MONTEREY BAY COMMUNITY POWER TECHNICAL STUDY

5/4/2016

Prepared by Pacific Energy Advisors, Inc.

This Technical Study was prepared for the Monterey Bay Community Power initiative (MBCP) for purposes of forming a Community Choice Energy (CCE) program, which would provide electric generation service to residential and business customers located within the counties of Monterey, San Benito and Santa Cruz. A detailed discussion of the projected operating results related to the MBCP program, including anticipated costs and benefits, is presented herein.

Monterey Bay Community Power Technical Study

PREPARED BY PACIFIC ENERGY ADVISORS, INC.

Table of Contents

EXECUTIVE SUMMARY

This Community Choice Energy ("CCE") Technical Study ("Study") was prepared for the Monterey Bay Community Power initiative ("MBCP"), by Pacific Energy Advisors, Inc. ("PEA") under contract with the County of Santa Cruz, for purposes of describing the potential benefits and liabilities associated with forming a CCE program within the counties of Monterey, San Benito and Santa Cruz (the "MBCP Partnership"). Such a program would provide electric generation service to residential and business customers located within the unincorporated areas of the MBCP Partnership as well as the incorporated cities therein. In aggregate, there are twenty one (21) municipalities located within the MBCP Partnership, which include the aforementioned counties as well as the following cities located therein: Capitola, Carmel, Del Rey Oaks, Gonzales, Greenfield, Hollister, King City, Marina, Monterey, Pacific Grove, Salinas, San Juan Bautista, Sand City, Santa Cruz, Scotts Valley, Seaside, Soledad and Watsonville (together, the "MBCP Communities").

This Study addresses the potential benefits and liabilities associated with forming a CCE program over a ten-year planning horizon, drawing from the best available market intelligence and PEA's direct experience with each of California's operating CCE programs – PEA has unique experience with regard to California CCE program evaluation, development and operation, having provided broad functional support to each operating CCE, which include Marin Clean Energy ("MCE"), Sonoma Clean Power ("SCP"), Lancaster Choice Energy ("LCE"), and CleanPowerSF, which will commence service to its first phase of residential and business customers located within the City and County of San Francisco during Spring 2016. PEA utilized this direct experience to generate a set of anticipated scenarios for MBCP operations as well as a variety of sensitivity analyses, which were framed to demonstrate how certain changes in the base case scenarios would influence anticipated operating results for the MBCP program. At the request of the MBCP Partnership, PEA also completed stand-alone analyses for each of the three participating counties to facilitate each entity's understanding of the costs and benefits associated with independent CCE formation (as opposed to CCE formation as part of a multi-county partnership). The results associated with these stand-alone, county-specific analyses are further discussed in Appendix A, County-Specific Scenario Analyses.

MBCP's Prospective Customers

Currently, Pacific Gas & Electric ("PG&E") serves approximately 285,000 customer accounts within communities of the MBCP Partnership, representing a mix of residential (≈86%), commercial (≈12%) and agricultural (≈2%) accounts. These customers consume nearly 3.7 billion kilowatt hours ("kWh") of electric energy each year. While the majority of customers fall under the residential classification, such accounts historically consume only 36% of the total electricity delivered by PG&E while commercial and agricultural accounts consumed the remaining 64% (comprised of ≈48% commercial consumption and ≈18% agricultural consumption). Peak customer demand within the MBCP Communities, which represents the highest level of instantaneous energy consumption throughout the year, occurs during the month of September, totaling 661 megawatts ("MW"). Under CCE service, each of these accounts would be enrolled in the MBCP program over a three-phase implementation schedule commencing in 2017, as later discussed in this Study. Consistent with California law, customers may elect to take service from the CCE provider or remain with PG&E, a process known as "opting-out." For purposes of the Study, PEA utilized current participatory statistics compiled by the operating CCE programs to derive an assumed participation rate of 85% for the MBCP program; the remaining 15% of regional customers are assumed to opt-out of the MBCP program and would continue receiving generation service from PG&E. Customer and energy usage projections referenced throughout this Study reflect such adjustment.

MBCP Indicative Supply Scenarios

For purposes of the Study, PEA and the MBCP Partnership identified three indicative supply scenarios, which were designed to test the viability of prospective CCE operations under a variety of energy resource compositions, emphasizing the MBCP Partnership's interest in significantly reducing greenhouse gas emissions ("GHGs") through increased use of carbon-free electric energy sources – it is important to note that, according to the United States Environmental Protection Agency, the main GHGs include carbon dioxide (in 2014, carbon dioxide accounted for 80.9% of all human-activity created GHGs within the U.S.; electric power sector carbon dioxide emissions also accounted for 30% of total U.S. GHGs in 2014), methane, nitrous oxide and fluorinated gases[1]; however, during the combustion of fossil fuels, not only are carbon dioxide and nitrous oxide emitted but also carbon monoxide, volatile organic compounds, sulfur dioxide and particulate matter; to the extent that the MBCP program is successful in reducing the use of fossil fuels within the electric power sector, a broad spectrum of pollutants, including GHGs, would also be reduced. With these considerations in mind, the following supply scenarios were constructed for purposes of completing this CCE Study:

- **Scenario 1**: Maximize renewable energy and greenhouse gas emission ("GHG") reductions while not exceeding the incumbent investor-owned utility's ("IOU"), Pacific Gas & Electric Company ("PG&E"), projected generation rates. Under Scenario 1, clean energy sources would be generally limited to California-based, bundled renewable energy products and a minimal amount of regionally produced hydroelectricity.[2, 3]
- **Scenario 2**: Maximize renewable energy and GHG reductions while not exceeding PG&E's projected generation rates. Under Scenario 2, clean energy sources would be limited to California-based and regionally produced, bundled renewable energy products.
- **Scenario 3**: Maximize MBCP rate competitiveness while achieving a 25% annual reduction in GHG emissions relative to PG&E's projected resource mix. Under Scenario 3, clean energy sources would include California-based and regionally produced, bundled renewable energy products as well as regionally produced hydroelectricity.[4]

When considering the prospective supply scenarios evaluated in this Study, it should be understood that MBCP would not be limited to any particular scenario assessed in this Study; the Study's supply scenarios were developed in cooperation with MBCP project management for the purpose of demonstrating potential operating outcomes of a new CCE program under a broad range of resource mixes, which generally reflect key objectives of the MBCP Partnership. Prior to the procurement of any particular energy products, MBCP would have an opportunity to refine its desired resource mix, which may differ from the prospective scenarios reflected herein.

When developing MBCP's indicative supply scenarios, PEA was directed to include additional assumptions. In particular, all scenarios include the provision of a voluntary retail service option that would provide

[1] U.S. Environmental Protection Agency: https://www3.epa.gov/climatechange/ghgemissions/gases.html.

[2] Consistent with California's Renewables Portfolio Standard ("RPS") laws, retail sellers of electric energy, including CCEs, must procure a minimum 33% of all electricity from eligible renewable energy sources by 2020; with the recent enrollment of Senate Bill 350, California's RPS procurement mandate has been increased to 50% by 2030. All MBCP supply scenarios addressed in this Study were attentive to such minimum requirements, ensuring MBCP compliance with California's RPS on a projected basis.

[3] Industry accepted GHG accounting practices generally recognize eligible renewable energy sources as GHG-free. Under the Scenario 1 and 3 portfolio compositions, incremental purchases of non-RPS-eligible GHG-free sources, specifically electricity produced by larger hydroelectric resources (with nameplate generating capacity in excess of 30 megawatts) would be procured by MBCP to achieve targeted GHG emissions reductions.

[4] Under Scenario 3, the proportion of RPS-eligible renewable energy is projected to minimally exceed specified RPS procurement mandates throughout the Study period.

participating customers with 100% renewable energy (presumably for a price premium); for purposes of this Study, it was assumed that only a small percentage of MBCP customers would select this service option (≈2% of the projected MBCP customer base), which is generally consistent with customer participation in other operating CCE programs. In addition, all scenarios assume the availability of current solar development incentives as well as an MBCP-administered net energy metering ("NEM") service option, which could be used to further promote the development of local, customer-sited renewable resources. PEA was also directed to exclude the use of: 1) unbundled renewable energy certificates (due to ongoing controversy focused on environmental benefit accounting for such products); 2) specified purchases from nuclear generation, which is generally unavailable to wholesale energy buyers, including CCE programs, but represents a significant portion of PG&E's energy resource mix[5]; and 3) coal generation,[6] which is a cost-effective but highly polluting domestic power source.

Projected Cost Impacts to MBCP Customers

Based on current market prices and various operating assumptions, as detailed in Section 2: Study Methodology, this Study indicates that MBCP would be viable under a broad range of market conditions, demonstrating the potential for customer cost savings and significant GHG reductions. In particular, Scenarios 1 and 2 demonstrate the potential for general rate parity, relative to projected PG&E rates, over the ten-year study period while providing the region with significant electric power sector GHG emissions reductions through the predominant use of bundled renewable energy resources. Scenario 3, which was designed to maximize rate competitiveness with PG&E while also reducing annual electric power sector GHG emissions by 25%, demonstrated the potential for meaningful MBCP cost reductions (ranging from 3% in Year 1 to 5% in Year 10 of projected operations) while also achieving significant environmental benefits. As previously noted, none of the prospective supply scenarios include the use of unbundled renewable energy certificates; renewable energy products will be exclusively limited to "bundled" deliveries produced by generators primarily located within: 1) California; 2) the MBCP Communities; and 3) elsewhere in the western United States. As described above, each prospective supply scenario incorporates differing proportions of clean energy resources to achieve MBCP's desired objectives.

General Operating Projections

When reviewing the pro forma financial results associated with each of the prospective supply scenarios, as reflected in Appendix B of this Study, the "Total Change in Customer Electric Charges" during each year of the study period reflects the projected net revenues (or deficits) that would be realized by MBCP in the event that the program decided to offer customer electric rates that were equivalent to similar rates charged by PG&E. To the extent that the Total Change in Customer Electric Charges is negative, MBCP would have the potential to offer comparatively lower customer rates/charges, relative to similar charges imposed by PG&E; to the extent that such values are positive, MBCP would need to impose comparatively higher customer charges in order to recover expected costs. Ultimately, the disposition of any projected net revenues will be determined by MBCP leadership during periodic budgeting and rate-setting processes. For example, in the cases of Scenario 3, each year of the study period reflects the potential for net revenues. Such net revenues could be passed through to MBCP customers in the form of comparatively lower electric rates/charges, as contemplated in this Study, utilized as working capital for program operations in an attempt to reduce

[5] According to PG&E's 2013 Power Content Label, 22% of total electric energy supply was sourced from nuclear generating facilities; in 2014, a similar proportion of PG&E's total electric energy supply was sourced from nuclear generating facilities: 21%, as reflected in PG&E's Power Source Disclosure Report for the 2014 calendar year.

[6] According to the California Energy Commission, approximately 6% of California's 2014 total system power mix is comprised of electric energy produced by generators using coal as the primary fuel source: http://energyalmanac.ca.gov/electricity/total_system_power.html.

program financing requirements, or MBCP leadership could strike a balance between reduced rates and increased funding for complementary energy programs, such as Net Energy Metering, customer rebates (to promote local distributed renewable infrastructure buildout or energy efficiency, for example) as well as other similarly focused programs. MBCP leadership would have considerable flexibility in administering the disposition of any projected net revenues, subject to any financial covenants that may be entered into by the program.

Environmental Impacts

With regard to MBCP's anticipated clean energy supply and resultant GHG emissions impacts, each prospective supply scenario yielded different environmental benefits, resulting from the diverse composition of clean energy sources within each supply scenario. Such benefits were generally quantified in consideration of the anticipated carbon intensity of PG&E's prospective supply portfolio relative to similar projections for MBCP. To the extent that each of MBCP's indicative supply portfolios incorporated higher proportions of non-carbon-emitting generating technologies than PG&E, GHG emission reductions are expected to occur following MBCP implementation. For example, Scenario 1, which was specifically designed to maximize GHG emission reductions through the exclusive use of California-based renewable energy supply and a small amount of additional, regionally produced hydroelectricity (which was only incorporated in Year 1 of projected MBCP operations for purposes of achieving general rate parity with the incumbent utility), resulted in annual GHG emissions *reductions* ranging from approximately 36,000 (or 20%, Year 1 impact) to 164,000 (or 42%, Year 10 impact) metric tons. Supply Scenario 2, which was similarly constructed to Scenario 1, utilizing both California-based and regionally produced renewable energy products to achieve MBCP's desired environmental objectives (without additional hydroelectricity), resulted in annual emissions *reductions* ranging from approximately 36,000 (or 20%, Year 1 impact) to 238,000 (or 62%, Year 10 impact) metric tons. Supply Scenario 3 yielded slightly different emissions benefits through the use of a more diverse portfolio of clean energy resources, including California-based and regionally produced renewable energy as well as hydroelectricity, creating a projected annual GHG emissions reduction of 25% during each year of the Study period. This level of projected GHG emissions reductions equates to 45,000 metric tons in Year 1, increasing to 97,000 metric tons in Year 10.

When considering MBCP's projected environmental benefits, it is noteworthy that current market pricing for renewable and GHG-free power sources is becoming increasingly cost competitive when compared to conventional generating technologies. This trend has allowed for the inclusion of significant proportions of GHG-free electricity within each of MBCP's prospective supply scenarios while retaining cost competitiveness. With regard to the anticipated GHG emissions impacts reflected under each scenario, it is important to note that such estimates are significantly influenced by PG&E's ongoing use of nuclear generation, which is generally recognized as GHG-free. In particular, the Diablo Canyon Power Plant ("DCPP") produces approximately 20% of the utility's total annual electric energy requirements. During the latter portion of the Study period, DCPP will need to relicense the facility's two reactor units (in 2024 and 2025, respectively) and there is some uncertainty regarding PG&E's ability to successfully relicense these units under the current configuration, which utilizes once-through cooling as part of facility operations – use of once-through cooling is no longer permissible within California, and affected generators must reconfigure requisite cooling systems or face discontinued operation. To the extent that PG&E's use of nuclear generation is curtailed or suspended at some point in the future, MBCP's projected emissions reductions would significantly increase under each operating scenario. However, due to the timing of the relicensing issue facing DCPP, substantive increases to projected environmental benefits (resulting from prospective changes to PG&E's nuclear power supply) should not be assumed during the Study period.

The various energy supply components underlying each scenario are broadly categorized as:

- Conventional Supply (generally electric energy produced through the combustion of fossil fuels, particularly natural gas within the California energy market);
- "Bucket 1" Renewable Energy Supply (generally renewable energy produced by generating resources located within or delivering power directly to California);
- "Bucket 2" Renewable Energy Supply (generally renewable generation imported into California); and
- Additional GHG-Free Supply (generally power from large hydro-electric generation facilities, which are not eligible to participate in California's RPS certification program).

For the sake of comparison, Table 1 displays PG&E's proportionate use of various power sources during the most recent reporting year (2014) as well as the aggregate resource mix within the state of California, as reported by the California Energy Commission ("CEC"). During the Study period, planned increases in California's RPS procurement mandate and various other factors will contribute to periodic changes in PG&E's noted resource mix. Such changes will affect projected GHG emissions comparisons between MBCP and PG&E.

Table 1: 2014 PG&E and California Power Mix

Energy Resource	2014 PG&E Power Mix[1]	2014 California Power Mix[2]
Eligible Renewable	**27%**	**20%**
--Biomass & Waste	5%	3%
--Geothermal	5%	4%
--Small Hydroelectric	1%	1%
--Solar	9%	4%
--Wind	7%	8%
Coal	0%	6%
Large Hydroelectric	8%	6%
Natural Gas	24%	45%
Nuclear	21%	9%
Unspecified Sources of Power	21%	14%
Total[3]	**100%**	**100%**

[1]*Source: PG&E 2014 Power Source Disclosure Report;*
[2]*Source: California Energy Commission - http://energyalmanac.ca.gov/electricity/total_system_power.html; and*
[3]*Numbers may not add due to rounding.*

Projected Economic Development Benefits

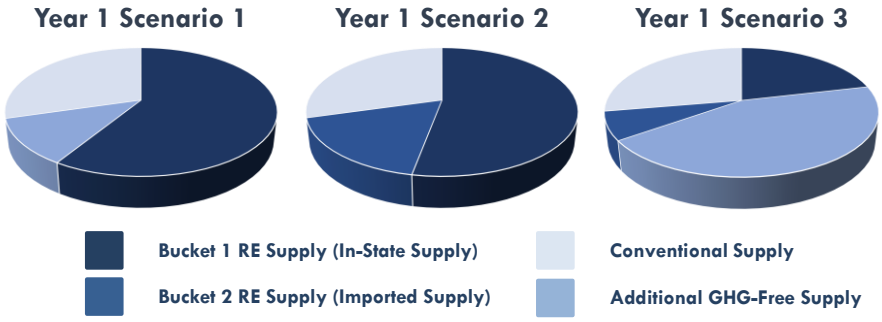
MBCP's projected long-term power contract portfolio is also expected to have the potential to generate substantial economic benefits throughout the state as a result of new renewable resource development. A moderate component of this impact is expected to occur within the local economy as a direct result of renewable infrastructure buildout to be supported by a MBCP-administered Feed-In Tariff program, which could be designed to promote the development of smaller-scale renewable generating projects that would supply a modest portion of MBCP's total energy requirements. The prospective MBCP long-term contract portfolio, which is reflected in the anticipated resource mix for each supply scenario, includes approximately 340 MW of new generating capacity (all of which is assumed to be located within California and some of which may be located within certain of the MBCP Communities). Based on widely used industry models, such projects are expected to generate up to 11,000 construction jobs and nearly $1.4 billion in total economic

output. Ongoing operation and maintenance ("O&M") jobs associated with such projects are expected to employ as many as 185 full time equivalent positions ("FTEs") with additional annual economic output approximating $28 million. MBCP would also employ a combination of staff and contractors, resulting in additional ongoing job creation (up to 29 FTEs per year) and related annual economic output ranging from $3 to $9 million.

Consolidated Scenario Highlights

The following exhibit identifies the projected operating results under each indicative supply scenario in Year 1 of anticipated MBCP operations. Additional details regarding the composition of each supply scenario are addressed in Section 2.

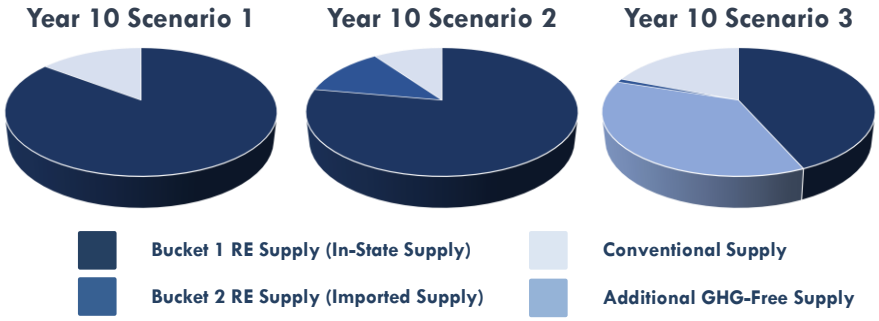
Monterey Bay Community Power Indicative Supply Scenarios: Year 1



Key Considerations	Scenario 1	Scenario 2	Scenario 3
General Environmental Benefits	59% Renewable 70% GHG-Free	71% Renewable 71% GHG-Free	28% Renewable 72% GHG-Free
Rate Competitiveness	≈rate parity relative to PG&E projections	≈rate parity relative to PG&E projections	Average 3% savings relative to PG&E rate projections
Projected Residential Customer Cost Impacts[1] [1] Average monthly usage for MBCP residential customers ≈ 446 kWh	Projected MBCP & PG&E costs are equivalent	Projected MBCP & PG&E costs are equivalent	Average $3.01 monthly cost savings relative to PG&E projections
Assumed MBCP Participation	85% customer participation rate assumed across all customer groups	85% customer participation rate assumed across all customer groups	85% customer participation rate assumed across all customer groups
Comparative GHG Emissions Impacts	0.126 metric tons CO2/MWh emissions rate; ≈35,660 metric ton GHG emissions reduction in Year 1 (≈20% reduction)	0.126 metric tons CO2/MWh emissions rate; ≈36,301 metric ton GHG emissions reduction in Year 1 (≈20% reduction)	0.119 metric tons CO2/MWh emissions rate; ≈44,573 metric ton GHG emissions reduction in Year 1 (≈25% reduction)

The following exhibit identifies the projected operating results under each supply scenario in Year 10 of anticipated MBCP operations.

Monterey Bay Community Power Indicative Supply Scenarios: Year 10



Key Considerations	Scenario 1	Scenario 2	Scenario 3
General Environmental Benefits	85% Renewable 85% GHG-Free	90% Renewable 90% GHG-Free	44% Renewable 81% GHG-Free
Rate Competitiveness	Average 1% savings relative to PG&E rate projections	Average 1% savings relative to PG&E rate projections	Average 5% savings relative to PG&E rate projections
Projected Residential Customer Cost Impacts[1] [1]Average monthly usage for MBCP residential customers ≈ 446 kWh	Average $1.57 monthly cost savings relative to PG&E rate projections	Average $1.79 monthly cost savings relative to PG&E rate projections	Average $6.23 monthly cost savings relative to PG&E projections
Assumed MBCP Participation	85% customer participation rate assumed across all customer groups	85% customer participation rate assumed across all customer groups	85% customer participation rate assumed across all customer groups
Comparative GHG Emissions Impacts	0.063 metric tons CO2/MWh emissions rate; ≈163,559 metric ton GHG emissions reduction in Year 10 (≈42% reduction)	0.042 metric tons CO2/MWh emissions rate; ≈237,857 metric ton GHG emissions reduction in Year 10 (≈62% reduction)	0.082 metric tons CO2/MWh emissions rate; ≈96,594 metric ton GHG emissions reduction in Year 10 (≈25% reduction)

Findings and Conclusions

Based on the results reflected in this Study and PEA's considerable experience with California CCEs, the MBCP program has a variety of electric supply options that are projected to yield both competitive customer rates and significant environmental benefits. To the extent that clean energy options, including renewable energy and hydroelectricity, are used in place of anticipated conventional power sources, which utilize fossil fuels to produce electric power, anticipated MBCP costs and related customer rates would be marginally higher. However, Scenario 3 indicates that the potential exists for significant GHG emissions reductions and marginally increased renewable energy deliveries under a scenario in which MBCP rates are meaningfully below similar rates charged by the incumbent utility. In general terms, each of the indicative supply scenarios discussed in this Study reflects the potential for MBCP to promote meaningful reductions in electric-sector GHG emissions while offering competitive electric generation rates.

Ultimately, MBCP's ability to demonstrate rate competitiveness (while also offering environmental benefits) would hinge on prevailing market prices at the time of power supply contract negotiation and execution. Depending on inevitable changes to market prices and other assumptions, which are substantially addressed through the various sensitivity analyses reflected in this Study, MBCP's actual electric rates may be somewhat lower or higher than similar rates charged by PG&E and would be expected to fall within a competitive range needed for program viability.

As with California's operating CCE programs, MBCP's ability to secure requisite customer energy requirements, particularly under long term contracts, will depend on the program's perceived creditworthiness at the time of power procurement. Customer retention and reserve accrual, as well as a successful operating track record, will be viewed favorably by prospective energy suppliers, leading to reduced energy costs and

customer rates. Operational viability is also based on the assumption that MBCP would be able to secure the necessary startup funding as well as additional financing to satisfy program working capital estimates. As previously noted, it is PEA's opinion that MBCP would be operationally viable under a relatively broad range of resource planning scenarios, demonstrating the potential for customer savings as well as reduced electric-sector GHG emissions throughout the region.