (Waste to fuel) | 7 – 16 | 52 - 120 | NA |
| Ocean Power | 150 | 130 | NA |
| **TOTAL** | **837 -846** | **1247 – 1315** | **6.7** |

Renewable Resource Potential in Marin County.
Source: Jody London Consulting, 2007

PG&E's Stance on Community Choice Energy

California law requires PG&E and other utilities to support Community Choice Energys once they are operating, and not to interfere with a community effort towards Community Choice Energy. Nevertheless, PG&E is waging a "soft" campaign against Community Choice Energy statewide that claims the utility is better at meeting renewable energy objectives. The *SF Bay Guardian* has been following PG&Es recent attempts to thwart Community Choice Energy in San Francisco.[46, 47]

While PG&E asserts that its power will be cleaner, Marin County officials have challenged PG&E to prove it and so far they have not been able to. Months ago, PG&E submitted a critique of Navigant's draft business plan and Navigant responded, contesting PG&E's assertions. PG&E's "plan" appears to be largely a tabulation of what California state authorities will in any case be compelling utilities to provide. PG&E has resorted to rougher lobbying tactics which, for example, led to a formal complaint to the CPUC by San Joaquin Valley's Community Choice Energy.[48] PG&E reportedly threatened several Tulare County supervisors with a lawsuit, leading them to back out of a Community Choice Energy commitment.

Consultants and industry experts believe closely regulated PG&E would not be able to withhold power or raise transmission costs prohibitively once Community Choice Energy started up. PG&E cannot treat Community Choice Energy customers any differently than customers in other regions.[49]

[46] http://www.sfbg.com/entry.php?entry_id=3584&catid=4
[47] http://ww.sfbg.com/entry.php?catid=107&entry_id=3819
[48] http://docs.cpuc.ca.gov/Published/proceedings/C0706025.htm
[49] Community Choice Energy Environmental Ombudsman's New Year's Update, Email form Ed Mainland, Jan 6, 2008.

## Oakland Oil Independence by 2020 Task Force

The Oakland City Council established the "Oil Independent Oakland by 2020" (OIO) Task Force on October 17, 2006. The Task Force was commissioned to develop an action plan for Oakland to become oil independent by 2020, including addressing strategies to create jobs and economic growth in Oakland and by examining potential new policies within the city's municipal power that would benefit its residents.

Recognizing the many problems associated with our dependence on oil, the City Council realized the potential for the city to make significant changes to reduce that dependence and become one of the world's leading cities in sustainable development.

The Task Force convened in April 2007, met at least monthly and dissolved in December 2007. A final report of recommendations was presented to the Public Works Committee in February 2008, which includes the following:

Top Recommendations

1. Adopt the ***Oil Depletion Protocol***, thereby committing the City of Oakland to reduce oil consumption in the entire city of Oakland by 3% per annum
2. Reconfigure the city into multiple ***Urban Villages*** that co-locate residential, commercial, retail, and possibly light industrial. This involves and number of steps including updating the General Plan, design review guidelines, and zoning.
3. Develop and implement a ***Public Transit Master Plan***. This also involves an update to the General Plan and the task force strongly urges Oakland to consider electrified transport and in particular a municipal streetcar system.

Enabling Recommendations

1. Establish an Oil and Gas team charged with management of Oakland's oil independence activities
2. Develop financing options including a local carbon tax and regional congestion charging
3. Embark on a massive public outreach and education campaign

Preparedness Recommendation

1. Develop Contingency Plans for oil price and availability shocks

The report recommends that Oakland aim for 50% renewable energy by 2017 and that the city develop more local renewable generating capacity to make the city more resilient and create meaningful green jobs. Further, the report recommends that Oakland fully commit to the co-development of a Joint Powers Authority (JPA) with Berkeley and Emeryville to use Community Choice Energy as a means to generate clean local power and green jobs in the East Bay.

The JPA should include the following components into the CCA plan:

- Solar photovoltaic as a key component of the CCA. While solar is not as cost-effective as wind, given federal subsidies, projections of lowered manufacturing costs, and the low cost of capital for municipalities, solar can certainly be a cost effective way to boost locally generated renewable power and quickly ramp up CCA, while providing many green-collar jobs installing and maintaining solar panels.
- A "feed-in tariff" or a strong "net-metering" plan so that municipalities, businesses, and individuals are fully compensated for any net solar energy they contribute to the grid. This would eliminate the incentive for building owners to undersize their solar systems.
- Energy efficiency and conservation as key components of the plan. Energy efficiency is generally considered the cheapest electricity "generation" option and could generate a large number of green jobs for youth through programs such as California Youth Energy Services (CYES). Efficiency and conservation measures will reduce demand, which has the collateral benefit of further enhancing the reliability of the JPA's power supply and lessening the environmental impacts from conventional sources.
- Investigate financing options such as municipal bonds (e.g., San Francisco's H bond measure) and federal subsidies such as the "new market tax credit" for low income communities.
- Use some of the CCA cost savings to fund green jobs training for youth of color and coordinate with green jobs programs like the Oakland Green Jobs Corps.
- Consider programs like the one recently announced in Berkeley that allow property owners to pay for energy efficiency improvements and solar system installations as a long-term assessment on their individual property tax bills.
- Consider the possibility of setting up the JPA such that other East Bay municipalities such as Richmond and San Leandro can be added in the future.

The report also notes that CCA is a superb opportunity to demonstrate regional leadership in oil independence and renewable energy.

## Greenhouse Gas Reduction Plans

A number of participants in Local Governments for Sustainability's (ICLEI) flagship campaign, Cities for Climate Protection® (CCP), are in the Bay Area, including the counties of Marin, Santa Clara, and Sonoma; the Marin Municipal Water District; and the cities of Berkeley, Cloverdale, Cotati, Fairfax, Healdsburg, Novato, Oakland, Petaluma, Rohnert Park, San Anselmo, San Jose, San Francisco, San Jose, Sausalito, Sebastopol, Sonoma, and Windsor. The program is designed to educate and empower local governments to take action on climate change.

The CCP campaign's 5 milestones are a performance-oriented framework and methodology that assist US local governments in developing and implementing harmonized local approaches for reducing global warming and air pollution emissions, with the additional benefit of improving community livability. The 5 milestones are:

1. Conduct a baseline emissions inventory and forecast
2. Adopt an emissions reduction target for the forecast year
3. Develop a Local Action Plan
4. Implement policies and measures
5. Monitor and verify results

In Milestone 3 of ICLEI's Cities for Climate Protection (CCP) program, the local government develops a Local Action Plan that describes (or lists) planned policies and measures to reduce greenhouse gas emissions. One of the policies could potentially be Community Choice Energy to the extent that a credible case could be made that the Community Choice Energy will have lower greenhouse gas emissions than the status quo. Berkeley's Climate Action Plan mentions Community Choice Energy as an option for reducing greenhouse gas emissions. It appears that the County of Marin working with ICLEI will incorporate Community Choice Energy (with the goal of 100% renewable energy) into its Climate Action Plan. Other climate action plan policies could be those that encourage local green power such as financing mechanisms for purchasers such as the property tax assessment payment plan of Berkeley as well as feed-in tariffs. All the Bay Area participants of the CCP should be potential allies in the campaign to develop more local clean energy.

## Building Energy Use Actions[50]

[From the City of Berkeley's Draft Climate Action Plan, January 2008]
Enhance Energy Services and Standards for Existing Residential Properties
Expand and better integrate programs for low-income households

Climate protection strategies have both costs and benefits. It is important for our community to ensure that the costs of reducing GHG emissions are not a burden on those who cannot afford to pay them, and that everyone shares the benefits of the climate protection effort.

A number of programs currently offered in Berkeley are specifically designed to both reduce energy costs for low-income households and protect the environment at the same time. The programs include:

- City of Berkeley Weatherization Program: Created in 1982, the City's weatherization program addresses health and safety issues in low-income homes and enables increased energy efficiency and conservation. The program is funded through federal grants. Like the Energy Partners program mentioned below, the

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

weatherization program offers numerous services to low-income households for free, including: new energy efficient appliances, water heater blanket, widow repair and replacement, low flow showerheads, and much more.

- Low-Income Energy Efficiency (LIEE) Program: Funded by the State of California, the LIEE program provides no-cost weatherization services and energy education to low-income households in Berkeley and other communities throughout the state. The services are administered in Berkeley through PG&E's Energy Partners program. Energy services provided for free to low-income households include: attic insulation, energy efficient refrigerators, floor and wall repair, and much more.

Together, the Energy Partners and City weatherization programs serve about 520 low income households in Berkeley per year, or about four percent of all low-income households annually. Program staff persons estimate that on average each household served by these programs reduces annual energy consumption by 10 - 25 percent, saving residents over $100,000 on collective energy costs every year.

Despite the obvious success of these programs, the City, PG&E and the appropriate state and federal agencies can take steps to increase the programs' effectiveness. Better integrating the programs and expanding the services provided to include additional energy saving measures and a more comprehensive home energy audit would result in increased energy efficiency and cost savings for the low-income customers.

Review and update the City's Residential Energy Conservation Ordinance and explore other opportunities to make energy improvements at the point of sale

The 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 standard meant to help protect residential building owners and tenants from energy price increases by reducing the amount of energy used for heat, hot water, and lighting. RECO was adopted in Berkeley in 1980.

The ordinance states that every home or apartment building sold or transferred in Berkeley or undergoing renovations with a total value of $50,000 or more must meet energy and water efficiency requirements for a range of building systems and features, including: toilets, showerheads, water heaters, attic insulation, exterior door weather stripping and common area lighting (for multi-unit buildings).

RECO has served Berkeley well and has been copied and implemented by other U.S. cities. As a vehicle for energy and water efficiency improvements it has a far reach because it is mandatory and is applied whenever a home or apartment building is being sold or renovated. As noted earlier, in order for Berkeley to achieve its aggressive emissions reduction target, it must focus on improving the energy efficiency of existing buildings. RECO can be updated to help achieve that goal.

The average energy savings associated with RECO measures currently ranges from about 10 - 20 percent per building. The ordinance is mainly directed at achieving savings in natural gas. It is also an important vehicle for water efficiency improvements. Options for improving RECO include reevaluating the current list of prescriptive measures to identify potential additions or subtractions from the list. As with other energy programs outlined in this plan, the City should also consider integrating a more comprehensive energy audit into the RECO process. Finally, RECO may also be used to establish energy ratings for homes.

An expanded, more effective RECO could significantly increase the energy and cost savings achieved by residents. With an average of 700 residences changing ownership every year, it is possible that an aggressive RECO program could collectively reduce energy consumption by 504,000 kWh and 84,000 therms annually, saving Berkeley residents over $160,000 and reducing greenhouse gas emissions by nearly 9,000 tons per year by 2020.

It is important to note that the impact of RECO is limited to the time of sale and major renovations. Also, because it is a minimum standard that will apply to all buildings, RECO will probably not include more comprehensive and expensive measures that might be pursued on a voluntary basis given the proper information and support infrastructure. Therefore, the City should also pursue programs and policies that promote voluntary improvements to existing housing units. For example, one opportunity to do so is to work with the real estate industry to conduct outreach and education to property owners regarding the benefits of increased energy and water efficiency.

Identify opportunities for energy savings in renter-occupied commercial buildings

Similar to the residential market, there is an owner/tenant split incentive in the commercial market: commercial renters usually pay the utility bill and have little incentive to invest in building improvements related to energy; the owner does not pay utilities and therefore has little incentive to invest in improvements that would reduce energy consumption and costs. Unlike the residential rental market however, commercial property owners are not subject to rent control and can therefore pass through the costs of improvements without going through the procedures mandated for rented residential properties.

RECO (described above) increases the implementation of energy saving measures in buildings being sold or undergoing major renovations. However, that is a relatively small number of buildings. To address buildings that are not being sold or renovated, it will be worthwhile to establish incentives and programs to make it easier for property owners to make energy upgrades. Establishing new mandatory energy standards for all commercial buildings may eventually be necessary. Finally, the City could initially encourage, and later require, disclosure of energy performance on all new leases

## Energy Efficiency Incentives

There are a great variety of incentives for energy efficiency, including price, financing, tax, rebate, direct install, market and process measures providing some form of benefit beyond what the energy product or service alone would provide. Incentives are given to customers, retailers, manufacturers and installation contractors. Incentives are best implemented using local resources and at points of intervention under local control.

Oakland's current incentive programs for green building and solar energy fast-track permits and provides fee rebates. Fast tracking could be extended to energy efficiency permits and fee rebates.

California utilities have developed an extensive system of energy efficiency measurement although it usually takes place at the end of a program cycle (currently three years). Ongoing monitoring is important, since incentiveswaste resources if taken primarily by those who would have done the same thing without the incentive.

**Standard Offer.** "Standard offer" programs make excellent use of incentives. California utilities widely use a similar system called "standard performance contracts" in commercial programs, but have never offered them in residential programs. Texas emphasizes standard offer programs in the residential sector and achieves 40% more savings per dollar than California, system-wide.[51]

A standard offer is a fair, unbiased process, which offers a standard amount of payment for saving a certain amount of energy in a particular sector (e.g. homes, small business, large business, institutional, agricultural, or industrial). The administrator can also set other parameters, such as savings in particular geographic locations or "peak" times of day or evening. The energy efficiency contractor designs the service provided and sets the level and type of incentives offered to customers.

There is a simple, short application and selection of contractors is fully transparent, first-come, first-served, usually within two weeks. The contractor assumes all risk and is not paid if the savings are not achieved and verified. The job must also be completed within a set amount of time. (By contrast, California utility programs require extensive applications and take up to a year for award of contracts, which takes place in secret. The ratepayer is on the hook for the full cost of the program, whether or not any energy was saved.)

**On-Bill Financing.** This financing system for energy efficiency takes care of one of the greatest barriers to customer purchase of efficient products: the up-front expense to the ratepayer. A rebate generally pays only a small portion of the cost, the ratepayer pays the bulk of it. On-Bill Financing eliminates the up-front cost. After the efficient item is installed, the bill stays at the old rate, or just slightly less, until the item is paid off, with interest, through the energy savings. After many false starts over the years, three

[51] See discussion of Standard Offer program structure, www.womensenergymatters.org

California utilities currently have small On-Bill Financing pilot programs, although PG&E has none.

# Energy Efficiency and Community Choice

**From Women's Energy Matters (11/2007)**

The Community Choice law clearly states:

> No later than July 15, 2003, the [CA Public Utilities] Commission shall establish policies and procedures by which any party, including, but not limited to, a local entity that establishes a community choice aggregation program, may apply to become administrators for cost-effective energy efficiency and conservation programs… Public Utilities Code 381.1(a) [52]

Nevertheless, the Commission delayed creating polices and procedures for Community Choice Aggregators (CCAs) to administer energy efficiency programs. It gave monopoly control of energy efficiency funds to utilities for the 2006-08 cycle ($2.7 billion divided among PG&E, Edison, and Sempra). However, CPUC stated:

> We may revisit the issue of allocating energy-efficiency funds to Community Choice Aggregators…we may ultimately find that Community Choice Aggregators are appropriately independent agencies that should have considerable deference to use [Public Goods Charge] funds.[53]

*It appears that the CPUC will only take action if and when CCAs assert their rights to control energy efficiency in their territories.*

**Why does it matter whether CCAs control Energy Efficiency programs?**

1. ***Energy Efficiency is potentially the cleanest, quickest, and least expensive energy resource,*** making it an essential part of a CCA's "integrated resource plan."

2. CCA control of Energy Efficiency means ***lower rates for CCA customers and a wealth of economic development*** for the community.

3. Economical energy efficiency balances the higher up-front costs of renewable energy; ***this enables a CCA to move more quickly to 50% or more renewables.***

4. CCAs can let customers know they are committed to efficiency and can do a better job. ***Utilities promise efficiency to persuade big customers to stay in their system.***

5. ***49 out of 50 non-utility programs saved more energy at less cost than utility-controlled programs*** in a four-year experiment by the CPUC (2002-05).

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[52] Women's Energy Matters (WEM) worked with Assemblywoman (now Senator) Carol Migden's office to make sure Energy Efficiency was included in Community Choice legislation (AB117, passed in 2002). As a public interest representative in the CPUC's energy efficiency proceedings since 2001, WEM has defended CCAs' access to Energy Efficiency funds.

[53] CPUC Decision 0501055 January 27, 2005, pp. 76-77. A provision in AB117 ensured that Public Goods Charge funds collected in CCA territories would be spent there, even if the CCA were not in charge of EE programs. The Commission zeroed in on this ambiguity and avoided creating an opportunity for CCAs to apply for their funds.

6. ***Utilities demanded 30% profits to offset their fundamental conflict of interest with saving energy;*** CPUC awarded them 12% — but the conflict remains. ***Non-utility energy efficiency providers require no "profit incentives".***

7. Utilities have a long record of ***exaggerating their savings claims, charging high administrative costs, and refusing to cooperate with cities and counties.***

**What is the Public Goods Charge for Energy Efficiency?**

The Public Goods Charge is a monthly surcharge on all utility bills that provides funds for energy efficiency, renewables, and low-income programs.

**How much Energy Efficiency money would be available for CCAs?**

The CPUC estimates that the Public Goods Charge provides about $10/yr. per person for energy efficiency, but utilities collect an additional "energy efficiency procurement" surcharge that is twice as large. CCAs could levy similar surcharges and/or use bond funds for efficiency as well as renewables. There is no limit on how much money CCAs can devote to energy efficiency.

**What exactly *is* Energy Efficiency?**

"Energy Efficiency" encompasses a wide variety of energy-saving technologies and services for homes, businesses, governments, institutions, factories and farms. These include insulation & weatherizing, installing and servicing efficient lighting and other appliances, more efficient heating/ cooling (including tree planting), energy-saving industrial and agricultural machinery, and more efficient building designs, which may include natural lighting, heating and cooling.

**Recommendations to ensure CCA access to energy efficiency funds:**

• CCAs should include energy efficiency in their *Implementation Plans* and *Requests for Proposals.*

• CCAs should notify the CPUC by letter and/or formal resolution that they intend to administer their energy efficiency funds as the law allows, and request that the Commission provide a method for them to apply. *Timing: ASAP. There is no need to delay pending an official CCA declaration or adoption of an implementation plan.*

• CCAs should work together (and get help from their state representatives) to see that the CPUC follows through.

***Non-profit, public control of energy is essential to solve climate change.***

*Investor-owned-utilities' earnings and stock prices depend on selling more energy, so they have a fundamental, irreconcilable conflict of interest with saving energy.*

*Customer-owned Community Choice Aggregators are uniquely able to access low-cost, long-term municipal financing and create public-private partnerships to maximize Energy Efficiency and Renewables, leading the way to a clean, efficient, affordable energy future — with stable, low rates and a wealth of economic development for the community.*

# The Status Quo

As shown in the table below, PG&E is projecting that it will only be able to supply about 14% eligible renewables for 2008. They have already indicated that they are unlikely to meet the Renewable Portfolio Standard target of 20% eligible renewables by 2010. From

2006 to 2008, the largest shifts in PG&E's power mix have been away from coal and large hydropower and towards nuclear, natural gas, and to a lesser extent RPS-eligible renewables. Business as usual over the decades to come with PG&E will likely entail a strong commitment to natural gas (including liquefied natural gas or LNG) and nuclear power. PG&E's increasing reliance on nuclear power is contrary to aims of the Nuclear Free Berkeley Act and the use of nuclear energy in the city may violate the Act.

Public power utilities in the Bay Area offer greener electricity at lower rates than PG&E. Alameda Power and Telecom's (AP&T) electricity rates are 12-91% lower than PG&E at each pricing tier for a power mix that includes 57% renewable (41% geothermal, biomass & waste 9%, and 6% wind). Palo Alto Utilities offers two plans for residential service, both of which are less than PG&E and AP&T for the first 300 kWh. The 100% renewable energy PaloAltoGreen program offers a California blend of 97.5% wind and 2.5% solar generation at average additional cost of less than $10 per month. Further, these public utilities were relatively unaffected by the California Electricity Crisis of 2000-2001 compared to PG&E which had large rate increases, rolling blackouts, and eventually was bailed out from bankruptcy by millions of ratepayer dollars.

| ENERGY RESOURCES | PG&E 2008 POWER MIX* (Projected) | 2006 CA POWER MIX** (For Comparison) |
|---|---|---|
| Biomass and waste | 4%*** | <1% |
| Geothermal | 4% | 4% |
| Small hydroelectric | 4% | <1% |
| Solar | <1% | 0% |
| Wind | 2% | <1% |
| **Coal** | **2%** | 29% |
| **Large Hydroelectric‡** | **17%** | 31% |
| **Natural Gas** | **44%** | 35% |
| **Nuclear** | **22%** | <1% |
| **Other** | **1%** | 0% |
| **TOTAL** | **100%** | 100% |

* At least 95% of PG&E's Power Mix is from PG&E-owned resources, purchased from individual suppliers, or provided by the California Department of Water Resources.
** Percentages are estimated annually by the California Energy Commission based on electricity sold to California consumers during the previous year.
*** In the Biomass and waste section of its Renewable Portfolio Standard, PG&E includes the electricity it purchases from two municipal solid waste incinerators in Stanislaus County, California.[54,55] While it may be an eligible renewable technically, this energy is not clean as explained in the Appendix.

[54] Pacific Gas & Electric, Planning for California's Clean Energy Future: "As defined in Senate Bill 1078, which created California's renewable portfolio standard, an eligible renewable resource includes…selected municipal solid

PG&E has received over a billion dollars from ratepayers to replace steam generators, turbine rotors, reactor vessel heads to keep their aging nuclear reactors operating, thus delaying investments in renewable energy programs. A cost-benefit and risk analysis is underway to determine the economic impacts of the state's dependence on aging reactors.[56] Despite current law prohibiting construction of new nuclear facilities in California until the issue of waste disposal is resolved, PG&E's CEO has announced the utility is interested in future nuclear reactors − again reducing funds for efficiency, renewable and non-radioactive sources of generation. See the Appendix for more information on the pitfalls of nuclear power for the Bay Area.

**Why Renewable Energy CAN compete with fossil fuels**

It is a myth that the cost of renewable energy cannot compete with that of fossil fuels. As renewable production has increased, the price has decreased. Compare this with the increasing costs of fossil fuels, as well as uranium used in nuclear power, and it becomes apparent that inaction will be very expensive.

In the winter of 2007–2008, PG&E ratepayers are enjoying some of the lowest private utility power rates in the country. This is a reflection largely of the utility's dependence on inexpensive hydro-electric power and subsidized nuclear power as well as the relatively low cost of natural gas since 2005. Indeed, currently natural gas storage levels are at a record high, which has lowered PG&E natural gas rates by 7% from a year ago.[57]

But the current state of the natural gas market is deceptive. East Bay residents are likely to pay much higher rates in the future if the energy portfolio does not significantly change as fossil fuel prices of all types are expected to rise over time. PG&E's inability to control rates is the primary risk of inaction. PG&E rates have increased by 43% since 2000 and are scheduled to increase again in 2008.

While PG&E's renewable development has not kept pace with targets of the California Renewable Portfolio Standard, it is partnering on a project to spend billions on importing Liquefied Natural Gas from gas fields abroad. The PG&E project would involve a coastal import terminal located in Coos Bay, Oregon, and a 225-mile pipeline that would bring natural gas to the California border. The project, if approved, will have a capacity of 1 billion cubic feet of natural gas per day, or nearly 50 percent of PG&E's natural gas usage. This will mean that for the first time ever, the East Bay's energy grid will be largely dependent on fossil fuels from the Middle East, Russia or elsewhere to keep our lights on and homes heated.

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waste facilities" Available online at: http://www.pgecorp.com/corp_responsibility/reports/2006/environment_planning.html (browsed February 22, 2008)

[55] Covanta Energy website: "Electrical Power generated at the facility is sold through a contract to Pacific Gas & Electric (PG&E) Available online at: http://www.covantaholding.com/site/stanislaus/stanislaus-facility-process.html (browsed February 22, 2008)

[56] http://www.energy.ca.gov/contracts/siting.html

[57] Fox Business News. "January Natural Gas Bills 7 Percent Lower than One Year Ago." January 2, 2008. http://www.foxbusiness.com/markets/industries/energy/article/january-natural-gas-bills-7-percent-lower-year-ago_422010_11.html

The cost for energy derived from natural gas rose from 6 cents per Kilowatt hour in 2003 to 10.1 cents in 2007. As a result, the cost of electricity from the typical natural gas peaking power plants increased by 220%.[58] As natural gas is a finite resource, its price over the long term will surely increase especially as demand overtakes supply.

## Public Power in Alameda and Palo Alto

Some of the nation's largest cities – Los Angeles, San Antonio, Seattle and Orlando – operate publicly owned electric utilities. Public power in the United States includes more than 2,000 community-owned electric utilities, serving over 45 million people or about 14 percent of the nation's electricity consumers. Public power utilities are operated by local governments to provide communities with reliable, responsive, not-for-profit electric service.

Public power is an expression of the American ideal of local people working together to meet local needs. Public power utilities are directly accountable to the people they serve through local elected or appointed officials.

Public power utilities have many distinct characteristics that benefit the consumers of the individual community it serves including but not limited to:

- Lower electricity rates[59]
- Equal or greater reliability
- Efficient service – lowest cost consistent with reliability, community goals and sound business practices
- Not-for-profit status – lower costs and no split allegiance between customers and stockholders
- Greater portion of revenues stay in community

Public Power utilities in the Bay Area include Alameda Power and Telecom (AP&T) and Palo Alto Utilities. As shown in the table below, AP&T's electricity rates are 12-91% lower than PG&E at each pricing tier. And notably, AP&T's power mix already includes 57% renewable (41% geothermal, biomass & waste 9%, and 6% wind). The balance is 28% large hydropower, 8% coal, and 7% natural gas.

| **Comparison of PG&E and Alameda Power & Telecom Rates** | | |
|---|---|---|
| **Residential** | **Energy Charge** ($/kWh) | **"Average"** |

[58] Community Environmental Council. "Santa Barbara County Renewable Energy Blueprint." 2007. Available at www.fossilfreeby2033.org.
[59] http://www.appanet.org/files/PDFs/ppcostsless2005.pdf

| Service Rate Schedule | Tier 1 (Baseline) | Tier 2 (101-130% of baseline) | Tier 3 (131-200% of baseline) | Tier 4 (201-300% of baseline) | Tier 5 (Over 300% of baseline) | Total Rate (per kWh) |
|---|---|---|---|---|---|---|
| **PG&E** | $0.11560 | $0.13142 | $0.22166 | $0.30507 | $0.34878 | $0.16419 |
| **Alameda Power & Telecom** | $0.10287 | $0.11690 | 0.18293 | 0.18293 | 0.18293 | Not Available |
| **PG&E costs more by** | 12% | 12% | 21% | 67% | 91% | Not Available |

As shown in the table below, Palo Alto offers two plans for residential service, both of which are less than PG&E and AP&T for the first 300 kWh. The 100% renewable energy PaloAltoGreen program offers a California blend of 97.5% wind and 2.5% solar generation at average additional cost of less than $10 per month. The program counts more than 100 local businesses as participants.

| Palo Alto's Residential Rates | | | |
|---|---|---|---|
| **Residential Service Rate Schedule** | Energy Charge ($/kWh) | | |
| | First 300 kWh | Next kWh | Over 600 kWh |
| **Palo Alto** | $0.07729 | $0.10266 | $0.13698 |
| **Palo Alto Green** | $0.09229 | $0.11766 | $0.15198 |

As shown in the table below, Silicon Valley Power offers two plans for residential service, both of which are less than PG&E. The 100% renewable energy Santa Clara Green Power program offers energy from wind and solar projects in Northern and Southern California for only an additional $0.015 per kilowatt-hour.

| Silicon Valley Power Residential Rates | | |
|---|---|---|
| **Residential Service Rate Schedule** | Energy Charge ($/kWh) | |
| | First 300 kWh | Over 300 kWh |

| | | |
|---|---|---|
| **Silicon Valley Power** | $0.07527 | $0.08653 |
| **Santa Clara Green Power** | $0.00927 | $0.10153 |

As shown in the table below, PG&E's general business rates are higher than both AP&T and Palo Alto. PG&E costs 22% more than AP&T for general non-residential service. PG&E costs more than 31% and 17% more than 100% renewable energy from Palo Alto and Silicon Valley Power.

| Comparison of Business Rates for PG&E and public power utilities | | | | |
|---|---|---|---|---|
| | Energy Charge ($/kWh) | | | PG&E costs |
| Basic commercial service | Average | Summer | Winter | more |
| 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 | | 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% |

# Environmental and Social Justice

From a national perspective, studies indicate that hundreds of thousands, if not millions of jobs could be created, depending on the strength of the policy approach. Redefining Progress estimates that clean energy can produce 652,000 U.S. jobs in 10 years, and 1.4 million by 2025, reducing unemployment by 14%.[60] The Union of Concerned Scientists concludes that a 20% renewable energy standard for U.S. electrical utilities would create over 185,000 jobs by 2020.[61] This growing body of evidence indicates that renewable energy technologies and investments in energy efficiency hold tremendous job creation potential. Clean energy development not only helps to mitigate the twin challenges of climate change and fossil fuel dependency, it holds great promise in addressing the need for high-quality jobs with pathways to sustainable careers for marginalized communities who have yet to benefit from the burgeoning green economy.

Community Investment and Green Job Training Programs

[60] J. Andrew Hoerner and James Barrett, *Smarter, Cleaner, Stronger: Secure Jobs, A Clean Environment, and Less Foreign Oil*, Redefining Progress, September 2004, 2-4, http://www.rprogress.org/publications/2004/SmartCleanStrong_National.pdf

[61] Union of Concerned Scientists, *Cashing In on Clean Energy*, 2007, http://www.ucsusa.org/clean_energy/clean_energy_policies/cashing-in.html

Community investment in renewable energy provides an important opportunity to place interns and graduates of city-supported green collar job training programs in meaningful and well-paid positions. To do this, social and economic justice organizations like the Ella Baker Center for Human Rights advocate for policies that provide "pathways out of poverty" into green sectors for people with barriers to employment (i.e., criminal history, language barriers, employment gaps, lack of high school diploma, low-income background, etc.). As the Center's co-founder Van Jones notes, "We must connect those who need work the most with the work that most needs to be done."

In addition to vocational training, green job training programs should enable participants to develop a strong foundation grounded in the following skill sets: basic literacy, job readiness, digital literacy, financial management, and customer service. Such programs should also provide assistance with child care, transportation, nutrition, drug/alcohol counseling, and living wage compensation to ensure that participants aren't forced to choose between work and training. Lastly, trainees should be placed whenever possible in partner green businesses so that they can receive vital on-the-job experience that will prepare them for long-term green careers.

Alameda Power and Telecom's Energy Assistance Program

The Energy Assistance Program (EAP) provides ongoing assistance to qualifying low-income customers. The main objectives of the program are to reduce the qualifying customer's energy use and provide bill assistance by applying a 25% discount to the customer's monthly electric bill. Program highlights include:

- A free energy audit and recommendations for improvements to reduce energy use
- The installation of up to four compact fluorescent bulbs at no cost
- The replacement of older, inefficient refrigerators meeting certain criteria at no cost. (If the household is a rental unit, a contribution from the landlord is required.)
- Weatherization for homes with electric heat.
- Replacement of fire-hazardous halogen torchieres with new, energy-efficient compact fluorescent torchieres.

The EAP is funded by Alameda Power & Telecom's Public Purpose Program. It is administered by the American Red Cross, who determines eligibility.

For more information, please call the Red Cross at 510-814-4200.

Alameda Power and Telecom's Project EASE

Project EASE (Energy Assistance through Supportive Efforts) provides short-term emergency assistance to residential customers who are financially unable to pay their electrical bills and who have no alternative source of assistance. The program is intended to help after all other resources have been expended.

Project EASE is funded by voluntary customer contributions and an annual contribution from Alameda Power & Telecom. The maximum disbursement for each customer or household is $200 within a 3-year period.

Contribution forms are available on the website and also appear regularly in The FLASH.

Again, the American Red Cross administers this program and is also in charge of determining eligibility.

For more information, please call the Red Cross at 510-814-4200.

## Liquefied Natural Gas

While PG&E's renewable development has not kept pace with targets of the California Renewable Portfolio Standard, it is partnering on a project to spend billions on importing Liquefied Natural Gas from gas fields abroad. The project would involve a coastal import terminal located in Coos Bay, Oregon, and a 225-mile pipeline that would bring natural gas to the California border. The project, if approved, will have a capacity of 1 billion cubic feet of natural gas per day, or nearly 50 percent of PG&E's natural gas usage. This will mean that for the first time ever, the East Bay's energy grid will be largely dependent on fossil fuels from the Middle East, Russia or elsewhere to keep our lights on and homes heated.

PG&E is considering investing in Liquefied Natural Gas at a time when Liquefied Natural Gas demand is rising dramatically, especially in the Pacific Rim. As an example of the price increases the East Bay can expect from Liquefied Natural Gas imports, a utility in Japan paid $18 per one thousand British thermal units (MMBTU) for Liquefied Natural Gas bought on the spot market in January 2008.[62] At the same time, domestic natural gas was trading at about $7.50 per MMBTU.

Liquefied Natural Gas projects each have environmental impacts that are unique to the region where it is either extracted or imported. Despite claims to the contrary, Liquefied Natural Gas is neither clean, safe, nor necessary for the West Coast. The reasons are listed below.

• **It contributes to global warming** – Natural gas is a fossil fuel that, when burned or released into the atmosphere, contributes to global warming. The process of getting Liquefied Natural Gas from one continent to another adds greatly to the emissions.

• **It's expensive** – Like oil, Liquefied Natural Gas is a global commodity that is quickly rising in price as demand increases and supplies tighten. California would be competing

[62] Reuters. "Japan Utility Pays $18 per MMBTU for LNG on the Spot Market." January 3, 2008. http://economictimes.indiatimes.com/International__Business/Japan_utility_pays_18_per_mmBtu_for_spot_LNG_Sources/articleshow/2671358.cms

for LNG with Europe, India, and Pacific Rim countries, likely leading to higher utility bills.

• **It will displace cleaner alternatives** – New Liquefied Natural Gas infrastructure costs billions of dollars to build. This is money that could be better invested in clean alternatives, such as energy efficiency and renewable energy.

• **It pollutes** – Liquefied Natural Gas imports means continued, if not greater, dependence on natural gas power plants. These emit tons of nitrogen oxide and other pollutants that are known to cause asthma and other respiratory ailments.

• **It's dangerous** – Liquefied Natural Gas, if it escapes from a storage tank or ship, can quickly vaporize. If this vapor ignites, it can create an immense fireball that would incinerate everything in its path.

• **It will lead to global instability** – Like oil, Liquefied Natural Gas dependence will lead to greater military misadventures. Much of the world's coveted gas fields lie in places like Iran, Iraq, Central Asia, and other regions the U.S. has attacked in order to secure fossil fuel resources.

• **One day it will peak** – While there is debate on the volume of natural gas left in the world, one thing is sure: someday it will peak and eventually run out. Burning it as fast as we can will only lead to that day coming sooner rather than later.

• **It leads to human rights abuses** – Liquefied Natural Gas extraction projects have led to the spread of disease in the Amazon, abuses by the Indonesian military against the West Papuan people, and the erosion of the indigenous way of life on Sakhalin Island, Russia.[63]

## Nuclear Power

California's reactors are located on seismically active earthquake faults. A July 2007 earthquake in Japan illustrates the danger, as the event disabled 6000 MW of generation, caused radioactive leaks and is the most expensive natural disaster of 2007.

Terrorist attacks have not been adequately addressed – PG&E and the Nuclear Regulatory Commission have yet to prove that storage of highly radioactive waste will be safe from acts of terrorism, sabotage or insanity.

Cooling reactors requires one million gallons a minute – the damage from "once-through-cooling" seriously degrades the coastal waters where nuclear power plants are located, and is the subject of a federal lawsuit currently awaiting decision by the Supreme Court.

[63] Ratepayers for Affordable Clean Energy website: www.lngpollutes.org

Uranium mining activities have negative environmental impacts and produce GHG emissions. The health impacts of Uranium mining are the subject of litigation in several states.

# Alternative Energy

Waste to Energy

Today's "waste-to-energy" incinerator and landfill companies falsely claim that they can safely, cost-effectively and sustainably turn materials such as household trash, tires, medical waste, biomass and hazardous waste into "renewable" electricity and fuels like ethanol and bio-diesel. Pacific Gas & Electric even goes so far as to include as part of its Renewable Portfolio Standard the electricity it purchases from two municipal solid waste incinerators in Stanislaus County, California.[64],[65]

Far from being sources of renewable energy, incinerators and landfills emit harmful pollutants into the air, soil and water, waste more energy than they generate[66], and contribute to climate change.[67] New incinerator technologies[68] promoted in California with names such as pyrolysis, gasification, and plasma, have shown even higher costs, less dependability[69], and more harmful emissions[70][71][72][73] when compared with traditional mass-burn incinerators.

More than two thirds of the materials we use in the United States are still burned or buried[74], despite the fact that we have the technical capacity to cost-effectively recycle, reuse or compost the vast majority of what we waste. For every item that is incinerated or landfilled, a new one must be created from raw resources rather than reused materials. This requires a constant flow of resources to be pulled out of the earth, processed in factories, shipped around the world, and burned or buried in our communities. The impact of this wasteful cycle reaches far beyond local

[64] Pacific Gas & Electric, Planning for California's Clean Energy Future: "As defined in Senate Bill 1078, which created California's renewable portfolio standard, an eligible renewable resource includes…selected municipal solid waste facilities" Available online at: http://www.pgecorp.com/corp_responsibility/reports/2006/environment_planning.html (browsed February 22, 2008)

[65] Covanta Energy website: "Electrical Power generated at the facility is sold through a contract to Pacific Gas & Electric (PG&E) Available online at: http://www.covantaholding.com/site/stanislaus/stanislaus-facility-process.html (browsed February 22, 2008)

[66] Morris, Jeffrey, Comparative LCA's for curbside recycling versus either landfilling or incineration with energy recovery, International Journal of Lifecycle Assessment, Vol. 10, Nov. 4, July 2005, pp. 273-284.

[67] U.S. Environmental Protection Agency, *Solid Waste Management and Greenhouse Gases, A Lifecycle Assessment of Emissions and Sinks,* 3rd Edition, September, 2006, p. 125

[68] U.S. Environmental Protection Agency, Title 40: Protection of Environment, Hazardous Waste Management System: General, subpart B—definitions, 260.10, current as of February 5, 2008.

[69] Global Alliance for Incinerator Alternatives (GAIA), Greenaction for Health and Environmental Justice, *Incinerators in Disguise,* 2006.

[70] Jay Chen, P.E., South Coast Air Quality Management District, Emerging Technologies Forum, IES Romoland Emission Tests, Status Update, April 17, 2006.

[71] Weber and Sakurai, Chemosphere 2001: at oxygen concentrations below 2 % and temperatures between 430-470 degrees C, "considerable amounts of PCDD/F were formed"; higher ratios of PCDF than PCDD

[72] Rosemann, Lorenz, Bahadir & Hopf, Frensenius Environ. Bull. (1998): high increase in PCDF in pyrolysis of plastics residues and different liquid wastes.

[73] Mohr, Nonn & Jager, Chemosphere (1997): household waste pyrolysis, while total PCDD decreased, PCDF increased 3-4 fold, resulting in net increase in TEQ

[74] US EPA, 2006 MSW Characterization Data Tables, "Table 29, Generation, Materials Recovery, Composting, Combustion, and Discards Of Municipal Solid Waste, 1960 To 2006," Franklin Associates, A Division of ERG. Available online at: http://www.epa.gov/garbage/msw99.htm.

disposal projects, causing greenhouse gas emissions, wasted energy and pollution thousands of miles away.

Telling facts include:

- The U.S. Environmental Protection Agency's 2006 report *Solid Waste Management and Greenhouse Gases* shows that it is far better for the climate to recycle, rather than incinerate or landfill discarded materials. For example, the report shows that incinerating a ton of mixed plastic rather than recycling it, causes more than six times as many greenhouse gas emissions.[75]
- According to research published by Friends of the Earth in 2006, getting energy from incinerating waste produces 33 percent more greenhouse gas emissions than burning coal in power stations.[7677]
- Recycling materials saves 50 percent more energy than incinerating those same materials generates.[78] For example, recycling mixed paper saves more than ten times more energy than what can be generated and offset by incinerating it.[79]
- Studies show elevated levels of dioxin—a known carcinogen—in the blood of people living near municipal solid waste incinerators when compared to the general population. [808182]
- Incinerators and landfills oblige communities to waste valuable resources and taxpayer dollars for decades to come. For example, by the end of the contract in 2009, Detroit taxpayers will have paid over $1 billion to build and operate the incinerator. Detroit could have saved over $55 million in just one year if it had never built the incinerator.[83]

Incinerators and landfills negatively impact public health and the environment, and gobble up public taxpayer money meant for real renewable energy, waste reduction and climate solutions. Community health and climate change demand that we strengthen waste reduction, reuse, recycling and composting as a means to reduce greenhouse gas emissions and energy use, and that we stop subsidizing waste incineration and landfilling as renewable sources of energy.

## Cogeneration

Locally sourced eliminates energy loss from transmission. It requires little or no increase in fossil fuel usage, and cuts the carbon emissions significantly.

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[75] U.S. Environmental Protection Agency, *Solid Waste Management and Greenhouse Gases, A Lifecycle Assessment of Emissions and Sinks,* 3rd Edition, September, 2006, p. 125

[76] Hogg, Dominic "A Changing Climate for Energy from Waste?" Friends of the Earth, March 5, 2006

[77] Rabl, A., A. Benoist, et al. (2007). Editorial - *How to Account for CO2 Emissions from Biomass in an LCA.* International Journal of Life Cycle Assessment 12(5): 281.

[78] Morris, Jeffrey, Comparative LCA's for curbside recycling versus either landfilling or incineration with energy recovery, International Journal of Lifecycle Assessment, Vol. 10, Nov. 4, July 2005, pp. 273-284.

[79] U.S. Environmental Protection Agency, *Solid Waste Management and Greenhouse Gases, A Lifecycle Assessment of Emissions and Sinks,* 3rd Edition, September, 2006, p. 102-103

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[81] P. Elliott and others, "Cancer incidence near municipal solid waste incinerators in Great Britain," BRITISH JOURNAL OF CANCER Vol. 73 (1996), pgs. 702-710.

[82] Leem et al., 2006. Risk Factors Affecting Blood PCDDs and PCDFs in Residents Living near an Industrial Incinerator in Korea. Arch. Environ. Contam. Toxicol. 51:478–484 .

[83] The Ecology Center, *Detroit Incinerator: Billion Dollar Boondagle* Found at http://www.ecocenter.org/recycling/detroit.php (browsed on February 8, 2008)

executive and director for the North Carolina Sustainable Energy Association, says, "In the legislation, if the source of waste heat is a renewable resource such as wind, solar or biomass, it's considered a renewable. If it's an improvement in traditional sources, it's an energy-efficiency measure."

A recent Environmental Protection Agency (EPA) study examined 16 major industries and found enough waste energy to support 96 gigawatts of new clean power capacity and generate 19 percent of the country's electricity.

Tapping available waste energy could replace 190 coal plants, power 48 million homes and slash US. greenhouse emissions by 17 percent.
By: Johnston, Marsha W.. E - The Environmental Magazine, Jan/Feb2008, Vol. 19 Issue 1, p22-24, 3p;

Wind Energy

The Spanish Center for Renewable Energy is currently building an innovative test center dedicated to developing wind energy.

Modern Wind turbines consist of four main components: A foundation unit, a tower a nacelle (turbine housing), and a rotor. Typical foundation is a giant concrete block buried in the earth. The Nacelle contains primary components such as the main axle, gearbox, generator, transformer, control system, and electrical cabinet. The rotor consists of a hub, usually with 3 blades attached.

There are 3 ways to regulate output: passive stall in which the turbine operates at a constant speed of revolution with nonadjustable blades. Aerodynamics will force the blade profile to stall at winds exceeding 12 to 15 m/sec depending on turbine type. Active stall where the turbine moves with a constant speed of revolution but with adjustable blades, when the wind exceeds 12-15m/sec the blades are rotated into the wind to produce a stall effect. Finally, two types of pitch-based output regulation: pitch and variable speed pitch. In pitch, turbine moves with constant rev speed and with adjustable blades, the leading edge of the blades turns into the wind to reduce uplift. IN variable speed pitch, the speed of rev changes and the blades are adjustable, also with leading edge into wind.

The conversion of power is about 1:100 and the electricity is sent through a high-voltage transformer to the utility power grid. An example: V90 turbine in Portland, OR with rotor diameter of 90m maximum output 3MW at 15m/sec.

Typical height limits in US are 80m to 100m high. Experts say 100m high turbines are better inland and 80m high are better on coast.

Software evaluates all operating and climatic data. 2 instruments record wind speed and direction, first measures, second monitors first and takes over if breakdown.
By: Mahoney, Patrick. Machine Design, 8/9/2007, Vol. 79 Issue 15, p47-51, 4p, 4c

On average, it costs about $1million/MW to construct a wind turbine farm. (compared to $600,000/MW for a conventional gas-fired plant)

Geothermal

The first geothermal plants in the United States date to the 1920s when they consisted of little more than airborne/generators placed atop geysers in northern California. Known as "flash" geothermal units, these plants captured geothermal fluid in a vessel where it flashed to steam to drive a turbine. Those early plants were small - about 20 kW. And because geothermal fluid is heavily laden with brine and other highly corrosive minerals that quickly take their toll on turbines, flash plants can have high maintenance costs relative to the amount of power they generate.

By I960, Pacific Gas & Electric had developed about 20 geothermal plants on The Geysers in northern California. At their peak, the Geysers produced about 2,000 MW, which for a time, was enough to supply most of San Francisco's power needs. But such extensive use drew down the resource.

Output diminished as condensation depleted the geothermal wells. Eventually, the Geysers produced around 1,000 MW. Today, The Geysers are owned and operated by independent power producer Calpine Corp. Calpine bought a 5 percent interest in a 20 MW plant at The Geysers in 1989 and has since consolidated ownership of 19 of the 21 facilities representing about 750 MW drawn from 350 active wells. That makes Calpine the world's largest private producer of geothermal electricity. Calpine continues restoring The Geysers to higher capacity by injecting clean wastewater from local municipalities. A 29-mile-long underground pipeline delivers 8 million gallons of reclaimed water each day. A 41-mile long underground line being built will deliver another 11 million gallons of reclaimed water a day.

**TABLE 1 NEAR-TERM NEW GEOTHERMAL POTENTIAL IN WESTERN U.S.:**

| **Capacity** | **(MW)** | **Number of Sites** |
|---|---|---|
| California | 2,400 | 25 |

Binary technology resolves several problems associated with flash systems. For one thing, it can operate with cooler water - typically in the range of 225 F to 360F compared to the 500 F to 600 F range needed for flash plants. Fluid in the geothermal loop heats a "working" fluid in the secondary loop that has a lower boiling point than water. Furthermore, a binary plant design exposes none of the geothermal fluid to the atmosphere, meaning what little pollution is generated by a pure geyser—primarily hydrogen sulfide—is also eliminated. After all, even geothermal plants must meet Clean Air Act emission regulations.

So-called "produced water" or "produced water cut" exists in many U.S. oil and gas producing regions. Produced water can range from 200 F to more than 400 F, meaning it could produce geothermal electricity with cither binary or flash technology. Electricity

could be used on-site to reduce grid power costs and might even generate enough electricity to sell to the grid.

The Energy Policy Act treated geothermal well and called for additional funding, says NREL's Bruce Green. Since passage of Energy Policy Act in 2005 however, the Bush Administration and the Office of Budget Management have said they want to cut funding and incentives in half because they view geothermal technology as mature and ready to go it alone.

"Congress has passed a $5 million geothermal program and the Senate a S23.5 million program," says Gawell. DOE continues to push a $5 million program. Gawell says the industry could use up to $60 million to share the cost of new technology and project development.

By: Blankinship, Steve. Power Engineering, Jan2007, Vol. 111 Issue 1, p24-30, 4p