

Alternatives Analysis: Electricity from Renewable Sources for Sonoma County

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EXECUTIVE SUMMARY

This report considers the feasibility of alternative approaches to procure electricity from renewable sources for Sonoma County. The 2008 Sonoma County Community Climate Action Plan (CCAP) concluded that Community Choice Aggregation (CCA) was the local solution most capable of significantly reducing greenhouse gas emissions in Sonoma County and helping achieve this community's 25% emission reduction goal. This report evaluates alternative potential strategies for developing clean, locally controlled electricity capacity. This study considered the greenhouse gas, legal and financial impacts of three alternatives identified for this study:

1. **PG&E Plus:** Broadening existing PG&E programs to increase renewable energy generation and energy efficiency.
2. **PWRPA:** Expanding the role of the Power and Water Resources Pooling Authority of which the Sonoma County Water Agency (SCWA) is a member, to increase renewably sourced electricity.
3. **Incremental Pathways to Community Power:** Pursuing an incremental path toward a CCA or other form of community power.

PG&E Plus

Sonoma County currently relies primarily on PG&E to decrease GHG emissions associated with electricity. Additional initiatives in Sonoma County intended to augment PG&E's energy efficiency and renewable energy activities include:

- Sonoma County Energy Independence Program (SCEIP), a local government program that enables property owners to finance energy efficiency, water efficiency, and renewable energy improvements.
- Solar Sonoma County, a nonprofit engaging local government, solar industry, utility, and community stakeholders to maximize deployment of residential and commercial solar PV and thermal systems.
- Countywide Retrofit/Renewables Initiative, now part of Energy Upgrade California, whose aim is to increase the uptake of voluntary energy efficiency retrofits for residential and commercial properties.

PWRPA

PWRPA is a California Joint Powers Authority comprised of nine irrigation districts that pool their allocations of inexpensive hydropower from the Western Area Power Administration (WAPA). Given current regulatory constraints, PWRPA may only serve government-owned, potable water pumping loads. Since this represents less than one percent of the county's overall electricity load, PWRPA appears to be unable to affect electricity supplies for most Sonoma County customers.

Incremental Pathways to Community Power

The three incremental approaches toward community power considered in this report are:

- Expand Healdsburg Municipal Utility District or create a Sonoma County Municipal Utility District.
- Follow the model created by Cape Light Compact that began with two local governments joining together and later expanded to include 23 cities and three counties.
- Join Marin Energy Authority (MEA) either individually or collectively. MEA is the first California CCA to provide electricity to local customers.

Findings

Relative to Sonoma County's goal of a 259,000-ton annual reduction in GHG emissions associated with electricity by 2015, the options discussed in this report could produce the following results:

- PG&E Plus – 15,000-ton annual reduction by 2015.
- PWRPA – Best-case annual *reduction* of 21,000 tons GHGs to a worse-case *increase* of 3,500 tons by 2015. The most likely range is much smaller than this – from an 8,700-ton decrease to a 1,400-ton increase, assuming only government customers could participate.
- Countywide CCA – 693,000-ton reduction by 2015. Even with expected opt-out rates, participating municipalities could achieve emissions reductions targets for electricity within their jurisdictions. (neither expanding the Healdsburg Municipal Utility District nor creating a Sonoma County Municipal Utility District appears to be a viable option.)

This analysis suggests that no local policy option exists under California's current market structure, regulations and laws to achieve Sonoma County's GHG emission reduction target that is superior to CCA.

An incremental path to forming a CCA emerges as a preferable option for Sonoma County. The

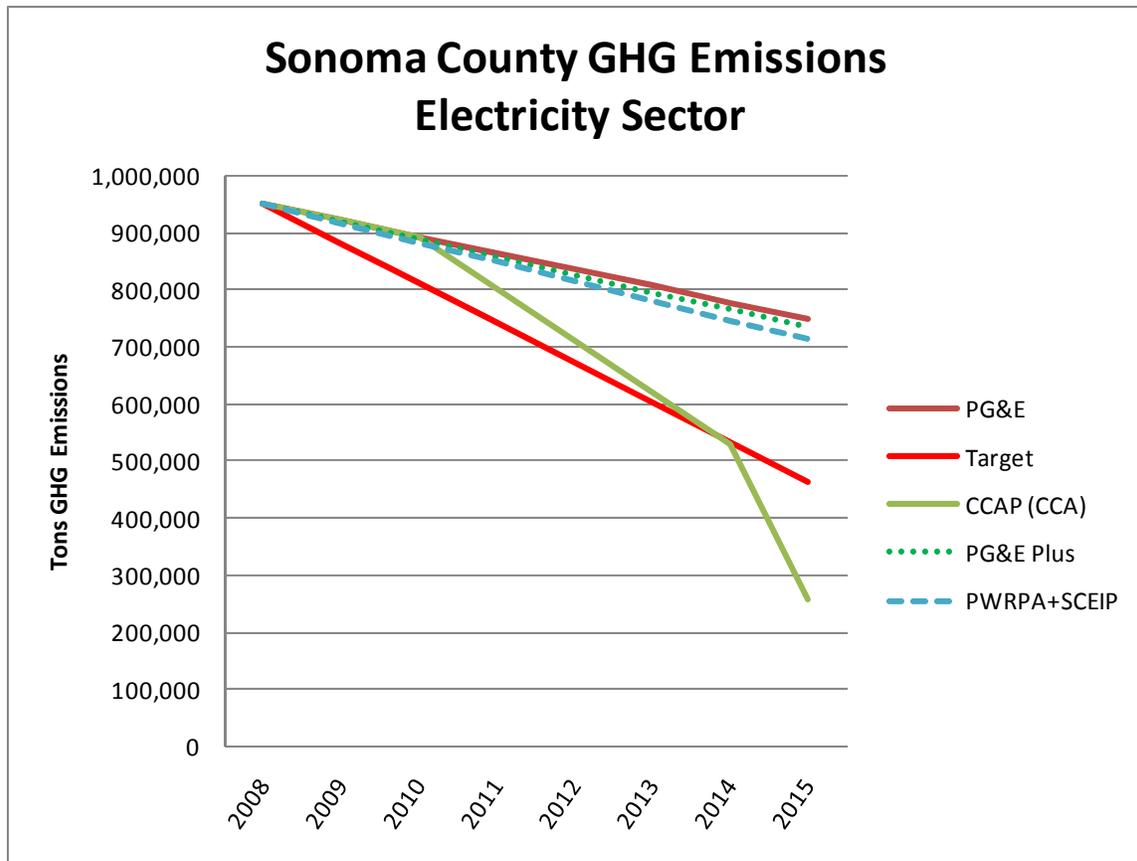
option of having Sonoma County municipalities and/or the county join the Marin Energy Authority (MEA) either individually or collectively would require surmounting political obstacles in both counties. Further analysis of the costs and benefits of this alternative may be desired to ascertain the viability of this pathway to clean energy deployment. In the absence of further analysis for joining MEA, the preferred incremental approach appears to be for two Sonoma County municipalities to join together to form a CCA, following Cape Cod's model. To the degree that such a CCA proves advantageous, other Sonoma County municipalities could be expected to join over time.

PG&E has erected considerable political, legal and financial barriers to California communities pursuing CCA, and will likely do the same if Sonoma County municipalities move toward formation of one.

Year	GHG Emissions (tons) from Electricity
1990 actual	618,000
2008 actual	951,000
2015 target (25% below 1990)	463,500
2015 recommended in CCAP	259,000

However, long-term financial, legal and environmental advantages of a CCA appear to outweigh the short-term hurdles.

While this report finds that the GHG-reduction impacts of existing programs are small compared to those that could be accomplished under a CCA, the existing programs are nevertheless critical to Sonoma County’s progress to meet its GHG reduction target. Sonoma County should thus continue implementing and augmenting its programs that save energy and water, and generate more renewable power. These include SCEIP, Solar Sonoma County, Energy Upgrade, PWRPA, RESCO, SCWA pilot projects, and PG&E’s energy efficiency programs. The relative economic attractiveness of various clean energy options will continue changing as technologies mature and are deployed at scale, as markets adapt to deliver them, and as mechanisms to monetize social and environmental values evolve. Moreover, investments in ongoing capacity building for intelligent energy infrastructure development and management will reap economic rewards through reduced utility rate increases and reduced costs related to reliance on fossil fuels.



Notes:

1. PG&E projection based on compliance with 33 percent Renewable Portfolio Standard by 2020
2. PWRPA + SCEIP is best case scenario based on adequate available hydroelectric power
3. CCAP renewable portfolio assumes construction begins in 2010, with a five year rollout plan

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DISCLAIMER

The opinions, findings, conclusions, and recommendations in this report are solely those of the authors.

While the report is dated March 2011, almost all of the work on the report occurred during 2010.

APPENDICES

The following appendices to this report are available at www.climateprotection.org:

- Appendix I: Utility and County Energy Programs
- Appendix II: PWRPA
- Appendix III: Incremental Paths
- Appendix IV: CCA
- Appendix V: RCPA Letter to PG&E

GLOSSARY

ACES Power Marketing – Alliance for Cooperative Energy Services Power Marketing. Formed by several generation and transmission cooperatives joining together to provide wholesale energy risk management services as a result of the volatile energy markets of the late 1990s.

Base load – The minimum amount of power that a utility or distribution company must make available to its customers, or the amount of power required to meet minimum demands based on reasonable expectations of customer requirements.

Calpine – Calpine Corporation (NYSE: CPN), headquartered in San Jose, owns and operates the largest fleet of natural gas power plants in the U.S. and is also the nation's largest geothermal power producer, providing close to 24,000 MW of electricity in 18 states. Calpine's primary customers are industrial electricity users, government agencies, and electric utilities. 10% of its revenues come from the California Department of Water Resources.

Carbon emission intensities – The average emission rate of a given pollutant (in this case, carbon) from a given source relative to the intensity of a specific activity; for example grams of carbon dioxide released per unit of energy produced.

Coral Energy – Shell Oil company subsidiary that buys, stores, and moves natural gas.

CCA – Community Choice Aggregation, a system adopted into law in the states of Massachusetts, Ohio, California, New Jersey and Rhode Island that allows cities and counties to aggregate the buying power of individual customers within a defined jurisdiction in order to secure energy supply contracts.

CCAP – Community Climate Action Plan, and for the purposes of this report, the specific plan for Sonoma County.

CEC – California Energy Commission, the state's primary energy policy and planning agency.

CPUC – California Public Utilities Commission, regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC serves the public interest by protecting consumers and ensuring the provision of safe, reliable utility service and infrastructure at reasonable rates, regulating utility services, and promoting competitive markets.

CSI – California Solar Initiative, is the solar rebate program for California consumers who are customers of the investor-owned utilities including Pacific Gas and Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E). CSI offers solar customers different incentive levels based on their solar system performance.

Demand – The number of kilowatts or megawatts delivered to the load at a given instant. The rate at which electric energy is delivered to or by a system, part of a system, or a piece of equipment. The primary source of "demand" is the power-consuming equipment of customers.

Emissions coefficient – A unique value for scaling emissions to activity data in terms of a standard rate of emissions per unit of activity (e.g., pounds of carbon dioxide emitted per Btu of fossil fuel consumed). (<http://www.eia.doe.gov/glossary/index.cfm?id=E>)

EM&V – Evaluation, Measurement, and Verification, the performance of studies and activities aimed at determining the effects of a program, as well as the data collection, monitoring, and analysis associated with the calculation of gross energy and demand savings from individual sites or projects. The term “EM&V” is a catchall acronym for determining both program and project impacts.

GHG – Greenhouse gas is gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the so-called greenhouse effect. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

IOU – Investor-Owned Utility, a business organization that that engages in the generation, transmission, and distribution of electricity for sale generally in a regulated market. Commonly referred to a “public utility” (despite actual ownership), IOUs are managed as private enterprises rather than as a function of government or a utility cooperative. California’s major IOUs include Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric.

JPA – Joint Powers Authority, an entity created by two or more public authorities such as local governments or utilities operating collectively.

LANL – Los Alamos National Laboratories, national security research and development institution working in the bioscience, chemistry, computer science, earth and environmental sciences, materials science, and physics disciplines.

Load shape – The distribution of energy requirements over time.

Long Term Procurement Plan – A reviewed and approved plan for investor-owned utilities to purchase energy, overseen by the CPUC. The plan establishes policies and utility cost recovery for energy purchases, ensures that utilities maintain a set amount of energy above what they estimate they will need to serve their customers (called a reserve margin), and implements a long-term energy planning process.

Metric ton – A unit of weight equal to 1,000 kilograms, also known as the long ton (2,240 pounds).

MUD – municipal utility district

Municipalization – The transfer of corporations or other assets to municipal ownership. The transfer may be from private ownership (usually by purchase) or from other levels of government. It is the opposite of privatization.

NCPA – The Northern California Power Agency, headquartered in Roseville, California, is the is a not-for-profit joint powers agency that represents and provides support for 17 member communities and districts in Northern and Central California. NCPA was founded in 1968 as a forum through which community-owned utilities could prevent costly market abuses employed by private utilities at that time,

and to make investments to ensure an affordable, reliable and clean future energy supply for the electric ratepayers served. (<http://www.ncpa.com/>)

Net metering – An electricity policy through which the owner of a renewable energy system receives retail credit for at least a portion of the electricity the system generates.

Power dispatching or dispatch services – Electricity is by its nature difficult to store and has to be available on demand. Consequently, unlike for other products, it is not possible, under normal operating conditions, to keep it in stock, ration it, or have customers queue for it. Demand and supply vary continuously. There is therefore a physical requirement for a controlling agency, the power system operator, to coordinate the dispatch of generating units to meet the expected demand of the system across the transmission grid.

PWRPA – Power and Water Resources Pooling Authority (pwpra.org), a Joint Powers Authority comprised of nine irrigation districts that organized in 2004 under California state law to collectively manage individual power assets and loads. PWRPA serves 15 water purveyors in the Sacramento-San Joaquin Valleys and coastal counties of California.

RESCO – For the purposes of this report, RESCO refers to the research, development, and demonstration Renewable-Based Energy Secure Communities, that is, of mixed renewable energy technologies in an integrated, sustainable, and optimum manner coupled with advancements in energy efficiency, smart grid integration, energy storage, combined cooling, heating and power, and co-production of value-added products such as biofuels in communities that will help make California’s electricity and transportation fuels more diverse, safe, cleaner, and affordable. (RESCO is also as an acronym for Renewable Energy Services Companies.)

Retail wheeling – Refers to the ability of an energy consumer to select their own energy supplier, or "wheel in" energy from one of two or more different suppliers. When a utility on one region sells energy to a customer in another utility's territory, the energy is said to be “wheeled” to the customer. Also refers to the process of delivering energy supplied by one party over a transmission system owned or controlled by another party.

Short ton – A unit of weight equal to 2,000 pounds, also known simply as “ton.”

SCWA – Sonoma County Water Agency

WAPA – Western Area Power Administration (wapa.gov), one of four power marketing administrations within the U.S. Department of Energy whose role is to market and transmit electricity from multi-use water projects. WAPA markets and delivers reliable, cost-based hydroelectric power and related services within a 15-state region of the central and western U.S.

INTRODUCTION

This report considers the feasibility of alternative approaches to procure electricity from renewable sources for Sonoma County, a pursuit motivated by this community's commitment to energy independence and climate protection. Sonoma County requires a significant, rapid increase in renewable energy, among other necessary actions, to achieve the greenhouse gas (GHG) reduction target of 25 percent below 1990 levels by 2015, a goal that the County of Sonoma and all nine municipalities in Sonoma County adopted by resolution in 2005.¹

The Sonoma County Community Climate Action Plan (CCAP), issued in 2008 and developed by the Climate Protection Campaign in partnership with government, business and the community at large, found that Community Choice Aggregation (CCA) was the local solution most capable of significantly reducing greenhouse gas emissions in Sonoma County and helping achieve this community's 25% emission reduction goal.² Recognizing that CCA will face political and other roadblocks, this report evaluates other potential strategies for developing clean energy capacity and expanding supply systems at the local level to achieve the County's goal.

The three alternatives addressed in the study are:

1. **PG&E Plus:** Broadening existing utility and county programs to increase renewable energy generation and energy efficiency.
2. **PWRPA:** Expanding the role of the Power and Water Resources Pooling Authority, of which SCWA is a member, to increase renewably sourced electricity.
3. **Incremental Pathways to Community Power:** Pursuing alternative incremental pathways toward a CCA or some other variation of community power. Pathways include forming or expanding a municipal utility district, forming a CCA with one or two municipalities, or seeking to join the Marin Energy Authority's CCA program.

A fourth section summarizing Community Choice Aggregation is included so that readers may easily reference this approach. In addition, appendices to this report allow readers to access supplemental material developed for this study.

Where possible, this report quantified, analyzed, projected and compared the GHG emission impacts associated with each alternative. Similarly, the legal and financial impacts associated with each alternative are described where possible, as are opportunities and challenges.

The quantitative framework employed for the GHG emissions analysis was derived from the CCAP, which recommended solutions for the electricity and natural gas sectors that represent a 37 percent reduction below 1990 levels, and a 58 percent reduction with high performance energy efficiency and renewables included. The CCAP calls for a local power mix of 67 percent renewables-sourced electricity,

¹ Nine municipalities: Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, Windsor. An example of a resolution: Sonoma County Board of Supervisors, #05-0827, September 27, 2005, www.sonoma-county.org/edb/pdf/innovation/bos_resolution050827.pdf

² www.coolplan.org

demonstrating how the electricity and natural gas sector could compensate in part for GHG reductions needed from more difficult sectors such as transportation to reach the overall goal.

Other sources of information for this report came from interviews with local government staff, from data for existing programs, and from electric power use in Sonoma County. Data sources included PG&E, the California Energy Commission (CEC), the California Independent System Operator (CAISO), the California Public Utilities Commission (CPUC), and other sources referenced in footnotes. Interview questions focused on interviewees' knowledge of local energy program structure and factors affecting program growth to evaluate and predict the market potential of these programs.

SECTION I: PG&E PLUS – UTILITY AND COUNTY ENERGY PROGRAMS

This section begins with a description of the projected impacts from electricity use in the county if Pacific Gas & Electric (PG&E), the incumbent investor-owned utility (IOU), continues in its current position as the primary electricity provider. Following this is an examination of the impact of additional initiatives in the county that are now and potentially could further enhance PG&E's energy efficiency and renewable energy activities.

PG&E

Sonoma County currently relies primarily on PG&E to decrease GHG emissions associated with electricity. PG&E is obligated by state laws and regulations to increase its renewable portfolio and efficiency throughout its service territory. Since 2002, California's Renewables Portfolio Standard (RPS) law requires investor-owned-utilities (IOUs) in the state to supply a portion of the delivered electricity from eligible renewable sources by a specific date. Until 2003, California's RPS required retail sellers of electricity to serve 20 percent of their load with renewable energy. In 2003, the Governor called for an acceleration of the RPS, urging that 20 percent of electricity come from renewable sources by 2010 rather than 2017; this accelerated standard became law in September 2006. In 2008, Executive Order S-14-08 set the state RPS at 33 percent by 2020.³

The State also requires PG&E to deliver both electricity and natural gas efficiency improvement programs throughout its service territory, as well as to administer the California Solar Initiative (CSI) program, which includes adding 765 megawatts of net-metered rooftop solar photovoltaic (PV) generation for existing buildings in its service territory by 2016.⁴ PG&E's energy efficiency programs are funded largely through the state-mandated Public Goods Charge. The California Public Utilities Commission (CPUC) supervises PG&E and the other IOUs on these expenditures, including the proportion of funds that are spent in each region across their service territories.

Under Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, GHG emissions from electricity generation will be capped at 1990 levels by 2020. For the electricity and natural gas sectors, the California Energy Commission (CEC) and the CPUC have issued an opinion and recommendations for implementing carbon emissions reduction in the electricity and natural gas sectors.⁵ Both IOU-owned and imported electricity generated from fossil fuel sources are subject to the cap. According to the California Air Resources Board (CARB) AB32 Scoping Plan, California will establish a carbon market beginning in 2012 that will use a portion of the revenues generated from auctions of carbon credits to augment efficiency programs statewide, as well as for investment in renewables.

PG&E's total portfolio currently stands at 14.4 percent from renewables, and therefore is not meeting the state's RPS targets. PG&E is not alone; to date none of California's investor-owned utilities have

³ <http://gov.ca.gov/executive-order/11072/>. Executive Order S-14-08 also directed the California Air Resources Board (CARB) to implement this through regulation. CARB voted unanimously on September 23, 2010, to set the RPS at 33% by 2020.

⁴ <http://pge.com/myhome/saveenergymoney/solarenergy/csi/csiprogramstatistics/index.shtml>

⁵ California Public Utilities Commission and California Energy Commission; Final Opinion and Recommendations on Greenhouse Gas Regulatory Strategies; October 2008.

complied with the RPS targets. PG&E claims that it will exceed 20 percent by 2013, within a three-year compliance window.

PG&E's Ability to Achieve Sonoma County's GHG Emission Reduction Goal

Sonoma County's Community Climate Action Plan (CCAP) includes an extensive analysis of PG&E's ability to achieve Sonoma County's GHG emissions reduction goal of 25 percent below 1990 levels.⁶ The accuracy of the data, assumptions, methodology, and results of the analysis were confirmed by PG&E staff and consultants during several meetings with CCAP authors.

The CCAP considered three options for achieving GHG reductions in the electricity sector:

- Continue with PG&E on the premise that the IOU will rapidly and significantly revise its long-term energy procurement and efficiency plans, or
- Create a separate entity that would enable the county to explore alternative procurement and access to low-cost financing, i.e., CCA, or
- Combine both options to leverage their respective strengths through collaboration.

Since the CCAP was issued in 2008, local government staff and consultants in Sonoma County have made numerous requests of PG&E representatives for the company's current, specific, quantified plans for helping Sonoma County reduce its GHG emissions.⁷ To date, PG&E representatives have not supplied the requested information. Until new information becomes available with which to update the CCAP's projections for electricity supplied by PG&E, the figures in CCAP stand as the best available. Even assuming the best possible low-carbon scenario for PG&E supplied electricity by 2020, Sonoma County emissions from electricity would still be at twice the level needed to achieve the county's targeted levels for 2015.

Challenges and Opportunities

As an IOU, PG&E is obligated to earn a profit for its shareholders. Until fossil fuel becomes more expensive relative to renewables, insufficient financial incentives exist for PG&E to accelerate the proportion of renewables in its electricity mix. PG&E may also be impeded from accelerating its renewable mix because it lacks full control of its resource planning and development as a regulated monopoly.

One major challenge Sonoma County faces in greening its electricity is lack of control over its source of electricity. PG&E has a monopoly over supplying power to most of Sonoma County, and PG&E is regulated by the CPUC, not Sonoma County. During interviews, local government staff offered several ideas for persuading, pressuring, and penalizing PG&E to switch its source of electricity from fossil fuels to renewables:

⁶ Sonoma County Community Climate Action Plan, 2008, p. 21-37, www.coolplan.org

⁷ Dave Brennan, former Regional Climate Protection Authority Program Coordinator, sent a memo to a PG&E local representative requesting information in collaboration with this study. PG&E has not yet provided a written reply to the letter. A copy of the memo sent to PG&E is shown in the Appendix.

- Local governments could appeal to PG&E by showing a larger renewable portfolio would help PG&E fulfill its marketing pitch as the “greenest utility in America.” Intensifying local explorations of establishing a CCA might pressure PG&E to do better than its current 14 percent renewable mix. Sonoma County could try to convince the CPUC to require all utilities meet RPS goals by conditioning its profit recovery on compliance with state RPS goals.
- The CPUC could penalize PG&E for RPS non-compliance by removing or curtailing its access to the energy efficiency Public Goods Charge funds.

The challenge with several of these strategies described above is influencing the CPUC to act. A newly elected governor might, especially if encouraged, appoint CPUC commissioners who will pressure and penalize PG&E for non-compliance with the RPS and AB 32.

For more details and analysis of PG&E, see Appendix I, Sections A.1-8.

Existing County Programs that Enhance PG&E Activities

Sonoma County’s Energy Independence Program (SCEIP) enables property owners to finance energy efficiency, water efficiency, and renewable energy improvements through voluntary property assessments. This is also referred to as Property Assessed Clean Energy or PACE financing. Because these assessments are liens, when property ownership changes hands, the assessments remain with the property. Repayment is made through the property tax billing system over terms ranging from 5 to 20 years. From March 2009 when SCEIP began to March 2010, SCEIP processed about 1,400 projects – about 1.4 percent of the total potential candidates. Total project value to date is about \$30 million.⁸ As of July 2010, SCEIP had received \$46 million in net applications (defined as the active applications after rejections and dropouts). Approximately 65 percent of financing has gone to solar PV installations with the remaining 35 percent going to water conservation and energy efficiency projects.

Solar Sonoma County (SSC) is a program that has been largely funded by federal Department of Energy “Solar America Cities” grants. The purpose of SSC is to engage local government, solar industry, utility, and community stakeholders in a public-private partnership to maximize the deployment of residential and commercial solar PV and thermal systems through policymaking and market-based programs. Solar Sonoma County has set a near-term target for all of Sonoma County property owners of 25 megawatts (MW) of newly installed solar photovoltaic (PV) systems by March 2011, which would result in a countywide cumulative installed solar capacity of 42 MW. The longer-term potential goal is to have 250 MW of solar PV in Sonoma County by an as yet unspecified date. SSC has developed a Solar Implementation Plan that recommends programs, policies, and initiatives for local governments to accelerate progress toward these goals.⁹

The Comprehensive Retrofit Program is the local version of a statewide initiative, Energy Upgrade California (EUC) whose aim is to increase the uptake on voluntary energy efficiency retrofits for residential and commercial property owners in Sonoma County. The program integrates marketing, contractor certification, and access to financing and incentives. It combines utility efficiency rebates and

⁸ Data provided by Liz Yager, SCEIP Program Manager.

⁹ www.solarsonomacounty.org

other incentive programs with SCEIP financing as a way of overcoming the initial cost barrier of efficiency retrofit projects. The program is administered by the Sonoma County Regional Climate Protection Authority and is funded by a combination of federal and state grants.

Greenhouse Gas Impacts

Relying on SCEIP to meet Sonoma County's GHG emission reduction goal in the electricity sector, the total cost of retrofits financed through SCEIP would need to total an estimated \$1 to \$2 billion. At the current rate of \$2 to \$3 million per month, SCEIP would need approximately 40 project funding cycles of \$45 million apiece and 55 years to achieve the target, and its funding/project rate would need to be increased to \$30 million per month.¹⁰ To meet the County's 25 percent GHG emission reduction target by 2015, 9 to 10 percent of residential PG&E electricity accounts (20,000) and 14 percent of commercial accounts (7,000) would need to participate in SCEIP with energy efficiency and renewables projects and reduce their net electricity consumption to near zero.¹¹

Solar Sonoma County's goal to achieve 25 MW of newly installed solar PV between March 2008 and March 2011 would equal an annual GHG emission reduction of slightly more than 9,000 tons. At the CCAP's current targeted emission reduction level of nearly 350,000 tons per year for the electricity sector, this would represent about 2.5 percent of the CCAP target for the electricity sector.

The overall goal of the Comprehensive Retrofit Program is to retrofit 80 percent of buildings in Sonoma County to reduce energy use by an average of 30 percent and reduce GHG emissions from the built environment by 168,000 tons per year, and thus achieve Sonoma County's GHG emissions target for energy efficiency.

Challenges and Opportunities

The primary, potentially critical challenge to SCEIP and all PACE programs nationwide is the recommendation issued in July 2010 by the Federal Housing Finance Agency (FHFA) to prohibit any lien taking senior status to the mortgages backed by Fannie Mae or Freddie Mac. This has stopped nearly all PACE programs nationwide.¹² Opportunities for reviving SCEIP and PACE are a legal suit to force the FHFA to reverse its recommendation, and proposed legislation that would override the FHFA's recommendation.¹³

The major challenge for Solar Sonoma County is that individual residential and commercial solar PV remains relatively expensive initially, the process is still complex, and systems are not uniformly cost effective for property owners, particularly for properties with lower electricity use. In the absence of a PACE-type program or power purchase agreements, both residential and commercial solar projects must either be privately funded or self-financed. The opportunity is that individual rooftop, net-metered, solar

¹⁰ These figures are estimates based on SCEIP's reported installations of renewable capacity.

¹¹ Please see Appendix II, Section B.2 for the calculations underlying these estimates.

¹² More information about this challenge and several others facing SCEIP is provided in Appendix II, Section B.4.

¹³ The Sonoma County Board of Supervisors decided to continue SCEIP regardless of the FHFA's recommendation. Nevertheless, SCEIP has seen its business drop by about 50% because of the Agency's action, according to staff.

PV systems have come down in price, providing an increasingly attractive electric supply option for homeowners and businesses.

The scope of the Retrofit Program is currently limited because participation is voluntary. No mechanism exists to ensure that the program will exceed the historical performance of other efficiency programs offered by utilities, typically in the one to two percent GHG emissions reduction range.¹⁴ The Retrofit Program's potential to penetrate the market depends in part on its capacity to provide compelling financial incentives and successfully address other consumer barriers. By raising awareness of SCEIP, the Retrofit Program will likely increase participation as consumers realize they can overcome the initial cost barrier.¹⁵

Solar Sonoma County and the Comprehensive Retrofit Program are challenged to endure without the continued support of state and federal funding on which these programs now depend.

Appendix I, Sections B-D provides additional details about SCEIP, Solar Sonoma County, and the Comprehensive Retrofit Program, along with an analysis of their potential contributions to CCAP goals.

Expanded Net Metering

Expanded net metering could provide a breakthrough approach for solar PV deployment in Sonoma County. Recent variations on net metering in California include:

- Meter aggregation for multiple systems at different facilities on the same piece of property owned by the same customer
- “Virtual” meter aggregation, where certain customers can net meter multiple systems at different facilities and properties owned by the same customer
- “Community net metering” or “neighborhood net metering,” which allows for the joint ownership of a solar energy system by different customers¹⁶

CPUC Rule 18 presents one of the most significant constraints to expanded net metering.¹⁷ Rule 18 requires separate meters for every electrical service connection and prohibits customers from reselling electricity received from IOUs.

Rule 18 might be circumvented in two ways.¹⁸ First, an owner of a property, for example, a shopping mall with multiple energy customers but with only one assessor's parcel number, could become a “mini utility” by generating power and serving its tenants. PG&E permission would not be required for this. Second, a property owner generating excess solar energy could provide the excess to a nearby apartment

¹⁴ For example, see: *New York Times* “Opt-in vs. Opt-out,” Richard H. Thaler, September 29, 2009 and “Do Defaults Save Lives?” Eric J. Johnson and Daniel Goldstein (21 November 2003) *Science* 302 (5649), 1338. [DOI: 10.1126/science.1091721]

¹⁵ Please refer to “Resource Efficiency and Market Barriers,” Ned Orrett, President, Resource Performance Partners, Inc., www.coolplan.org.

¹⁶ Database of State Incentives for Renewables & Efficiency (DSIRE) www.dsireusa.org/solar/solarpolicyguide/?id=17

¹⁷ Per Alan Strachan who was interviewed for this study.

¹⁸ Per Alan Strachan.

complex with the help of a governmental agency like SCWA. With CPUC permission, SCWA could become “the intermediary between mini-utilities” to monitor agreements between customers, administer electric bill credits and charges, and set rates but it would not sell retail power directly to customers.

As long as Rule 18 remains unchanged, however, the above two options will be limited to multi-metered properties such as hospitals, business parks, corporate centers, and campuses – approximately 10 to 20 percent of the market. In the unlikely scenario that CPUC eliminated Rule 18, the entire solar PV market could be opened to development.¹⁹

Even if 10 to 20 percent of the market participated in either of the above scenarios, this would address only the commercial electricity sector and fall short of Sonoma County’s GHG emission reduction target. In 2008 commercial electricity demand in Sonoma County produced approximately 300,000 tons of GHG emissions. The CCAP allocated a reduction target of approximately 185,000 tons or approximately 40 percent to this sector.

Legal and Financial Considerations

No overriding legal considerations (other than those already addressed) bear on these alternatives because PG&E, SCEIP, Solar Sonoma County, and the Comprehensive Retrofit Program all currently exist as legal entities. However, staying with the status quo (i.e., maintaining PG&E as Sonoma County’s primary provider of electricity) would likely mean that Sonoma County communities would continue to depend on fossil fuel well into the future. Because fossil fuels are finite and energy consumption is predicted to grow, most forecasts indicate increasing costs.

Conclusion

Even assuming PG&E efficiency and renewable energy programs meet best-case projections for GHG emissions reductions and local programs perform at optimum levels, these will not be enough to achieve the emissions reductions required to reach Sonoma County’s goal by 2015.

¹⁹ Per Alan Strachan.

SECTION II: PWRPA – POWER AND WATER RESOURCES POOLING AUTHORITY

This section considers the potential of the Power and Water Resources Pooling Authority (PWRPA) to enable the Sonoma County Water Agency (SCWA) to increase renewable energy generation that would serve selected SCWA customers in Sonoma County. Randy Poole, former General Manager of the Sonoma County Water Agency, believed that using PWRPA to increase Sonoma County’s access to renewable energy might be a real option, and so this is seriously considered in this report.

SCWA buys electricity from PWRPA, a California Joint Powers Authority comprised of nine irrigation districts organized in 2004 under state law to collectively manage electrical power generation assets and loads.²⁰ PWRPA serves 15 water purveyors, including SCWA, and covers a significant portion of the Sacramento and San Joaquin Valley and coastal counties of California.

PWRPA has access to inexpensive hydropower from the Western Area Power Administration (WAPA), a 15-state power provider with an average power price within competitive range of PG&E’s rates. However, in dry years, PWRPA must supplement this hydropower with electricity purchased from other sources on the open market. PWRPA’s power supply is thus of varying carbon intensity based on the changing availability of hydroelectric power and the need to supplement it with natural gas and coal-fired wholesale system power.

In a very wet year, SCWA gets up to 93 percent of its electricity from hydropower projects. In a dry year, as little as 14 to 15 percent of the electricity comes from hydropower projects, and the agency must meet the rest of its demand by purchasing electricity on the open market.

WAPA’s inexpensive power lowers SCWA’s overall average power cost and reduces the agency’s exposure to variations in power costs. However, in recent years which have been dryer than average, decline in hydropower availability has led to higher power prices and greater carbon intensity in PWRPA’s portfolio than PG&E’s.

SCWA’s experience with wholesale power procurement has been mixed. Exposure to price volatility and risk can be mitigated considerably by increasing local renewable energy supplies and decreasing reliance on the wholesale energy market.

See Appendix II, Section A, for more information about PWRPA.

Scope of Potential Market

Several factors constrain the ability of PWRPA to supply renewable power to users in Sonoma County.

First, PG&E has challenged PWRPA’s ability to serve new loads that rely on PG&E’s infrastructure for transmission and distribution. On June 24, 2010, PWRPA and PG&E entered into a settlement agreement under which PG&E agreed to distribute up to 15 MW of power to new loads of existing and new PWRPA

²⁰ PWRPA, 3514 West Lehman Road, Tracy, California, 95304. Kent Palmerton, General Manager.

customers over the next five years.²¹ The extent to which PWRPA can provide new service above and beyond the agreed-upon 15 MW is uncertain.

Second, a present only government customers with electric loads associated with water pumping are eligible to be served with electricity through PWRPA.²² The combined overall electricity demand of all government entities in Sonoma County is 92 million kilowatt-hours per year, of which about 42 million kilowatt-hours are associated with water systems, with a subset of this from pumping loads.²³ The serviceable electricity load is 20-30 million kilowatt-hours per year, approximately 1.5 percent of the county's total electricity usage. This is approximately equal to the current electricity consumption of SCWA and its power supply allocation from PWRPA.²⁴

Moving another 20 million kilowatt-hours per year to renewable sources through PWRPA would transfer about 0.6 percent of the countywide load to SCWA's PWRPA program.²⁵ To put this in perspective, the annual electricity load targeted by the CCAP as part of a 67 percent across-the-board new renewable electricity portfolio is 3,000 million kilowatt-hours per year.

Assuming PWRPA's current restrictions could be overcome, the scope and size of the potential market beyond government customers would be limited by terms of the contractual agreement between PWRPA and PG&E. Expanding service to private customers might also be subject to other regulatory restrictions that, since 2001, prevent new customers from leaving utility service to receive direct access service.

Greenhouse Gas Impacts

Estimating the greenhouse gas impacts of developing renewable energy facilities through PWRPA to serve an identified group of eligible SCWA customers is not straightforward. Calculations depend on the scope and size of the market that could be served legally by PWRPA. The potential GHG reduction impact of renewable energy through SCWA/PWRPA based on current service limitations would achieve less than one percent of the CCAP goal. GHG calculations also depend on the size of SCWA water pumping loads and on the carbon footprint of PWRPA power, both of which vary significantly from year to year, as previously discussed.

See Appendix II, Section A for more specifics about PWRPA's power mix.

²¹ Settlement Agreement in Federal Energy Regulatory Commission Docket No. EL10-7-000 at 2-3.

²² Interview with Spencer Bader, SCWA Division Manager, Administrative Services, June 22, 2010.

²³ Data obtained from PG&E by LPI on behalf of the Sonoma County Water Agency and Sonoma local governments in 2009.

²⁴ SCWA's estimated in-house potable pumping-only load it is about 20M MWH per year. The Geysers Project wastewater pumping, operated by City of Santa Rosa Utilities Department, is non-potable and would not fall within this target definition.

²⁵ Analysis is based on PG&E aggregate data for these loads, received through a PG&E CCA-Info tariff data request by LPI on behalf of Sonoma County Water Agency and Sonoma County local governments.

Opportunities

Two scenarios by which SCWA could develop more renewable energy generation through PWRPA to sell power to other eligible water contractors follow.

1. PWRPA could purchase and market new SCWA renewable generation.

SCWA has the authority to generate and sell power as a wholesaler. However, the settlement agreement with PG&E described earlier places limits on its ability to do this. SCWA cannot sell power retail or be a supplier, but the agency can generate and sell to another retailer such as the Northern California Power Agency (NCPA), PG&E, or PWRPA. In the absence of constraints, SCWA could use PWRPA as a conduit for the distribution of SCWA-generated renewable energy to municipal water pumping operations. This strategy would apply to new loads such as the City of Santa Rosa's Laguna Wastewater Treatment Plant expansion now under construction. SCWA could also seek to partner with municipalities to assist the municipalities in developing renewable energy projects financed through PWRPA using SCWA as the umbrella organization. Municipalities might participate on an incremental basis, and thereby test how such an approach works before offering retail power services to private sector commercial and residential customers.

2. PWRPA could be an investor in Sonoma County renewables.

Up to the present, SCWA's primary interest in expanding capacity for renewable energy generation has been to power its own facilities. Currently, SCWA is considering jointly investing with PWRPA in projects in Sonoma County. A challenge with this approach is the cost of developing renewable energy facilities. While investments inside the County increase property values and provide jobs, lower land prices in other areas of California may result in more power at less cost in some categories of renewables, such as wind or solar power.

See Appendix II, Section C for more details about scenarios 1 and 2.

Challenges with PWRPA

The four opportunities listed above face three major challenges. These are summarized in the following table along with their potential resolutions.

Challenge to PWRPA Expansion	Potential Resolution
1. PWRPA may be limited to public potable water pumping customers.	Focus on new public loads such as the City of Santa Rosa's Laguna Water Treatment Plant expansion.
2. PWRPA may be limited in its ability to add new customers.	Obtain favorable ruling from FERC.

<p>3. Other PWRPA members are more interested in low-cost energy and may not want to engage in major projects that add costs.</p>	<ul style="list-style-type: none"> • Have the higher costs associated with renewable power be paid solely by those taking the power. • Convince PWRPA members of their current vulnerability to be able to comply with the state’s RPS given their reliance on hydroelectric power and fossil fuels.
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See Appendix II, Section D for more detail about these challenges with PWRPA expansion.

Conclusion

State legislation that established SCWA limits the types of services the agency can offer. SCWA procures most of its electric power through PWRPA which provides hydropower supplemented with market purchases. Expanding PWRPA electricity services in Sonoma County must be considered in the context of an agreement with PG&E that limits the amount of new service it can add and limits service to government customers with water pumping loads. Expanding PWRPA’s ability to deliver additional power may require either PG&E consent or state legislation.

Current regulations makes only government-owned potable water pumping loads eligible for expanded renewable energy power generated through PWRPA. Given the inherent infrastructure, legal, and policy challenges, the PWRPA option will not yield sufficient capacity to contribute to achieve 67 percent renewables-sourced electricity for Sonoma County by 2015.

SECTION III: INCREMENTAL PATHWAYS TO COMMUNITY POWER

Can regional community power be developed through incremental steps? Would this approach be more politically feasible and thus simpler and faster to implement than Marin County’s all-at-once approach? Would an incremental path reduce local government exposure to the perceived costs and risks associated with community power? This section addresses these questions by considering three incremental approaches toward community power:

- Expand Healdsburg Municipal Utility District or create Sonoma County Municipal Utility District
- Follow Cape Light Compact model
- Join Marin Energy Authority

Expand Healdsburg Municipal Utility District or Create Sonoma County Municipal Utility District

The City of Healdsburg has an established municipal utility district (MUD) through which city residents and businesses receive electricity. The General Manager of Healdsburg’s MUD was interviewed to assess the feasibility of using this entity as a means for switching other parts of Sonoma County to community power.²⁶

Healdsburg MUD’s electric load size is relatively small, peaking at 21 MW with less than one percent annual load growth. The only significant growth on the horizon is the new Saggio Hills resort development expected to add about 7 MW of electrical load to the utility.

Other Healdsburg MUD characteristics include:

- Customers – 5,500 total electricity accounts of which 4,300 are residential
- Revenue – 40 percent residential, 30 percent commercial, 30 percent industrial
- Load – 29 percent commercial, 35 percent industrial, 35 percent residential
- Rates – Low compared with PG&E rates²⁷
- Local power – Currently 40 percent of the electricity Healdsburg receives is from geothermal generation from the Geysers.²⁸

Healdsburg is a member of Northern California Power Agency (NCPA), a Joint Powers Authority of municipal utilities and other public entities including irrigation districts. NCPA has two sets of members. Large members such as Silicon Valley Power and the cities of Roseville and Redding co-invest in generation but do not participate in the power pool and do not receive dispatch and scheduling services to ensure load requirements are met on a daily, hourly, and real-time basis from NCPA. That is, their electricity demand is not managed as part of NCPA’s overall power supply, as it is for smaller members.

²⁶ Elizabeth Kirkley, GM, City of Healdsburg Electric Utility in Healdsburg on May 14, 2010.

²⁷ On average rates are 7 cents per kilowatt-hour including administration costs.

²⁸ 2010 Healdsburg estimates from Elizabeth Kirkley.

Healdsburg may legally enter into a business or co-investment relationship with a CCA, SCWA, or any other local government in Sonoma County. According to its staff, Healdsburg MUD would not be interested in investing in power generation if the costs would require raising their current rates. “They don’t want to increase rates under any circumstances,” asserted staff. However, Healdsburg might be an attractive partner for selling excess power to a CCA.

See Appendix III, Section A for more information about Healdsburg MUD power generation development.

Using Healdsburg MUD as a means for helping other parts of Sonoma County switch to community power does not appear to be a viable option. Healdsburg MUD prefers to maintain its small size, low-cost power, and financial stability and low rates make it disinclined to develop higher-cost renewables.

Although not truly an incremental path, another option worth addressing is formation of a Sonoma County Municipal Utility District, as allowed under state law. About 25 percent of Californians receive electricity from MUDs with lower rates on average than IOUs. However, the last California MUD created to supply power was formed decades ago – the Sacramento Municipal Utility District (SMUD), which started providing power service in 1946. Creating a MUD is very challenging – much more so than creating a CCA. Local government staff interviewed for this study believes that PG&E would vigorously oppose a MUD because it would threaten their distribution infrastructure with eminent domain taking. Voter approval must be won to form a MUD, but local governments are prohibited from spending funds to support a campaign to win voter approval. By contrast, PG&E would undoubtedly spend millions to oppose it, as evidenced by the failed MUD campaigns in San Francisco and the attempted SMUD annexation of Yolo County. Apart from a likely lengthy and expensive eminent domain litigation process, formation of a MUD would entail hundreds of millions of dollars of public investment in transmission and distribution systems. Because of the major public debt to acquire or develop distribution infrastructure, creating a MUD poses a significant financial risk.

Follow Cape Light Compact Model

Alternatively, a local government agency in Sonoma County could form a CCA either alone or in partnership with another local government. Assembly Bill 117, California’s law that gives municipalities authority to establish a CCA at any time, also allows an existing CCA to expand to include other local governments by ordinance through formation of a joint powers authority (JPA) and to do so incrementally.

The Massachusetts’ Cape Light Compact began in 1997 through an intergovernmental agreement for establishing competitive power supply, energy efficiency, and consumer advocacy. However, Compact founders realized that many local governments weren’t interested in going forward with implementation of the CCA. Therefore, the Compact started with the two most interested local governments, the Town of Falmouth and the Barnstable County Commission, the Massachusetts’ analogue to Sonoma County’s Board of Supervisors. Once the Compact was officially established, towns that initially were less interested changed their minds and joined. Today, the Cape Light Compact has 165,000 customers in 23 cities and three counties, constituting all of Cape Cod, Nantucket, and Martha’s Vineyard.

Benefits and Opportunities

The primary benefit of the Compact's incremental approach was to enable leading municipalities to create the CCA quickly rather than undertake a multi-year, multi-government coordination process. By moving forward rather than waiting for reluctant partners to come on board, the Compact was able to get started in one year. The initial two-member Compact defined the purpose of the organization and tackled important regulatory and legislative matters in a timely manner. During the second year, nearly all other Cape towns joined the Compact. By comparison, Marin Energy Authority took much longer to form.

The incremental path appears to be more effective and efficient than a regional approach that requires many local governments with widely varying interests to move together simultaneously.

Costs and Uncertainties

Cape Light Compact's incremental path had one notable flaw. The original purpose for the CCA was to generate green power locally, a purpose supported by the two local governments that began the Compact. Additional municipalities that joined the Compact later had less commitment to this vision. Consequently, the Compact was eventually governed by members who were not aligned with the original purpose, and therefore developed energy strategies and programs that veered away from the vision. This led to procurement changes that delayed distributed generation investments and energy efficiency programs for a number of years, undermining the Compact's long-term competitiveness and service appeal. The Compact has since returned to its original purpose of generating local green power.²⁹

Cape Light Compact's process underscores the importance of including a clear purpose in the entity's charter. For example, the Marin Energy Authority defined its primary purpose as GHG emission reduction.

Join Marin Energy Authority

Policymakers in both Marin and Sonoma are contemplating the feasibility and benefits of Sonoma County municipalities – either singly or in groups – joining the Marin Energy Authority (MEA). MEA staff has indicated an interest in bringing in new members.³⁰ MEA is the first California CCA to provide electricity to local customers, a major feat that occurred despite daunting obstacles posed by PG&E.³¹ MEA's first phase of customers now buys greener power at comparable rates to PG&E's.

Benefits and Opportunities

²⁹ See "Community Choice Lessons Learned and Best Practices: a Report Prepared for the San Francisco Public Utilities Commission, Local Power, Inc., August 15, 2009, pp. 26-27, http://sfwater.org/Files/Reports/CCA_Lessons_AUG3109.pdf.

³⁰ Stevens, Lorelee, "Marin Energy Authority receives EPA award; looks to next steps," *North Bay Business Journal*, August 9, 2010.

³¹ See, for example, "Leno energy hearing draws litany of complaints about PG&E tactics," *Marin Independent Journal*, Nov. 9, 2010, http://www.marinij.com/business/ci_16567767?source=most_viewed.

Joining MEA may appeal to Sonoma municipalities in Sonoma County that wanting to minimize start-up costs associated with forming a CCA such as preparing RFPs and required implementation plans, and negotiating with suppliers. Joining MEA may also appeal to municipalities interested in moving forward sooner than later, and in accessing green power at good rates. Currently, MEA customers receive a minimum of 25 percent RPS-compliant renewable energy as part of their power mix. MEA is receiving 78 percent renewables from hydropower and wind.³²

A recent California Energy Commission report on CCA indicates that significant savings may result from the formation of large regional CCAs rather than city-by-city CCAs. A critical determining factor is the “load shape” (the distribution of energy requirements over a designated time period) of the CCA and any municipality that might join incrementally. If the load shape of a joint CCA program is more statistically normal – that is, if the demand level remains relatively constant – compared to the load shape of a single community, then the combined CCA would be able to procure a larger amount of standard, base load energy at lower overall cost.³³

Financial Considerations

In concept, larger aggregations provide more cost effective service than smaller ones by sharing reserve capacity and program costs across more municipalities. As previously discussed, actual costs depend upon the load shape that results from a combination of communities’ power demands relative to the load shape of each separately. Currently, MEA’s rates correspond to Marin’s load size and shape. Adding Sonoma County partners would likely require substantial changes in MEA’s agreement with its energy service provider to accommodate these new loads.

Costs for energy largely depend on the shape of the demand curve; a flatter curve results in lower costs. Thus, if a city with daytime industrial and commercial energy demand like Oakland or Richmond were to combine with a suburban community with mostly nighttime residential demand, then a cost benefit will likely occur. But if a suburban town with evening residential demand and low daytime commercial/industrial demand were to join a CCA with the same pattern of demand, the compounding demand peaks may actually *increase* the cost base. Because Marin and Sonoma counties have similar load shapes, a potentially compounded evening residential peak may result. Thus, it remains to be seen whether the addition of one or more municipalities from Sonoma County to MEA would reduce, increase or maintain the cost base of serving either community. That determination would require a case-by-case analysis.

Legal and Political Considerations

MEA is legally allowed to admit new members and negotiate with its energy supplier, Shell North America, to add the load of one or more municipalities. However, Marin may have to surmount political obstacles to make this happen. Possible MEA considerations include:

³² PG&E is restructuring its rates in 2010 to lower rates for large customers.

³³ “Community Choice Aggregation Pilot Project,” Stoner, G. Patrick, 2009, California Energy Commission, PIER Renewable Energy Technologies Program, CEC-500-2008-091, p. 6.

- Increasing cost of service: Expanding MEA beyond Marin could potentially cause rates to increase and therefore harm the program. Actual rates will depend on market conditions and the additional annual demand curve of commercial and residential load.
- Increasing operational risk: MEA had to overcome significant public doubt about increasing the risks associated with supplying reliable electricity. Adding new members from Sonoma County may cause concern that a larger procurement volume represents new risks to MEA.
- Raising controversy: MEA had considerable opposition from local media, business interests, and economic conservatives. Expanding beyond Marin County may invite unnecessary controversy and distract the agency from its mission of green energy generation and GHG reduction.
- Diluting control: Accepting new members might lead to a loss of political control over the agency, potentially threatening its original mission.

Sonoma County municipalities may also raise issues about joining MEA, including:

- MEA's GHG reduction target is less aggressive than Sonoma County's. Consequently, joining MEA may prevent Sonoma County from fully pursuing CCA, its most promising GHG reduction solution.
- Compared with the CCA defined by the CCAP, MEA's business plan relies more heavily on purchasing green power on the market rather than producing local green power as soon as possible. Less reliance on producing local green power means less local investment, job creation, and energy independence. On the other hand, Marin's approach avoided selling bonds to raise the funds needed for local investment and avoided having to study and determine CEQA compliance for MEA.

As MEA assumes full operational status, it may consider applications from local governments outside Marin County for either exchanges of power, co-investment in renewable resources, or both. If able to accommodate new loads from municipalities in Sonoma County, MEA could negotiate with its supplier to add load associated with a prospective new member in order to determine the positive or negative cost impacts. Sonoma County municipalities should consider MEA as part of the overall portfolio of clean energy deployment pathways, either contributing clean energy supply to municipalities in Sonoma County in proportion to MEA's scale as it expands, co-investing in local renewable energy facilities, or both.

For more details about the Marin Energy Authority, see Appendix III, Section B.

Conclusion

This inquiry finds that neither expanding Healdsburg's MUD nor forming a Sonoma County MUD is a viable approach. An incremental path toward the establishment of a countywide CCA in Sonoma County following the Cape Light model emerges as a preferred approach. One or two Sonoma County municipalities can take the lead, thereby avoiding having to win the assent of every local government and diminishing the complexity and time required when collaborating among many parties. Whether Sonoma County municipalities should join with Marin through MEA remains an open question that depends on many cost and legal considerations. Resolution of these issues would require further analysis beyond the scope of this study.³⁴

³⁴ One task of the Sonoma County RESCO project is to address governance issues. It is expected that further exploration of Sonoma County municipalities joining MEA will be pursued as part of this task.

SECTION IV: COMMUNITY CHOICE AGGREGATION

Assembly Bill 117 passed into law in 2002 and gave any California municipality authority to become a CCA unilaterally at any time by adoption of a local ordinance and submission of an Implementation Plan and Certification to the CPUC. The law also allows municipalities to collectively form a CCA through a Joint Powers Authority.

In a CCA, the incumbent investor-owned utility (PG&E for Sonoma County) would continue to deliver the electricity over its wires, read the electric meters, and issue bills. The sources for electricity generation and the price for the energy supply would be determined locally through a contract with a competitive energy service provider, which could be either an energy “trader” that buys and sells power in wholesale electricity markets or an energy merchant that actually owns power plants, infrastructure, and fuel supplies. Marin Clean Energy, the first CCA in California to offer power to customers, opted for the latter, selecting Shell North America to provide power to the CCA, and is now evaluating other companies to develop local renewable power facilities.

CEC Findings from CCA Pilot Program

The California Energy Commission (CEC) conducted a CCA pilot program and published its findings in a report analyzing the costs, benefits, and risks prepared by the Local Government Commission in April 2009.³⁵ The pilot program assessed the feasibility of implementing CCA programs for 12 participating local governments and examined whether they could achieve a minimum renewable energy mix of 40 percent (double the RPS standard). The project successfully demonstrated how each of these jurisdictions could establish a CCA to increase the use of renewable energy substantially above independently owned utility levels with little or no increase in electricity rates for participating ratepayers.

The CEC study concluded that the primary impediments to CCA development are:

- Up front costs associated with studying, planning, and starting up the programs
- The perception that community choice aggregation entails significant risk relative to the obtainable near-term benefits
- Potential opposition from the incumbent utility

The following excerpt is from the CEC report summary:

The studies' results were that forming a community choice aggregation could bring rate benefits to customers, anywhere from 1 percent to 10 percent of bills on average, due primarily to certain capital financing advantages the community choice aggregator would possess. The facts that a community choice aggregator can directly invest in generation facilities, eliminating the profit (return on equity) and associated taxes that must typically be recovered through utility rates, and that a community choice aggregator can use tax-exempt bonds to finance its acquisition of electric

³⁵ “Community Choice Aggregation Pilot Project,” Stoner, G. Patrick, 2009, California Energy Commission, PIER Renewable Energy Technologies Program, CEC-500-2008-091.

resources, were found to provide sufficient cost advantages to enable the community choice aggregator to increase the level of renewable energy procurement above the state-mandated 20 percent without adversely affecting rates.

The feasibility studies established an economic framework for evaluating the costs, benefits, and risks of implementing community choice aggregation. The studies identified the critical quantitative factors that must be considered in evaluating a community choice aggregation program, including:

- *Projected utility generation rates.*
- *Customer usage characteristics and community load profile.*
- *Wholesale energy costs, including energy, renewable energy, and capacity.*
- *Scheduling coordination costs.*
- *Operations, administrative, and general costs.*
- *Non-bypassable charges assessed by the incumbent utility.*

The potential benefits from community choice aggregation identified in the feasibility studies include:

- *Increased customer choice.*
- *Local control of resource decisions and rates.*
- *Lower electricity costs.*
- *Opportunities for innovative new energy programs (energy efficiency, distributed generation, economic development, and so forth).*
- *Support for local infrastructure investment.*

Although the CEC project was intended to help CCA succeed in California, the final report conveys a prominent implied note of caution by focusing its recommendations on changes to state-level CCA implementation policies that would ameliorate major economic, financial, and political impediments facing local government entities applying for CCA certification. To date, there has been no apparent action on these recommendations.³⁶ “Until the first community choice aggregation program is able to prove the concept in actual practice (in California), the conservatism of most local governments favors the status quo,” the report observed.

For a summary of the CEC report’s conclusions and recommendations, see Appendix IV, Section A.

³⁶ Detailed descriptions about PG&E’s activities to block local communities from implementing CCAs as well as recommendations for state legislative and regulatory changes to prevent PG&E from doing so were made in testimony given at a hearing held by State Senator Mark Leno on November 9, 2010. Video of hearing: <http://cmcm.tv/node/591>. Article about hearing: http://www.marinij.com/business/ci_16567767?source=most_viewed.

Greenhouse Gas Impacts

The CCAP concluded that establishing a CCA in Sonoma County would provide the leading means for the most significant strides toward Sonoma County's GHG emission target – 25 percent below 1990 levels by 2015. As described in the Plan, Sonoma's CCA would roll out about \$2.5 billion of infrastructure to deliver the required renewable portfolio by 2015 at prices competitive with PG&E's.

The portfolio' proposed renewable power generation, storage facilities, and demand technologies include:

- The Geysers Geothermal Electric Generation Stations – 125 MW
- Biofuel Cogeneration Plant – 60 MW
- Wind Power Project – 50 MW
- Pumped Storage – 90 MW
- Capacity Balancing Battery – 18 MW
- Solar Thermal Concentrator – 60 MW
- Community Solar Photovoltaics – 16 MW
- Energy Efficiency, Smart Grid & Demand Response – 35to 100 MW

Renewable-Based Energy Secure Communities (RESCO)

Sonoma County's Renewable-Based Energy Secure Communities (RESCO) project, funded with a \$1 million grant from the CEC's Public Interest Energy Research (PIER) program, is bringing the CCAP's recommended electricity portfolio into much higher resolution with clearer timelines for both regional demand curve economic modeling and technology insertion modeling. RESCO is a partnership of SCWA as lead agency, Los Alamos National Laboratories, the Regional Climate Protection Authority, the Climate Protection Campaign, and Local Power, Inc. The project runs from mid 2009 to mid 2012.

The purpose of this RESCO project is to develop a plan for Sonoma County customers to receive 67 percent local renewable power with no adverse impact on their electric bills. The design will be simulated for greenhouse gas and economic impacts by Los Alamos National Laboratory (LANL) using its CLEAR modeling simulation software. This modeling is expected to provide one of the most comprehensive analyses in the nation of the impact of renewable energy on a local community, anticipated as another national first for Sonoma County.

The "smart grid" is a key factor in Sonoma County's RESCO project, as interoperability of renewable distributed generation and storage improves energy resilience (the "secure" aspect of RESCO). Multiple intermittent renewable power generators automated with local storage, demand control, and "islanding" capabilities provide the physical upgrade and basis for local resilience.

RESCO is exploring how, creatively used, a CCA can impact and integrate energy use beyond electricity. For example:

- Helping accelerate the shift of transportation fuel from fossils to renewables by financing electric vehicle battery storage that connects to the smart grid.
- Conversion of organic waste into biogas to either generate electricity or replace fossil natural gas.
- Offering an opt-in residential and business retail natural gas service that provides revenue to finance heating and hot water retrofits using several geothermal and solar heat technologies. Preliminary analysis indicates a synergistic opportunity for a CCA to leverage accelerated retrofits of building-heat and water-heat, major sources of GHGs.

Financial Considerations

CCA rates are designed to compete favorably with PG&E's, and are determined through competitive bidding and private sector implementation, followed by negotiation with a preferred supplier. After this happens, the CCA offers services to PG&E electricity customers. Customers therefore have two choices, PG&E and CCA, rather than the single choice they now have. State law further protects ratepayers by requiring that they have four opportunities to opt-out of the CCA.

The CCA being designed for Sonoma County through RESCO will provide Sonoma County with several billions dollars and thousands of new green jobs, provided that the renewable infrastructure was built locally. By continuing to be a national leader through establishment of a CCA, Sonoma County could attract further state and national attention and funding.

Another benefit of investment in local renewables is the economic multiplier effect. Dollars formerly exported to distant owners of fossil or nuclear power plants and fuels through electricity bill payments will remain in circulation in Sonoma County, further augmenting income, jobs, and tax base.³⁷

Methods of Financing CCA Program Implementation

Revenue bonds issued by a local municipality or Joint Powers Authority can provide start-up financing for a CCA. Community Development Bonds, Tax Assessment District Bonds, and other municipal revenue bonds can also be used to finance renewable energy facilities and energy conservation measures. Adoption of a Certificate of Determination, based on a local public agency acting as financier or co-financier of a CCA, may be used to finance upfront administrative program costs including consultants, staff, and marketing. CCA member agencies, limited by state law to counties and cities, could partner with agencies such as SCWA to finance projects to provide electricity for their CCA program, and thus arrange to pay for their CCA-related administrative costs by borrowing against revenue bond debt service. Municipal revenue bond preparation and a decision to offer public financing to support a renewable energy or conservation project may also draw investment from suppliers. This supplement to public financing might be used to help support many important activities related to starting up the CCA, including bridge financing for construction of energy projects.

Once operational, a CCA program is self-funded through the revenue derived from customers' monthly electric bill payments. CCAs do not burden city or county general funds, as they are a separate legal

³⁷ The modeling to be done through the RESCO project is expected to provide details of the economic impacts on Sonoma County of a CCA.

enterprise. They reroute a large, non-tax revenue stream and thereby increase the market power and policy-making authority of those municipal governments which choose become part of a CCA. However, failure to secure adequate financing for a CCA can result in program cash flow issues. Marin Energy Authority's program resorted to securing a loan, co-signed by private individuals, to fund its operation during a critical negotiation process with the supplier, Shell North America.

Conclusion

In the short run, maintaining the status quo is legally and financially easier than changing to a different system for electric power procurement. However, the long-term advantages of a CCA appear to outweigh the short term hurdles. Municipalities that wish to act now and start a CCA may do so at any time, and may combine later with one or more other local municipalities to pursue a joint CCA.³⁸

In interviews for this report, a key challenge with CCA identified by those interviewed was the perceived capacity of local governments to effectively navigate the energy field. Having already successfully implemented cutting edge programs like SCEIP and RESCO, Sonoma County has demonstrated it has the capacity to learn rapidly, act collaboratively, innovate, and lead. Moreover, professionals in the energy field can be employed to serve a Sonoma County CCA, just as they do with IOUs.

CCA should be viewed not as an end but a means of making significant GHG reductions possible because it dramatically increases the ability to invest in local energy production, demand technology, and a smart grid. CCA exists as a major opportunity to achieve GHG reductions on the scale needed without taxes or rate increases. The local economic benefits such as job generation associated with this level of investment could be unparalleled if the infrastructure investments required to generate renewable power were made locally by the CCA.

More information about Community Choice Aggregation is provided in Appendix IV, Section A.

³⁸ A description of the process of CCA formation is provided in "Community Choice Aggregation Pilot Project," Stoner, G. Patrick, 2009, California Energy Commission, PIER Renewable Energy Technologies Program, CEC-500-2008-091. Also, extensive documentation of the process followed by the Marin Energy Authority is posted online: www.marincleanenergy.info.

CONCLUDING DISCUSSION

This study analyzed alternatives to Community Choice Aggregation as described in the CCAP. On one end of the spectrum are programs and strategies that enhance PG&E's current direction on GHG reduction; these are limited in their reach and GHG-reducing capacity, implementation tends to be slow, and lack geographic market density. On the other end of the spectrum is creating a Sonoma County Municipal Utility District, a task so daunting that the last MUD created in California was in 1946.

The quantitative framework employed in this analysis was derived from the CCAP. To briefly recap, GHG emissions from Sonoma County's electricity supply reached 951,000 tons in 2008. In 1990, the county's GHG baseline year, electricity sector CO₂ emissions were 618,000 tons. Solutions recommended in the CCAP for the electricity sector would reduce emissions to 259,000 tons per year by 2015.³⁹ By bringing electricity and natural gas down 58 percent below 1990 levels (instead of just 25 percent below), 27 percent of the GHG reductions in the CCAP would come from the electricity sector. Extra reductions in the electricity sector are recommended in the CCAP to compensate for anticipated shortfalls in reductions from transportation and other sectors.

Year	GHG Emissions (tons) from Electricity
1990 actual	618,000
2008 actual	951,000
2015 target (25% below 1990)	463,500
2015 recommended in CCAP	259,000

Relative to Sonoma County's 259,000-ton GHG reduction goal by 2015, the options discussed in this report could produce the following results:

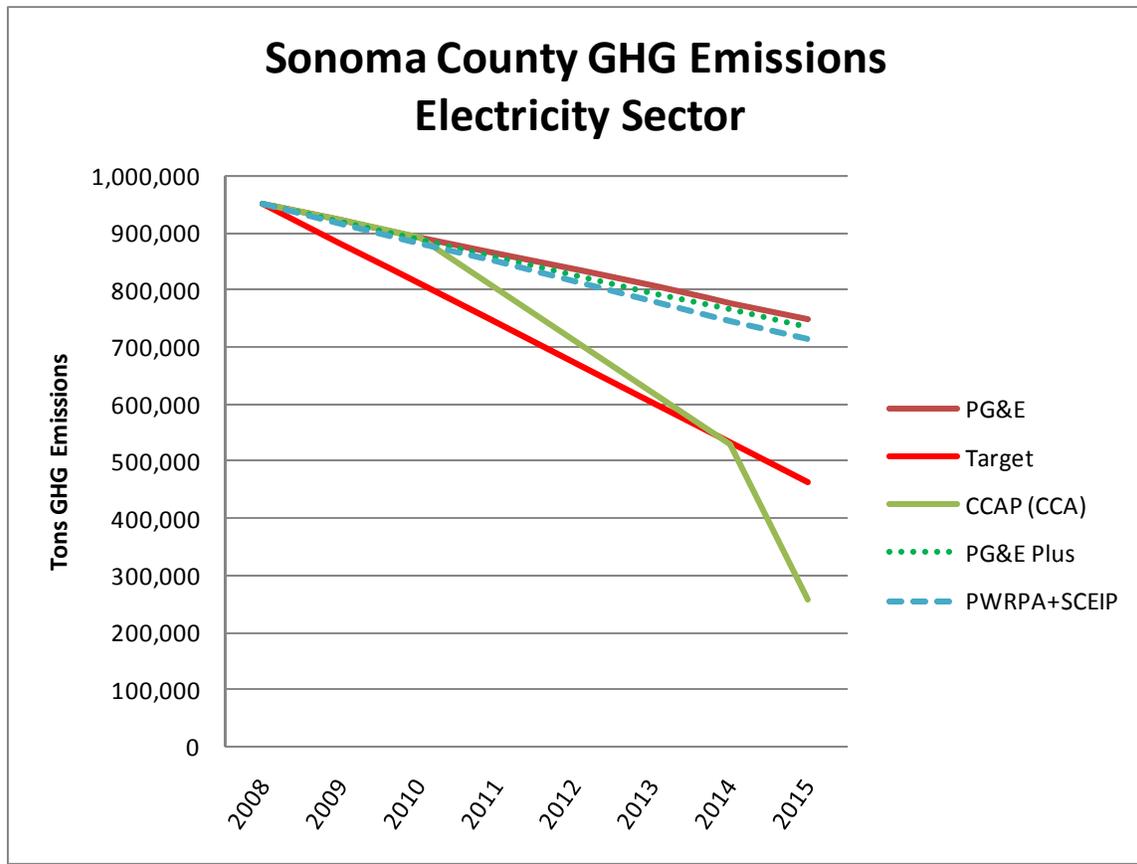
1. PG&E plus – 15,000-ton reduction by 2015.⁴⁰
2. PWRPA – Best-case *reduction* of 21,000 tons GHGs to a worse case *increase* of 3,500 tons by 2015. The most likely range is much smaller than this – from an 8,700-ton decrease to a 1,400-ton increase, assuming only government customers could participate. PWRPA and SCEIP *combined* reduce GHG emissions by 36,000 tons. Thus, even in best-case scenarios, SCEIP and PWRPA programs combined would provide less than five percent of the reduction by 2015 that a CCA program offers.
3. Countywide CCA – 693,000-ton reduction by 2015. Even with expected opt-out rates, participating municipalities could achieve all emissions reductions targets within their own jurisdictional boundaries either through starting new CCA in Sonoma County, or joining MEA under the condition that their current renewables mix intensely accelerate and if the load shape were complementary.⁴¹

Thus, through this analysis we affirm that no other local policy option currently exists under California's market structure, regulations, and laws to achieve Sonoma County's GHG reduction target than CCA.

³⁹ These recommendations were based on reaching a 67 percent RPS by 2015 and procuring generating electricity from 82 percent non-emitting (16 percent large hydro) sources.

⁴⁰ This is based on an uptake rate of 3MW/year starting in 2009 – 2015.

⁴¹ Figure assumes that all Sonoma County municipalities will rapidly join in a Sonoma County CCA. Actual numbers depend on if and when municipalities become part of the CCA.



Notes:

1. PG&E projection based on compliance with 33 percent Renewable Portfolio Standard by 2020
2. PWRPA + SCEIP is best case scenario based on adequate available hydroelectric power
3. CCAP renewable portfolio assumes construction begins in 2010, with a five year rollout plan

While this report finds that the GHG-reduction impacts of existing programs are small compared to CCA, these are nevertheless critical to Sonoma County’s progress to meet its GHG reduction target. Sonoma County should thus continue implementing and augmenting where possible all its programs that save energy and water, and generate more renewable power. These include SCEIP, Solar Sonoma County, Energy Upgrade, PWRPA, RESCO, SCWA pilot projects, and PG&E’s energy efficiency programs. The relative economic attractiveness of various clean energy options will continue changing as technologies mature and are deployed at scale, as markets adapt to deliver them, and as mechanisms to monetize social and environmental values evolve. Moreover, the investment in ongoing capacity building for intelligent energy infrastructure development and management will reap economic rewards through reduced utility rate increases and reduced costs related to reliance on fossil fuels.

In addition to the alternatives addressed in this report, emerging alternatives should be tracked, explored, and evaluated. For example, former Attorney General Jerry Brown requested that the CPUC allow virtual net metering beyond the limited population now eligible for this. Other legislative initiatives, such as broader feed-in tariffs, could also offer new opportunities for Sonoma County.

An incremental path to CCA emerges as a preferable option for Sonoma County. This report recommends that two Sonoma County municipalities join together to form a CCA. To the degree that this proves advantageous, other municipalities in Sonoma County could be expected to join in time.