Arcata CCA Feasibility Study

Humboldt State 2013 Capstone Project

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1 Background

Community choice aggregation (CCA) is an energy procurement model that allows local governments to pool, or aggregate, the electric load of their residents, businesses and institutions in order to purchase electricity on their behalf. The reasons to pursue CCA vary by community, but the main reasons among them are lower electricity costs, cleaner energy supply, greenhouse gas reduction benefits and the development of local generation assets to boost economic development in the region (Marshall, 2010).

There are now 6 states within the United States (California, Illinois, Ohio, Massachusetts, New Jersey, and Rhode Island) that have either implemented or started CCA programs and the cities that implement them do not have to wait for federal action to accrue the economic and carbon reduction benefits of a CCA. Local governments can move forward with power procurement through CCA if they live in one of six states that have adopted the requisite enabling legislation (Marshall). However, the vast majority of local governments in these states have not yet begun the process of investigating CCA due primarily to the complexity of the issue, costs of start-up, and lack of information on how to proceed (Marshall, 2010).

In retrospect, the handful of CCAs that exist, have developed through local grassroots and political advocacy, effective technical support and the goodwill of CCA predecessors who have shared their experiences on an ad-hoc basis. However, as these CCAs mature and new ones come on-line, there is a need for a coordinated network of CCAs that could build powerful advocacy and regulatory alliances, share knowledge, encourage innovation and facilitate start-up funding to incentivize CCA expansion (Marshall, 2010).

CCA is an energy procurement model first utilized in the late 1990s in the states of Massachusetts and Ohio. In deregulated or partially deregulated states, CCA allows local governments or groups of local governments to aggregate the electric load of their residents, businesses and institutions in order to purchase electricity on their behalf (Bolten). CCA is often described as a hybrid model because it does not require full municipalization (i.e., public power) to access the wholesale energy market. Rather, CCA focuses on the generation and procurement side of the energy business and partners with existing utilities to provide transmission and distribution of the electricity produced or procured through the local CCA program (Marshall, 2010).

This partnership approach underscores both the elegance and logic of the CCA model. CCA allows community control and choice over energy supply and electricity rates without assuming the substantial operational costs of a full “wire and pole” infrastructure (Marshall, 2010). The utilities are protected by State government regulations and customer exit fees, and continue to profit from the transmission, distribution and customer support services they provide to residential, commercial and municipal customers.

CCA diversifies and democratizes the retail energy marketplace. It does this through the provision of energy choice, competitive and stable rates, local decision-making and

accountability, energy reliability and a higher percentage of renewable resources within the power supply mix (Marshall, 2010). Through CCA, the community which is made up of residential, small commercial and small municipal customers are able to access the wholesale marketplace and purchase electricity that aligns with their community's economic development, environmental and renewable power goals.

The CCA model has been successfully operating in the states of Ohio and Massachusetts since the late 1990s. Approximately 2.2 million customers are being served by CCAs in these two states alone. Four additional states — California, Rhode Island, New Jersey and Illinois — have passed CCA enabling legislation over the last 10 years (Bolten).

In May 2010, the Marin Energy Authority(MEA) launched Marin Clean Energy (MCE), the first CCA program to operate in California. At full capacity, MEA is expected to serve 80,000 business and residential customers (Marshall, 2010). Also in California, the City and County of San Francisco, the City of San Luis Obispo and the County of Sonoma are in active development phases, with San Francisco on the verge of signing a power contract to launch their "Clean Power SF" program. The City of Arcata (Humboldt County, Calif.) recently expressed strong interest to join MEA's program, and communities in Illinois and New Jersey are in the feasibility phases of their first programs. The states of New Mexico and Colorado have expressed interest in CCA as they seek to expand local energy choice and renewable power supply.

Currently the Marin Energy Authority is looked at as the most attractive alternative for the City of Arcata for the option of joining a CCA. There has been interface between City of Arcata and the MEA on ways of facilitating an agreement that would allow Arcata to either be a part of, or have purchasing power agreements with MEA, to facilitate a longer term goal for a more local CCA, in Humboldt County.

2 Objectives and Constraints

2.1 Objectives for this Study

The objective of the project is to provide adequate information on a general structure of a CCA as well as the specifics for the CCA's of Sonoma and Marin, and to help inform the city of Arcata on what joining a CCA might look like versus creating its own.

2.1.1 Overall Objectives for CCA's

- Our overall objective is to create a stable, flexible and effective CCA structure for the city of Arcata
- Promote, foster and develop energy independence and autonomy for the city of Arcata
- Reduce greenhouse gas emissions for the city, in line with the Arcata GHG reduction plan of 2006
- Exploit and incorporate renewable strategies outlined in the RESCO report and to promote and develop jobs, local renewable energy sources, and energy security
- Serve as an ideological and procedural example to Humboldt county creating its own CCA
- Identify constraints and concerns inherent in each CCA option, along with the long term considerations or possible solutions
- Explore and recommend the most feasible and synergistic options for achieving these objectives in an effective and digestible manner, to the decision makers and citizens of Arcata

2.2 Constraints

The largest consideration for Arcata creating or joining a CCA is that there are various options available. Arcata must apply the needs and realities of its requirements with the readiness of the different plans. The main considerations of the city of Arcata, that this group can identify, are representation, resources, time, and feasibility of the various options. Additional recurring issues present in all options are the long term viability, adaptability and feasibility, as well as, the costs and fees associated with each. The option of joining an already established CCA appears to be the simplest option because the answers to many of these questions have already been explored and quantified by the organization to be joined.

One major issue present in joining a CCA is that of representation. Part of constructing a CCA is building a board of directors and the possibility of adding an additional representative from a distant city might be problematic. How important is it for the city of Arcata to have a spot on the board in order to have input to the program? Matthew Marshall of the Redwood Coast Energy Authority (RCEA) speculated that the RCEA would need to create an an additional division to meet these hypothetical needs, should the RCEA be involved in the representation of Arcata on a board.

Arcata has a relatively small amount of potential customers and resources, so starting a CCA on its own might be too costly to be feasible. Most costs associated with creating a CCA are set, regardless of the size of a city, making it harder for small cities with smaller budgets to start their own. Arcata's small customer base might also provide it with less bargaining leverage when it comes to making deals with power companies or other counties. Fluctuations in demand or opt-out rates are also expected to be more pronounced as the financial burden of such shifts would be spread upon fewer customers and the resilience of the system, reliant on fewer people.

Reasonable time frames for any CCA options would be at least one year from initiation. Detailed feasibility studies, legal framework, administrative structure and life cycle creation, as well as, power purchase agreements would all need to be explored and finalized. For a county wide CCA, the time frame would be much lengthier, since other cities in the county have not considered the process.

Social and political feasibility are also constraints that must be looked at. The nature of CCAs is that they are purely voluntary and community acceptance and participation is an integral part of the health and success of any CCA program. Arcata's politically progressive demeanor would suggest that slight increases in energy costs would be received favorably if the objectives outlined above were being achieved. Education of the city's residents about the program and the benefits it brings would be an important piece of any option. Arcata's City Council is increasingly interested in CCA and the Energy Committee along with the Environmental Services division is now exploring the initial framework for what the program would look like. A program that incorporates locally produced renewables would likely have higher community support due to revenue and jobs being kept or created in the community. All social and political feasibility constraints would primarily be associated with cost, risks of starting such a program.

3 Universal Considerations for All Options:

3.1 Setup for Customers

Under the existing rules administered by the CPUC, the local electric utility, PG&E, would use its transmission and distribution system to deliver the electricity supplied by the CCA program. PG&E would also continue to provide all metering and billing services (Dalassi, pg 27). The way this would work is customers would receive a single electric bill each month as usual from PG&E and that bill would show both the charges for CCA generation services and the charges for PG&E services. From there the money would be collected by PG&E and would be electronically transferred each day to the CCA program's account. The great part about this program is that even if you are a CCA customer you will still be eligible for programs operated by PG&E and funded through distribution rates, such as subsidies for energy efficiency and customer solar incentives.

The CCA program would participate in the electricity market to purchase electricity from generators, brokers, or markets, and it may provide electricity generated from its own power plants that it develops or acquires in the near future. There are also other services that could be offered as well such as new programs to promote conservation of energy efficiency, local distributed generation such as on site solar photovoltaic systems, electric vehicle charging, and customer load shifting.

3.2 Electricity Purchases

Overall the CCA program would be responsible for supplying the net electric demand of all enrolled customers. On top of that the program would be able to source that supply of energy from a variety of markets as well as through the program's own generation resources (Dalessi, 2011). When it comes to energy requirements they are financially settled by the California ISO or CAISO, and they play a vital role in balancing supply and demand on the electric grid and operates short term markets for energy as well as real time balancing services to cover the moment to moment fluctuations in electricity consumption (Dalessi, 2011).

3.3 Renewable Energy Purchases

Renewable energy purchases may take two forms; the first is energy bundled with associated renewable attributes. The second way is through unbundled renewable attributes, known as renewable energy certificates or REC's which are sold without the energy commodity (Dalessi, 2011). These types of purchases are typically made under bundled, long term contracts of 20-25 years. For already established renewable generation resources the purchases are short term and consist of unbundled renewable energy certificates (Dalessi, 2011).

3.4 Generation and Transmission/Grid Services

The generation costs would consist of: development costs, capital costs for land, plant and equipment, operation and maintenance costs, and fuel costs (if applicable). Capital Costs are generally financed for CCA programs with long term debt, and the annual debt service and required coverage would an element of annual CCA program costs (Dalessi, 2011). There are a number of transmission and grid management services that CAISO charges market participants for and some of them include: costs of managing transmission congestion, acquiring operating

reserves and conducting CAISO markets and other grid operations. The costs would be analyzed by the scheduling coordinator for the CCA program, and are supposedly passed through the program with no mark-up (Dalessi, 2011).

3.5 Billing, Metering and Data Management

PG&E provides all of the billing and metering services for all CCA programs and charges for these services in accordance with tariffs that are regulated by the CPUC. Meter data also gets posted to a data server that the CCA program would be able to access for its power accounting and settlements (Dalessi, 2011). Even though PG&E would continue to issue the customer bills and processes the customer payments, the CCA program will have a large amount of data to manage and must be able to exchange data with PG&E using automated processes (Dalessi, 2011).

3.6 PG&E Surcharges

Part of CCA programs is having the CCA customers pay the CCA's rates for generation services, PG&E's rates for non-generation services and two surcharges that are currently included in the PG&E's generation rates: the Franchise Fee Surcharge and the Power Charge Indifference Adjustment (PCIA) (Dalessi, 2011). The Franchise fee charge ensures that PG&E collects the same amount of franchise fee revenues whether a customer takes generation service from a CCA or from PG&E. The PCIA is a charge that is intended to ensure that generation costs incurred by PG&E before a customer transitions to CCA service are not shifted to remaining PG&E bundled service customers (Dalessi, 2011).

3.7 6 Steps in Structuring a CCA

1.) CCA Entity Formation: This is where the city or entity must legally establish themselves, unless there is a municipality that already has legally registered as the CCA entity within the jurisdictional boundaries and ordinances.

2.) Regulatory Requirements: The CCA must meet certain requirements set forth by the CPUC. An implementation plan must be adopted by the CCA municipal entity, and that Implementation plan must be submitted to the CPUC (Dalessi, 2011). The plan must include:

- An organizational structure of the program, it operations and funding
- Ratesetting and other costs to participants
- Provisions for disclosure and due process in setting rate and allocating costs among participants
- The methods for entering and terminating agreements with other entities
- The rights and responsibilities of program participants, including, but not limited to, consumer protection procedures, credit issues, and shut off procedures.
- Termination of the program
- A description of the third parties that will be supplying electricity under the program, including information about financial, technical, and operational capabilities (Dalessi, 2011).

A statement of intent must also be included with the implementation plan. The CPUC then has 90 days to look over the plan, review and certify it. After the implementation plan is certified then the CCA entity must submit a registration packet to the CPUC which includes:

- The service agreement with PG&E, this could require a security deposit and

- A bond or some sort of sufficient insurance to cover any re entry fees that may be imposed against it by the CPUC for involuntarily returning customers to PG&E service (Dalessi, 2011).

On top of these documents the CCA program would also have to participate in a resource adequacy program in order to see if the program is in a realm that is compliant with serving customers.

3.) Procurement: In order for there to be enough power the power supplies must be secured several months in advance of commencing service. There should also be power purchasing agreements among more than one power supplier for adequate negotiations followed by a selection process.

4.) Financing: Like mentioned earlier there must be a substantial amount of funding to cover start up costs and working capital. The start up funding would be secured early in the implementation process as these funds would be needed to perform the activities leading to service commencement (Dalessi, 2011).

5.) Organization: Several months before the program stars there should be staff positions filled to conduct the implementation process. There should also be contracts with other service providers, such as for data management services (Dalessi, 2011).

6.) Customer Notices: After all of the previous steps are completed customers must be given notices regarding their pending enrolment in the CCA program and containing program terms and conditions and opt out instructions at least twice within a sixty day time frame before automatic enrolment.

4 Arcata Stand Alone Option

4.1 Structure

The stand alone option for Arcata would be to create and administer its own CCA, independent of external entities, to service the 17,000 residents and local businesses in the city. Arcata would be able to incorporate existing structures like the Arcata city council, Arcata energy committee and possibly RCEA to make administrative, structural, purchasing and regulatory decisions. The city would be able to provide the logistical and administrative support for both temporary or permanent staff as well as an easy integration of management and implementation of CCA functions. The end result of the structure would most likely involve a board of directors and a additional staff on the city's payroll, size of which is unknown at this point. Arcata would also have complete autonomy and control over renewable projects funded by capital derived from the profits of a successful CCA program.

4.2 Action Items and Timeline

4.2.1 Phase I: Planning and Analysis – 6 to 12 Months

- Obtain and analyze customer load data – Complete
- Issue Requests for Proposals for Arcata Power Purchase Agreements
- Interface with PG&E about CCA
- Analyze economic and administrative impacts of a CCA
- Analyze options and create potential systems of administration and distribution.
- Interface with stakeholders and policy makers
- Verify and modify potential system parameters

4.2.2 Phase II: Operations – 6 to 12 Months

- Modify, adopt and submit implementation plan
- Identify and secure any short term financing, if required
- Solicit, negotiate or commit to PPA contract
- Separate from PG&E

4.2.3 Phase III: Service to Customers – On Going

- Provide notice to any current and all new customers
- Enrol new customers in service and establish accurate customer accounting and billing processes
- Provide customer service and educational information to customers
- Provide for all required compliance filings to account for new load being served as well as any procurement for new load
- Interface with the CPUC

4.3 Potential Advantages of a Standalone CCA

- Arcata would have 100% autonomy in choosing the type of power it would provide to its customers. Arcata will have final say in the places it chooses to purchase power and how any accrued renewable energy investment would be spent.
- Arcata would have flexibility and autonomy over the types of products and services it would provide. Other CCAs have a varying percentage of renewable power packaged in tiered options available to its consumer and Arcata would be bound to these already established products.
- Should Arcata choose to reinvest in local renewable power projects, this would bring local jobs and more resilient energy security to the region.
- Arcata has the advantage of the Redwood Coast Energy Authority, an established entity dedicated to the development and implantation of sustainable energy initiatives that reduce energy demand, increase energy efficiency and advances renewable energy resources in the region. The expertise and history of the RCEA is an invaluable asset.
- Arcata already has the Renewable-based Energy Secure Community (RESCO) plan, providing a framework for future renewable energy projects. Future renewable energy projects could follow this framework.
- Arcata would set the standard and create the structure in which an eventual Humboldt County CCA would follow.
- Arcata would not be locked into a contract with a larger CCA, an action that could delay a unified Humboldt CCA
- The report on Arcata's energy requirements does not indicate any abnormalities to 'normal' energy demands when compared to other cities of similar sizes and make ups. The effects of summer or non-school session power usage will be negligible to nonexistent.

4.4 Potential Disadvantages of a Standalone CCA

- The timeline for, or feasibility of, Humboldt County joining the CCA is unknown at this point. It has been conjectured that the rest of Humboldt County will be ready to begin CCA proceedings within a 10 year time frame. The eventual incorporation of a larger body joining the CCA, the logistics or costs associated with it cannot be planned for nor anticipated.
- If a CCA energy supplier fails to provide enough energy during peak energy demand, service interruptions and emergency procurement of additional power from outside sources can be expected. This risk could be very costly as frequent interruptions could cause customers to leave the program, and emergency PPAs are likely to be expensive.
- The size, scope and budget of an Arcata CCA could pose a high risk to the success and feasibility of the project that would otherwise be insulated by joining a larger CCA.
- Regulatory risks include new laws or taxes, making a possible CCA more expensive to operate and possibly jeopardizing the thin margin Arcata would be forced to operate in due to its size.
- Arcata's small size leaves it vulnerable to fluctuations in demand and participation. Potential stressors exist that need to be identified and planned for.
- The ability to secure short or long term funding for the project might be difficult due to the risk posed by such a small entity.

- Returns on investment intended to promote local renewable energy projects could be insufficient to make meaningful additions to the CCAs renewable energy portfolio in a timeframe feasible to customers.
- There is the potential for unforeseen energy shifts or slightly increased opt out rates due to indoor marijuana growing operations and Arcata's 2012 excessive electricity use tax. Should these 450 households opt-out of the CCA program due to the additional increase in costs, this should equate to a loss of 7.6% of total annual usage on top of any projected opt out rates. Please see Table 5
- Arcata is dependent upon Humboldt State University Students for a large portion of its population. long term fluctuations in the number of students or living options present in Arcata could represent a large percentage of total use. Fortunately, Arcata's energy load does not fluctuate significantly during summer months (Figure 1) when a large portion of students leave the city (SCPA, 2013).

4.5 Costs

4.5.1 Start Up

Pre-start-up costs could range from $750,000 to $1,700,000, assuming pre-start-up costs do not vary much depending on the size of the county. Our teams research indicates that would be only marginal decreases in these costs as consultant fees, legal fees, security requirements and administrative work would be similar in scope regardless of the number of people in the CCA. Pre-start-up costs are based off Sonoma and Marin's implementation feasibility studies. Start up activities include: costs for staffing and professional services, security deposits, the CCA bond/financial security requirement, communications and customer notices, data management, and other activities that must occur before the program begins to provide electricity to customers (Dalessi, 2011).

4.5.2 Rate Additions

In all cases Arcata looks to be on track to mostly mirror Marin's rate increases. The cost responsibility surcharge, the power charge indifference adjustment, delivery charges and the franchise fee surcharge, as well as the rates at which the Power Purchase Agreements can be negotiated will, at its base, be the 1%-3% increases seen in Marin.

However due to Arcata's size, administrative costs, program budget and renewable energy investment capital generation will be more pronounced as it will be spread over fewer ratepayers. On the low end: two city employees making $50,000 per year, a $50,000 operating budget and $100,000 per year to spend on renewable energy investment would result in a $.00420 /kWh increase. On the High End: three city employees making $50,000 per year, a $100,000 operating budget and $500,000 per year to spend on renewable energy investment would result in a $.01001 /kWh increase. Depending on the rate payer, this could represent an additional 2.0% to 7.5% increase on top of any increases. Please see Table 6

These numbers are assumed with the current load of Arcata as per the Dalessi, 2013 report. A 20% decrease in consumption due to opt out rates or the 7.6% decrease projected from the Excessive Electricity Use Tax could exaggerate these figures further.

4.5.3 Projections

- Assume opt-out rate of 20% according to Sonoma County projections. (SCPA, 2013)
- PG&E's generation rates yields a projected average annual increase of approximately 4% (Dalessi, 2011).

5 Potential Advantages and Risks Considered in Sonoma Clean Power Authority Decision

5.1 Potential Advantages

The potential advantages for Sonoma County to start their own CCA and provide electrical power through this program rather than a utility are:

- Since CCA entities have the ability to select the type of power it can provide to its customers, it can focus on renewable power sources such as wind and solar and reduce overall reliance on generation using using fossil fuels such as gas or coal.
- Through focusing on local renewable generation sources, the money or taxes that are paid by residents of Sonoma County and the region would stay within the local economy.
- The idea of local control also brings about a new influence toward building a governing board that would be comprised of local elected officials, so that residents could more easily influence decisions about the operation and priorities of the CCA.
- Financial costs are always on the locals minds when it comes to creating their own energy and because public entities are able to finance electrical generation facilities with tax-exempt bonds and do not have to pay dividends to shareholders, a public CCA may in the long run be able to provide electricity at a lower cost than utilities.
- Through increasing the amount of power obtained from long term contracts or self owned generation facilities, a public CCA can create set energy prices and provide improved stability to its customers.
- By giving customers an option as to where they want to receive their energy from you are increasing consumer choice.
- A CCA can be a big influence within the community when it comes to providing a market for small scale private renewable energy projects like solar.

(Sonoma County Water Agency 2011)

Along with the advantages listed above there are also 4 scenarios that Sonoma is looking into when considering how they will go about obtaining renewable energies and potentially starting their own facilities in order to meet renewable energy demands. Depending on the scenarios listed above a CCA would increase the electricity bill for a resident by $4-$10 per month. At the same time this will significantly reduce greenhouse gas emissions and create local jobs and produce positive economic impacts (Sonoma County Water Agency 2011).

5.2 Potential Risks

There are risks associated with starting a new CCA program. Some of the risks that Sonoma County faced include:

- High start-up costs associated with hiring expert personnel to cover legal, financial, and engineering work. Sonoma County's estimated start up cost was $1.7 million. Arcata is a smaller city, but many initial start-up costs would be the same regardless of size.

- Pre-start-up costs also exist, which would be for feasibility studies and entering into formation agreements, and for Sonoma County were estimated to be $500,000 to $750,000.
- PG&E might actively oppose a CCA program, although there was not much opposition at the time the feasibility report was created for Sonoma.
- Unforeseen events might cause CCA rates to increase or PG&E rates to decrease. This could lead to fewer customers than anticipated, and if new power generation facilities can't sell locally they might have to sell to a third party for a lower price than expected.
- If the CCA program sets up costs that are too heavily influenced by electricity or natural gas prices, then its prices could rise too high. If its prices are set to rigidly in the long term, then a fall in alternative prices could leave CCA prices too high, and customers would be lost.
- If a customer base isn't properly secured the CCA could be left with high debts, and no options to finance them. Even if customers don't opt-out they could still go out of business or leave the county, which could be detrimental if they are particularly large energy customers.
- If CCA energy supplier's fail to provide enough energy during peak energy demand times the CCA program would be forced to buy from an outside source, which could be very expensive.
- Regulatory risks include the possibility of new laws or tariffs that would make CCA more expensive to create, or more expensive for customers to utilize.

(Sonoma County Water Agency, 2011)

Many of these risks could be lessened or nullified by joining another CCA program. The start-up risks would not be a factor. The post-implementation risks will be much less uncertain, and will affect the program at large, and have a relatively smaller effect on smaller cities (Sonoma County Water Agency 2011).

6 Summarized Information on Sonoma County's CCA

- Sonoma County's energy prices would likely be higher than PG&E prices for the duration of the 20 years examined by the Dalessi study.
- This price increase to customers does not however, take into consideration the increased economic benefits to the county for the creation of local renewable power and jobs.
- (Sonoma County Water Agency 2011)
- Goals for achieving 100% renewable; the water agency is currently using 97% renewable which includes 2 MW solar, small hydro and local landfill gas.
- The Sonoma County CCA will offer a 33% renewable energy option as the default choice, an optional 100% renewable energy option, and an optional opt-out decision.

(SCPA, 2013)

6.1 Cities Involved

- Cloverdale
- Cotati
- Petaluma
- Rohnert Park
- Santa Rosa
- Sebastopol
- Sonoma
- Windsor

6.2 Financing Costs

As of now the CCA program just for Sonoma would need capital to cover start-up costs, working capital, and any generation or other project financing. Start-up costs are estimated at $1.7 million, which would fund the program for about 6 months prior to commencement of service to customers (Dalessi, 2011). Start up activities include: costs for staffing and professional services, security deposits, the CCA bond/financial security requirement, communications and customer notices, data management, and other activities that must occur before the program begins to provide electricity to customers (Dalessi, 2011). The estimated start-up costs for Sonoma's program are shown in the (Table 4).

6.3 Joining

A shared services arrangement with Sonoma CCA could reduce the costs of implementing and operating the CCA program. However, depending on how the relationship is structured, there could be a loss of autonomy (mentioned in risks) and a potential for compromised objectives relative to an independent implementation approach. If there was a joining between Arcata and Sonoma, board representation and voting shares would present perhaps conflicting policy issues. Apart from membership, other partnership structures could be explored that might allow Arcata and Sonoma to coexist under different energy service contracts and reduce CCA operating costs while both places still preserving over important issues like resource planning, rate setting, generation development, energy efficiency and other local programs.

7 Arcata Joining Marin Energy Authority

This section explores the possible structure of Arcata joining Marin Energy Authority (MEA) as well as the feasibility of that happening, based on cost savings and Arcata's role in that system. The MEA looks like the most attractive option to the city of Arcata avoiding the start-up costs of a CCA; the MEA currently employs 15 full time and one part time staff members, and has over 120,000 customers. According to their most recently published financial report FY2013 (ending in March), the MEA has over $52 million in operating revenue and $48 million in expenses (MEA 2013), which demonstrates the stability and income to make it a viable option to the city of Arcata.

Marin County's community choice aggregation program, run by Marin Clean Energy (MCE) offers 3 options: 50% renewable energy, 100% renewable energy, or an opt-out option. Marin provides 67% carbon free resources. Average cost savings for small businesses in Marin due to CCA are estimated to be $8 per month in the winter, and $2.50 per month in the summer (Lean Energy, 2013).

Napa has recently started considering joining Marin's CCA program as an affiliate county. In order to do so it must conduct a $20,000 feasibility study to assess whether or not its addition would be a net benefit, or loss for the already existing members of the program. Normally Marin doesn't consider new members that are more than 30 miles from its service area, or members that have more than 40,000 potential new customers, but it does make special exceptions (Gneckow, 2013).

7.1 Advantages

- Joining large CCA with over 120,000 customers and $52 million in operating revenues
- Start-up costs would be negligible, since Arcata would be joining on to an existing already functional CCA
- Very stable, large CCA
- 53% renewable Energy from MEA, with costlier 100% renewable option
- 15 full time employees already at MEA
- advantages of feed-in-tariffs for small energy producers(up to 1 MW)
- MEA has numerous members with similar/smaller communities than Arcata

7.2 Disadvantages

- Increase to existing customer bills by about a dollar a year
- Arcata would be part of a large organization meaning control and local power may take a backseat to the greater interests of the CCA at large
- Significant investment would still be needed for the community to develop local power, no guarantee of it, with MEA.
- Board of MEA meets in San Rafael, CA making Arcata's involvement a logistical challenge
- Costs,

- Average increase of PG&E bill by a dollar, per year (MEA)
- local renewable power may be impeded by Arcata joining MEA in the interest of larger in county(Marin) projects

7.3 Cities involved

- City of Mill Valley
- Town of Tiburon
- City of Sausalito
- City of San Rafael
- Town of San Anselmo
- Town of Ross
- City of Richmond
- City of Novato
- City of Mill Valley
- County of Marin
- City of Larkspur
- Town of Fairfax.

8 Combined Operations

8.1 Example of Combined Operations

The Sonoma County Water Board considered receiving help from Marin County to implement their CCA plan. A report by Dalessi found that Maximum cooperation could save Sonoma County $1.5 million in start-up costs and as much as $2.6 million annually. Ways to cooperate included:

1) Full participation in Marin's CCA program MEA.
2) Lesser cooperation and only performing some administrative functions.

Partial cooperation was considered unlikely, because Sonoma County's size and energy use is similar to Marin's. This could cause electricity prices to rise for Marin's residents. Sonoma has more residents, so another concern would be the weight of votes and decision making influence in the CCA program.

If Arcata were to join with Sonoma County it would likely not have a big influence on the decisions of the CCA board, because it is so small comparatively. But because of its size it would also not likely make a big difference in prices for Sonoma County. Sonoma is also looking at 5 year power contracts for joining cities like Arcata. According to the discussion between Karen and Sonoma it would seem as though the JPA has an exit clause that mentions exit fees and each city would have a member on the board. It is important to also note that Cities do not have to have a member of the JPA but if they pass the ordinance that authorizes the JPA to serve the constituents and they will receive a voting member on the board (Sonoma County Water Agency 2011).

8.2 Advantages of Combined Operations

- Joining Sonoma or Marin would save up to $1,150,000.00 in start-up fees.
- Implementation fees would be greatly reduced.
- For customers Sonoma has a standard 33% renewable energy option, an optional 100% renewable energy option, and an option to opt-out.
- Marin County offers a 50% green power plan, or a 100% green power plan. The 100% green power plan is $0.01/kWh extra. (U.S. Department of Energy)
- Joining a large CCA program would stabilize load variability and reduce the risk of energy supply shortages, which would also ensure a more stable price.
- Joining an already existing CCA would be significantly faster than starting one.
- If the program is successful it could inspire other cities to consider starting a CCA program in Humboldt.
- By 2032 it is estimated that CCA costs will be equivalent to PG&E costs for Sonoma (Sonoma County Water Agency 2011).
- Marin County has provided average savings in utility bills for small businesses.

8.3 Disadvantages of Combined Operations

- Arcata would likely have to enter an agreement of a minimum of 5 years commitment, which would make it hard to leave if more counties want to create a Humboldt CCA sooner than that.

- Arcata would have less of a voice in the program, and might not be guaranteed a regular spot on the decision making board.
- Costs for customers would be about 3-10% more than PG&E costs if Arcata joins Sonoma.
- Though costly in the short term, Arcata could benefit economically from setting up its own program. It could create jobs and energy infrastructure, which would not happen in the same magnitude if it joins another CCA program.

9 Problems

- Lack of knowledge when it comes to analyzing Cost Benefit Analysis for very detailed and thorough feasibility studies.
- Lack of current Energy data for just the City of Arcata, if the city is serious about trying to join or create their own CCA they will need to probably conduct a feasibility study like Marin's or Sonoma's.
- Managing the learning curve associated with research, economic data and jargon laden reports and studies.
- Choosing the best sources for information and synthesizing a coherent and relatively accurate projection.
- Not having post implementation data or rates for Sonoma County.

10 Conclusion

Arcata is looking into creating a CCA program. Its options are a joint program between Arcata and Sonoma, a joint program between Arcata and Marin, or a standalone program. This report attempts to detail and describe some of the aspects of what the different scenarios might look like. It was found that joining Sonoma or Marin would be cheaper and timelier than if Arcata were to create its own CCA program. However, if Arcata creates its own program it would benefit from more autonomy in the program, more jobs, and the possibility of more renewable energy growth within the city. Many of the numbers used were taken from Sonoma County and Marin County CCA data and feasibility studies, so actual figures could be lower for Arcata's program, due to its smaller size and reductions in CCA fees as it becomes a more developed process.

11 Acknowledgements

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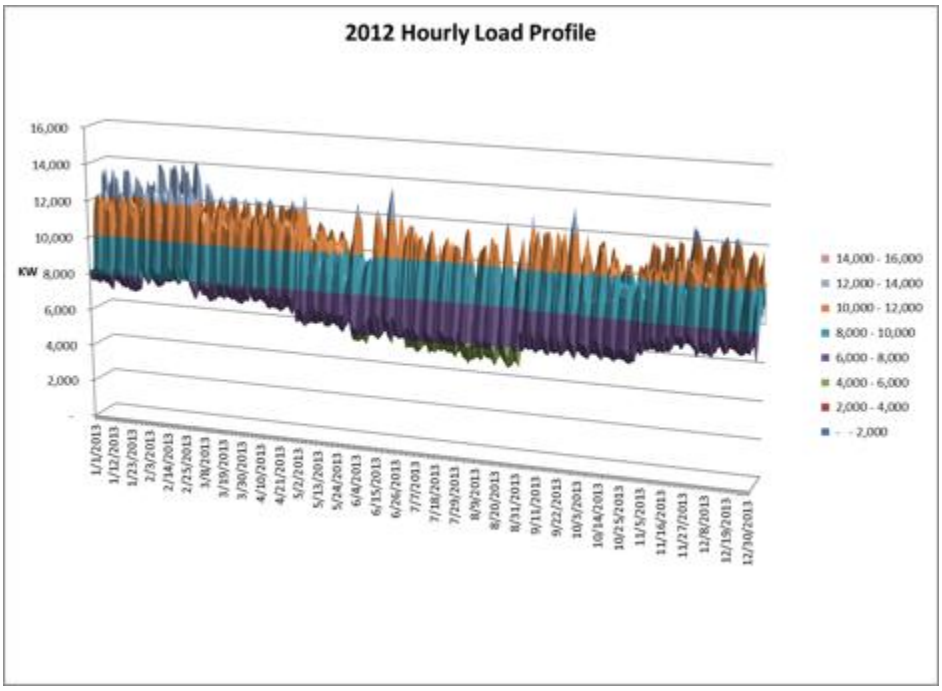
12 Appendix

Figure 1: Arcata Load Profile



(Dalessi, 2013)

Table 1: Arcata Load Data 2012

Customer Group	Electric Accounts	Total Energy (kWh)
Residential	6,889	40,835,998
Small Commercial	980	16,424,307
Medium Commercial	53	7,917,511
Large Commercial	42	13,828,851
Industrial	1	1,437,031
Agricultural and Pumping	7	22,421
Street Lighting	83	485,771
Total	**8,055**	**80,951,890**
Yearly Average (kW/h)	**9,241**	

(Dalessi, 2013)

Table 2: Savings Table with Start up and Joining fees

Cost	Low	High
Start-up Cost Savings (one-time)	$1,650,000.00	$1,650,000.00
Joining Fees (one-time)	$500,000.00	$130,000.00
Net Savings (one-time)	$1,150,000.00	$1,520,000.00

(Dalessi, 2011)

Table 2 shows a range of cost savings under the assumption that Sonoma fees would range from a low of $130,000 to a high of $500,000. These estimates were based off of fixed cost analysis for Sonoma joining Marin's CCA program.

Table 3: Costs for joining another county or employing inside Arcata

Cost	Amount
Staff and Professional Services for City of Arcata ($/Year)	$2,200,000.00
Incremental Costs assumed paid to Sonoma ($/Year)	$2,100,000.00
Annual Cost Savings Potential ($/Year)	$100,000.00

(Dalessi, 2011)

Table 3 is an estimation of costs for creating a staff to overlook this process based on $1 per MWh or $2.1 million annually. The staffing costs are broken down in the next Table 4 below.

Table 4: Estimated CCA Program Start-Up Costs for Arcata

Cost Item	Amount
Staffing and Professional Services	$2,200,000.00
Marketing and Communications	$180,000.00
Data Management	$150,000.00
PG&E Service Fees	$40,000.00
Miscellaneous Administrative and General	$150,000.00
Financial Security/Bond Carrying Cost	$3,000.00
Total	$2,723,000.00

(Dalessi, 2011)

Table 5: Excessive Electricity Use Tax

	# of Accounts	% of Accounts	Total kWh / Year	% of Total kWh
Homes EEUT	450	6.53%	6,156,000*	7.60%
Residential	6889	85.52%	40,895,998	50.44%
City Wide	8055	100.00%	80,951,890	100.00%

*Assumes 600% of 190 kWh monthly baseline

Table 6: Possible Costs for The City of Arcata

	Salary	Benefits x 1.4	$ /yr	$ /yr per Ratepayer*	$ / kWh**
Two City Employees @50k /yr	$100,000.00	$140,000.00	$140,000.00	$17.38	$0.00173
Three City Employees @50k /yr	$150,000.00	$210,000.00	$210,000.00	$26.07	$0.00259
Operating budget 50K /yr			$50,000.00	$6.21	$0.00062
Operating Budget 100k /yr			$100,000.00	$12.41	$0.00124
Operating Budget 150k/yr			$150,000.00	$18.62	$0.00185
Renewable Capital 100k /yr			$100,000.00	$12.41	$0.00124
Renewable Capital 200k /yr			$200,000.00	$24.83	$0.00247
Renewable Capital 300k /yr			$300,000.00	$37.24	$0.00371
Renewable Capital 500k /yr			$500,000.00	$62.07	$0.00618

*Assume that the cost per year, per ratepayer is evenly distributed as not adjusted for consumption of energy usage.
**Assume that the current kWh demand is based off the Dalessi, 2013 report of 80,951,890 kWh yearly base load.

Table 7: Marin CCA and PG&E rate comparisons

Residential: E-1 / RES-1 (Basic Residential)	**PG&E**	**MCE Light Green (50% Renewable)**	**MCE Deep Green (100% Renewable)**
Generation Rate ($/kWh)	$0.07884	$0.07400	$0.08400
PG&E Delivery Rate ($/kWh)	$0.12521	$0.12521	$0.12521
PG&E PCIA/FF ($/kWh)	n/a	$0.00664	$0.00664
Total Electricity Cost ($/kWh)	$0.20405	$0.20585	$0.21585
Average Monthly Bill ($)	**$103.62**	**$104.54**	**$106.62**
Percent Price Increase from PG&E	**0**	**0.89%**	**2.90%**

Commercial: A-1 / COM-1 (Small Commercial)	**PG&E**	**MCE Light Green (50% Renewable)**	**MCE Deep Green (100% Renewable)**
Generation Rate ($/kWh)	$0.08366	$0.07405	$0.08405
PG&E Delivery Rate ($/kWh)	$0.11086	$0.11086	$0.11086
PG&E PCIA/FF ($/kWh)	n/a	$0.00547	$0.00547
Total Electricity Cost ($/kWh)	$0.19452	$0.19038	$0.20038
Average Monthly Bill ($)	**$230.01**	**$225.12**	**$236.94**
Percent Price Increase from PG&E	**0**	**-2.13%**	**3.01%**

Commercial: A-10S / COM-10S (Medium Commercial)	**PG&E**	**MCE Light Green (50% Renewable)**	**MCE Deep Green (100% Renewable)**
Generation Rate ($/kWh)	$0.08781	$0.08022	$0.09022
PG&E Delivery Rate ($/kWh)	$0.08346	$0.08346	$0.08346
PG&E PCIA/FF ($/kWh)	n/a	$0.00597	$0.00597
Total Electricity Cost ($/kWh)	$0.17128	$0.16966	$0.17966
Average Monthly Bill ($)	**$2,247.03**	**$2,225.75**	**$2,356.95**
Percent Price Increase from PG&E	**0**	**-0.95%**	**4.89%**

Commercial: E-19SV/ COM-19S (Large Commercial and Industrial)	**PG&E**	**MCE Light Green (50% Renewable)**	**MCE Deep Green (100% Renewable)**
Generation Rate ($/kWh)	$0.0809	$0.0717	$0.0817
PG&E Delivery Rate ($/kWh)	$0.0692	$0.0692	$0.0692
PG&E PCIA/FF ($/kWh)	n/a	$0.0050	$0.0050
Total Electricity Cost ($/kWh)	$0.1501	$0.1459	$0.1559
Average Monthly Bill ($)	**$31,037.44**	**$30,171.62**	**$32,239.37**
Percent Price Increase from PG&E	**0**	**-2.79%**	**3.87%**

AG-1A / AG-1A (Small Agricultural)	**PG&E**	**MCE Light Green (50% Renewable)**	**MCE Deep Green (100% Renewable)**
Generation Rate ($/kWh)	$0.08375	$0.08350	$0.09350
PG&E Delivery Rate ($/kWh)	$0.18456	$0.18456	$0.18456
PG&E PCIA/FF ($/kWh)	n/a	$0.00544	$0.00544
Total Electricity Cost ($/kWh)	$0.26830	$0.27350	$0.28350
Average Monthly Bill ($)	**$151.95**	**$154.90**	**$160.56**
Percent Price Increase from PG&E	**0**	**1.94%**	**5.67%**

AG-5A / AG-5A (Large Agricultural)	**PG&E**	**MCE Light Green (50% Renewable)**	**MCE Deep Green (100% Renewable)**
Generation Rate ($/kWh)	$0.07269	$0.06684	$0.07684
PG&E Delivery Rate ($/kWh)	$0.08757	$0.08757	$0.08757
PG&E PCIA/FF ($/kWh)	n/a	$0.00544	$0.00544
Total Electricity Cost ($/kWh)	$0.16026	$0.15985	$0.16985
Average Monthly Bill ($)	**$621.24**	**$619.65**	**$658.42**
Percent Price Increase from PG&E	**0**	**-0.26%**	**5.98%**

LS-1 / SL-1 (PG&E-Owned Lighting)	**PG&E**	**MCE Light Green (50% Renewable)**	**MCE Deep Green (100% Renewable)**
Generation Rate ($/kWh)	$0.07278	$0.06800	$0.07800
PG&E Delivery Rate ($/kWh)	$0.06088	$0.06088	$0.06088
PG&E PCIA/FF ($/kWh)	n/a	$0.00122	$0.00122
Total Electricity Cost ($/kWh)	$0.13366	$0.13010	$0.14010
Average Monthly Bill ($)	**$192.15**	**$187.03**	**$201.41**
Percent Price Increase from PG&E	**0**	**-2.66%**	**4.82%**

LS-2 / SL-1 (Customer-Owned Lighting)	**PG&E**	**MCE Light Green (50% Renewable)**	**MCE Deep Green (100% Renewable)**
Generation Rate ($/kWh)	$0.07278	$0.06800	$0.07800
PG&E Delivery Rate ($/kWh)	$0.06088	$0.06088	$0.06088
PG&E PCIA/FF ($/kWh)	n/a	$0.00122	$0.00122
Total Electricity Cost ($/kWh)	$0.13366	$0.13010	$0.14010
Average Monthly Bill ($)	**$573.81**	**$558.52**	**$601.45**
Percent Price Increase from PG&E	**0**	**-2.66%**	**4.82%**

(MCE, 2013)

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