



Notes regarding submitting comments on this Draft Work Product:

Comments are Due June 20, 2018.

Comments shall be no longer than 5 pages.

Comments should be submitted to LDBPcomments@ebce.org

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DRAFT



LOCAL DEVELOPMENT BUSINESS PLAN 2018

EAST BAY COMMUNITY ENERGY
CLEANER ELECTRICITY. COMMUNITY BENEFITS.

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EBCE & the LDBP

What is EBCE?

East Bay Community Energy, also known as EBCE, is a new local retail electricity supplier in Alameda County. EBCE will provide cleaner, greener energy at lower rates to our customers. EBCE will reinvest earnings back into the community to create local green energy jobs, local programs, and clean power projects. As a not-for-profit public agency, EBCE is accountable to its community and customers, not shareholders.

Vision

EBCE seeks to deliver economic, environmental, and social benefits to the communities of Alameda County by providing cleaner electricity at competitive rates, developing local resources that drive new investments, and creating increased demand for high-paying jobs. EBCE will offer carbon-free energy with solar, wind, and hydropower sources. Over time, EBCE will increase the amount of solar and wind in the power mix as our community moves towards 100% renewable energy.

Leadership

The East Bay Community Energy Board of Directors is made up of elected officials from each of the 12 participating jurisdictions and one (non-voting) representative from the Community Advisory Committee (CAC). The EBCE Board meets once a month and all meetings are open to the public. The CAC consists of nine members appointed by the EBCE Board of Directors. The CAC acts as a liaison between key stakeholders and the EBCE Board, holding public committee meetings on a regular basis.

Commitment to Clean Energy

At EBCE, providing cleaner, greener energy at lower rates to customers is a top priority. Getting your electricity from EBCE is a simple way to reduce greenhouse gas (GHG) emissions and meet local, state, and national climate action goals. As EBCE begins serving customers in 2018, it will launch with an ambitious power mix goal with higher percentages of renewable energy than PG&E. EBCE will also offer an opt-up premium product for customers who want to double-down on environmental protection and power their homes or businesses with 100% carbon-free energy. EBCE is also investing in efforts to create more local sources of renewable energy. This will support local job creation, and help to build a more sustainable future for our communities.

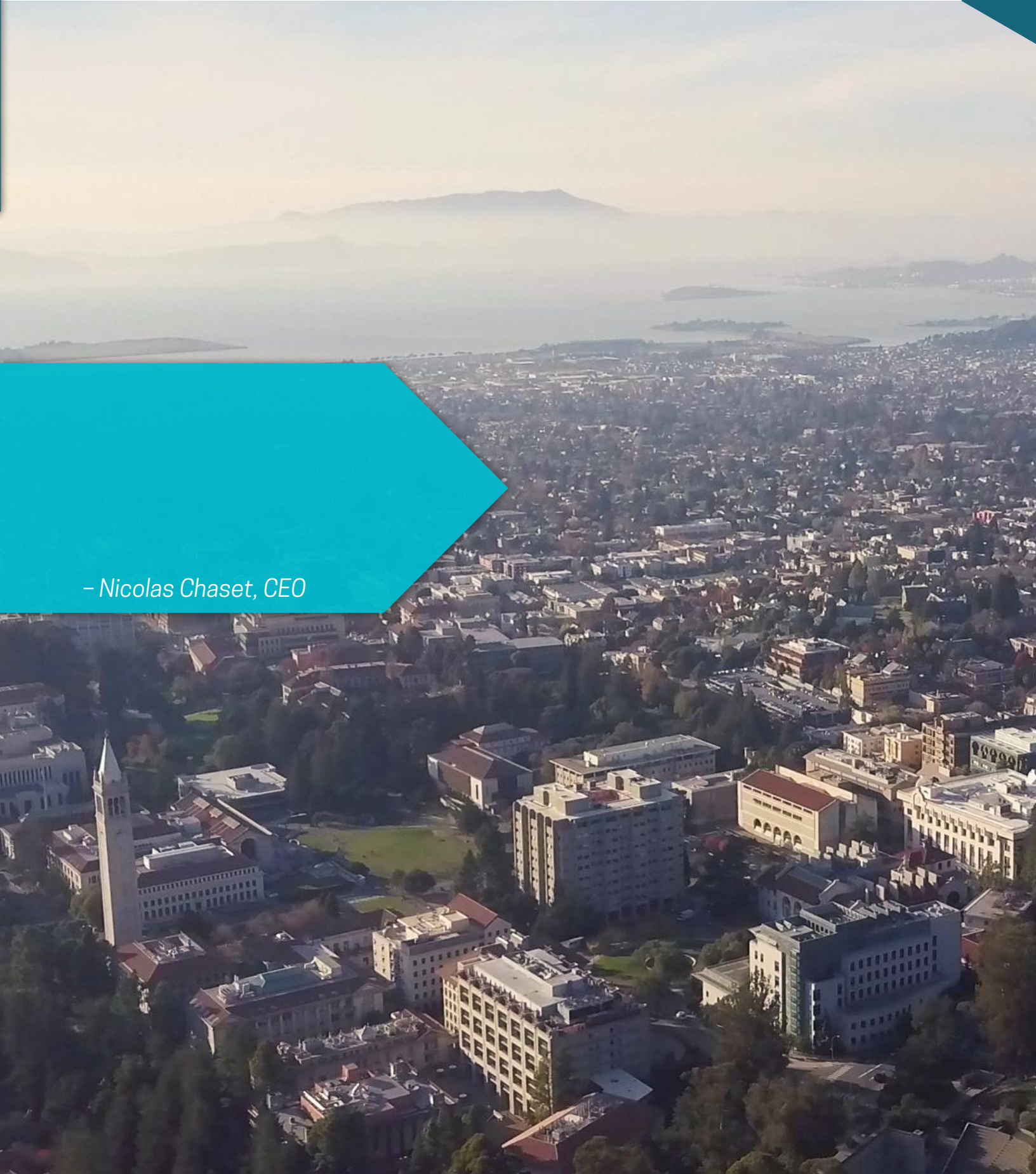
Local Development Business Plan

The Local Development Business Plan (LDBP) is intended to develop a comprehensive framework for accelerating the development of clean energy assets within Alameda County. The LDBP explores how EBCE can contribute to fostering local economic benefits, such as job creation and customer cost-savings. The LDBP also identifies opportunities for development of local clean energy supplies, explains how to achieve EBCE's community benefits goals, and provides strategies for local workforce development for adoption by the EBCE Board of Directors.

CEO Message

Note- This section of the Local Development Business Plan is reserved for a message from EBCE's CEO (Nicolas Chaset), which will be included in the Final version of the LDBP document.





- Nicolas Chaset, CEO

LDBP Executive Summary

Introduction

The East Bay Community Energy (EBCE) Local Development Business Plan is intended to support the achievement of a bold vision for implementing a Community Choice Aggregation (CCA) program in Alameda County, with a strong focus on developing local clean energy assets and maximizing local environmental, economic, and social benefits. It seeks to do this by providing a comprehensive framework for rapid deployment of beneficial clean energy programs and resources throughout the EBCE service territory.

The LDBP identifies short-term, no regrets opportunities as well as some of the tradeoffs between different local development goals. It also maps out a path to pursue and accelerate achievement of those goals (including economic and workforce benefits), while maintaining enough flexibility to adapt to changes in state policy and regulation. In addition, it identifies innovative win-win programs to create good jobs, provide programs that enhance economic equity, stimulate economic development, and enhance the integration of local distributed energy resources (DER) in ways that enhance EBCE's long-term stability and reliability as an organization that the Alameda County community will depend on for years to come.

Ultimately, the Local Development Business Plan is an ambitious and exciting plan because it seeks to strike a balance between the pragmatic and the progressive. This plan translates the aspirational vision for EBCE into feasible, step-by-step recommendations for implementation. It is a roadmap for demonstrating what is possible when the community takes control of its own energy procurement and prioritizes delivery of local benefits in addition to maintaining financially stable operations.

LDBP Project Structure

The LDBP project structure was dictated by the Request for Proposals, which outlined a comprehensive and interrelated set of seven tasks that comprised the required research and analysis activities and resulting work products. Figure 1 provides an overview of that structure.

Task #	Description
1	Grid-side DER Assessment: Solar & Wind Resource Assessments, Locational Benefit Factors
2	Customer-side DER Assessment: Hot-spot Analysis, Heat Maps, Energy Efficiency/Demand Response/Energy Storage Assessments
3	Development Models and Strategies: Collaborative Procurement/Agency as Developer, Feed-in Tariff, NEM, Fuel Switching, Rate Design
4	EBCE Development Issues: Labor & Workforce Development Policies, Financing, Ownership Models
5	Implementation and Policy Issues: Capacity Building, Contracting, Permitting, Equity, Citizen Participation, Clear & Transparent Reporting
6	Integrated Resource Planning: Integrating Local Resources w/Long-term Planning & Procurement, New Generation, Energy Storage
7	Preliminary Plan Scenarios: Scenario Modeling, Fiscal & Economic Impacts, Final Local Development Business Plan

Figure 1: LDBP Project Structure required by the Request for Proposals.

Goals & Priorities for East Bay Community Energy

- EBCE's relationship with its customers is the highest priority.
- Maintaining stable and competitive rates is essential.
- Prioritizing the development and utilization of local clean energy resources in ways that maximize local benefits is highly important to the EBCE community.
- Actively supporting the development and maintenance of a highly-skilled local workforce is key to EBCE's long-term stability and success as an organization.
- The Local Development Business Plan is a unique and important tool that will support EBCE's ongoing efforts to deliver on the organization's core goals and priorities.

Overarching Principles of the Local Development Business Plan

- Create a framework and roadmap for accelerating local DER deployment and maximizing community benefits using the Community Choice Aggregation mechanism.
- Offer innovative program designs that can overcome market failures and incentivize meaningful community and organizational benefits.
- Develop local, clean, and dispatchable energy resources to support EBCE's core values and goals.
- Support a vibrant local economy and robust workforce through innovative energy programs and local clean energy investments.
- Protect the most vulnerable customers through targeted, beneficial local energy programming.
- Offer a diversified portfolio of local programs coupled with retail rate savings, which can deliver greater community benefits than rate savings alone.

Central Concepts & Strategies in the Local Development Business Plan

- An open, inclusive, and iterative process is necessary to realize the full vision for the LDBP, and a phased-in approach will support successful, cost-effective implementation of the plan.
- Effective delivery of LDBP Programs depends on a robust, integrated data platform, advanced data management practices, and ongoing data analytics.
- Community Benefit Adders (CBA's) can be an effective tool to ensure and enhance local benefits.
- Market Responsive Pricing (MRP) and Pay-for-performance (P4P) strategies can maximize beneficial impacts, constrain costs, and minimize risks associated with LDBP implementation.
- Leveraging EBCE's procurement role to engage local businesses and workers can support the LDBP.
- Contractual relationships with EBCE customers and stakeholders can create lasting, mutually beneficial partnerships and outcomes.
- Development of renewable and/or dispatchable distributed energy resources in Alameda County can provide a wide range of important benefits to EBCE and its customers.

Recommended Strategies

The resulting business plan makes a series of recommendations for a sequential approach to feasible and fiscally responsible implementation of the LDBP. The initial focus of the LDBP is on a set of strategies to be implemented in 2018 through 2020. The LDBP also provides a framework and iterative process to continually guide EBCE's local investments as it scales of its local development efforts in 2020 and beyond.

The LDBP recommends that EBCE implement the following projects and programs as early actions designed to accelerate beneficial local clean energy development in Alameda County:

- 1) **Demand Response (DR)**- The LDBP recommends conducting an early stage pilot designed to test innovative applications of Demand Response programming in the CCA context that yield mutually beneficial outcomes for EBCE and participating customers.
- 2) **Energy Efficiency**- The LDBP recommends a strategic approach to developing EE programming that creates synergy with established EE Program Administrators by leveraging customer data to significantly increase participation levels in existing energy efficiency programs.
- 3) **Building Electrification**- The LDBP recommends that EBCE develop an innovative approach to natural gas fuel switching programming has been developed through the LDBP process, which achieves deep decarbonization through permanent natural gas demand destruction.
- 4) **Transportation Electrification**- It is recommended that EBCE pursue grant funding and external partners to develop and implement an innovative pilot for medium and/or heavy duty fleet vehicle electrification, to determine the costs and benefits and provide a solid foundation for implementation of a programmatic approach to fleet electrification that delivers lasting and substantial local benefits.
- 5) **Collaborative Procurement**- Building on the successes of the R-REP and SEED Fund programs, the LDBP recommends a comprehensive program for working collaboratively with local government agencies, school districts, nonprofit organizations, and large commercial and industrial customers to develop beneficial clean energy projects that achieve lower costs through combined economies of scale. The following applications of the Collaborative Procurement program are recommended as innovative and feasible options for EBCE to pursue in the early stages of LDBP implementation:
 - a. **Municipal Feed-In Tariff (“MuniFIT”)**- A hybrid of the Collaborative Procurement and Feed-in Tariff programs recommended by the LDBP Consulting Team, this approach would involve working collaboratively with EBCE’s member jurisdictions to identify optimal sites for front-of-the-meter (FTM) renewable energy and energy storage development through a facilitated process that lowers the collective system costs for all participants. As a starting point, the LDBP recommends focusing the implementation of a Feed-In Tariff on supporting these municipal projects, whereby EBCE would provide a standardized offer (aka- FIT) to purchase the power produced by those systems at a favorable rate that benefits participating jurisdictions.
 - b. **Community Shared Solar Pilot**- The LDBP recommends a pilot deployment of 1-4 initial renewable energy projects that use innovative ownership models, which will allow EBCE to evaluate the real-world outcomes from new approaches to financing and ownership that create a pathway to equity for local businesses and residents who may have barriers to entry into the beneficial renewable energy generation market. This is another appropriate application of the Feed-in Tariff, as providing a standing offer can overcome market barriers that have slowed these projects. The pilot would also benefit from grant funding to achieve a greater scale, enabling EBCE to support the development and evaluation of multiple projects, each with different approaches to the ownership model.
 - c. **Community Net Energy Metering Pilot (“CNEM”)**- EBCE can test the potential for a collaborative “group procurement” approach to delivering behind-the-meter (BTM) solar and/or storage deployment at a greater scale that reduces costs, by partnering with one or more renewable energy developers.
 - d. **Direct RE Contracting for Large Customers Pilot**- The LDBP recommends that EBCE seek grant funding to develop an initial pilot that applies a Collaborative Procurement model to other large customer segments (i.e., school districts, government agencies, commercial and industrial accounts, etc.), which could provide similar benefits to those customers as Direct Access (DA) contracting and help reduce opt-outs of these valuable customers if the DA market is expanded in the future.

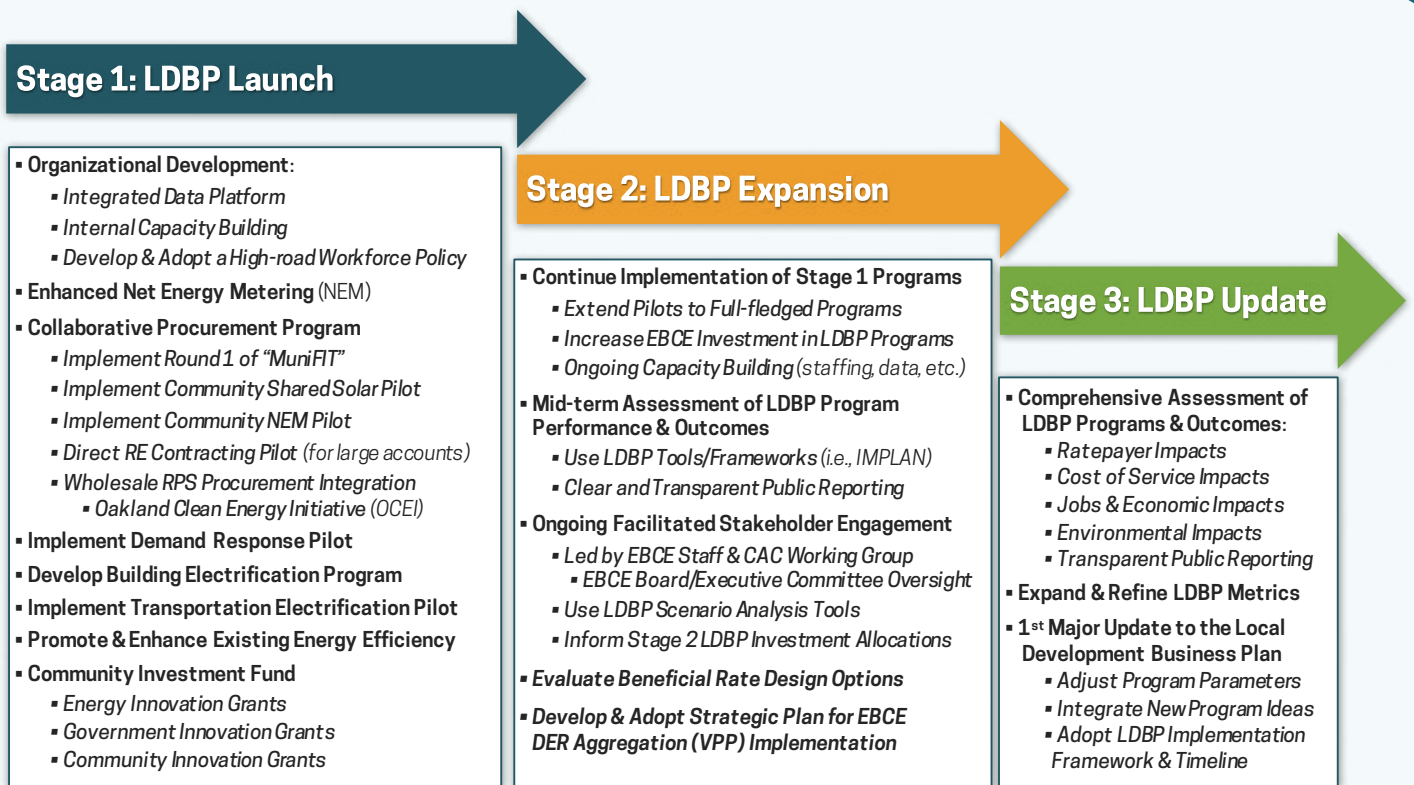


Figure 2: Recommended implementation timeline for the Local Development Business Plan in 3 Stages over the first 5 years of EBCE operations.

- e. **Utility-scale Renewable Energy & Storage**- The LDBP recommends strategies for soliciting utility-scale wind, solar, and energy storage through wholesale RPS procurement and competitive solicitations for new construction of in-county resources in collaboration with established, credit-worthy entities to overcome the early lack of EBCE credit rating.
- 6) **Enhanced Net Energy Metering (NEM)**- The LDBP recommends an innovative NEM structure that seeks to incentivize local renewable energy and energy storage deployment in ways that overcome market failures and barriers, enhances the value of NEM to EBCE, and maximizes community benefits achieved through the program.
- 7) **Community Investment Fund**- A new approach to directly supporting community innovations and local development is recommended by the LDBP, which involves setting up an internal, revenue-supported fund for providing grant funding to local governments, workforce training organizations engaging disadvantaged workers, community organizations, and entrepreneurs who are working on developing projects and/or services that align with EBCE's core mission and values.

LDBP Implementation Timeline

The Local Development Business Plan project was envisioned to support EBCE's bold vision for accelerating local development of clean energy resources to maximize community benefits in the early years of EBCE's existence. The recommended timeline (detailed in Figure 2) includes a significant number of early actions, which EBCE's Board and staff have already begun to implement. The timeline also indicates the recommended steps for assessing, refining, and updating the plan through a transparent, inclusive, and iterative process using the tools and frameworks developed during the LDBP project.



Community Choice Aggregation

“... a tool to accelerate the transition to clean energy and pursue other community priorities like local economic and workforce development”

LDBP

Introduction

Community Choice Aggregation (CCA) has been promoted as a mechanism to use energy procurement to pursue community priorities that may diverge from the priorities of Investor-owned Utilities (IOU). Many CCA advocates and communities in California see CCA as an effective tool for accelerating the transition to clean energy and achieve community goals like climate and environmental protection and local economic and workforce development.

In Alameda County, the Joint Powers Agreement (JPA) that established East Bay Community Energy (EBCE) sought to ensure that these goals would be pursued up front and be grounded in the operations of EBCE, rather than remaining aspirational. To determine how to implement these goals in a feasible and cost-effective way, the JPA called for the preparation of a Local Development Business Plan (LDBP). The resulting LDBP is designed to cover the first five years of EBCE operation, providing a roadmap for developing and procuring local energy resources, and provide a description of how EBCE will foster local economic benefits, such as job creation and innovative community energy programs.

A technical study completed before issuing the Request for Proposals (RFP) for the LDBP demonstrated that the Alameda County CCA could meet environmental and economic goals including competitive electric rates, GHG reductions, higher renewable content than PG&E, and provide a range of meaningful community benefits. The purpose of the LDBP has been to figure out exactly how to make that happen—to move from the conceptual to the operational.

The following paragraphs from the LDBP RFP describes this vision:

“As the Community Choice process in Alameda County has evolved over time, many local officials and stakeholders have expressed a desire for EBCE to act upon a strong commitment to the development of local renewable energy resources as the way to achieve a host of program goals related to greenhouse gas reductions, business development, job creation and ratepayer savings and local wealth generation.

This kind of robust local development requires a transition over time from simply procuring renewable electricity on the wholesale market to creating an optimized system of local distributed energy resources (DER) that play a larger and larger role in addressing the energy needs of our communities. But this transition does not happen by accident; the fundamental challenge is to set out a roadmap for making it happen within an aggressive yet achievable timeframe.”

In support of achieving the vision identified in JPA Agreement and LDBP RFP, this Local Development Business Plan includes the following:

1. A description of how EBCE will contribute to fostering local economic benefits, such as job creation and community energy programs.
2. Opportunities for local clean energy development and innovative approaches to local programming that can help EBCE can achieve the stated goals.
3. Employment and labor standards that relate to the execution of EBCE energy programs.
4. Clear and transparent reporting practices including the identification and explanation of the sources of electricity procured by EBCE.

Since the LDBP project team was selected and initiated the work tasks, EBCE has hired its founding staff. Other technical products are being

produced by other consulting teams, and the EBCE staff has the challenge of integrating the guidance from a wide range of experts into its short and long-term planning processes. The complexity and risks involved with launching a CCA successfully, including securing the capital necessary for initial energy procurement, and maintaining retail rate competitiveness can push local development goals and benefits to the background.

In calling for the Local Development Business Plan, the JPA sought to ensure that local development goals were woven into the basic fabric of EBCE. In the process of developing this plan, it has become clear to the Consulting Team how important extensive community stakeholder engagement and data-driven analysis to support early business decisions are to optimizing the opportunities for beneficial local development. It has also become clear that the most ambitious goals around meeting local energy demands through the development of local energy supplies, and maximizing local community benefit will take sustained commitment and effort over a time period much longer than the five-year horizon covered in this initial iteration of the plan.

The LDBP identifies short-term, no regrets opportunities as well as some of the tradeoffs between different local development goals. It also maps out a feasible path to pursue and accelerate achievement of EBCE's core goals and priorities, while maintaining enough flexibility to adapt to changes in state policy and regulation. In addition, the LDBP identifies win-win strategies to create good jobs and provide innovative programs that enhance economic equity, stimulate economic development, and enhance the integration of local clean energy resources in ways that enhance EBCE's long-term stability and reliability as an organization that the Alameda County community will depend on for years to come.

Ultimately, this is an ambitious and exciting plan because it is as pragmatic as it is progressive. This plan translates the aspirational vision

for EBCE into feasible implementation. It is a roadmap for demonstrating what is possible when the community takes control of its own energy procurement.

Structure of the LDBP

This document is the Local Development Business Plan itself, and it is the final result of the LDBP project. The business plan represents a distillation of dozens of work products delivered to EBCE over the course of a year-long exhaustive public process, and it is meant to be used by the organization to guide investment decisions for local energy development programming over the first five years of EBCE's operations.

The pages that follow provide a high-level roadmap for the deployment of local programs designed to support and enhance EBCE's financial performance, enrich the EBCE customer experience, and maximize community benefits delivered by the CCA in its early years of existence.

This document does not attempt to delve deeply into any particular program idea, or provide the detailed or technical analyses that underpins the recommendations. That level of detail is provided in the underlying documents that have been produced and delivered to EBCE, which have undergone extensive public and professional review through an unprecedented level of transparency and stakeholder engagement.

Each of the individual work products produced over the course of the LDBP project have been published and circulated for public comment. These documents are included as attachments to the business plan, and are made available on EBCE's Local Development Business Plan web page. The extensive volume of material that constitutes the whole of the LDBP project provides the research and analytical methodologies, source references, complete technical analyses and findings, and recommendations on which the resulting plan was constructed. Readers who wish to learn more about the process, outcomes, or supporting

technical information are encouraged to review the underlying background documents.

This business plan is meant to be accessible by a wide audience, including EBCE customers, as well as EBCE's administrators, staff, consultants, and service providers. It lays out a summary of the analysis and findings, and provides a comprehensive framework for flexible, pragmatic and cost-effective implementation of the LDBP over a five-year period commencing with the launch of the EBCE program in the summer of 2018. This document also includes specific discussions of a set of recommended early actions that EBCE staff may consider implementing over the course of the first two and a half years of operations.

While the LDBP has attempted to take a holistic and comprehensive approach to evaluating, structuring and prioritizing beneficial local clean energy programming, many possibilities that EBCE may ultimately pursue are well outside the scope of this initial planning effort. New and nascent technologies and programmatic structures are emerging rapidly in the energy industry in which CCA's operate, and EBCE will have new and valuable data sets and insights of its own after the initial years of operation. For this reason, the LDBP recommends a living and iterative process that is meant to evolve over time.

Many of the recommendations contained here involve building on the foundation of the LDBP using EBCE staff expertise, the ever-evolving data platform that is integral to the LDBP, and the vast base of knowledge and experience that is contained in the diverse base of stakeholders that will be essential to EBCE's long-term success. In many ways, this is the essence of the LDBP. It is a truly living document that must be cultivated and nurtured through an open and thoughtful, iterative process.

The LDBP Consultants are proud of the work presented here, so very appreciative of the many stakeholders who advocated for the development



Figure 3: Alameda County has an abundance of clean, renewable energy resources that can be harnessed to benefit EBCE and the communities it serves, which is the essence of the LDBP.

of EBCE and engaged with the LDBP process, and endlessly thankful to the EBCE Board and staff for supporting this seminal body of work. We hope the LDBP, and all of the underlying work products serve as a spring board for other CCA's who wish to prioritize the development of local resources and maximize local benefits using the unique capabilities and resources offered by the Community Choice Aggregation mechanism.

The LDBP is structured in three parts. **Section I- Early Actions for Local Development** offers a detailed discussion of a set of recommended early actions for EBCE to consider implementing in between 2018 and 2020. **Section II- Supporting Resources, Policies, and Strategies** includes a number of key resources and policy considerations for EBCE to consider. **Section III- Ongoing Analysis, Implementation, and Refinement** provides a review of scenario analysis tools and findings, and a discussion of how EBCE can further evaluate its local development options in the context of their relative environmental, economic, and fiscal impacts.

SECTION I. Early Actions for Local Development

Feasible first steps for implementation of the Local Development Business Plan to support achievement of EBCE's bold vision for a community-focused retail energy system that benefits the ratepayers of Alameda County.



1. Demand Response

Demand response (DR) can reduce operating costs for the CCA, provide important resources for reliability, help defer upgrades to generation, transmission and distribution systems, and deliver economic benefits EBCE and its customers. Fundamentally, demand response is needed to minimize costly mismatches between the supply and demand for electricity. Demand response a tool that would allow EBCE to smooth out the peak loads (i.e., during an unexpected heat wave) and/or shift peak demand to better align with periods of lower cost supply.

Types of Demand Response

1. “Shed” is load curtailment to reduce peak demand
2. “Shift” is nudging customer load toward times of high renewable generation
3. “Shape” is the re-shaping of customer load profiles
4. “Shimmy” is harnessing loads to mitigate short-run ramps and disturbance

The pie chart in Figure 7 shows the relative contribution of those rate tariffs to the aggregate load in Alameda County. The E1 rate tariff is predominant for residential customers and shows a large peak in the evening when people return home from work. The E19 rate tariff is for commercial facilities and shows a smoother peak driven by work day hours. This data is informative in tailoring demand response programs for different customer sectors to target the hours of greatest need in that sector.

It is also important to consider the aggregate load across the system. Figure 8 shows the total hourly electricity draw in EBCE territory.

Aggregate Demand in Alameda County

- Ranges from <600 MW to >1600 MW
- Rises throughout the day, peaks around 8 pm
- Meanwhile, NEM generation peaks around 1 pm and drops to zero at 8 pm

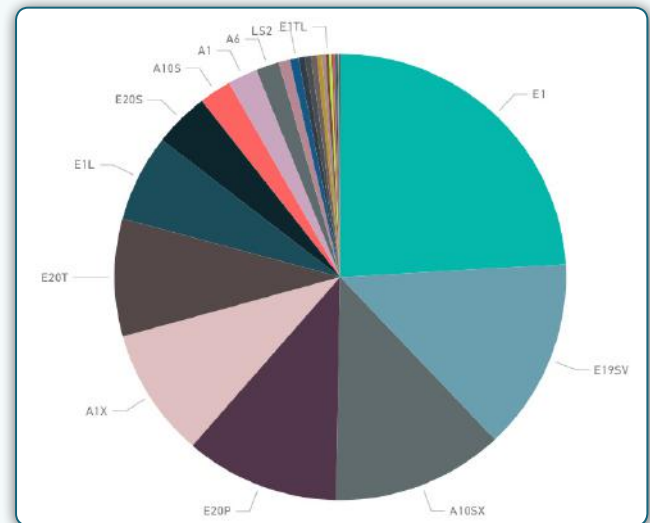


Figure 7: EBCE's account distribution by rate schedule.



Figure 8: EBCE's annual hourly load curve (Maximum- top, Average- middle, and Minimum- bottom) in 2016. Note the emerging “Duck-curve,” which is less pronounced than the statewide averages.

Key Recommendations

There is an effective pathway for EBCE to enter the DR market incrementally. Initially, EBCE can act as a pass-through entity for existing DR offerings from PG&E. This would allow EBCE to have a DR product available soon after launch while gradually building up the in-house capabilities to eventually have a robust set of programs for customers. Initial DR offerings could lean on the experience of established DR providers, while eventually developing the capabilities to offer DR products and programs directly to customers.

Initial years of operational data will inform the optimal DR portfolio, targeting the time periods and customer base that will maximize energy savings.

Implement Demand Response Pilot

The LDBP recommends that EBCE implement an DR pilot project during Stage 1 to test program design options and collect valuable data to inform a robust rollout of DR programs in later stages.

One pressing opportunity relates to Peak Day Pricing (PDP), which is not compatible with CCA. PG&E's PDP program offers non-residential customers lower electricity rates from May 1 to October 31 in exchange for significantly higher rates from 2 pm to 6 pm on 9 to 15 peak days per year. Notification is sent the day before a peak day event (typically hot summer days) with the goal for the customer to reduce usage during this time.

The PDP program is popular with participating customers, and losing access to the it may be cause for some customers to opt out of EBCE. It is recommended that EBCE pursue an innovative pilot to explore the potential for a customized CCA DR program to provide similar benefits to EBCE and its customers.

Focus on Enhancing Existing DR Programs

There are existing programs that EBCE can leverage in Stage 1 of LDBP implementation, including:

Base Interruptible Program (BIP) is a more involved version of the PDP program. Like PDP, it also offers lower utility rates in exchange for load reductions during peak times, but with more stringent requirements for load reduction in exchange for higher regular savings. It is designed for larger users who have an average monthly demand of at least 100 kW. As short as a 30-minute notice is given for curtailments, with event frequency limits of 4 hours per event, 1 event per day, 10 events per month, and 120 hours per year.

Scheduled Load Reduction Program (SLRP) is a version of load reduction which gives the customer more control. It allows participants to choose their load reduction amount and their load

reduction time (4 hour blocks during weekdays). The customer earns \$0.10/kWh for reducing load during the selected time(s) each week. There are no penalties for non-reduction. This program is also for larger customers as the load reduction amount must be at least 100 kW. The program is offered June through September.

Optional Binding Mandatory Curtailment (OBMC) Plan is different from the others as it does not offer a financial incentive for participation, but rather offers exemption from rotating outages. To qualify, customers must reduce their load by up to 15% below an established baseline within 15 minutes of notification. The events can occur at any time. This program is administered at the circuit level, so customers sharing a circuit must coordinate with their neighbors.

Capacity Bidding Program (CBP) is a program run by 3rd party aggregators. Each aggregator has their own program rules and recruits customers. Universal features include operation from May through October and eligibility for agricultural, commercial, and industrial customers only. There are currently 9 PG&E qualified aggregators.

Evaluate DR Incentive Structures

It is also recommended that EBCE evaluate the following DR incentive structures for implementation:

Automated Demand Response (ADR) pays the customer a financial reward for installing energy management technology that enables demand response at the facility. After installing the electric controls, the customer receives automated event signals from PG&E which initiate pre-programmed DR strategies. The incentive payment depends on the technology (lighting pays the highest) and the customer must be enrolled in a PG&E DR program.

Permanent Load Shift via Thermal Energy Storage (PLS-TES) provides large financial incentives for installing equipment that facilitates permanent load shifting using TES technologies. TES shifts cooling loads to off peak hours by storing energy in a cold water or ice tank.



EBCE could work on behalf of large commercial and industrial users to identify and join appropriate programs for that customer. This feasibility work would likely be performed by a third party.

2. Energy Efficiency

Energy efficiency (EE) is a vital resource for any load-serving entity like EBCE, and the California legislature and regulators have made EE a top priority in energy procurement policies for decades. The State's Energy Action Plan (EAP), State legislation such as Senate Bill 350 (SB 350-De Leon), and recent California Public Utilities Commission (CPUC) Decisions have reaffirmed this commitment to meeting California's growing energy needs *"through all available energy efficiency and demand reduction measures that are cost effective, reliable, and feasible."*

The strong commitment to EE as a priority resource has kept California's per capita energy consumption flat and stable despite significant growth in the population and economy, saving Californian's billions of dollars and reducing energy-related environmental impacts greatly over this period of time.

Ultimately, energy efficiency can be a resource building activity for EBCE that unlocks reduced wholesale market procurement, costs, and risk. By developing a strong internal process

that deploys the use of an integrated data platform, cost-causation based EE targeting, and in-house EM&V processes that enable pay-for-performance contracting strategies for EE implementation, EBCE's most expensive loads can be targeted and reduced through the implementation of internally developed and/or outsourced energy efficiency services. This can yield a lower cost portfolio for EBCE, allowing the organization to deliver enhanced customer experiences and outcomes while maintaining low and stable retail rates

Focus on Enhancing Existing EE Programs

EBCE will operate within a well-established and robust environment of energy efficiency technology vendors and service providers and thought leaders in the California EE policy and programming arenas. As such, participation and collaboration with existing EE providers already serving EBCE's service territory will be essential to achieving EBCE's energy efficiency goals and advancing its core mission to provide clean, locally produced electricity and community benefits at a competitive price to its customers.

It is therefore recommended that during its first two years of operation, as EBCE is establishing itself and the infrastructure, staffing and financial resources it needs to scale up its LDBP implementation efforts, the CCA support existing

EE programs offered by established Program Administrators (PA's) already serving the Alameda County region, including: PG&E, East Bay Energy Watch (EBEW), BayREN, and StopWaste. This recommendation also extends to the existing Property Assessed Clean Energy (PACE) financing programs, which EBCE can promote as an option to finance beneficial EE measures to its residential and non-residential customers.

Working to connect with these existing EE resources will involve initial coordination and planning to explore options for collaborative, mutually-beneficial strategies for leveraging the unique programs and resources available. EBCE can provide value in this equation by supporting deeper penetration and uptake of existing programs in the EBCE territory through customer outreach and referrals, and in return gain knowledge and insights and build customer trust and brand recognition by association with these well-regarded EE Program Administrators.

Leveraging Data and Customer Relationships

It is further recommended that during this initial stage of LDBP implementation, EBCE devote resources to the development of a robust, integrated data platform that will allow EBCE staff and administrators to extract the full value from the unique data resources it has access to. EBCE staff can use this platform to conduct back-office analytics to support an iterative LDBP program planning process, and the identification of optimal targets for EE (and other DER) programming.

The LDBP also recommends that EBCE leverage the unique capabilities of its call-center service provider (Sacramento Municipal Utility District/SMUD) in regards to selection and training of highly-skilled Customer Service Representatives (CSR's) and in-house, outbound call-enabled Customer Service Center (CSC) to implement a best-in-class approach to customer engagement. This will provide allow EBCE to drive customer

participation in any EE program offerings through direct, targeted engagement strategies.

During this initial startup phase, but after its first complete year of serving its full load and customer base, it is also recommended that EBCE conduct Cost of Service (COS) study to provide further granularity to the preliminary cost-causation analysis offered herein, and will help identify the most beneficial load reduction opportunities. A detailed COS study will further inform and guide EBCE's decision making process, and help ensure that all EBCE EE program offerings yield maximum benefit to the CCA and the communities and customers it serves.

Finally, during this first phase, it is recommended that EBCE develop and release a Request for Qualifications designed to solicit input and ideas from qualified vendors of EE technologies and services, and to build a stable of pre-vetted contractors capable of supporting EBCE's EE programming in subsequent phases.

Key Recommendations

The following recommendations are intended to help guide EBCE's initial efforts to fulfill its commitment to providing meaningful and cost-saving energy efficiency programming and opportunities to its customers in the most beneficial and cost-effective manner.

- Support existing programs offered by established EE Program Administrators already serving the Alameda County region.
- Develop an integrated data platform to collect the data necessary to conduct a detailed Cost of Service study, target expensive loads for reduction through EE, and support pay-for-performance contracting strategies.
- Leverage trained customer service representatives and customer service center (outbound calling).



Fuel Switching Programs

Displacing fossil fuel consumption with clean, renewable energy through strategic transportation and building electrification programming can support a range of EBCE goals, and enhance long-term stability.

Beneficial Electrification

Since their inception, CCA programs in California have been leaders in the State's aggressive climate protection campaign, and they have consistently exceeded greenhouse gas (GHG) and Renewable Portfolio Standard (RPS) targets and outpaced the investor-owned utilities (IOU's) when it comes to carbon-free content in their respective energy portfolios. However, as the State continues to ratchet up those targets and begins to contemplate setting 100% renewable/carbon-free goals for all load-serving entities (LSE's), the ability to maintain this competitive edge will become more and more challenging. The new frontier for GHG reductions in the CCA space

will be innovative fuel switching programs, which essentially provide an incentive for customers to move away from fossil fuels in favor of clean, low-carbon electricity.

This process is often referred to as "beneficial electrification," and it can apply equally to the electrification of the built environment (i.e., switching natural gas-fired appliances to smart and efficient electric equipment), as well as the transportation system (i.e., swapping vehicles with fossil fuel-based internal combustion engines for clean electric vehicles). One of the key benefits of fuel switching programs is the potential for CCA's like East Bay Community Energy

to address multiple sources of GHG emissions that can be challenging to reach, including point source emissions from the transportation and natural gas sectors. CCA's are uniquely positioned to leverage their influence over these sectors through the land-use authority of their jurisdictional members, as well as their ability to engage directly with customers and stakeholders in the communities they serve to promote the value and virtue of transitioning away from fossil fuel as a primary source of energy.

This can be a boon for retail electricity providers like CCA's, since it not only represents the potential for substantial GHG reductions, but it can also generate new revenues through increased sale of kilowatt hours, presenting a potentially golden opportunity for EBCE to consider and take advantage of. In the CCA context, fuel switching programming pays multiple dividends and benefits the CCA, its customers, and California ratepayers at large by reducing emissions and strain on the grid, while mitigating risk exposure and lowering operating costs for the CCA.

These strategies also provide a valuable co-benefit for CCA's that are working to reduce loads through demand-side management (DSM) programs like Energy Efficiency, because the new electricity load that fuel switching yields for the CCA essentially backfills the reduced loads delivered by DSM, allowing the CCA to maintain a stable revenue base.

3. Building Electrification

As the carbon intensity of California electricity generation decreases due to the shift away from fossil fuel-based power plants to clean, renewable resources, eliminating natural gas consumption by switching appliances to high-efficiency heat pump electric models can reduce overall GHG emissions. Targeted electrification of Alameda County's buildings through programmatic fuel switching initiatives can also increase and stabilize retail electricity sales for EBCE.

The LDBP Consultants recommend that natural gas fuel switching strategies be pursued in concert with other programs (i.e., EE, DR, etc.). Specifically, high efficiency heat pumps should be widely deployed for water and space heating. Accelerating the electrification of buildings will require broad based efforts including making building electrification a policy priority, effective marketing strategies and consumer education, updating building codes, designing an effective incentive structure, and workforce education and training.

EBCE has an opportunity to demonstrate leadership in this arena through implementation of LDBP natural gas fuel switching program recommendations. This opportunity includes the potential for achieving deep decarbonization that stretches well beyond what is possible in the electricity sector alone, and extending the CCA value proposition to California's legislature and regulatory institutions who are already asking how CCA's can support the State's aggressive climate protection goals beyond procurement of clean electricity portfolios.

The innovative approach to stimulating local building electrification proposed by the LDBP provides a sustainable framework for a programmatic approach to natural gas fuel switching that can yield significant benefits. The recommended program design was developed to deliver immediate GHG emission reductions, create new demand for local skilled labor, build new and stable revenue streams for EBCE, and overcome barriers to customer adoption of ultra-high efficiency and low emission heat pump technologies.

Key Recommendations

1. Pursue grant funding opportunities to support an initial building electrification pilot incentives to evaluate program design parameters, appropriate rebate levels, and consumer interest.

2. Use the experience and data gleaned from the pilot to conduct internal analysis of customer load profiles using the integrated data platform, and refine program design criteria.
3. Include fuel switching strategies and electric heat pump technologies in workforce training initiatives, to support development of the trade skills necessary to implement a robust EBCE building electrification strategy.
4. Evaluate opportunities for enhancing building electrification strategies, such as the potential to provide a premium opt-in natural gas service to provide new revenues to support enhanced fuel switching rebates and incentives.

4. Transportation Electrification

The promise of widespread adoption of electric vehicles (EV's) presents one of the most substantial opportunities to decarbonize the transportation sector, while simultaneously providing energy portfolio and grid benefits to electric utilities and LSE's (including CCA's).

While several California IOU's and CCA's have explored the role of rebates and incentives as a practical strategy to drive individual consumers towards EV purchases, leases, and installation of electric vehicle charging infrastructure (EVCI), the LDBP recommends that EBCE focus on achieving significant near-term greenhouse gas and criteria pollutant reductions through medium and heavy-duty vehicle electrification programs.

Taking an active role in supporting the electrification of the transportation system by working with commercial fleet owners, the freight and shipping industry, and public transit providers in the EBCE service territory through innovative public private partnership (PPP) strategies presents a substantial opportunity for mutually beneficial outcomes for EBCE, the communities and customers it serves, and the State of California as a whole.

In the near-term, pursuing grant and foundation capital to offer grid-enabled charger pilots designed to test the waters of load shaping services can lay an early foundation for progressing EBCE towards the implementation of smart-grid functionality, real time price signals, and a transactive energy market paradigm that engages EV owners and fleet managers as partners in the long-term build out of a virtual power plant (VPP) strategy.

This vision for strategic and beneficial transportation electrification can provide aggregation opportunities and dispatchable load capacity able to support EBCE's management of wholesale procurement risks, providing new and flexible local resources to portfolio managers and scheduling coordinators that support Resource Adequacy (RA) and real-time energy procurement needs, which otherwise may have to be supplied by costly, carbon-intensive resources like fossil fuel-fired peaker plants.

Key Recommendations

1. Pursue grant money to pilot medium and heavy duty vehicle fleet electrification strategy program. Potential funding possible from CEC, Low Carbon Fuel Standard, IOU's, Strategic Growth Council, and philanthropic foundation sources.
2. Implement TOU non-tiered rate structure for commercial EV fleets and residential EV owners.
3. Offer Incentives for grid-enabled chargers.
4. Offer ongoing education and outreach for the personal EV market segment (i.e., Ride and Drive events).
5. Facilitate regional forum for the development of reach codes, standards, and land use policies to build on early leadership demonstrated by EBCE members and stakeholders (i.e., the City of Fremont's EV Readiness program).

Beneficial Localization

By incentivizing the development of new renewable generation and energy storage assets within Alameda County, EBCE can support California's aggressive climate protection and clean energy goals, while delivering meaningful local benefits.



5. Collaborative Procurement

Collaborative procurement of local DER's has a strong history in the San Francisco Bay Area, especially in EBCE's service territory, including successful examples in the communities of Albany, Piedmont, Berkeley, Emeryville, Fremont, Oakland, and the County of Alameda itself, as well as with the Hayward Area Recreation and Park District and University of California-Berkeley. These shared sustainability initiatives brought together municipally-owned facilities into single Requests for Proposals (RFP's) for on-site solar development across multiple contracting agencies.

Due to the relatively small sizes of many of the cities, financial and staff-time costs of pursuing clean energy individually were a barrier to achieving citywide clean energy goals. Through the aggregation of multiple municipal facilities, feasibility assessment and RFP management tasks were handled more efficiently than through a "one-off" process, and sites that otherwise would not have been pursued for clean energy development currently have operational solar systems in place.

Collaborative initiatives have been successful in getting projects constructed, with pricing 12-14% lower than prevailing prices for individual solar projects on similar government facilities. Additionally, with an identified "Lead Agency" taking the lead on RFP management and contract negotiation, participating agencies have experienced an estimated 50-75% reduction in administrative and legal costs and effort than if they had pursued such projects on their own.

Key Recommendations

The LDBP recommends a multifaceted Collaborative Procurement program that leverages this emerging best practice for local DER development to overcome market barriers and penetrate hard-to-reach market segments, including low-income and disadvantaged communities, government agencies, and innovative ownership models (i.e., community shared solar).

By creating a comprehensive Collaborative Procurement program that includes community benefit criteria and labor standards to promote good jobs, large-scale local development can be successfully pursued in a cost-effective way, to the mutual benefit of the community, site owners, local energy developers, the local workforce, and EBCE. The Collaborative Procurement is a model that can be applied broadly, and the LDBP recommends that EBCE consider six distinct approaches to implementing the Collaborative Procurement program, as follows.

a. Municipal Feed-in Tariff ("MuniFIT")

To support the rapid deployment of beneficial clean energy resources at local municipal properties, it is recommended that EBCE conduct an early collaborative procurement in partnership with its member jurisdictions. This would be a hybrid of the Feed-In Tariff (FIT) and the Collaborative Procurement programs, that would allow EBCE to tailor the FIT program to focus on supporting solar (and solar + storage) project development at local government-owned and operated facilities. The process would include an initial allocation of capacity to each jurisdiction (i.e., a range of 250 kW to 2 MW based on each jurisdiction's size and/or annual energy load).

Each jurisdiction would have an opportunity to elect one or more pre-identified projects, or work with EBCE to identify one or more potential sites that could host a project. EBCE would then manage the Collaborative Procurement process, determining feasibility and project specifications for each selected site, and ultimately managing the competitive procurement of front-of-the-meter (FTM) renewable energy and/or energy storage system installations across all jurisdictions to achieve economies of scale that can significantly reduce costs. Projects that are constructed would be eligible to receive a favorable, long-term Power Purchase Agreement (PPA) through a tailored FIT offering designed to overcome market failures and barriers typical in the municipal market segment for renewable energy development.

It is recommended that EBCE target a procurement of 10-15 MW for the MuniFIT to reduce delays caused by building too big an initiative, while still capturing economies of scale. Where possible, sites for inclusion should be able to host solar systems larger than 1 MW to ensure required scale to see pricing and process efficiencies.

b. Community Shared Solar Pilot

To help define the most impactful role for EBCE in supporting the development of local renewables through innovative approaches to Community Shared Solar, it is recommended that EBCE offer FIT pricing to support the development of initial pilot projects that demonstrates an innovative ownership model and meets EBCE's standards (i.e., workforce, location, integration of energy storage, etc.).

This early pilot will also help EBCE determine the best criteria to ensure meaningful local benefits and develop crucial insights into how these projects work in real-world applications. Since the pilot project would include valuable research regarding innovative ownership structures and policies that support them, it could be supported by external grant funding from organizations like the California Energy Commission (CEC) or the Rocky Mountain Institute (RMI).

For this pilot implementation of the Community Shared Solar concept, the LDBP team recommends targeting 1-4 projects (500 kW to 1 MW each), which meet standardized criteria. This will allow EBCE to evaluate multiple approaches to innovative community ownership models, and develop the criteria necessary to offer this as a standing LDBP program. To support this program, EBCE would need to carve out a dedicated FIT allocation to projects developed by grantees.

c. Community Net Energy Metering

Collaborative procurement of DER's has a strong history in the San Francisco Bay Area and, particularly, in EBCE territory, including sites in the communities of Albany, Piedmont, Berkeley, Emeryville, Fremont, Oakland, and the County of Alameda itself, as well as with the Hayward Area Recreation and Park District and University of

California-Berkeley. These shared sustainability initiatives brought together municipally-owned facilities into single Requests for Proposals (RFP's) for on-site solar development across multiple contracting agencies. Due to the relatively small sizes of many of the cities, financial and staff-time costs of pursuing clean energy individually were a barrier to achieving citywide clean energy goals. Through the aggregation of multiple municipal facilities, feasibility assessment and RFP management tasks were handled more efficiently than through a "one-off" process, and sites that otherwise would not have been pursued for clean energy development currently have operational solar systems in place.

Collaborative initiatives have been successful in getting projects constructed, with pricing 12-14% lower than prevailing prices for individual solar projects on similar government facilities. Additionally, with an identified "Lead Agency" taking the lead on RFP management and contract negotiation, partner agencies experienced an estimated 50-75% reduction in administrative and legal costs and effort than if they had pursued such projects on their own. From the experience and lessons learned, a best-practices guide (Purchasing Power: Best Practices Guide for Collaborative Solar Procurement)² was developed, and has been widely distributed and followed by subsequent initiatives across the nation.

As part of the comprehensive Collaborative Procurement strategy, EBCE can address market failures and barriers that have prevented interested customers from being able to access the benefits of rooftop solar. A Community Net Energy Metering (CNEM) approach, that is based on the principles developed in previous municipal collaborative procurements, would allow for greater economies of scale by effectively aggregating many behind-the-meter renewable energy and/or energy storage installations into single projects, leading to lower costs for all participants.

Benefits to EBCE

1. Encouraging and enabling the greater use of clean, green energy from local sources.
2. Allow EBCE to secure a clean, locally-produced



energy supply at wholesale generation rates, with small lease payments.

3. Viable with little staff or consultant capacity
4. Allows for inclusion of robust workforce development standards that might not otherwise be applicable for individual for smaller projects.
5. Provide EBCE with baseload power from local resources.
6. Goodwill and credibility by leading community efforts to drive down costs and barriers for municipal government or other customers to go solar.
7. Gain valuable insight into the latest pricing and financing models used by the renewable energy community, to help the CCA with its own development projects.
8. Gain insight into innovative technology types
9. Give EBCE the ability to target specific geographic locations or customer classes for which on-site generation would be most useful for portfolio management, risk management, and/or grid-supply/management purposes.

Establishing a Replicable Process

By creating a replicable process for implementation of the Community NEM strategy, EBCE can pursue cost-effective deployment of rooftop solar at a much greater scale, extending the benefits of NEM to a greater number of EBCE customers, as well as

local clean energy developers and workers.

The process for implementing a collaborative community net metering program could generally follow the 11 steps outlined below, as explained in the Purchasing Power best practices guide with variations according to EBCE's capabilities and goals, and with some steps expedited or skipped due to previous work completed through previous collaboratives or existing relationships with the participating agencies.

Step 1: Early recruiting

- EBCE can target customers by class, or by desired program outcomes. Community engagement has already begun through the EBCE development process.

Step 2: Solar project workshop

- Lead or participate in regular public events to build the brand and minimize opt-out numbers.

Step 3: Consolidated analysis of sites

- For potential sites and customers that score highly in the pre-screens, EBCE could use internal or external funds to start a revolving fund to provide full feasibility assessments at no cost to the agencies and the customers. EBCE could use in-house or contracted staff to perform the analyses, with the added benefit of having better visibility into possible feeder- or transformer-sizing issues than most solar developers or consultants have available.

Step 4: Internal decision maker consultation

- For public agency collaborative community NEM, Agency decisions to proceed with solar procurement would still need to be made at the Council or Board level, but EBCE has an internal connection through its Board membership, which can help align interests at the outset of program development. As long as agency staff have been engaged through the workshops and feasibility site visits, internal support should be more readily obtained.

Step 5: Design of procurement process and documents

- It is recommended that EBCE develop a robust solicitation process (i.e., RFP) to guide a competitive process. As-needed support can be secured from EBCE's portfolio manager, outside consultants, or through review of previous collaborative procurements.

Step 6: Request for proposals

- EBCE would issue the bid documents on behalf of the participating customers, and EBCE staff are well-suited to organize bidder conferences and site walks, or outside or agency support can be obtained.

Step 7: Proposal evaluation

- EBCE staff would work with agency support to evaluate and score proposals and proposers. Previously-used evaluation matrices are available to help prioritize goals.

Step 8: Negotiations and awards

- EBCE staff and legal team are skilled in energy contract negotiations and would provide significant value to the process of finalizing contract terms and conditions.

Step 9: Installation project management

- Prior to this stage, EBCE would hand off negotiated contracts to agency staff or customers for presentation and final approval. Upon Notice to Proceed (NTP) on construction, vendors or agencies would make a reimbursement payment to the EBCE revolving fund, and the next round of procurement can be planned.

Step 10: Commissioning and operations

- Likely not applicable to EBCE, though EBCE could negotiate viewing access to all solar monitoring for sites developed through the program, for promotional use on EBCE's website.

Step 11: Celebration of success

- When projects are completed, EBCE would participate in celebration events and would receive public relations goodwill for supporting community self-reliance, local employment, bill savings, and emissions reductions.

CNEM Recommendations

For EBCE to proceed with the Community NEM program such outlined above the following recommendations apply:

- Select target facility types, customer types or grid locations that provides optimal benefit to both the CCA and the customer. We recommend residential customers and public safety buildings as a Round 1 targets in need of DER's for resilience in addition to energy, and they have public relations appeal that would be difficult to match with any other facility types.
- Target a procurement of 5-10 MW to reduce delays caused by building too big an initiative, while still capturing economies of scale.
- Prepare to start the second round of procurement shortly after starting to receive reimbursement payments. Prior to the receipt of payments, identify next target group and prepare outreach strategy and materials. If the initial procurement finishes in 12 months, expect approximately 6 more months for engineering and permitting prior to receiving reimbursements at NTP on construction, which would trigger outreach for the second round.

The first projects could be brought on-line within 24 months of the initialization of the program. If a relatively modest procurement of 5 MW results in 4 MW of contracted projects (80% conversion rate), the resulting solar projects would output over 6 million kWh of clean local energy. Projections place cost of NEM in the PPA pricing

in the \$0.06-\$0.13/kWh range. Assuming a mid-range of \$0.07/kWh, the procurement could result in 6 million kWh of energy for \$420,000 in energy costs, with the development and procurement costs (\$225,000, in this example) repaid by the solar installer through the PPA price.

d. Direct RE Energy Contracting Pilot

Another innovative option for EBCE to explore would help retain large commercial and industrial (C&I) customers who may consider opting out of EBCE in favor of Direct Access (DA) contracts, as the state considers expanding the DA market in the near-term.

The proposed approach would involve working with these valuable customers to provide them with a comparable option to DA, by actively soliciting renewable energy supplies on behalf of those customers through a similar process outlined in the Collaborative Procurement section above. EBCE would help the customers secure favorable pricing for wholesale renewable energy (RE) contracts that help the customers simultaneously achieve cost savings and sustainability goals. This could provide substantial encouragement for these customers to remain with EBCE, allowing EBCE to provide supplemental energy supplies and services and maintain low opt-out rates despite an expanded DA market.

It is recommended that EBCE conduct a pilot application of this innovative program option, seeking a small number of large C&I customers to participate to develop insights and customer perspectives necessary to refine the process and criteria that could support a more programmatic offering of this service to a wider pool of EBCE customers in a later phase.

Local Procurement Standards

EBCE can include targets and incentives in its wholesale renewable energy procurements (i.e., Requests for Offers, Auction Terms, and/or Requests for Proposals for new construction), which seek a minimum portion of the solicited energy supplies to be met with local resources. This could be framed as a mandatory minimum

threshold (or “requirement”), or it could be incentivized through Community Benefit Adders (i.e., bid point adders that increase a bidder’s score on a competitive solicitation).

Local Development of Utility-Scale Renewables

EBCE also has the option and ability to solicit proposals to construct new, utility-scale (i.e., 10-100+ MW projects) wind and solar development within its resource-rich service territory. EBCE can pursue multi-site procurements by issuing RFP’s and/or entering into bilateral negotiations with project developers who have shovel-ready projects based in Alameda County.

Benefits to EBCE

1. Encouraging and enabling the greater use of clean, green energy from local sources.
2. Allow EBCE to secure a clean, locally-produced energy supply at wholesale generation rates, with small lease payments.
3. Viable with little staff or consultant capacity.
4. In economic development in the region.
5. Provide EBCE with baseload power from local resources.
6. Good will and credibility by leading community efforts to drive down costs and barriers for large customers.
7. Gain valuable insight into the latest pricing and financing models used by the renewable energy community, to help the CCA with its own development projects.
8. Gain insight into innovative technology types.
9. Give EBCE the ability to target specific geographic locations or customer classes for which on-site generation would be most useful for portfolio management, and/or risk management purposes.

With the use of a revolving fund, the “Agency as Developer” model could theoretically continue in perpetuity after its initial funding. If desired, internal program management requirements could be minimized by creating an open enrollment period for a target facility type, customer class, or grid location.



Figure 6: Location of jet fuel-fired (“peaker”) power plant to be replaced by the Oakland Clean Energy Initiative.

e. Utility-scale Collaborative Procurement

It is recommended that EBCE apply the Collaborative Procurement principles and methodologies to procurement of local, utility-scale renewable energy and energy storage to achieve greater economies of scale and lower costs, while resolving issues surrounding lack of credit as a new agency. This involves EBCE partnering with credit-worthy commercial entities and/or government organizations with mutual interests for the purposes of joint procurement.

Example: Oakland Clean Energy Initiative

The Oakland Clean Energy initiative (OCEI) represents an early implementation of the Collaborative Procurement strategies outlined above. The project opens a RFO process designed to phase out the 165 MW Dynegy Oakland Power Plant, located near Jack London Square which is approaching its retirement age. The plant began operations in 1978 and operates under a Reliability Must Run (RMR) contract with the California System Operator (CAISO). While the plant provides reliability services it runs on jet fuel and being located in one of the most densely populated parts of the County presents an air quality concern.

The OCEI is a partnership between EBCE and PG&E to offer reliability services that replace the need for the power plant with DER’s and energy storage capacity. CAISO recently approved the process and EBCE is working through a RFP process to buy local energy and capacity project while PG&E purchases reliability products from the same resources.

At completion an expected 20-45 MW of new clean energy resources are expected to enter the service area in the form of energy storage projects and front of the meter renewable generation projects. New DER projects must be located within Alameda County, making the project align with the LDBP’s identified new generation and energy storage capacity goals.

Benefits to EBCE

- Build a portfolio of clean energy resources that displaces fossil fuel and new transmission .
- Eliminate GHG and Criteria and related local public health impacts.
- Unlock local DER development as a replicable way for a CCA to meet energy resource needs.
- Enable local workforce benefits.
- Increase reliability and energy resilience.
- Form mutually beneficial collaboration between EBCE and partners like PG&E and CAISO.

6. Enhanced NEM Program

EBCE has made the development of local distributed energy resources (DER's) a priority through strong commitments in its Joint Powers Agreement (JPA). Balancing the need for low energy procurement costs and competitive customer rates with the goal of developing local clean energy resources presents some logistical and financial challenges, which require a multifaceted portfolio approach to local DER development.

EBCE has an outstanding opportunity to use an innovative Net Energy Metering (NEM) program to reduce opt-out activity and build a strong relationship with its customers, while simultaneously working to reduce grid issues, better manage internal costs and risks, and fulfill its goals for local clean energy development and community benefit.

Background

Under the current NEM program, Investor-owned Utilities (IOU's) in California are required to compensate participating customers at the "full retail price" for energy produced by interconnected solar photovoltaic (PV) systems installed behind-the-meter (BTM). This full retail price means that energy produced and used on-site fully offsets pricing for energy that would have otherwise been supplied by the utility. Additionally, excess energy produced and exported to the utility grid is credited at the same price as the utility would charge for energy use at the same time. With NEM, the grid effectively serves as a financial battery—excess generation is exported to the grid, bill credits are accrued, and customers can use those bill credits at times when their solar systems are not producing energy.

Community Choice Aggregators (CCA's) such as EBCE are not required to offer NEM programs. However, most California CCA's have chosen to effectively mirror their incumbent utilities' NEM programs, with some attempting to offer



Figure 4: Rooftop residential solar is a common application of NEM.

enhanced value. For example, MCE Clean Energy (formerly Marin Clean Energy) offers a NEM program with the same parameters as PG&E's NEM offering, but with a bonus "export credit." At any point when the interconnected solar system produces more energy than the facility can use, the system exports the energy to the general utility grid. Under normal NEM, this export energy is given a value that equates to the rate schedule and Time-of-Use (TOU) period that the host facility regularly uses. Under MCE's NEM program, this export energy receives an additional \$0.01/kilowatt-hour (kWh) credit.

A number of other CCA's, such as Silicon Valley Clean Energy (SVCE), Peninsula Clean Energy (PCE), and Sonoma Clean Power (SCP) also offer enhanced NEM programs. For these CCA's, the NEM arrangement is paid on a monthly basis, rather than at an "annual true-up" as done by PG&E and MCE, whereas any bill credit is rolled over into succeeding months. These CCA's also offer an annual cash-out for the customer to receive a check for remaining credits, which PG&E does not currently offer. The offering of monthly bills and an annual cash-out were programmatic decisions based on significant customer survey efforts, and the LDBP recommends that EBCE mirror these popular enhanced-NEM program structures.

Key Recommendations

The LDBP recommends that EBCE offer an enhanced NEM program at the start of its customer operations to minimize opt-outs and ensure a positive NEM customer experience.

Financial Value Adders

Providing additional financial value (“adders”) to the standard baseline credit for any exported energy delivered to the grid by projects that meet certain criteria is an innovative way to drive targeted DER deployment. It is recommended that the adders offered by EBCE be cumulative, meaning that a NEM project can qualify for more than one adder.

For new NEM projects, it is recommended that EBCE offer a small baseline export adder, which will send a clear signal that the intention is to prioritize the development of new DER installations that more directly support EBCE’s goals and priorities.

The LDBP recommended adders fall into three separate groupings: Community Benefit, Workforce, and Supply-Shift, with adders limited to one per grouping (e.g., if a project meets the multiple criteria in the Community Benefit Adder grouping, it is still only eligible for one adder in that category).

Category 1: Community Benefit Adders

The Community Benefit adders are intended to stimulate equitable DER development, and provide enhanced support for customers who may have a harder time affording solar on their homes, or for tax-exempt municipal agencies who provide community services but are unable to directly access federal tax benefits.

Income-qualified: EBCE is unique among California CCA’s in its level of commitment to supporting social justice and economic equity. The CCA has already enacted a \$0.01/kWh export credit for qualified customer to serve as an additional incentive to income-qualified

residential customers who may otherwise not be able to access solar installations on their homes. Many residents may have incomes over the poverty line and may own their homes, but still struggle with monthly bills, and for them, making investments in clean energy may not be feasible without additional incentives. By providing an export adder that makes the solar-buying decision more financially attractive, EBCE can help these customers move forward with the investment

Tax-exempt Government Institutions: Similar to residents of modest means, governmental entities often lack financial resources, including meaningful access to tax-related incentives, to pursue and develop DER’s. An export credit of \$0.01/kWh has been enacted by EBCE to serve as an additional incentive to support the government agencies in the EBCE service territory in meeting their long-established environmental and planning goals. As a furtherance of this concept, EBCE could consider supporting the vibrant non-profit and/or faith communities that create the character of the East Bay.

Category 2: Workforce Adder

This adder category addresses the pressing desire in the EBCE community to incentivize projects that use skilled local labor paid at prevailing wages.

Prevailing wage: EBCE is also unique as a CCA in its unparalleled dedication to supporting the local workforce. Rather than attempting to require all local DER installers to pay prevailing wages, EBCE could offer another additive export credit for projects built with labor rates meeting a specified minimum standard.

For example, EBCE could develop a list of registered contractors who demonstrate compliance with the established labor standards (including prevailing wage criteria) through a pre-qualification process. Projects installed using EBCE-registered contractors would be eligible for an additional \$0.005/kWh export credit.



Category 3: Supply-shift Adders

The Supply-shift adders are focused on avoiding future problems around over-generation during the middle of the day, when solar could potentially generate more energy than grid customers need. These adders incent design and technology decisions that are more likely to provide energy to on-site users or to the grid during the late afternoon and early evening hours, reducing the sharp disparity between low net demand in the middle of the day and high peak demand times in the morning and early evening.

West-facing solar: West-facing solar arrays (oriented at between 240 and 330 degrees, for example) achieve approximately 6-10% lower energy output than south-facing arrays, but the higher percentage of output in the afternoon, when grid demand is higher, is more valuable to the CCA. With utility-standard Time-of-Use rates

moving toward specifying Peak periods in the late afternoon and early evening, west-facing arrays will already likely achieve higher benefits under NEM, but an additional export credit of \$0.005/kWh could further incent such installations and produce economic benefits for EBCE.

Small wind: Small wind energy systems can be installed on homes and commercial buildings for on-site use. Wind energy can be more intermittent than solar energy in urban and suburban California settings, but tends to reach daily wind-speed maximums in the early evenings. This timing works well with higher net demands at those times, so an additional \$0.005/kWh export credit could lead to more financially-viable small wind installations, and could be paired with a CCA-led pilot program to push such installations, either in partnership with equipment providers or with CCA-member municipalities.

Energy storage: Distributed energy storage is one of the key opportunities for enabling EBCE to manage current and future grid issues, such as resource adequacy and the need for spinning reserves. By incentivizing energy storage in decentralized locations, combined with a market agreement to allow CCA access (through off-site monitoring controls) to identified storage capacity, the CCA can utilize a territory-wide network of dispatchable resources that provide the lowest-cost method of meeting resource adequacy and demand requirements.

With an export credit of \$0.005/kWh, the CCA would be creating a clear market signal that energy storage is a highly-desirable addition to any installed DER's within its territory. Again, the roll-out of this incentive could be paired with a pilot procurement and deployment initiative, such as a subsidized or on-bill-financed battery-storage equipment offering that includes virtual power plant (VPP) control technology and cooperative agreements for use of the installed kW capacity.

It would also pair well with an EBCE-specific TOU rate structure designed to incentivize dispatchable DER adoption.

Eligibility for the energy storage adder would depend upon a set of operating parameters. With some adjustment for the expected smaller system sizes of NEM projects, those operating parameters could include: storage capacity requirements related to percentage of associated DER capacity and useful energy/time capacity; agreement to enable EBCE control of charge/discharge times through future opt-in demand response program; and software controls to enable such a demand response program.

These parameters could change over time, as EBCE finds itself in greater or less need of distributed energy storage, or depending upon program performance and overall impact. Similarly, the NEM export incentive for storage could be increased to further stimulate the installation of a network of dispatchable assets for the CCA.

Additional Details Of Proposed NEM Program

Avoid true-up timing mistakes: As some other CCA's (including PCE) have done, onboarding of current NEM customers can be scheduled to take place in the month of, or immediately after, the customer's typical PG&E true-up month. This will avoid customer saving losses resulting from immediate true-up at the transition time.

Monthly billing, with late spring cash-out: Monthly billing is recommended to ease customer transition. It is further recommended that EBCE allow customers to cash-out any accrued credits every April or May, which provides additional value compared to the PG&E program.

Under the PG&E NEM program, any remaining credits at the true-up time are simply lost. As part of a standardized cash-out date in April or May, EBCE would need to budget for major cash outlays at that given time every year.



Figure 5: Example of a residential energy storage system with integrated electric vehicle charging, which uses the Powerwall lithium-ion battery made by Tesla, a clean energy industry leader with major manufacturing facilities in Alameda County.

Length of NEM payout term: The term of the incentives should be aligned with state requirements around NEM offerings and grandfathering. Installing solar is a long-term commitment for customers, so they need to understand the realistic timelines for program availability, which also supports a strong and responsible local development industry.

Collocating NEM projects with FIT projects: Projects built through a NEM program can be combined with a Feed-in Tariff (FIT) or other export-based valuation program, as long as the interconnection points are monitored separately, and physical and electrical constraints of feeder wires and transformers are considered and addressed. In general, NEM customers are typically unlikely to be FIT customers, and vice versa, so the programs can coexist separately, with minimal overlap.



7. Community Investment Fund

EBCE's operations are motivated by the creation of environmental and social benefits for the service area and its customers. EBCE lead grant making designed to accelerate local programs and businesses through the innovation phase and into market readiness can be an effective way for EBCE to give back to the community and assist the development of valuable local energy services.

The LDBP has identified three distinct types of community grants that EBCE could provide for local innovations including:

A. Energy Innovation Grant

Designed to direct investment through existing energy innovation centers such as Clean Fund, Powerhouse, the California Clean Energy Fund (CalCEF), and other non-profit accelerators towards innovative energy companies based in Alameda County. Supporting early phase innovation through grant making or co-investment can help create economic development outcomes and kick start local entrepreneurship and job opportunities.

B. Government Innovation Grant


The local government municipal members of EBCE often pursue grant funding to developed energy and climate action projects. EBCE can support this effort through delivery of cost-sharing and matching funds when partner jurisdictions seek or state or federal grants (i.e., California Air Resources Board, California Strategic Growth Council, California Energy Commission, Bay Area Air Quality Management District, U.S. Department of Energy, etc.), foundation grants (i.e., Rockefeller Foundation, David and Lucile Packard Foundation, Hewlett Foundation, etc.), or other funding sources that require matching funds.

C. Community Innovation Grant

Several non-profits and community organizations are actively pursuing projects designed to deliver social and environmental benefits to Alameda County. Programs such as Shared Solar, retrofits, projects designed to deliver human health benefits, workforce development efforts engaging disadvantaged and/or displaced workers, and projects in disadvantaged communities can directly benefit from EBCE grant making. Support for these programs can be subsidized with both financial and non-financial resources and EBCE could consider providing volunteered staff capacity, consultations, or written support of community lead projects.

Key Recommendations

1. Convene three community working groups to develop scope, structure, goals, budget and governance of Community Investment Fund.
2. Identify Alameda-County based organizations to partner with to support working groups
3. Finalize Community Investment Fund plan for Board approval at the end of 2018
4. Commence grant making solicitations in 2019



SECTION II. Supporting Resources, Policies, & Strategies

Integrated Data Platform

Next to its customers, data is a CCA's most valuable resource and mining that data to extract that value and manage risks is of critical importance to EBCE and successful implementation of the LDBP.

To assess the opportunities for local clean energy programs to benefit EBCE and the customers and communities it serves, it was essential to develop a deeper understanding of the characteristics of the load that the agency will be serving.

To facilitate this, the LDBP Consulting Team assembled a robust integrated data platform using a comprehensive energy data management system that leveraged a massive historical energy consumption data set provided by PG&E (including 2 full years of AMI interval data), along with historical local weather station data, CAISO market (Day Ahead and Locational Marginal) pricing data, County parcel data, portfolio and rate structure data, geospatial data, socioeconomic data, and environmental indicator data to provide extraordinary load profiling, DER targeting and energy "hot-spot" (higher than average energy use patterns that constitute opportunities for DER deployment) identification capabilities.

Using this integrated data analytics platform enabled a detailed study of the unique energy supply and demand dynamics within Alameda County that has identified significant opportunities for cost-effective energy programs that deliver substantial value for EBCE and its customers. The analysis made use of nearly all of the data available to EBCE under the CCA Info Tariff, especially the AMI Interval data that facilitated the development of granular load profiles and hourly/sub-hourly analysis of load data down to the customer level. A summary overview of key findings is provided below.

The purpose of the analysis of energy supply and demand dynamics that was conducted as part of the LDBP project was to provide actionable

information that can assist EBCE in developing strategies, programs and policies that create organizational, ratepayer and community benefits. Energy consumption patterns vary across space, sociodemographics, industry types, and climates.

Understanding the specific consumption patterns of EBCE territory thus enables strategic, targeted, and tailored decision-making that maximizes benefits and reduces risk. This is why the development of an integrated data platform that facilitates the analysis of multiple data streams that affect energy use patterns is crucial to EBCE's successful implementation of the LDBP.

It is important to note that this analysis was meant to provide a solid foundation for EBCE staff and contractors to build upon, and was intended to be the beginning of an ongoing and iterative process. EBCE's staff has already taken steps to further expand and refine the initial load profiling research presented here, and is on track to have an industry leading, in-house data management platform to support the effective delivery of the energy programs presented in this plan.

Snapshots of EBCE Loads

The following is a very brief overview of some of the findings from the LDBP load research and integrated data analysis. Detailed findings and discussion of methodologies and assumptions can be found in the accompanying attachments to this plan.

EBCE's load profile includes a diversity of load types distributed across a geographically and socioeconomically diverse region. EBCE's total estimated annual load of ~7,000 GWh is distributed asymmetrically across ~570,000 accounts, with the bulk of the accounts being in the residential sector. However, overall electricity consumption is highly skewed towards the non-residential sector, with a small number of high-consumption accounts consuming a disproportionately larger share of total kWh. ~1% of all EBCE accounts represent ~15% of the total load, and ~10% of the accounts constitute ~65% of the total load (see Figure 11). This is reflective of the fact that Alameda County is a center of industry and an international freight and shipping hub.

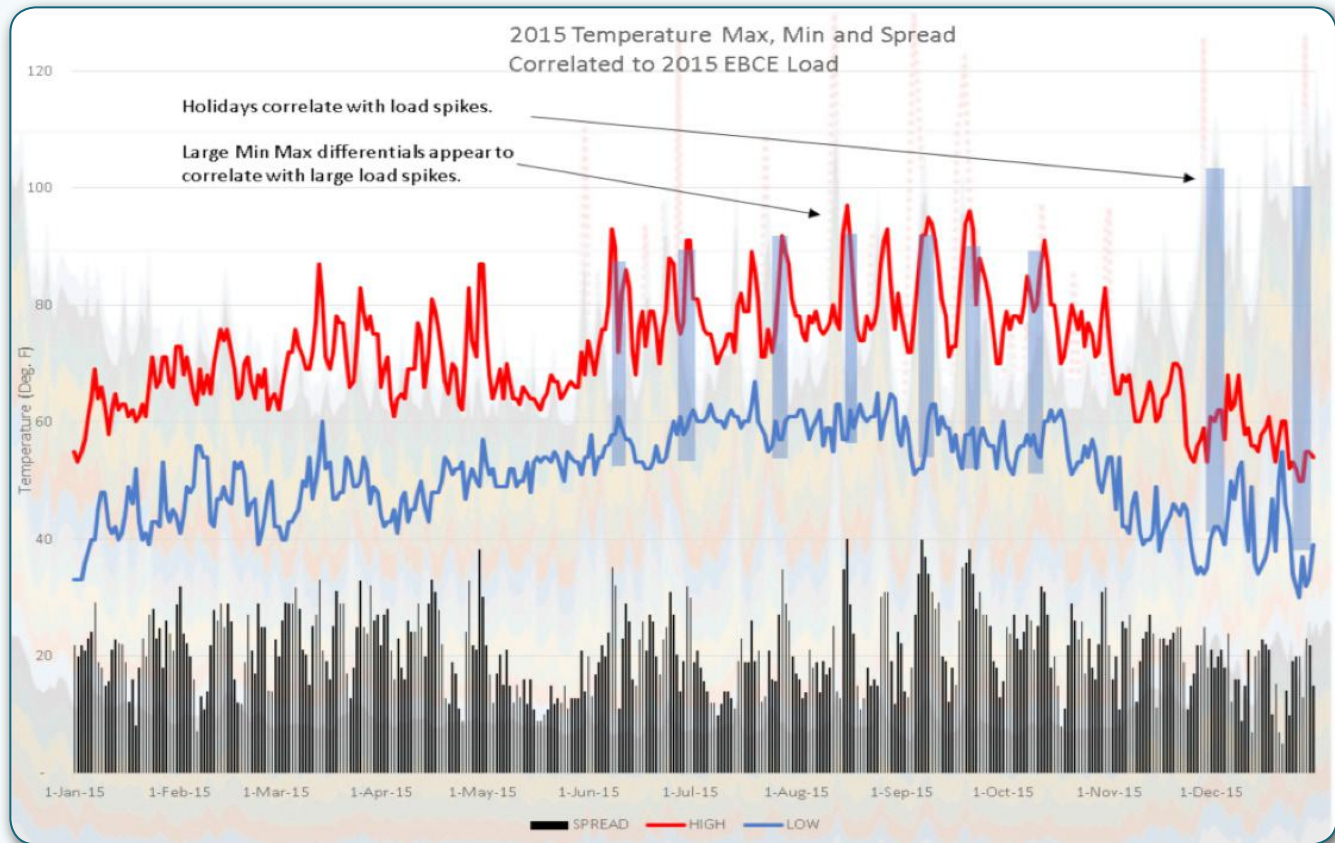


Figure 9: EBCE's 2015 total annual load curve (daily load for 365 days, as indicated by the x-axis) with Maximum and Minimum temperatures and daily temperature differentials overlaid. Note the strong correlation between extreme hot and cold temperatures, especially high swings between high and low temps, (indicated by the longest black lines at the bottom of the chart) and peak load days. There is also a strong correlation noted between peak load days and major holidays.

Peak electricity consumption days in both non-residential and residential sectors correspond with large differentials between minimum and maximum temperature fluctuations and high average locational marginal pricing (LMP), indicating a significant opportunity for improved efficiency in the electric space heating and cooling (HVAC) technology category. EBCE's average hourly load shape is unique due to the diversity of load types, geography, and socioeconomic conditions, which means that its peak and off-peak loads are not aligned with PG&E's system wide load profile.

Higher income residential areas in the east side of EBCE's territory use more electricity per service

address than those on the west side, but due to higher population total consumption is higher near the Bayshore sub-region (the densely populated inner East Bay, adjacent to the San Francisco Bay) where poverty is more prevalent.

The EBCE territory includes several communities that suffer from extreme poverty, and has a high concentration of low-income customers participating in the discounted utility rate program known as CARE, representing nearly 20% of EBCE's customers.

Air pollution contributes to health problems including eye, throat and nose irritation, asthma, heart and lung disease, and lung cancer. Local

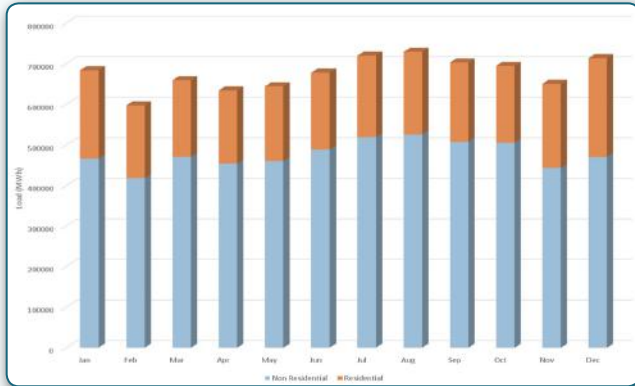


Figure 10: EBCE's monthly loads (GWh) in 2016. Note that the Residential load is shown in orange, and the Non-residential load is shown in blue.

	Number of Accounts	EBCE Item 15 2016 (kWh)	% of EBCE Accounts	% of EBCE Total Load
Residential	512,846	2,370,217,394	90%	34%
Commercial- Small	45,684	942,260,575	8%	14%
Commercial- Medium	4,888	1,007,949,773	1%	15%
Commercial- Large	2,707	2,522,095,707	0.48%	36%
Street Lights	3,666	52,502,873	0.64%	1%
Agriculture	146	23,185,379	0.03%	0.3%
TOTALS	569,938	6,918,211,700	100%	100%

Figure 11: Number of accounts and annual consumption by rate class, as well as percent of EBCE totals.

nitrous oxide, ozone, and diesel emissions correlate closely with variations in asthma rates by location. Should programs be developed that are able to mitigate emissions tied to and energy use EBCE can also begin to drive impactful human health outcomes. Emission-free power generation and increased electrification of transportation and building energy use directly reduce these three primary contributors to poor local air quality.

The locational correlations between siting opportunities, grid needs, health impacts, customer value, and economic development investment indicate high value opportunities to address disadvantaged communities' environmental justice needs for clean air and employment while meeting the electrical needs of the service area.

Critical public facilities are located throughout the county, and concentrated in population centers along the I-880 corridor where pollution indicators tend to be highest. The development of local distributed generation and energy storage resources (i.e., microgrids, nanogrids, etc.) in appropriate locations can enhance community resilience by ensuring access to power for local hospitals, fire and police facilities, water supply, and schools (etc.) that are used as temporary shelters or community resiliency centers.

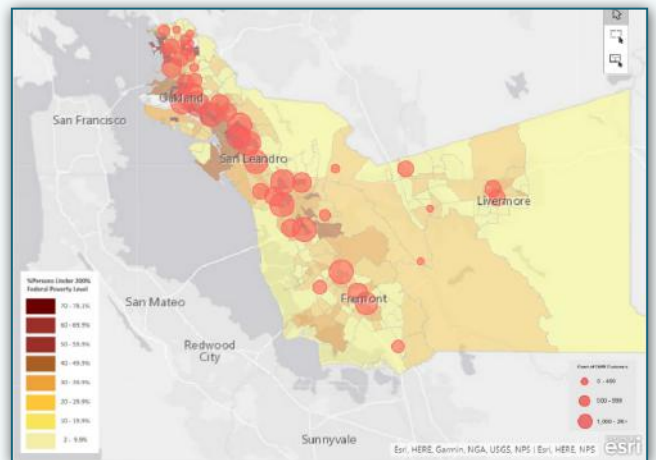


Figure 12: Heat-map showing overlay of high-poverty areas and geographical distribution of CARE customers.

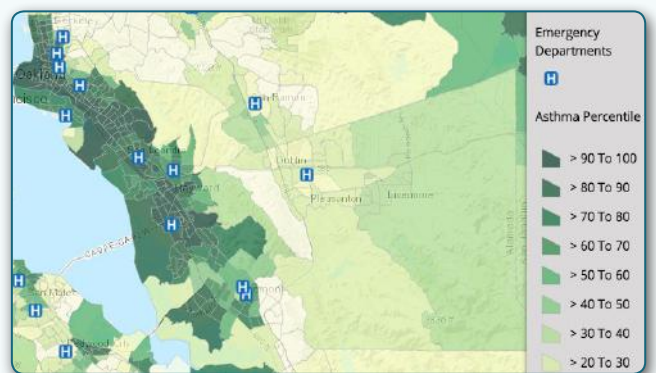


Figure 13: Alameda County Asthma Rates and co-location of emergency facilities (hospitals). Note the correlation with the I-880 corridor and high concentration of low-income customers, where pollution levels tend to be highest.

Local Solar Resources

The Alameda County region has abundant solar energy resources that can be harnessed by EBCE to power local homes and businesses with locally generated, carbon-free, renewable energy, while sustaining the local economy.



Solar Siting Survey

An extensive Solar Siting Survey (SSS) was conducted to determine the technical siting potential for commercial-scale solar photovoltaic (PV) installations throughout the EBCE service territory. While this particular survey focuses on Alameda County, the methodology used builds upon established best practices in the California solar industry, and can be applied to any defined geographic area.

In addition to assessing the technical solar potential, the LDBP consultants also conducted an Integration Capacity Analysis (ICA) of the nearest feeder line for each of the identified solar sites. By combining the ICA data with analysis of prospective solar sites, the LDBP Solar Siting Survey highlights the optimal locations to connect local solar to the electric grid, where the siting opportunity is excellent and interconnection is likely to be quick and cost-effective.

The SSS identifies lower cost and higher value renewable resource opportunities reflecting characteristics of all available sites in relation to existing loads and electric grid infrastructure. The goal of this survey was to identify feasible, commercial-scale sites for installing 1,000 kW (AC) or larger solar PV within the built environment. Note that the survey did not seek to identify suitable locations for utility-scale solar farms.

By highlighting high-quality PV siting opportunities, this survey was designed to guide the development of cost-effective local solar generation within Alameda County. The scope covered all urban areas of the county with the exception of the City of Alameda which has its own municipal utility.

Results of the Survey

The results of this can be used to create targeted marketing campaigns that allow EBCE and its member jurisdictions to focus on those properties

with high solar potential. The Solar Siting Survey identified over 650 MW (AC) of technical PV siting potential on over 250 discrete sites. A site is defined as a unique address (or group of related addresses) with the potential to host at least 1,000 kW (AC) on rooftops, parking lots, parking structures, and logical aggregations thereof.

It is important to note that the goal of the survey was to identify prospective solar sites that are worth further investigation, and that there was no consideration of structural integrity or other considerations that can only be discovered by performing a deeper and much more detailed study for each individual site. The technical solar siting potential will be reduced by constraints that were not considered like structures that cannot support extra weight without significant upgrade and grid bottlenecks that would result in excessive solar curtailment.

Summary of Solar Siting Survey

There is tremendous opportunity to expand local solar PV generation in Alameda County. To facilitate development of local renewable energy, the LDBP Consultants conducted the Solar Siting Survey, which identified over 660 MW of technical solar PV siting potential in the EBCE service territory.

Notably, more than 30% of this siting potential is on parking lots and parking structures, which are often overlooked siting opportunities for clean local energy. In total, this survey identified enough local solar PV capacity to power 165,000 homes.

While this survey identified solar siting opportunities of at least 1 MW (AC) in size, there is also siting potential for smaller PV projects in Alameda County. With a minimum project size of 500 kW, the LDBP Consultants expect a technical solar siting potential of 1.2 gigawatts (GW); a minimum project size of 100 kW would likely have uncovered over 2 GW of solar siting potential.

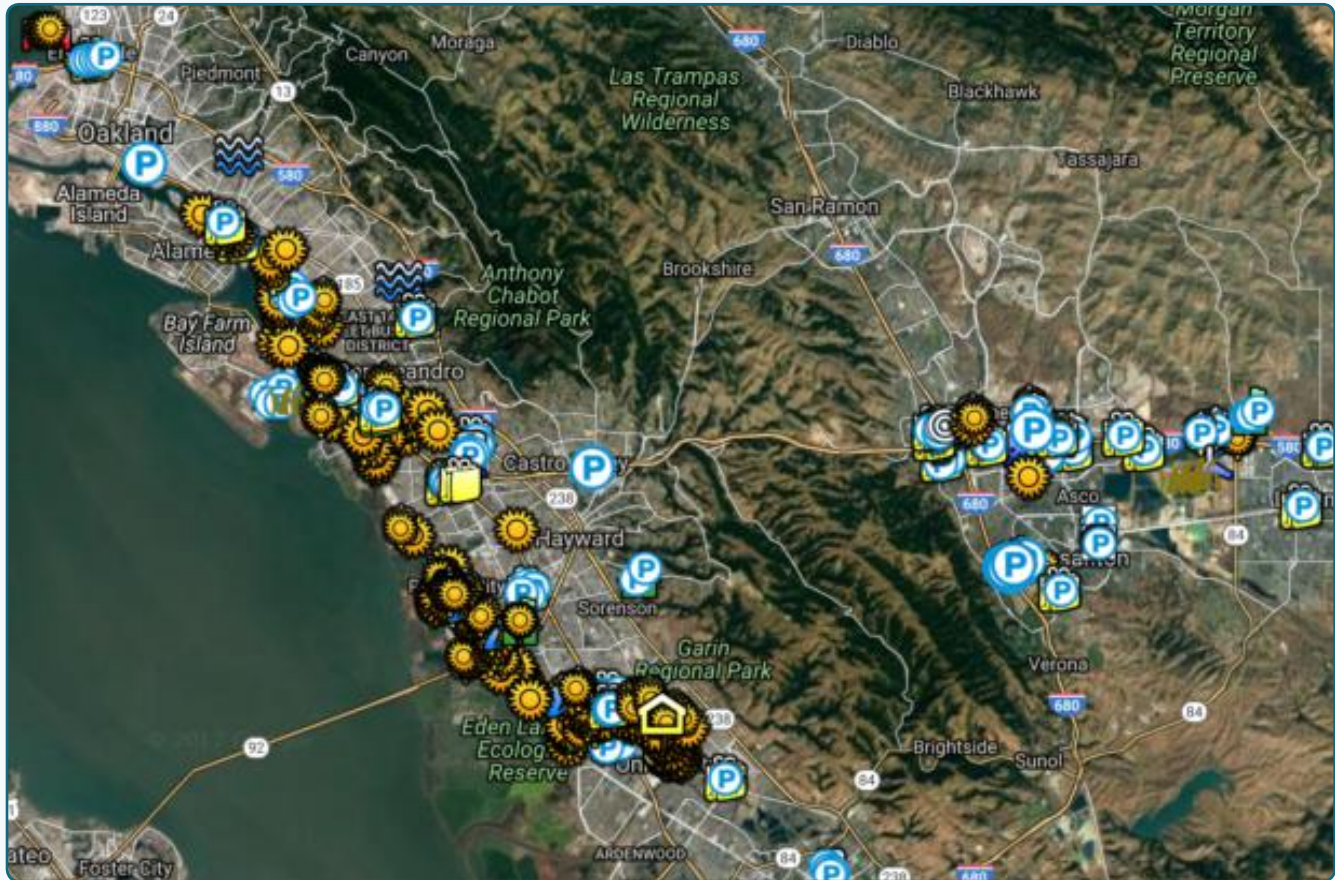


Figure 14: Overview of Solar Photovoltaic potential identified in the LDBP Solar Siting Survey. Note that this map was provided to EBCE staff in Google Earth format (i.e., a .kmz file), which allows users to zoom in down to the individual site level and get detailed information about each site.

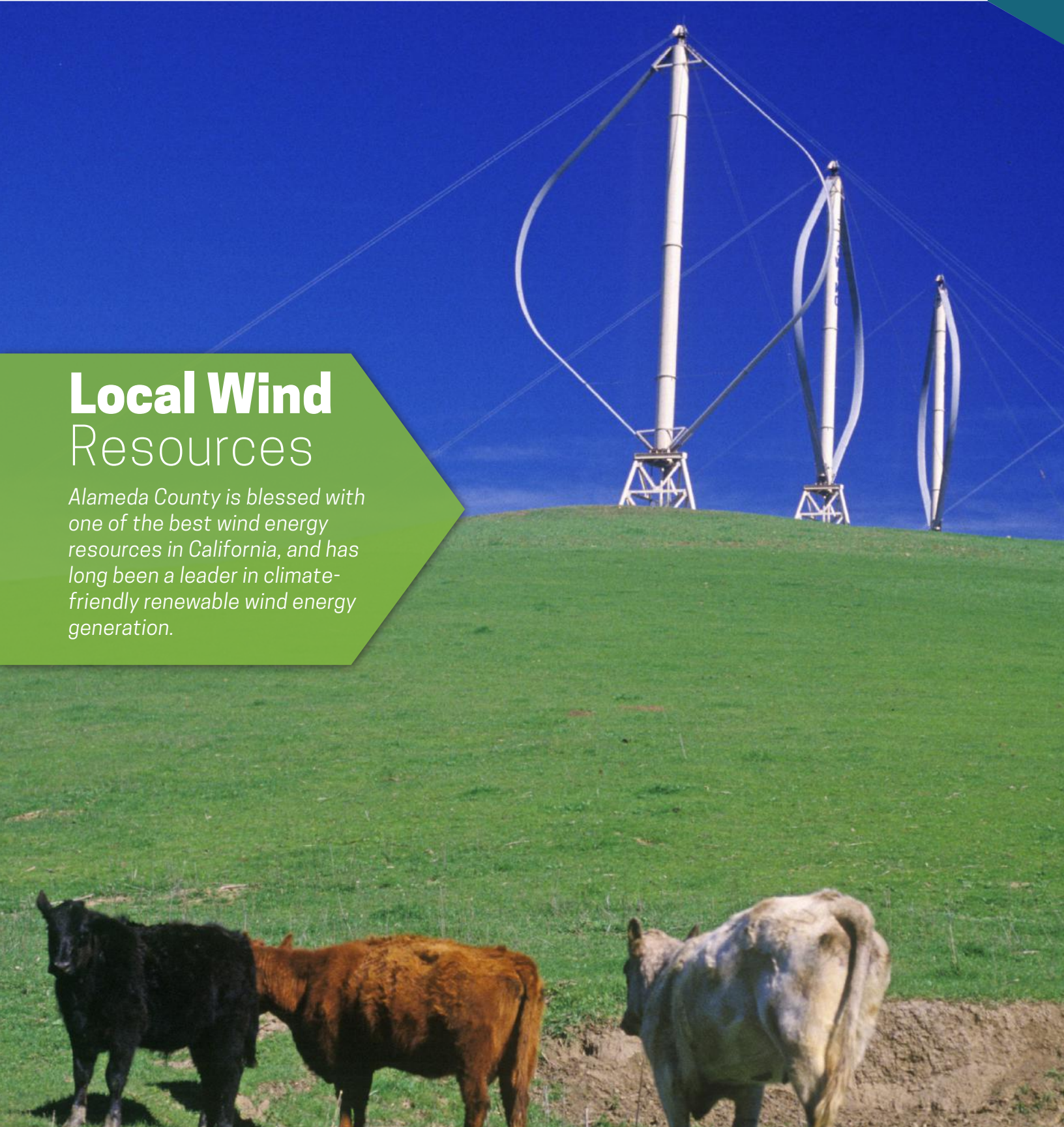
Developing the local solar projects identified in this survey can help create a stronger, more resilient grid in Alameda County. By pairing distributed solar with other distributed energy resources, such as energy storage, demand response, and electric vehicle charging infrastructure, EBCE can establish microgrids at community resiliency centers. These innovative configurations can be designed to provide indefinite, renewables-based, backup power to critical facilities in the event of regional power outages. With the addition of energy storage combined with solar, many of the large solar sites identified in this survey are prime candidates for these applications.

Participation rate (% of local solar potential identified in the EBCE Solar Siting Survey that is realized)	Required PPA rate (¢/kWh)
1%	7¢
2%	9¢
5%	11¢
11%	13¢
22%	15¢
36%	17¢
52%	19¢
66%	21¢
75%	23¢
82%	25¢
87%	27¢

Figure 15: Market Response at various pricing levels. (Note-These estimates are derived from a UCLA Luskin Center study of Los Angeles solar potential and associated methodology)

Local Wind Resources

Alameda County is blessed with one of the best wind energy resources in California, and has long been a leader in climate-friendly renewable wind energy generation.



Wind Siting Survey

A Wind Siting Survey, comparable to the Solar Siting Survey detailed above, was also conducted to identify suitable locations for distributed wind energy installations.

To find suitable wind development sites, the LDBP consultants overlaid wind speed maps with parcel information to find large, unoccupied, publicly owned land in high wind speed regions. Once these target sites were established, our team used standard wind turbine layout geometry to determine the capacity of each site and an excel based performance model to determine the energy yield of each turbine.

Consistent with the approach for the Solar Siting Survey, sites identified were compiled on both a Google Earth map (.kmz file) and an Excel spreadsheet. This approach allows EBCE staff and stakeholders to zoom in to the individual site level to get detailed information about each identified parcel.

The LDBP Wind Siting Survey showed the potential for 110 MW of wind capacity, primarily on public land though including some adjacent agricultural parcels. The wind turbine placement is focused on the two areas of the County with the highest average wind speed: the narrow stretch between I-880 and the Bay, and in the northeast corner near Mountain House.

Additional Notes on Methodology

- Identified large municipal or county owned properties suitable for development.
- Assessed average wind speed and hosting potential of identified parcels.
- Wind statistics taken from AWS Truepower.
- Place turbines in a realistic layout to determine each site's hosting capacity.
 - 2 MW turbines modeled, a popular middle of the road choice for developers.
 - Modeled turbine dimensions: 300 ft rotor diameter, 260 ft hub height.

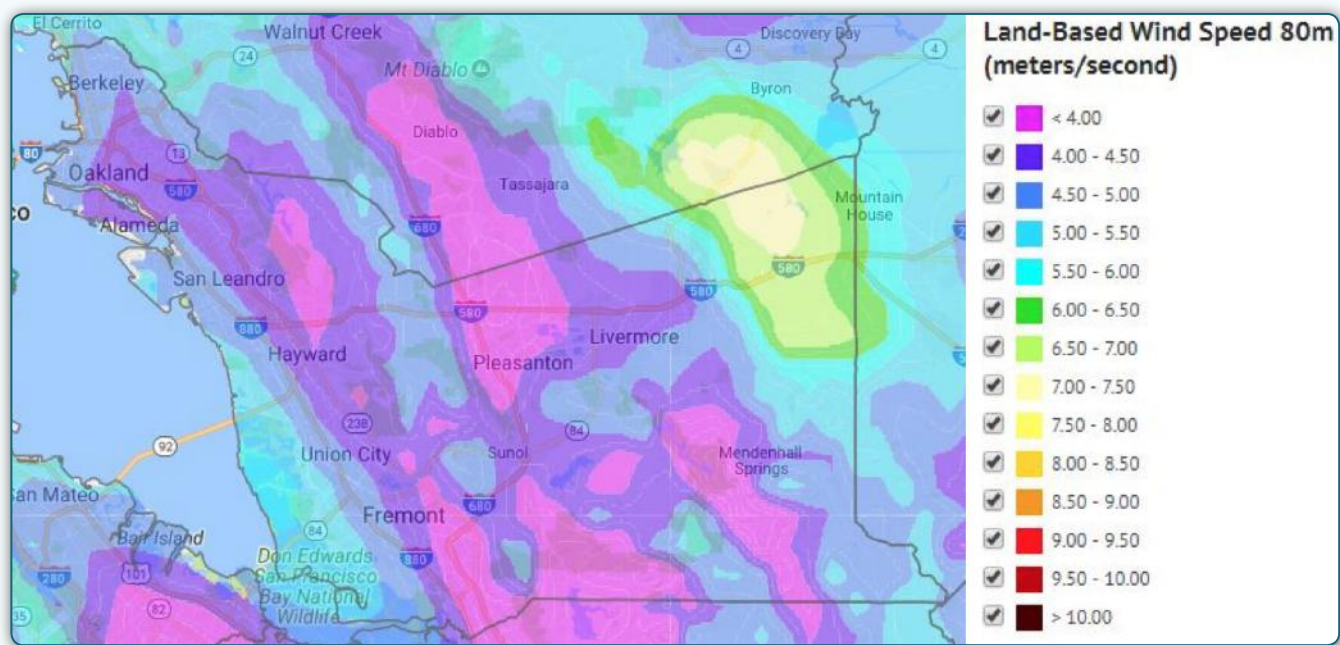


Figure 16: Wind Speed Map for the County of Alameda. Note that the highest wind speeds in Alameda County are concentrated in the northeast corner just west of Mountain House. The lower speed areas (in pink below) are where hillshade is experienced on the windward side of hills.

Results of the Survey

The survey identified suitable sites for fifty-five (55) 2 MW turbines within the EBCE service territory, for a total of 110 MW of wind capacity. These turbines were placed on 19 distinct parcels. These 19 parcels are arranged in 11 distinct clusters; many parcels are adjacent, increasing feasibility of development due to increased potential yield.

Over half the parcels identified as suitable locations are located north and east of Livermore, in the high wind speed corner of the County. Most of the remaining parcels are located in the next highest wind area, the corridor directly adjacent to the Bay.

The geographic breakdown of parcels as is follows:

- 80 MW on public land of over 50 acres in size, with 30 MW on adjacent agricultural land that does not appear to be actively farmed.
- 86 MW inland / 24 MW along bay.
- 28 MW in Mountain House area (highest wind speeds).
- 12 parcels in the NE corner of the County.
- 5 parcels along the Bay.
- 2 parcels were identified in miscellaneous inland regions of the County.

The turbine placement accommodates the topography of existing sites and the generally spacing rules that are designed to prevent eddies from one turbine affecting another either beside or behind it. Most of the identified parcels were publicly-owned land, though some are on adjacent agricultural properties:

- 80 MW on public land.
- 30 MW on adjacent agricultural land that does not appear to be actively farmed or is in transition away from agricultural use.

In regards to energy yield, the average capacity factor across the portfolio is 21%. This figure

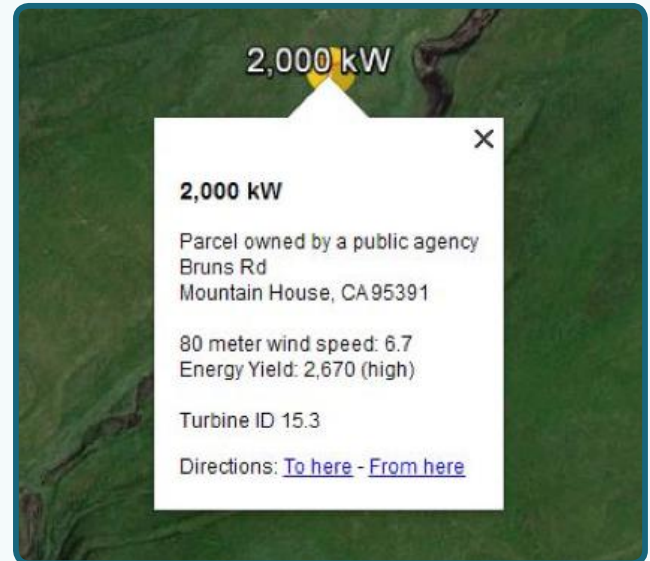


Figure 17: Sample detail from the Interactive Wind Siting Survey Map, showing a potential site for a 2 MW turbine on a publicly-owned parcel in the Mountain House area of East Alameda County.

Note- Zooming in to the pin level reveals some high level information, including parcel address and ownership status, average wind speed, and energy yield of each turbine.

ranges from a high of 30% in the Mountain House area to a low of 12% on the (2) inland parcels away from the high wind corridors. The breakdown of turbines by energy yield is as follows:

- 15 turbines in low energy yield areas (<1,500 kWh/kW/yr).
- 25 turbines in medium energy yield areas (1,500 to 2,500 kWh/kW/yr).
- 15 turbines in high energy yield areas (>2,500 kWh/kW/yr).

The high yield sites, primarily those in the Mountain House area, are likely to provide the best power prices and should be prioritized. Most of the existing wind capacity in the County is in this area, proving the viability of wind power here.

The medium yield sites could also provide acceptable power prices. An anemometer placed on site for several months can determine the actual wind speed distribution and provide a more accurate picture of the sites viability.

Integration with Long-term Planning

The Local Development Business Plan provides a framework for development of local energy resources, which can support EBCE's ten-year Integrated Resource Plan.



Integrated Resource Plans

Integrated Resource Plans (IRP's) have stood as commonplace power resource planning documents for decades. They have informed the energy purchasing practices of investor-owned utilities (IOU's), publicly owned utilities (POU's), and more recently Community Choice Aggregators (CCA's). IRP's have traditionally focused on equipping utilities to achieve competitive energy costs and subsequent low rates for customers through a combination of short and long-term power contracts filled from the wholesale market. These procurement decisions are often accompanied by energy risk management (ERM) policies that define how far in advance commitments to energy purchases are made to meet forecasted energy supply needs.

An Integrated Resource Plan* is a planning document that defines an electric utility's:

- Policy Goals (i.e., energy resource mix)
- Resource needs and Operational Constraints
- Energy priorities and resource choices
- Customer-side resources
- Long-term Procurement Plans

*Important Note- the LDBP is not an IRP, but it does recommend local resources for integration with EBCE's IRP.

IRP's are comprised of three main components:

1. Energy Forecasts: The first step in an IRP that evaluates energy demand needs in the service territory over a ten-year time horizon, as well as projected energy prices on the wholesale market during that planning horizon.

2. Energy Supply Procurement: Indicates the plan for procuring enough energy supplies to meet the forecasted load within the service territory.

3. Resource Adequacy Procurement: Ensures system reliability through procurement of adequate capacity to meet peak loads. LSE's are required to procure adequate RA to meet 115% of their historical peak load.

CCA's and IRP's

Until recently, IRP's have not been a regulated requirement for CCA's like EBCE. However, with California's focus on the mitigation of GHG emissions and the decarbonization of the State's energy system, IRP's have become a mandated requirement under Senate Bill 350 (SB 350). As a result, SB 350 (and the portfolio standards it creates) directly impacts the procurement decisions of portfolio managers and energy traders representing their respective load-serving entities (LSE's)—note that CCA's are classified as LSE's in California—in the wholesale energy market.

SB 350 was signed into law on October 7th 2015, and among other things it establishes a goal of reducing GHG emissions 40% below 1990 levels by 2030. The law also contains ambitious energy efficiency and renewable targets designed to help achieve this goal, including a 50% renewable electricity procurement (aka- Renewable Portfolio Standard, or RPS) goal and a doubling of energy efficiency savings in the electricity and natural gas sectors by 2030.

SB 350 is making Integrated Resource Plans a primary implementation mechanism to ensure the GHG goal is achieved. Under SB 350, IRP's must still balance supply with demand and address standard energy procurement needs and reliability as they have always done. However, they must now also demonstrate what the LSE is doing to meet the 2030 clean energy and GHG emissions targets.

SB 350's targets are also supported by Senate Bill 618 approved on October 2, 2017, which requires that LSE's (including CCA's) file IRP's that contribute to *“contribute to a diverse and balanced portfolio of resources needed to ensure a reliable electricity supply that provides optimal integration of renewable energy resources in a cost-effective manner, meets specified emissions reduction targets for greenhouse gases, and prevents cost shifting among load-serving entities.”*

EBCE's IRP will detail a 10-year plan for:

- Achieving GHG reductions 40% below 1990 levels by 2030.
- Achieving 50% RPS by 2030.
- Procuring energy efficiency and demand response resources that are cost effective, reliable, and feasible.
- Meeting mandatory energy storage targets.
- Integration of anticipated transportation electrification loads.
- A diversified procurement portfolio with short and long term products o Resource Adequacy (RA) requirements.
- Ensuring that the LSE fulfills its obligation to provide just and reasonable retail rates.
- Minimizing impacts on ratepayer bills (costs).
- Ensuring system and local reliability (RA).
- Enhancing the sustainability, efficiency, resilience, and safety of the distribution grid.
- Integrating demand-side management.
- Minimizing localized air pollutants and greenhouse gas emissions with early priority on disadvantaged communities.

IRP and LDBP Alignment

It is notable that many of the goals of the IRP are well-aligned with the goals of the LDBP, including:

- Selecting energy resources that result in economic development and local jobs while providing RA.
- Reducing carbon intensity through customer-facing energy programs.
- Meeting or exceed RPS standards.
- Preventing economic leakage (keeping money local).
- Community engagement, especially disadvantaged communities.
- Providing low and stable retail rates.

Mitigating Risk and Enhancing EBCE Stability and Reliability

Long term stability and reliability of East Bay Community Energy (EBCE) is an outcome achieved through balancing several operational, business, and utility activities. As such, the management of energy procurement, customer care, and strong relationships with partners and suppliers are all material to the evaluation of EBCE's business practices.

Transitioning to local renewable energy assets (generation, demand response, energy storage, and demand side management) is becoming a key strategy for planning for future CCA operational viability. As a result, the use of these distributed energy assets must be thoroughly planned from the perspective of stability and reliability.

The LDBP recognizes that, in the near-term, administrative overhead and operational costs of the organization are likely to increase along with the volume of Distributed Energy Resource (DER) owners seeking to be placed on specialized EBCE rate structures and interconnect their energy assets with the grid.

Similarly, the volume of project developers lobbying EBCE with energy services and local program solicitations including demand side management programs, energy storage, or energy efficiency offerings is also expected to increase. As a result, EBCE must anticipate and plan how to coordinate price signals and purchasing practices that incentivize customer behavior and programing.

New Generation as Risk Mitigation

Operating EBCE and implementing new local development programs is not without risk. Risk can affect EBCE's business model, procurement practices, fiscal health. If left unmanaged, systemic risk has the potential to derail operations, and prevent the organization from reaching its short-term, mid-term, and long-term planning goals and negatively impact EBCE's long-term stability and reliability.

New generation and energy resources (especially dispatchable assets like demand response and energy storage) can play a role in EBCE's ability to respond to market volatility and improve procurement outcomes. Energy efficiency and load shaping services can also help EBCE to shape its demand profile and flatten energy use within the service area.

If designed appropriately these activities can lower EBCE's exposure to price shock, grid disruption, or unplanned business expenses that may result from extreme weather events, loss of load, or natural disaster. Risk policies like those in the ERM will help build resilience into EBCE's operations, and if the ongoing development of risk management protocol incorporate DER's as a resource able to respond to market or volume risk resilience benefits can be extended to EBCE's customers, improving quality of life and ensuring stable and reliable service for years to come, regardless of what uncertainties the future holds.

Common CCA Risks:

- **Regulatory Risk:** Changing policy around generation requirements, rate structures, greenhouse gas emissions, renewable portfolio standards, energy efficiency requirements, and other state goals, targets, or incentive can all introduce risk to EBCE.
- **Financial Risk:** If unchecked, financial risks could pose a serious threat to EBCE's operations. Common sources include interest rate risk associated with EBCE's cost of capital and debt services, credit risk for services extended to EBCE's customers, liquidity risk or the ability to have cash on hand when needed, or operation risks such as a lawsuit or other unexpected costs.
- **Opt Out Risk:** EBCE's reputation and brand image play a large role in the retention of customers and prevention of opt out risk. Opt-out risk can result from misalignment between customer's service expectations, their rates, or the programs they benefit from.

- **Political Risks:** Engagement of other CCA's, local governments, and stakeholders can result in intervention strategies that can be effective measures in managing EBCE's long-term legislative and regulatory risks.

Key Recommendations

LDBP and IRP goals can be met through a combination of recommendations provided by the LDBP including:

Unlocking DER Potential to Support IRP:

- Integrated data platform and analytics.
- Use Adders to overcome market failures and incentivize dispatchable DER deployment.
- Implement Pay-for-performance contracting for load-shaping Energy Efficiency and Demand Response.
- Customized TOU and VDER rate designs to incentivize local generation and storage.
- Promote optional Demand Response participation through enhanced incentives.
- DER aggregation (Virtual Power Plant).

Supply Recommendations:

- Implementing LDBP programs to incentivize new local generation and energy storage (i.e., NEM, Collaborative Procurement, MuniFIT).
- Integrate local resource preferences into wholesale RPS procurement and solicitations.

RA Recommendations:

- Using Dispatchable assets allow DER's to interact with procurement management.
- Valuing renewables based on their time and place of use.
- Providing dispatchability through Energy Storage, Energy Efficiency, and Demand Response.
- Advanced schedule coordination to use dispatchable local resources to displace fossil fuel consumption (i.e., peaker plants).

Energy Storage

Contracting Strategy

Background

Under the AB 2514 (Skinner) energy storage mandate, EBCE is required to secure energy storage contracts to cover 1% of its peak load by 2020, with any related construction to be completed by 2023. For EBCE, at full enrollment, this represents a relatively sizable requirement.

Based on EBCE's Implementation Plan the agency's peak load at full enrollment is expected to be 1,416 MW, and that means that the overall local capacity requirement (50% of peak) will be 708 MW and the energy storage capacity requirement (1% of peak) will be ~14 MW. This presents some challenges for a new CCA like EBCE, which will most likely not have established a credit rating by the 2020 contracting deadline.

Beyond supporting EBCE's achievement of the Skinner mandate, energy storage systems can insulate EBCE from wholesale market risk, flatten load curves, reduce portfolio carbon intensity, create resilience outcomes, increase and stabilize revenues (i.e., congestion revenue) and drive operational cost savings.

The LDBP recommended energy storage contracting strategies are designed to help EBCE meet or exceed state mandated energy storage requirements and build towards the development of an operational virtual power plant (VPP) that aggregates distributed energy resources (including energy storage) into a valuable dispatchable asset.

Key Recommendations

1. Develop small-scale energy storage program for Residential CARE customers and other underserved market segments.
2. Implement NEM and FIT Dispatchability/Supply-shift adders to incentivize ES deployment.
3. Provide optional, mutually-beneficial contracting options and DR programs that allow EBCE customers to be active partners in creating value and cost-savings through ES.
4. Leverage Collaborative Procurement programming to ameliorate lack of credit rating issue (i.e., OCEI).
5. Deploy TOU pilots and customized rate structures that provide incentives for customers to install beneficial ES.
6. Use Loan Loss Reserve (LLR) to secure debt services, and build revolving fund to finance new ES projects.
7. Evaluate options for aggregation of ES assets to support VPP strategy.



Figure 19: The Energy Pod advanced flow battery energy storage system manufactured by Hayward-based Primus Power offers "long-duration, fade-free energy storage solutions for the smart grid."

Rate Design

as an Incentive

Background

As EBCE begins operations and assumes responsibility of power procurement on behalf of its customers it is reasonable to expect change anxiety and customer confusion that creates opt-out risk. For most CCA's this risk has been mitigated by reducing the amount of change customers experience by keeping customers on PG&E's rate design and tariff structures at launch. While the approach of mirroring PG&E's rates will alleviate short term concerns, EBCE can build upon the practice over a five-year period and use the powerful lever of rate design to shape and incent the optimization of energy use and conservation through the service area. If done correctly, and in conjunction with the collection and analysis of Settlement Quality Meter Data (SQMD) and service area specific load profiles,

EBCE can tie rate design to outcomes such as power procurement and settlement cost reduction while also creating social, environmental, and economic outcomes for ratepayers.

This section presents a number of recommendations including potential pilot able to drive outcomes through innovative rate design including:

- Special rate design promoting free or discounted power for CARE customers.
- Discovery of cost and energy saving opportunities for both EBCE and its customers.

- Load shaping and shifting services that flatten load curves and lower EBCE's volumetric risk and exposure to high settlement and market power procurement prices, while reducing greenhouse gas emissions.
- Long term creation of new revenue streams for EBCE and its customers through collaboration with ratepayers as transactive partners in the generation, dispatch, consumption, and conservation of energy.

In addition, to expanding pilot program models this section recommends an implementation timeline designed to enable EBCE to begin operations with PG&E tariffs and transition towards rates tailored to the service area that can create mutual benefit for EBCE and its customers.

Launching with PG&E Tariffs

As EBCE begins operations, it is recommended that EBCE mirror PG&E's rate design to minimize customer confusion and anxiety to prevent opt out risk. At launch EBCE will receive System Wide Dynamic Load Profiles and other billing determinants from PG&E. While this dataset will enable EBCE to begin its billing process it is not tailored to EBCE's unique load profile. For the first year of operations it is recommended that EBCE gather and track its customers' energy use, costs, and revenue potential in an internal integrated data platform to build a robust baseline for future study.

EBCE Cost of Service Study

After a full year of operation of EBCE at full enrollment a cost of service (COS) study has been recommended as a way to identify expensive to serve customer loads within the service area. This requires an experienced and highly-specialized skillset and sophisticated modeling tools and

resources to produce the most accurate and actionable insights necessary to minimize risk exposure. Over time, EBCE could develop the internal capacity to update and maintain the COS model to keep up with changing load patterns and dynamic market conditions. When a COS model is combined with an in-house data platform expensive problem loads and rate classes can be identified and provide EBCE with a detailed understanding of the costs of serving different customer classes. This baseline will ultimately inform the design and implementation of rate designs able to equitably distribute costs across all EBCE's customers.

After one full year of operations and a process of data collection and analysis is facilitated by the COS study EBCE can begin to implement rate design designed to bring improve operational and financial performance while incentivizing behavior change across its rate classes.

A few potential pilots for consideration include:

CARE Free Program

California's load curve contains a large mid-day "duck belly" resulting from solar generation that is currently not timed with mid-day energy use. As a result, California utilities have paid expensive curtailment contracts or in some cases paid other regional energy users such as the state of Arizona to off take excess solar generation at negative prices. EBCE may consider pursuing a rate design program that can in part prevent power and economic leakage, and mitigate solar curtailment and offer subsidized or free power to low income CARE customers in its service area.

A "CARE Free" program has been considered by the LDBP team and features zero cost mid-day weekend pricing in Disadvantaged Communities (DAC's) as defined by CalEnviroScreen. In essence the program can help lower the risk of curtailment and offer subsidized or free power to residents and businesses most disproportionately burdened by energy prices.

Peak Day Pricing

PG&E has deployed a Peak Day Pricing (PDP) program that offers business customers lower electricity rates from May 1 to October 31 in exchange for significantly higher rates (around \$0.85/kWh) from 2 pm to 6 pm on 9 to 15 peak days per year. Notification is sent the day before a peak day event (typically hot summer days) with the goal for the customer to reduce usage during this time.

While traditional Peak Day Pricing are not compatible with CCA billing processes, it is possible for EBCE to provide a pilot program that emulates PDP and provides similar for participating customers as soon as year one. This can provide valuable, cost-saving load shaping services to EBCE while preventing opt out, especially for E-19 and E-20 customers whose rate design currently includes peak day pricing.

Time of Use Rates

Time of Use (TOU) rates are becoming a commonly adopted rate design mechanism designed to both cover the costs of ramping energy use procurement as well as to use price signals to incent customers to alter their energy use behavior.

For example, both MCE and PG&E have adopted non-tiered EV charging TOU rates that place varying costs on EV charging based on service area wide profiles. It is expected that TOU rates will become mandatory rate structures state wide in the next few years. As a result, CCA's are considering ways to deploy TOU rates across all customer classes. Implementing similar programs at EBCE can both promote customer adoption of EV's, which can create fuel switching and new electric sales revenue for EBCE, and reduce tailpipe emissions throughout the service area.

The LDBP team recommends adopting similar programs but using the results of a COS study and a full year of energy and billing data to create TOU rates tailored to EBCE's unique load profile rather

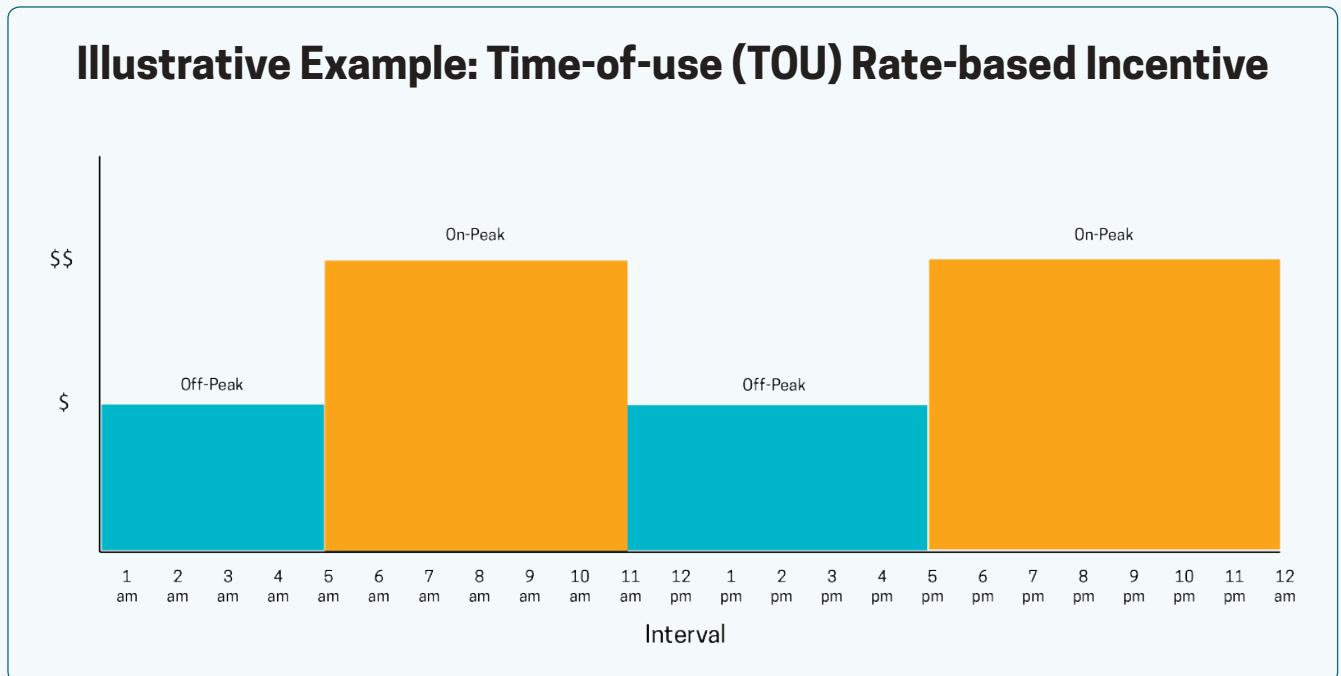


Figure 20: This is an example of a potential non-tiered TOU rate structure that could be offered by EBCE to encourage customers to adopt electric vehicles and energy storage, and use the devices to manage and adjust their charging behavior to avoid peak load times for EBCE, reducing procurement costs and risks. This structure would also encourage charging during peak solar production hours, reducing curtailment risks.

than modeling off of PG&E's TOU rate which are based on a system wide average load profile with a large duck belly that is not yet as pronounced in EBCE territory. An illustrative example of how a TOU rate-based incentive could be structured based on the LDBP analysis of EBCE's hourly load profiles is provided in Figure 20.

VDER Price Signals and Transactive Energy Models

Alternative rate structures are currently emerging that utilize instantaneous settlement and pricing structures to value the temporal and locational value of DER's. The Value of Distributed Energy Resources (VDER) program out of New York State provides one example of innovative rate design that builds in social and environmental value to the real-time price of energy dispatch.

Continued study and development of innovative rate design models that value the time and locational elements of energy generation can

provide a basis for EBCE to send price signals directly to customers in exchange for energy dispatch, conservation, or load shaping services. Similar in many ways to demand response programs in their function and administration, these new models have the potential to be aggregated to create the scale need for EBCE to monetize their value by bidding into CAISO market programs like the Demand Response Auction Mechanism (DRAM), as well as the potential to support transactive energy platforms in the future.

If customer owned DER's are aggregated by EBCE or a third party, the pooled resource could ultimately create new revenue streams for EBCE and its customers. While a long-term vision, such services can provide the basis for a Virtual Power Plant (VPP) able to supplement EBCE's portfolio manager with local generation and dispatch options able to offset wholesale energy procurement purchases and subsequent high

settlement charges through a transactive energy platform. The rate design and the pricing through which DER's dispatch is valued is essential to efficient operations and the creation of mutual benefit for EBCE and its customers.

Programmatic Implementation

By years four or five of operations SQMD and service area specific load and rate use data has been curated and analyzed and high performing pilot programs can be developed into mass market programmatic offerings. Standing programs that have been cultivated through a process of opportunity identification, pilot, and performance evaluation can scale outcomes and savings created during pilot phases into long term benefits.

The five-year window before programmatic implementation will also correspond with the completion of EBCE's current billing system contract, and enable EBCE to build or procure new billing and enterprise software tools needed to efficiently and effectively bill customers and collect the revenue needed to continue sustainable long-term operations.

Key Recommendations

- Develop in-house integrated data platform and analytical capabilities to conduct ongoing load research and analysis of EBCE settlement data and retail revenues to guide the development of beneficial rate structures.
- Conduct a Cost of Service study to determine how EBCE rate designs can be adjusted to balance and optimize customer savings and CCA financial health.
- Develop Time-of-use (TOU) and/or Value of Distributed Energy Resource (VDER) pilots to incentivize customer participation in LDBP programs, and develop real-world data and insights to support development of EBCE-specific rate designs.

Customer Financing Options

Introduction

Access to the capital required to fund and finance the upfront costs of the equipment and resources needed to save or generate power is one of the major barriers to wide scale adoption of local energy resources and the creation of energy savings. As a result, CCA's have considered the role of customer financing programs and their ability to catalyze the proliferation of energy efficiency retrofits, equipment upgrades, and to drive adoption of Distributed Energy Resources (DER's) like solar and energy storage. Programs such as On Bill Repayment (OBR), On Bill Financing (OBF), and Property Assessed Financing (PACE) have become household names in the utility space for their ability to provide payment in lock-step with the savings and revenue streams created by local energy projects.

While these programs have offered financing solutions, their implementation also presents challenges to Community Choice Aggregators like East Bay Community Energy (EBCE). Specifically, EBCE will launch without a credit rating, or the capital reserves to provide customer financing options in early years of development. Therefore, the organization will need to explore solutions that enable them to build the collateral needed to maintain stable operations and once established will enable EBCE extend debt services and financing programs directly to its customers.

Three major financing mechanisms have been deployed in California to offer retrofits or asset purchases at no out of pocket cost to ratepayers including OBR, OBF, and PACE. A fourth option which uses Tariff based repayment may provide a more inclusive financing model and is outlined below.



Local Energy Programs

Providing beneficial, local energy programming can reduce electricity costs, enhance customer experiences, and create meaningful partnerships with EBCE customers.

Property Assessed Clean Energy

Currently, commercial and residential customers in Alameda County have access to Property Assessed Clean Energy (PACE) financing programs, which allow businesses and residents to install water and energy efficiency and renewable energy generation equipment on their properties with no out-of-pocket costs.

Participating customers can borrow money to cover up to 100% the cost of energy efficiency improvements with no money down, and they repay the loan amount through a fixed charge on their property tax bills with extended payback terms of up to 30 years. Interest rates are highly competitive, and the loans can be transferred to new owners if the property is sold prior to repaying the full loan amount.

This approach to financing removes a number of significant barriers, and allows customers to implement comprehensive measures that achieve deep-retrofits and significant utility bill-savings that often go well beyond standard incentive-based programs.

There are many PACE programs and providers serving Alameda County, and the organizations running those programs have valuable experience and insights regarding the applications of clean energy financing in EBCE's service territory. It is recommended that EBCE explore possible collaboration and synergy with these programs.

On-bill Repayment and On-bill Financing Mechanisms

On-bill Repayment (OBR) and On-bill Financing (OBF) are customer-facing financing mechanisms that tie loan repayments for upgrades or new equipment installations to the customer's utility bill. The main difference between the two models is that OBR uses third party capital to finance to cover the upfront cost of the project while OBF uses internal resources to provide project financing to customers.



For this reason, it is likely that EBCE can launch an OBR program in the near term by partnering with existing PACE providers and energy efficiency service providers already established within the service area.

Key considerations of OBR and OBF include:

- Cost neutrality is important – any new installation, improvement, or retrofit results in savings without requiring any out of pocket expense or increase to the customer's bill.
- Transferability is desirable– allows for the project to continue payment on bill if the property changes owners.
- Opt out risk presents a concern for CCA based OBR and OBF programs, as a customer leaving CCA service would no longer receive a bill from the CCA, and thus would not have the means to repay project cost.
- Disclosure and notice – which requires indicating to future owners the on bill charge at time of sale.
- Ability for CCA to put on bill payments onto the customer's bill requires advanced functionality and coordination throughout billing

infrastructure and with the service providers involved in the billing process.

- Needs to be financeable at a hurdle rate better than what a customer can receive through private financing for customers to participate.

Tariffed On-bill Repayment

The fourth option for customer financing that is similar to OBF and OBR is what is known as Tariffed On-bill Repayment, which builds on the OBR/OBF options by leveraging the traditional utility tariff structures to enable cost-recovery for investments in upgrades on the customer side of the meter. In this case, the charges would be assigned to the meter rather than the individual, thus cost recovery would not be limited to the duration of occupancy by a current customer reducing real or perceived risks from the customer and financier perspectives.

A number of California water utilities have successfully deployed this mechanism along with added consumer protections (commonly referred to as Pay as You Save, or PAYS) for water equipment upgrades, and it has been proven successful at increasing participation rates and overcoming market barriers for low and moderate-income customers, renters and municipal customers in those applications.

However, there are currently some logistical and regulatory hurdles that would need to be cleared in order for CCA's to offer such a program. Despite recent advocacy to the CPUC the current statute does not support tying financing to electricity meters, and thus no California energy utility has yet sought approval to offer a tariffed on-bill repayment program to finance electrical upgrades. Any proposal to do so would require building a case at the CPUC level, since there is no precedent in California. In the CCA context, this would also require addressing issues related to the potential for CCA customers to opt out (return to the incumbent IOU), as well as prohibitions against CCA's disconnecting customers for non-payment.

Key Recommendations

Implementation of customer facing financing programs is suggested to occur over the course of the LDBP implementation timeline, as follows:

Leverage Established Financing Programs and EBCE Partnerships

In the near-term, during initial implementation of the LDBP, it is recommended that EBCE work to connect customers with existing PACE providers and Energy Efficiency financiers already active in the service area. Providing educational outreach, marketing, and website support designed to support these programs can help move financing to customers through existing channels in the near term while EBCE establishes a credit rating.

Develop OBR Offerings for Targeted Energy Efficiency and Fuel Switching

In the midterm, while EBCE is still establishing a credit rating, debit services, and building a loan loss reserve fund EBCE can consider partnering with outside OBR partners able to provide third party financing for customer projects.

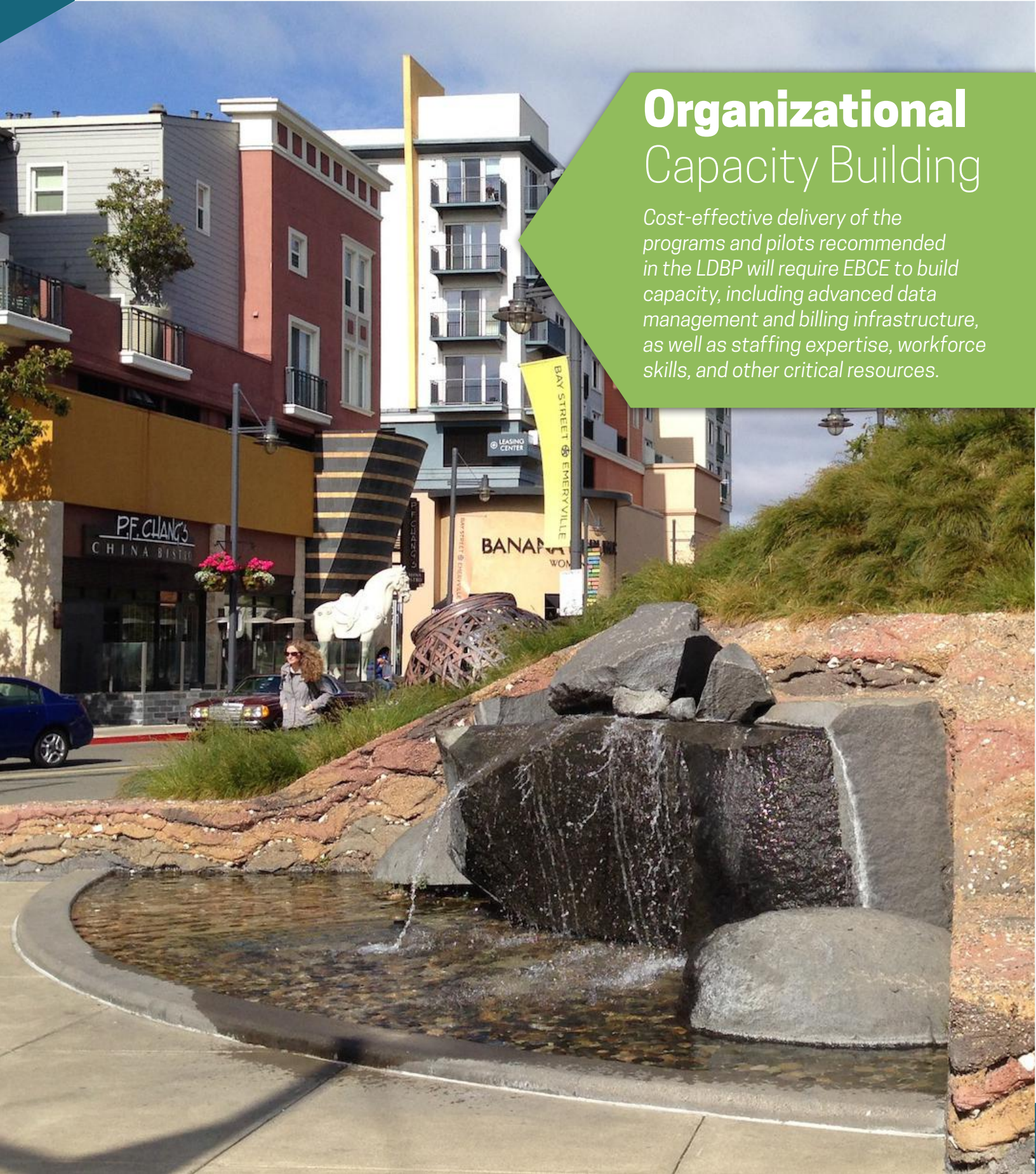
In support of the initial OBR offering, it is recommended that EBCE would act as the intermediary between the customer and the financier and would use customer bills to repay upfront project costs over time. Through deployment of OBR EBCE can provide favorable customer financing options for without needing to take on debt or put cash at risk.

Develop In-house OBF Offerings

In the long term once, a credit rating has been established, and a lock box has been sufficiently filled, EBCE can consider directly financing OBF or PACE programs supported by either debt services or through surplus lock box savings. EBCE should also continue to follow developments of a Tariffed OBF approach and observe or participate the regulatory process around new customer financing models.

Organizational Capacity Building

Cost-effective delivery of the programs and pilots recommended in the LDBP will require EBCE to build capacity, including advanced data management and billing infrastructure, as well as staffing expertise, workforce skills, and other critical resources.



Workforce Development

Workforce-related Goals of EBCE

Workforce development and other employment benefits were high priority goals behind the establishment of East Bay Community Energy. Three of the eleven goals articulated in the Joint Powers Agreement (December 1, 2016) related to workforce:

By establishing the Authority, the Parties seek to:

- f. Demonstrate quantifiable economic benefits to the region (e.g. union and prevailing wage jobs, local workforce development, new energy programs, and increased local energy investments);*
- g. Recognize the value of workers in existing jobs that support the energy infrastructure of Alameda County and Northern California.*

The Authority, as a leader in the shift to a clean energy, commits to ensuring it will take steps to minimize any adverse impacts to these workers to ensure a “just transition” to the new clean energy economy;

- h. Deliver clean energy programs and projects using a stable, skilled workforce through such mechanisms as project labor agreements, or other workforce programs that are cost effective, designed to avoid work stoppages, and ensure quality;*

This section of the Local Development Business Plan identifies policies and approaches that will help meet the goals in the JPA.

Background

Workforce development is an approach to economic development that seeks to enhance a region’s economic stability and prosperity by focusing on human capital—developing people and their marketable work skills—as opposed to business development. A coherent workforce development system consisting of supply side or “push” strategies and demand side or “pull” strategies.



Figure 21: IBEW’s Zero Net Energy Center in San Leandro provides a state-of-the-art training facility for local workforce development.

Local Workforce Recommendations

- 1) Do as much business as possible in and around Alameda County.
- 2) Develop goals and metrics to measure progress
- 3) Emphasize role as a “pull” organization and develop strategic “push” partnerships as shown:

PULL	PUSH
For large contracts, adopt and enforce workforce standards through project labor agreements, community workforce agreements, or other collective bargaining agreements.	Establish partnerships with community based training organizations that engage people with barriers to employment in c tracking training programs
For smaller or distributed work, develop a responsible contractor policy, and pre-qualify contractors or firms wishing to do business with EBCE.	Establish partnerships with community based organizations that provide minor and disadvantaged contractors and firm with technical assistance, bonding assistance, training, or other support

Figure 22: EBCE Local Workforce Development Recommendations

“Push” activities involve the engagement, training, and education of workers. Push organizations include pre-apprenticeship programs, community colleges, 4-year and professional education institutions, earn-as-you-learn apprenticeship programs, and other programs that train, educate, and otherwise prepare workers for jobs.

“Pull” activities include signaling the need for workers with particular knowledge, skills, and abilities, establishing minimum qualifications, and identifying goals for targeting particular types of workers. Pull organizations include employers, entities that procure goods and services, industry alliances that signal demand for workers with defined skills, and sometimes even funders or financiers, like the state or federal government that impose certain employment standards as a condition of funding.

EBCE’s Role

Because they are procurement organizations, load serving entities like EBCE, can best contribute to

workforce development as “pull” organizations, by stimulating demand for qualified workers. Serving in this role requires both a workforce policy for its own staff as well as establishing criteria or requirements that participating firms, contractors, and workers need to meet to sell goods or services to EBCE.

The challenge, and opportunity, is that to effectively meet its workforce goals, this role needs to be considered in each of EBCE’s business activities. Who EBCE chooses to do business with, and where they are located, will influence whether EBCE contributes to or detracts from its own and Alameda County’s workforce and economic development goals. The workforce outcomes resulting from EBCE’s core operations will dwarf any workforce-specific activities that EBCE undertakes on the supply side.

This is not to say that there is no role for EBCE on the supply side. Overtime, EBCE may become a helpful partner on local clean energy workforce

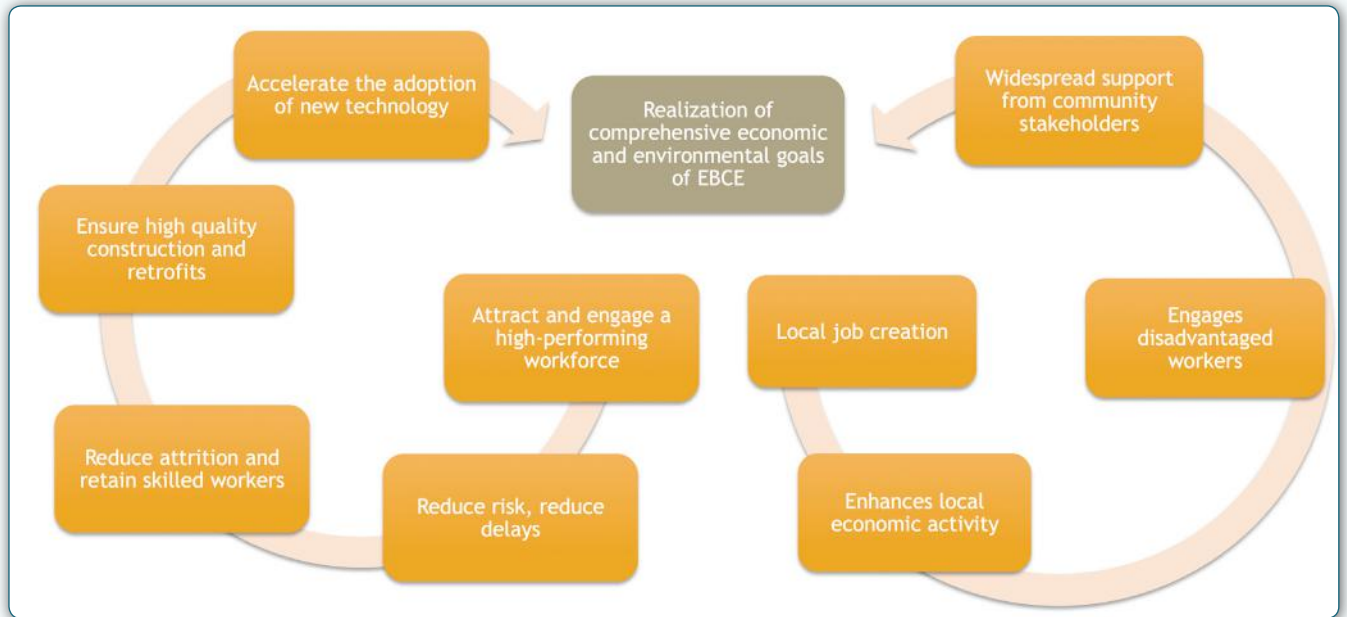


Figure 23: How a Strong Workforce Policy Enhances EBCE's Goals

training activities, but these investments should be made to bolster the existing workforce development network in Alameda County. For example, partnerships with local apprenticeship programs or grants to community-based pre-apprenticeship programs like Cypress Mandela or Rising Sun or the West Oakland Job Resource Center could strengthen critical links in the workforce supply chain.

“Pull” Organizations in Alameda County

EBCE is joining institutions like Alameda County, BART, AC Transit, the Oakland Airport, the Port of Oakland; Fremont, Oakland, and Hayward Unified School Districts, Cities of Berkeley, Hayward, Oakland, and San Leandro, the Oakland Army Base, East Bay MUD, and many other institutions in Alameda County playing vital roles in workforce development. Like EBCE, these institutions function on the “pull” side of the workforce development equation.

One way in which they do this is by signing project labor agreements (PLA's), project stabilization

agreements (PSA's), or community workforce agreements (CWA's) with the Alameda County Building Trades Council. Such agreements create a set of labor standards, specifying wages and benefits, ratios of journey persons to apprentices, and targeted hire provisions. to involve members of the community with barriers to employment and ensure the jobs created by the construction project will benefit workers in the community.

While PLA's and CWA's are effective workforce development approaches for large projects, smaller initiatives in which many different contractors participate in a program will require different approaches. For smaller activities, a responsible contractor policy can support workforce development goals. Responsible contractor criteria enforced through a system of pre-qualification is an efficient and effective pull strategy. Such criteria might include a history of excellent performance, no wage or labor law violations, OSHA certification, and evidence of a skilled and trained workforce.

A responsible contractor policy is valuable for smaller utilities, because the majority of the work

takes place upfront to vet and screen contractors. If the screening is effective, ongoing management can be minimal. Delaware Sustainable Energy Utility has a solid responsible contractor policy, and in California, SB350 requires adoption of a Responsible Contractor Policy for all ratepayer energy efficiency programs in California.

Key Recommendations

EBCE joins a long list of local institutions contributing to the economic and workforce development goals of Alameda County. While many EBCE business decisions will influence the contribution of EBCE to these goals, none are as important as the decisions made to invest in the local community, businesses, and workers. Money that EBCE spends on real work in Alameda County enhances the local economy. Efforts to support and engage a skilled and qualified workforce in Alameda County will help EBCE meet its transformative goals as an energy provider in California.

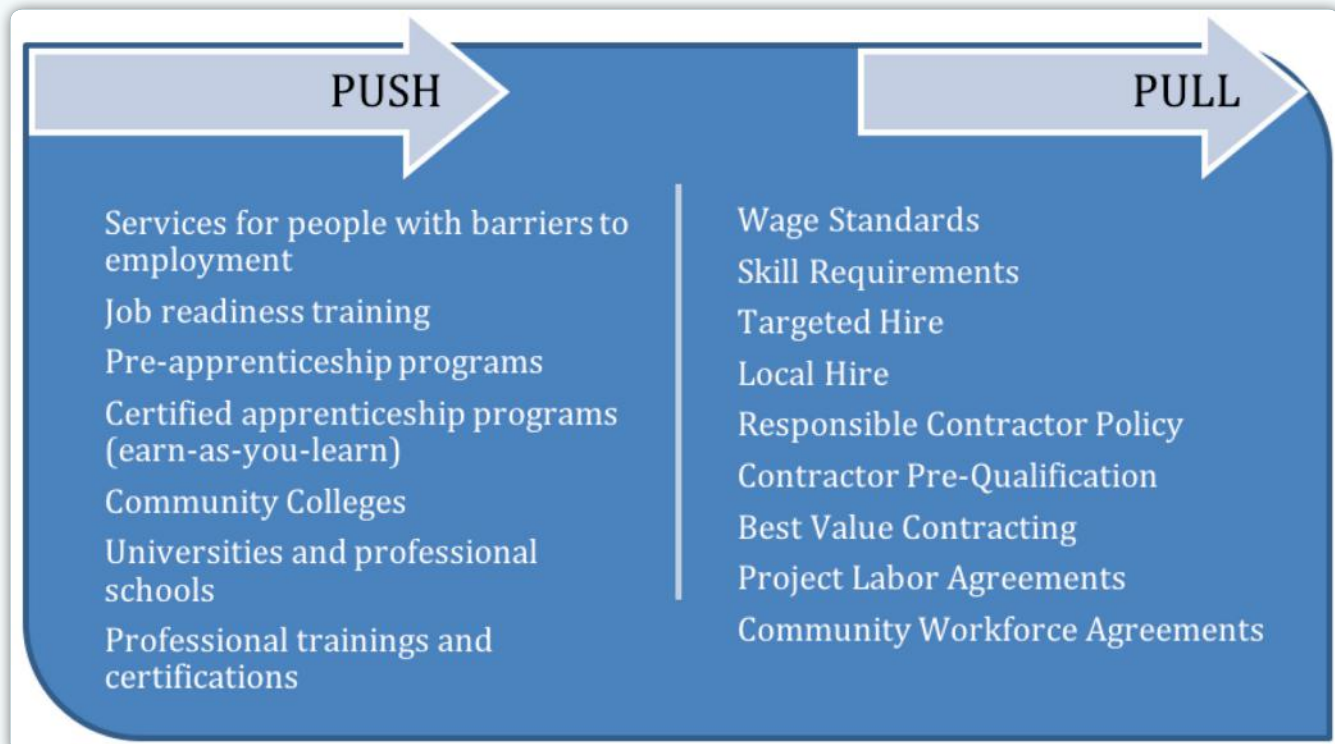


Figure 24: Push and Pull Workforce Development Components

“In 2012 the Oakland Army Base signed a Good Jobs Agreement which established a local hire goal of 50%, apprenticeship hire goal of 20% and disadvantaged hire goal of 25%. The agreement identifies the West Oakland Jobs Resource Center as the first source for hiring to meet disadvantaged worker hire goals. The agreement also has accountability mechanisms built in to ensure compliance. As of November 2017, Oakland Army Base met its apprenticeship hire goals and wildly exceeded its disadvantaged worker goals, thus demonstrating that there are workers in Alameda County with barriers to employment, hungry for good career-track jobs.” — EBASE: “Making Collaboration Work”

Figure 25: Example of local “pull” strategy achieving workforce goals.

It is recommended that conduct a detailed study in partnership with established local workforce development and training organizations (especially those engaging disadvantaged and/or displaced workers), to help EBCE better understand how it can leverage its unique position to be a force multiplier and provide the foundation for development of a “high-road” workforce policy that ensure positive outcomes for EBCE and the local workforce. EBCE is also encouraged to provide grant opportunities to such organizations to provide financial support for engineering new connections between those programs and EBCE, which can support positive outcomes and alignment with EBCE’s standards and objectives for workforce development.

Example Workforce Development Goals for EBCE

1. Engage a skilled and trained clean energy workforce both quality jobs for workers and quality work in clean energy investments.

- For **non-residential** work, enforce skill standards through Project Labor Agreements, Project Stabilization

Agreements (PSA’s), Community Benefit Agreements (CBA’s), or Community Workforce Agreements (CWA’s). Fund apprenticeship training through PLA’s (under which employers contribute to an apprenticeship training fund per each craft-hour worked) to support the next cohort of trained workers.

- For **residential work**, establish appropriate skill standards and enforce these standards through Responsible Contractor Policy.

2. Grow Alameda-based clean energy businesses owned and operated by under-represented populations (people of color, veterans, and women).

- Support businesses, contractors, and firms that are owner-operated and controlled by people of color, women, veterans, or other disadvantaged individuals by:
 - Partnering with unions to mentor and encourage new minority signatory contractors.
 - Adopting supplier diversity provisions in

the procurement processes.

- Implement a points-based bidding system that incentivizes disadvantaged business and local enterprise participation.
- Increasing contractor access to bonds and bonding assistance programs.
- Establishing mentorship programs to advise new contractors and guide them through steps to meet bonding and other certification requirements.

3. Create access to career pathways for disadvantaged workers in Alameda County.

- Develop and invest in partnerships with unions, apprenticeship programs, pre-apprenticeship programs, and other community-workforce organizations.
- Adopt targeted hire criteria within community benefits/community workforce agreements or PSA's/PLA's.
- Adopt responsible contractor policy with targeted hire criteria.
- Encourage local energy companies to adopt

first source language targets graduates of given pre-apprenticeship or apprenticeship programs.

4. Build career ladders through multi-craft, apprenticeship readiness programs.

- Partner with programs utilizing the Multi-Craft Core Curriculum(M3C) ensures that participants of pre-apprenticeship programs are gaining the skills necessary for entry and success in apprenticeship programs. Both Cypress Mandela and Rising Sun training programs in Alameda County use M3C.
- Provide program funding to pre-apprenticeship programs in Alameda County using M3C. Unlike apprenticeship programs, which are industry-funded, pre-apprenticeships often rely on a combination of grants from foundations, community colleges and government agencies.
- Ensure that training programs are not displacing paid employees. Be cautious in partnering with organizations that rely on volunteers for work for which people get paid, such as installing solar panels.



Figure 6: Aerial view of the IBEW Zero Net Energy Center in San Leandro, which provides cutting-edge training opportunities for local electricians.

DER Aggregation: the VPP Strategy

Dispatchable assets like energy storage, demand response, or smart thermostats can be aggregated—using sophisticated data and software platforms—into a Virtual Power Plant (VPP) able to offer a range of procurement, risk management, and cost saving benefits to EBCE.

EBCE Virtual Power Plant Strategy

All of the recommended strategies and program features included in the LDBP have been evaluated within the context of deploying a network of DER's within EBCE's service area. However, these assets will be distributed across ownership models and geographic location, and as a result may prove difficult to coordinate to create meaningful energy outcomes. As a result, aggregation of these distributed resources into a VPP has the potential enable EBCE to coordinate the use of DER's with procurement scheduling, and to offer both energy and non-energy benefits.

A VPP can provide EBCE with a local, dispatchable, and transactive clean energy resource capable of creating cost savings, managing market and operational risks in real-time, and offering valuable load shaping services that result in emission reductions and cost savings. This would rely on a integrated data platform and sophisticated enterprise software that is actively monitoring market conditions, weather data, forecasted and actual loads, and is able to remotely control DER's, integrate with EBCE's billing system, and interact with the wholesale energy market.

This would all need to occur in close collaboration with EBCE's portfolio manager and factor projected local generation (based on day-ahead weather forecasts), market variability, and any hedging strategies EBCE has in place.

In the long-term, the VPP strategy can support the transition to a transactive energy (TE) market by allowing EBCE to turn real time evaluation of their daily energy needs into price signals that notify participating customers of opportunities generate revenue or bill-savings by shedding load, or dispatching stored energy capacity (etc.). Customers would have the option to participate or opt-out of a given event, creating new financial opportunities for customer engagement and mutual benefits. The total capacity of participation is then calculated and aggregated by the VPP software platform, providing a valuable new resource for EBCE to meet local energy demand with local clean energy resources. Participating customers receive financial rewards for helping EBCE meet its energy supply needs.

Implementing the recommended VPP Strategy can yield new revenue streams for EBCE through existing market structures such as the Demand Response Auction Mechanism (DRAM), which allow registered entities to bid the resulting aggregated resource capacity into the CAISO market.

Key Recommendations

While the LDBP Consulting Team believes that a VPP platforms will be utilized by California CCA's in the future we also recognize that market is still maturing and undergoing change. As a result, it is recommend that in the near-term EBCE closely monitor the VPP market development and the outcomes of existing VPP pilots. It is also recommended that EBCE establish a dialog with VPP technology and service providers, and explore opportunities for near-term pilots using grant funding and/or other external funding sources.

As the VPP market evolves, it is recommended that EBCE focus on deploying a network of dispatchable DER's throughout its service territory through programs and incentives that include optional (and mutually beneficial) control clauses that will allow EBCE to aggregate those resources in the mid-term using VPP technologies.



Stakeholder Engagement

By working closely with its member jurisdictions, customers, local businesses, and other community stakeholders, EBCE can provide innovative programs and services, which can overcome market failures and barriers that have slowed local clean energy development.

Clear & Transparent Reporting

This section of the plan provides an overview of mandatory requirements and voluntary reporting opportunities for East Bay Community Energy (EBCE), and a set of recommendations that supports EBCE's process of meeting those requirements in ways that also enhance the organization's efforts to prioritize the use of local clean energy resources to meet regulatory mandates such as the Renewable Portfolio Standard (RPS) and the emerging Integrated Resource Plan (IRP) rules governing load-serving entities (LSE's) like EBCE.

EBCE was founded to bring cleaner electricity, at competitive rates and with greater community benefits to Alameda County. Clear and transparent reporting of the electricity sources, associated GHG intensity, generating sources and community benefits will help to communicate the full range of benefits EBCE brings the community, build trust among stakeholders and demonstrate EBCE's leadership within the CCA movement.

The LDBP provides recommendations across the following five areas:

- 1) Mandatory GHG intensity reporting requirements,
- 2) Options for voluntary GHG reporting,
- 3) Mandatory power disclosure requirement,
- 4) Options for additional power disclosure voluntary reporting, and
- 5) Recommendations for reporting community investments and social indicators.

The LDBP Consultant recommendations are based on an inherent belief in the power of transparency to improve stakeholder trust, community engagement and ultimately competitiveness in the Community Choice Aggregation (CCA) setting. Effective communication is both comprehensive and succinct. A clear and cogent set of metrics efficiently reported over time is more effective than an overly complex reporting system that creates undue burden on EBCE staff and confusion among stakeholders.

The LDBP Consultants support creating simple and accessible information and thus recommend including metrics and methods directly on the website (rather than buried in a report). We suggest developing an annual report as an addendum to metrics reporting that includes more details and context.

While the metrics in each category are the fundamental measure of EBCE's progress, it is equally important to include a description of the appropriate methodology or processes used to develop each metric. In other words, stakeholders need to also know where the numbers come from. EBCE stakeholders represent a variety of sectors (e.g. large business owners, community groups, residents), but many are increasingly sophisticated in their understanding of CCA operations, grid technologies and energy policy. Providing both well-developed metrics and methodology descriptions will further boost trust and enable stakeholders to more meaningfully contribute their feedback.

Considerations for EBCE Reporting

A clear and transparent reporting process has many benefits for EBCE and its stakeholders. A good strategy will:

- 1) Build and maintain trust among community members, customers, board members, CCA advocates, and other EBCE stakeholders,

- 2) Support improved internal decision-making,
- 3) Communicate the benefits EBCE brings to Alameda County (and beyond),
- 4) Demonstrate support and compliance for statewide legislative and regulatory policies and goals relating to the delivery of clean electricity to California ratepayers,
- 5) Provide EBCE customers with a means to report their own GHG emissions, using and EBCE specific emissions factor.

Key Recommendations

To ensure clear and transparent reporting, it is recommended that EBCE begin by reporting the following information on its website, and that a complimentary annual report is also developed that provides further details on the metrics, EBCE operations and future goals and plans:

GHG Intensity

- Due to the importance of this information to both EBCE stakeholders and the organization itself, we recommend developing a third-party verified metric for GHG intensity that draws from the California Energy Commission's Power content label as well as other industry best practices.
- Methodology used to quantify both the above.

Power Source Disclosure

- Percentage of sold power from each source and type as required under the power content label rules,
- Location of each source.

Financial, Community and Social Indicators

- Number of direct jobs created through EBCE power procurement, energy efficiency, demand response and energy storage programs,

- Dollars invested in community programs (and a description of those programs),
- Direct jobs created through EBCE community investments,
- Details about new resources developed as a result of EBCE policies and programs (i.e., number of MW of new distributed storage and/or generation, reduction of MWh's of EBCE's annual load resulting from energy efficiency programs, etc.)
- A clear explanation on how community program funding decisions were made.

General Reporting Guidelines

To ensure these benefits are maximized, it is recommended that EBCE adhere to the following reporting guidelines:

- 1) Report key findings clearly on the EBCE website.
- 2) Use simple, but elegant graphs, charts, and other infographics to communicate information in a visually compelling way.
- 3) Communicate, both the findings and the process used to develop those findings.
- 4) For financial reporting on program funding investments, include the process used to determine funding allocations (e.g. how and why certain program investments were decided upon).
- 5) Develop an annual report as an addendum to the metrics reporting on the website that provides more details and context.

Reporting these metrics every year and following these guidelines is an efficient, yet effective way for EBCE to communicate key information to its stakeholders. Such reporting will enhance engagement, improve decision-making and ultimately enhance competitiveness.

Streamlining Local Approvals

Background

Permitting requirements can create large barriers to renewable energy and DER installations. According to the U.S. Department of Energy, soft costs comprise 64% of the average cost of a residential solar photovoltaic installation. Among soft cost components, permitting is the area where local jurisdictions have the most involvement. The good news is there are many relatively simple steps that local jurisdictions can take to simplify and streamline their permitting process.

Many agencies have special fee structures for smaller residential projects, including the City of Berkeley, which caps their residential permits at a low level in order to encourage solar development. The fees for larger projects are based on valuations scales; some agencies may have special permit fee scales for solar which are not readily accessible on the website.

Key Recommendations

The LDBP suggests a two-pronged approach to improving the local jurisdictional approval process:

- Further standardize the permitting process for small, urban systems among the incorporated cities;
- Improve and clarify the zoning and use rules for larger systems on County land, with a focus on developable areas in the East County.

Local Permitting Standardization

It is recommended that EBCE focus on permit standardizations in the residential small rooftop sector. According to an LBNL report on city-level permitting processes in California, the cities with the best permitting practices reduce average residential PV prices by \$0.27-\$0.77/watt and shorten development times by 24 days relative to the worst cities.

In order to foster increased adoption among all jurisdictions, the formation of a working group would be the quickest and easiest approach. Such a working group would involve:

- 1-4 representatives from each jurisdiction:
 - Lead building official;
 - Building official handling solar plan reviews;
 - Building official handling solar inspections;
 - Sustainability staff lead
- Several industry representatives from both large and small solar installers in County.
- 1 organization to serve as convener and to drive the process.
 - Could be EBCE staff, or a regional non-profit or advocacy organization.

Monthly meetings over a period of 6-9 months would be sufficient to increase adoption of the Toolkit documents and result in more process standardization across the County. There is no cost burden associated with adoption of Toolkit documents – the only investment from EBCE and participating agencies would be in staff time.

Permit Fee Structures for Larger Systems

Unlike most building construction projects for which the valuation based permit fee scales were developed, ground mounted solar installations follow a highly repeatable design.

The LDBP team recommends modifying the permit fee structure for larger solar installations by:

- Basing the fee on cost recovery or the actual cost to administer the permit. Current state law requires that fees charged by a local enforcing agency for permit processing and inspection cannot exceed the reasonable cost of providing the service for which the fee is charged.
- In other words, fee revenue must only be used to defray the cost of permit processing and enforcement and cannot be used for general revenue purposes. These requirements are contained in Government Code Section 65850.55, Government Code Section 66016 and State Health and Safety Code Section 17951.

If a valuation based scale is to be used, implement a “cap” or ceiling on the fee amount in accordance with the following limits. Government Code Section 66015 sets specific limits on the amount local enforcing agencies can charge for solar PV permit fees. Fees in excess of these limits must be explicitly justified and are prohibited unless the municipality determines that it has already adopted a streamlined permit approval process

Local Zoning

In 2011, at the direction of the Board of Supervisors, the Planning Department began a review of existing county policies applicable to the development of larger solar arrays, as well as consideration of new policies to facilitate and inform the review of proposed arrays. The committee directed staff to initiate a public process to amend the County General Plan, with a goal of setting guidance that balanced solar development with competing natural and agricultural land uses. Unfortunately, after

receiving community input at a series of public meetings beginning in January 2012, this process was suspended indefinitely.

At the time, four key priorities were laid out:

1. Restore agricultural land after closure of solar array
2. Preserve productive agricultural soils
3. Enact a local host impact fee
4. Limit solar arrays in the South Livermore Valley Area Plan

This process went so far as to go through several revisions on a draft amendment to the East County Area Plan (ECAP). The solar general plan policies detailed therein addressed each of the priorities above, while also delineating the existing ECAP policies that would apply to solar arrays.

Zoning and Use Considerations for Larger Ground Mount Systems

The LDBP recommends that comprehensive review of land use policies for large solar arrays on County land should be re-opened. There is already significant progress in this area, including a draft solar amendment to the East County Area Plan (ECAP) and a set of public comments on these rules.

The end result of such a process would likely be to finalize the Amendment to the ECAP, as well as assisting Planning Department Staff in reviewing applications for solar arrays. The focus of this effort should be to:

1. Formalize where solar arrays are permitted and/or conditional uses
 - a. Solar is not currently a category that is specifically addressed. There are similar categories such as “public utility”

and “privately owned wind generators” but nothing specific to solar. The new category for solar would likely be split into tiers with acreage thresholds, such that there would be distinct use rules for arrays of different sizes and in different zones.

2. Formalize the review and approval process for solar applications
 - a. Determine which arrays may be administratively approved, which require approval by commission, and which may be subject to longer approval processes potentially involving community input. Define the studies and procedures that must be followed for those arrays requiring detailed review.
3. Establish “renewable energy zones” hotspot map where development of renewable facilities is prioritized.
 - a. These would be the zones without high value soil or competing interests in which the approvals process for larger solar arrays would be streamlined.

Community Development Agency staff created a high-level version of such a map as part of previous efforts to develop solar policies in 2011:

- Mapping tools have been created by public agencies to accelerate the zoning process. This map shows areas of important farmland, Williamson Act parcels, and areas where wind development is prioritized. The density of this map highlights the significant challenges in finding suitable land for large scale solar arrays, and emphasizes the need to provide the development community with a solar priorities map.
- There has been a lot of activity nationally

on developing appropriate standards for large solar arrays. The American Planning Association has a significant library of model planning and zoning rules for solar energy which could prove to be a useful resource for County staff. This library includes case studies of other public agencies that have added solar-specific provisions to Comprehensive Plans.

Brief Notes on CEQA

The California Environmental Quality Act (CEQA) requires state and local public agencies to analyze the environmental impacts of proposed physical development projects and adopt measures to mitigate those impacts. This applies to both publicly undertaken projects and private projects which must be approved by public agencies. Should EBCE choose directly developed or partner to create a new renewable energy project triggering the CEQA process is likely.

For solar developments:

- Rooftop systems are statutorily exempt from CEQA review.
- Carport systems are also exempt, provided they are over existing parking lots (existing for at least 2 years) and do not require the removal of any protected trees.
- Ground mount systems will generally require CEQA review

When CEQA review is required, the lead agency (which generally would be Alameda County) will first evaluate the project to determine whether it may have a significant effect on the environment, and thus whether an Initial or Comprehensive Environmental Impact Study is necessary.



Leveraging Local Leadership

Alameda County is home to world-class leaders in clean energy technology, research, development, and education.

Figure 27: The Joint Bioenergy Institute (JBEI) in Emeryville, CA is led by the Berkeley-based Lawrence Berkeley National Laboratory (LBNL).

Local Case Examples of Clean Energy Leadership

Local energy development has a long history in Alameda County and several projects and organizations are already hard at work to innovate and scale local energy solutions. The following projects stand as examples of the types of benefits that can be promoted by the programs included in the LDBP.

Lawrence Berkeley National Laboratory

Established in 1931, LBNL (aka- the “Berkeley Lab”) has provided nearly a century of leadership in energy technology, applications, and policy research. LBNL is the lead partner for the new Joint Bioenergy Institute (JBEI) in Emeryville, which is working to advance the development of next generation biofuels. LBNL is also a major research hub for the U.S. Dept. of Energy (DOE), and is home to the Joint Center for Artificial Photosynthesis (JCAP), and the Joint Center for Energy Storage Research (JCESR)

San Leandro Zero Net Energy Center: IBEW

Local training programs, centers and workforce services are very active within Alameda County. The Zero Net Energy Center (ZNEC) in San Leandro is owned and operated by IBEW Local Union 595 as a training and demonstration center for apprentice and journey-level electricians. The space boasts sustainable building and energy systems such as solar and wind generation, LED lighting, Variable Refrigerant Flow (VRF) systems, and other smart features designed to demonstrate efficient energy production and use technology. As a learning center the building is one of the largest Zero Net Energy buildings in California and acts a template for the future as it meets the California Energy Commission’s 2030 Net Zero Energy challenge 17 years ahead of schedule.

By working with local training centers like ZNEC, EBCE can help inform curriculum and skill requirements needed to prepare job seekers for the clean energy workforce – a benefit that will support the development of high-paying skilled trades jobs that facilitate the implementation of EBCE’s LDBP.

Fire Station 11 Microgrid: Gridscape Solutions

Leveraging grant funding provided by the CEC and a public-private partnership with the City of Fremont, Gridscape Solutions, a Fremont based company has recently completed the installation of a microgrid at Fremont Fire Station 11. The project integrates a 40 kW Solar PV carport canopy system and 95 kWh Energy Storage system using Gridscape Solutions' advanced, cloud-based Predictive Energy Management Software. The two-year demonstration is testing a commercial deployment of a modular microgrid application that is able to provide renewable energy to the facility, deliver cost savings, reduce the use of an existing diesel generator (and related emissions), and operate autonomously in island mode providing power to critical loads during an extended grid outage.

Gridscape Solutions is also working to define the standards of smart networks and controls for the electric vehicle, energy storage, and virtual power plant markets.

Summary


These are just a few examples of the outstanding clean energy leadership that exists in EBCE's service territory, which demonstrate that local economic benefit and energy outcomes can go hand in hand. The tools, talent, and services needed meet EBCE's IRP and LDBP goals exist within the service area. If these resources are leveraged strategically, they have the potential to support innovative clean energy programming that will enhance the environmental, economic, and social benefits delivered by EBCE to the Alameda County community.



Figure 28: Front view of the IBEW 595 Zero Net Energy Center in San Leandro, which was designed to be a world-class example of a ZNE building.



Figure 29: Aerial view of the Fremont Fire Station 11 Microgrid, a model for advanced emergency services microgrids and enhanced community resilience through innovative clean energy applications- developed by Fremont-based Gridscape Solutions.



SECTION III. Ongoing Analysis, Implementation, & Refinement

By focusing on opportunities for local clean energy development, the LDBP can help EBCE maximize beneficial outcomes for the communities of Alameda County.

Quantifying LDBP Benefits

Introduction

The analysis of economic benefits presented here uses projections of EBCE surplus revenues by year and provides an allocation of those revenues to various investment options and strategies that are available for EBCE Board consideration. These investments are then translated into economic benefits in terms of jobs and labor income impacts in Alameda County that could be associated with the LDBP over the first seven years of implementation.

Of the many community benefit investment options/strategies presented for EBCE Board consideration, the job and labor income impacts were analyzed for the following programs:

1. Feed-in Tariff (FIT) programs for solar and wind electricity generation
2. Net Energy Metering (NEM) programs for solar and wind electricity generation
3. Direct Investment in solar/wind electricity production
4. Energy Efficiency programs for commercial/industrial, residential, and CARE customers
5. Energy Storage Systems (individual to utility scale investments)
6. Demand Response programs to reduce peak demand
7. Electric Vehicle Incentives (autos, buses, trucks, and charging infrastructure)
8. Natural Gas Fuel Switching programs to encourage electric appliance uses
9. Utility Scale private investment
10. Retail electricity rate reductions

To support analysis of the financial and economic impacts, the LDBP Consulting Team developed key economic and financial assumptions related to capital costs, operating costs, and operational benefits from various levels of investment in the identified options and strategies. These assumptions include local workforce benefits (jobs, wages) from one-time direct installation and ongoing maintenance, plus indirect benefits for Alameda County from economic multiplier effects.

Overview Of Jobs and Labor Income Impact Approach

An important consideration of future EBCE investment decisions is the desire to increase local employment opportunities for skilled and unskilled labor. Notably, while the capital investment involved in new energy production and storage is substantial, the majority of the cost is attributable to capital equipment purchases that occur outside Alameda County. Therefore, the local job benefits of a new PV solar system or windmill are limited to the installation costs, as well as on-going annual impacts related to maintenance.

To conduct the analysis, an IMPLAN model was built that is specific to Alameda County. The jobs identified are county-wide, with the ultimate geographical distribution to be determined based upon program implementation and labor availability. Further, the labor income figures presented for nonresidential installations reflect journey level prevailing wages for Alameda County from the California Department of Industrial Relations. In addition to wages, these prevailing wage workers typically receive benefits, which include health and welfare, pension, vacation and holiday pay, training, and other payments that are included in labor income. Use of non-union labor would result in lower wage levels than are presented in the analysis.

For some options, there are on-going customer savings that translate into increased spending by customers at local vendors and thus increased induced employment, based upon IMPLAN household spending multipliers.

In general, job and labor income impacts can be expressed in the following ways:

Direct Impacts – Jobs and labor income related to installation and maintenance refer to work that is generally performed on-site. For commercial, industrial, and utility-scale installations, these wages typically reflect prevailing wage levels in Alameda County. Installation jobs occur during the construction phase and maintenance jobs occur during ongoing operations.

Indirect and Induced Impacts – Indirect jobs and labor income represent purchases from local suppliers within Alameda County of goods and services related to installation or on-going operations/maintenance. Induced jobs are created in the local economy when direct and indirect workers spend their earnings.

Total Impacts – Total job and labor income impacts comprise all direct, indirect, and induced impacts.

Community Benefits

The LDBP Consulting Team assessed the local economic and financial impacts of the LDBP program recommendations, including the per program job and labor income impacts in Alameda County and financial repercussions for EBCE.

Most of the evaluated investment strategies have one-time impacts associated with installation or construction, or with an initial purchase such as for electric vehicles or fuel switching. In addition, some of the projects such as FIT, NEM, utility scale solar and wind, and community investment also have on-going annual maintenance impacts that continue into future years.

The LDBP Consultants prepared an *Illustrative Jobs, Labor Income, and Financial Impacts Report*, which contains detailed findings based on not only direct investment by EBCE, but also the level of private investment. This report is provided as an attachment to the plan, and provides a more detailed accounting of methodologies and findings.

The largest job impacts come from NEM, utility scale wind and solar, fuel switching, and demand response. For NEM, the job impact is higher due to the relatively high level of annual investment that is assumed in this scenario. Utility scale solar and wind also generates a sizeable number of direct and indirect jobs due to the relative size of the installations.

Fuel switching generates a large number of one-time jobs related to appliance purchase and installation, while demand response generates increasing cumulative impacts based on on-going annual increases in consumer spending resulting from lower electricity bills. As more customers participate in demand response, the amount of income that is freed up for other types of consumer spending cumulates.

Note that labor income includes employee compensation (wages, salaries, and employer and employee contributions to social insurance) plus proprietor income (business owner income). Labor income impacts are proportional to the total number of jobs, but also reflect average wage levels as a measure of job quality.

Some strategies such as FIT, larger NEM installations, utility scale wind and solar, energy efficiency improvements for commercial, industrial and MUSH customers, utility-scale and industrial energy storage, industrial and large commercial demand response programs, and community investments that involve larger installation projects will generally result in the use of union labor at prevailing wages. These higher wage levels are reflected in the labor income impacts.



Comparative Investment Matrix

A comparative matrix of the economic and financial impact findings for each investment strategy is shown in Figure 31. Key findings to facilitate comparison include a Job Creation Metric and Net Cost to EBCE over 10 years (i.e., Net EBCE Investment).

From a community benefit perspective, the Job Creation Metrics show the resulting level of employment occurring in Alameda County. The program/option with the greatest local job impacts per \$1.0 million in initial investment, regardless of the entity making the investment (i.e., Gross Job Creation Metric), is Demand Response Programs, with a significant number of jobs from both installation activity and induced jobs from annual customer savings, particularly for industrial customers. This is followed by Energy Efficiency Programs, which also has a high gross job creation metric resulting from installation activity. These are followed by Fuel Switching, Reduced Retail Rates, FIT (solar), NEM, and Direct Investment, all with 5.8 or more total local jobs created per \$1.0 million invested.

The remaining programs all have 3.0 or lower estimated job generation rates per \$1.0 million invested. Notably, for many of these programs,

the total local job impacts are primarily one-time, whereas for Demand Response Programs and Reduced Retail Rates the impacts are on-going for the duration of the programs.

From an operational perspective, the estimated local economic benefits, including direct job creation, need to be balanced by the estimated costs to EBCE. On a relative basis Reduced Retail Rates result in the greatest net cost to EBCE, in the form of reduced profits. Providing competitive rates is necessary to EBCE's long-term success, but there is an inherent trade-off in doing so, as every retail rate reduction reduces the funding available for local programs and investment activities. The other options/strategies with the greatest financial cost impact to EBCE include FIT, Energy Storage, NEM, and Electric Vehicle Incentives, with lesser financial impacts for Community Investment, although the actual financial impact to EBCE will depend on the design of programs and the cost shared with consumers.

For certain options/strategies, costs are anticipated to be recouped through savings, such as for Energy Efficiency Programs and Demand Response Programs. These recouped savings are assumed to occur through reduced peak hour demand and thus energy savings for EBCE.

SUMMARY MATRIX OF ECONOMIC AND FINANCIAL IMPACTS OF EBCE LOCAL DEVELOPMENT BUSINESS PLAN OPTIONS AND STRATEGIES				
Investment Option (1)	Installation Impacts Hourly Wage	Job Creation Metric per \$1,000,000 Invested (2)		Additional GHG Benefits
		Gross Investment	Net EBCE Investment	
1. Feed-in Tariff				
Solar-Based	\$41.83	6.2	14.0	No Replaces other solar
Wind-Based	\$39.63	2.5	4.2	No Replaces other wind
2. Net Energy Metering	\$25.00 - \$41.83	5.8	58.0	No Replaces other solar/wind
3. Direct Investment Local Solar/Wind	\$45.00	5.8	NA	No Replaces other solar/wind
4. Energy Efficiency Programs	\$25.00 - \$49.08	10.5	NA	Yes Reduces need for natural gas peaker plants
5. Energy Storage Systems	\$25.00 - \$47.56	3.0	NA	Yes Reduces need for natural gas peaker plants
6. Demand Response Programs	\$25.00 - \$47.56	28.2 - 239.9	NA	Yes Reduces need for natural gas peaker plants
7. Electric Vehicle Incentives	\$34.11 - \$42.43	1.9	28.7	Yes Replaces gasoline/diesel
8. Fuel Switching Programs	\$25.00	7.5	42.8	Yes Replaces natural gas appliances
9a. Utility-Scale Solar	\$41.83	5.2	NA	No
9b. Utility-Scale Wind	\$39.63	2.2	NA	Replaces other solar/wind
10. Reduced Retail Electricity Rates	NA	7.2	7.2	No

Note: NA designates Not Applicable.

(1) These programs comprise options/strategies recommended by the LDBP Consultant Team.

(2) This is a metric unique to this analysis that measures direct and indirect jobs over 10 years created per \$1.0 million invested. The Gross Investment figure pertains to all investment, regardless of the entity, while the Net EBCE Investment figure pertains to EBCE only investment, be it capital investment or funds paid to energy service providers. In cases where only EBCE provides all the capital then the metrics are generally identical between the Gross Investment and the Net EBCE Investment figures.

Figure 30: Summary of impacts associated with LDBP program implementation.

Notes on Environmental Benefits

The LDBP recommendation to develop programs and strategies designed to catalyze the adoption local DER’s can lead to direct environmental benefit, such as greenhouse gas (GHG) emission and air pollutant reduction. The LDBP Consulting Team worked to identify potential for local programs to address known environmental impacts associated with various energy market dynamics.

While new generation and local renewable energy programs do not necessarily lead to direct emission reductions (due to the resulting displacement of wholesale procurement of renewables), the use of dispatchable energy storage assets, fuel switching programs, transport electrification,

demand response, and targeted energy efficiency programs can offer load shaping and peak reduction able offset the need for expensive and environmentally damaging fossil fuel combustion.

Figure 31 provides an overview of the benefits provided by each of the local energy programs recommended in the LDBP, including an indication of a program achieves additional (net) GHG reductions versus business as usual.

It is the recommendation of the LDBP Consultants that program investment consider the net total benefit of the impact of the program based on a combination of its environmental, social, and economic outcomes rather than focus on maximizing one benefit at the expense of another.

Recommended LDBP Options/Strategies by Program Typology				
Option/Strategy	Program Typologies			
	Local Energy Generation	Energy Load Shift	Customer Savings	Additional GHG Reduction (1)
1. Enhanced FIT (Solar, Wind, Energy Storage)	X			
2. Enhanced NEM (Solar, Wind, Energy Storage)	X		X	
3. Direct Investment (Design Build & Own: Solar, Wind, Energy Storage)	X			
4. Energy Efficiency		X	X	X
5. Energy Storage Systems		X	X	X
6. Demand Response		X	X	X
7. Transportation Electrification (Electric Vehicles)		X		X
8. Building Electrification (Natural Gas Fuel Switching)		X		X
9. Utility-scale Solar and Wind (Power Purchase Agreements)	X			
10. Reduced Retail Electricity Rates			X	

(1) This indicates programs that have a net additional GHG reduction benefit as compared to the business-as-usual scenario.

Figure 31: Evaluated LDBP Program Typologies indicating community benefits associated with each program type.

LDBP Scenario Analysis

Purpose of Analysis

The LDBP Consultants created a dynamic assessment framework that pulls together results and recommendations from across the LDBP research team to help guide the development of this plan.

The purpose of the analysis was to:

- Support investment decision-making
- Clarify complex relationships and trade-offs between various programs and investment portfolios
- Communicate complex data simply and clearly to multiple audiences

EBCE is the first CCA to invest in sophisticated analysis of local development prior to launching

service to its customers. This first of its kind analysis has produced a framework that can evolve over time to support refinements in EBCE's evaluation of LDBP programs and inform investment decisions. Ultimately, this type of data-driven decision-making will lead to better outcomes for EBCE, its customers, stakeholders, board, and entire community.

Goals for the Scenario Analysis

The purpose of the scenario analysis was to enable comparison of multiple complex metrics and programs in one simplified format. In addition, the LDBP Consultants sought to be completely transparent in the methods and assumptions used to develop the scenarios and analytical models, which are provided in detail in the accompanying *LDBP Scenario Analysis Report*.

Overview of the Scenario Analysis Tool

An advanced spreadsheet model was developed to allow the LDBP Consultants to compare a range of impacts from multiple scenarios.

The following figures provide a high-level overview of the structure of the LDBP Scenario Analysis Tool:

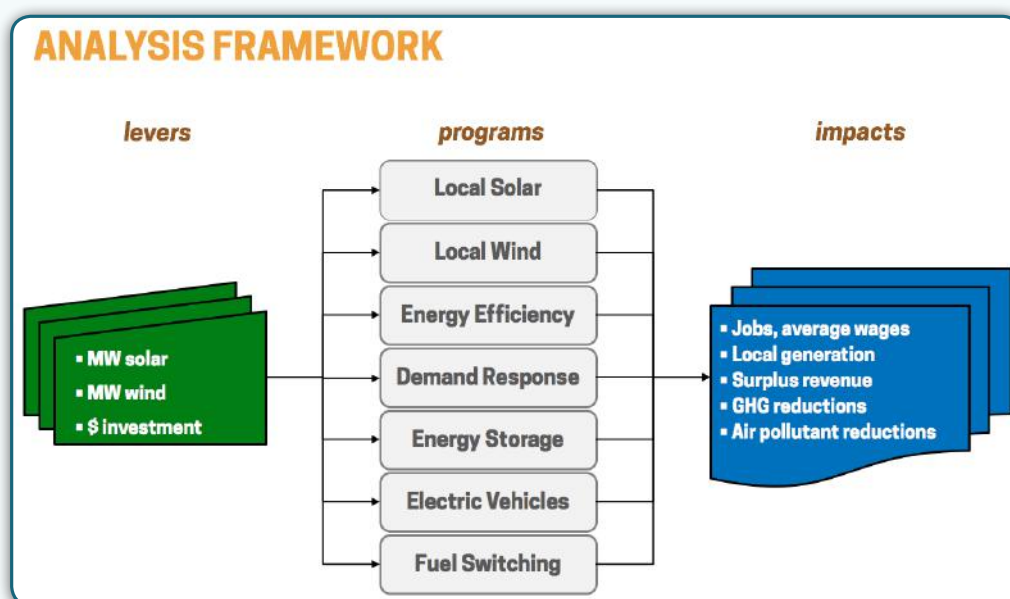


Figure 32: Shows the overall analysis framework, including Programs, Program Inputs ("levers"), and Scenario Model Outputs ("impacts").

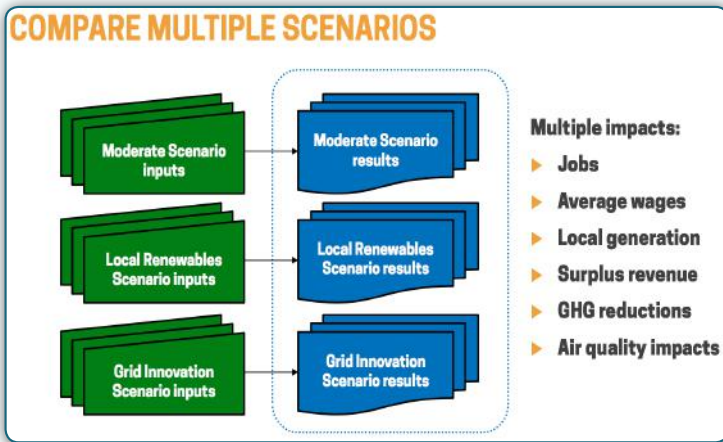


Figure 33: Illustrates the “apples-to-apples” comparison of multiple scenarios that was facilitated by the Scenario Analysis Tool.

Moderate Scenario

A moderate scenario was developed with a modest and balanced investment in each of the modeled programs, to provide a base case. The moderate scenario would create 3,231 direct jobs (5,494 total) in the 8-year time period from 2018 to 2025. It would lead to the installation of 386 MW of new renewables with a peak annual generation of 714 GWh/yr, approximately 10.2% of EBCE’s projected annual electricity load of 7,000 GWh/yr in 2025.

In addition, by incentivizing electric vehicle ownership and natural gas fuel switching (thus reducing emissions from the combustion of vehicle fuel and natural gas), as well as reducing total electricity consumption (through energy efficiency and demand response programs), the moderate scenario would reduce 393,084 MT CO₂e of GHG emissions and 67,348 kg NO_x of air pollutant emissions by the year 2025. It should be noted that increased local solar and wind do not lead to reduced greenhouse gas emissions or air pollution, due to the assumption that local renewables would replace distant renewables within EBCE’s procurement portfolio.

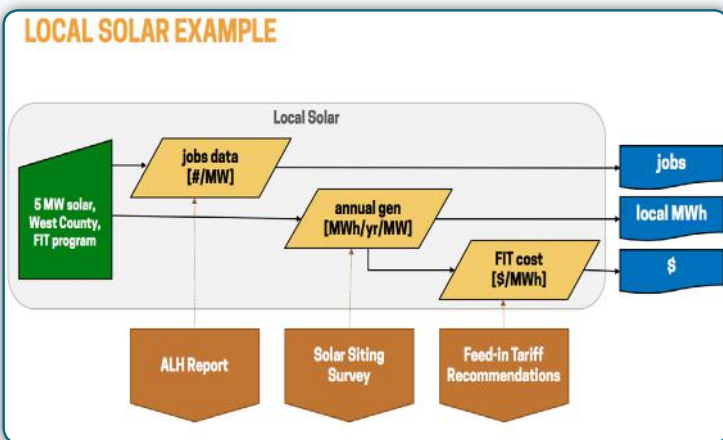


Figure 34: Provides an illustrative example of a program “module” within the Scenario Analysis Tool, including the range of inputs, data sources, and analytical outputs possible within this module.

Scenarios Analyzed

The LDBP Consultants have analyzed a substantial number of scenarios over the course of developing the analytical framework for the LDBP. It is beyond the limitations of this section to cover each of those scenarios in detail here. What follows is a brief overview of several of the most developed scenarios that were prepared for analysis, which taken together informed the development of the final plan you are reading.

Local Renewables Scenario

Compared to the moderate scenario, the local renewables scenario invests more in new local renewable generation through an expanded solar FIT program and more utility-scale solar, with lower investments in energy efficiency, demand response, and energy storage.

Over 8 years, the local renewables scenario would create 3,006 direct jobs (5,134 total). It would lead to the installation of 411 MW of new renewables, with a peak annual generation of 759 GWh/yr (10.8% of EBCE’s projected load). As no changes are made to the electric vehicle and fuel switching programs, GHG and air pollutant emission reductions are the same as in the moderate scenario: 299,295 MT CO₂e and 66,104 kg NO_x.

Grid Innovation Scenario

In the grid innovation scenario, solar and wind FIT programs are scaled back in favor of larger investments in grid innovation programs (energy efficiency, demand response, energy storage, fuel switching, and electric vehicles). To accommodate higher initial costs, implementation of the energy efficiency, demand response, energy storage, and fuel switching programs are moved back one year. The analysis showed that early investments in DR led to long-term savings for EBCE that could be invested back into local development programs.

Over 8 years, the grid innovation scenario would create 3,764 direct jobs (6,361 total). It would lead to the installation of 391 MW of new renewables, with a peak annual generation of 723 GWh/yr (~10.3% of EBCE's projected load). Larger investments in electric vehicles and fuel switching would reduce 502,716 MT CO₂e of GHG emissions and 101,022 kg NO_x of air pollutant emissions.

Key Findings and Relationships

The LDBP Scenario Analysis has made apparent a set of relationships that have been long understood by researchers and policy-makers that have been difficult to quantify at the local level. The scale of renewables impacts job creation, job quality, and financial costs. In general, utility-scale renewables create higher-quality ongoing jobs than rooftop solar. These larger projects, however, lead to a fewer number of jobs per MW than smaller distributed systems. From the CCA's perspective, larger local renewable installations are also more cost-efficient than smaller installations.

EBCE anticipates that new local utility scale solar can be procured for nearly the same cost as it can procure renewable energy supplies from existing remote solar facilities. Thus, it is possible to create high-quality jobs at no additional cost. Conversely, the smaller-scale solar discussed in this report comes at a premium of \$16 to \$45 per MWh.



Figure 35: One-time installation jobs per MW by solar size tier.



Figure 36: Annual maintenance jobs per MW by solar size tier.

The municipal FIT program and Enhanced NEM programs recommended in the LDBP—which include Community Benefit Adders to incentivize projects that deliver maximum value to EBCE and the customers it serves—are examples of how to ensure the higher cost for these developments results in significant local benefit.

Figures 36 and 37 show job creation benefits for the installation and maintenance of local solar projects by size tier. The size of the bubble indicates the number of jobs, and the vertical position shows the average hourly wage of induced jobs. Size tiers with asterisks (*) indicate single-axis tracking systems.

In regards to environmental benefits, the greatest current challenge to reducing the GHG intensity of the grid is how to supply the evening, night, and early morning load with renewable energy.

Increasing energy storage and shifting load from evening to daytime is the fundamental way to meet this challenge. Further, transportation accounts for 40% of statewide emissions, compared to 20% from the electricity sector. Thus, electrifying the transportation sector is essential to meeting California's greenhouse gas emissions goals.

It is clear from an environmental perspective that the grid innovation programs are the primary driver of emissions reductions among the recommended LDBP programs. However, these programs can be designed and combined in a way to ensure local economic benefit equivalent to local renewable programs.

As shown in the scenario discussion above, the grid innovation scenario reduces surplus revenue 9% more than the moderate scenario, but leads to 13% more direct jobs. For example, directing energy efficiency and energy storage programs towards CARE customers can increase public health (mitigating the health impacts of both intense heat and intense cold) and decrease regional energy poverty. Further, commercial and industrial demand response and energy efficiency programs can reduce energy costs for business and increase overall regional economic activity. EBCE should thus design programs to maximize these and other local benefits.

Additional findings of note include:

- New local renewables create jobs (at the highest cost to EBCE), but do not result in GHG or air quality improvements.
- Energy storage, electric vehicle programs, and fuel switching have the potential to reduce GHG emissions and improve air quality over time, but create fewer direct jobs.
- EE and DR also have potential to reduce GHG and air pollution over time. The benefits are less direct than the above programs, but these programs also support grid resiliency

and are thus essential to long term carbon reductions and sustainability.

Beyond the Numbers

- The purpose of the scenario analysis is to clarify and communicate a variety of impacts from a variety of programs in one place.
- CCA's generate dollars for community investment, not shareholder profits. The scenario analysis displays one set of options for this investment. Additional pathways are possible.
- There are important impacts of all of these programs that cannot be quantified; the final draft will include qualitative analysis.

Ongoing Scenario Analysis

The Local Development Business Plan is not a static report, but rather is a living document that supports the on-going process of analyzing, implementing and evaluating local development programs in EBCE territory. This report covers the first two years of program development and the early actions that demonstrate EBCE's commitment to innovation and local benefit. Local development, however, will continue over the long-term and EBCE needs a tool that can support on-going data-driven discussions among multiple parties. The scenario analysis tool was developed to meet this need.

The dynamic and flexible scenario analysis tool will support EBCE staff and the community advisory committee in determining program priorities and investment allocations over the mid and long term. This transparent process will ensure long-term success and buy-in of all EBCE programs.

In early summer 2018, EBCE will host a workshop facilitated by the LDBP team to discuss the cost and benefits from different future investment scenarios. In the workshop, the group will discuss and compare the costs and benefits from a variety of program options and run several scenarios

in real time. The presentation will include an in-depth overview of the job creation, environmental benefits, and financial impacts from all the programs covered in the LDBP. Following the workshop, EBCE and the community advisory committee will continue to use the tool to further development their implementation strategy.

The LDBP Consultants recommend using the tools, frameworks, and processes developed for the LDBP project to facilitate an ongoing process of refining LDBP program designs, prioritization of program options, and determining annual allocations for investment in local programs and projects.

It is recommended that this process be facilitated by a Working Group that includes members of the EBCE Executive Board Committee, Community Advisory Committee, and staff. The LDBP Team also recommends that this be an open, inclusive, and transparent public process, and that community stakeholders be engaged in the process to build upon the foundation of stakeholder engagement laid by the LDBP project.

Summary

The intention of the Scenario Analysis section of the LDBP is not to make recommendations to EBCE on how to proceed with local development. Instead the aim was to provide a high-level summary of the process used by the LDBP Consulting Team to arrive at the recommended approach to LDBP implementation presented in this plan, and to offer a framework to support decision-making through data-driven analysis.

It is important to note that it is often the details of program design that have the greatest impact on the level of benefit achieved by those programs, and it is a central recommendation of the LDBP that EBCE continue its ongoing efforts to design LDBP programs through an iterative process that evaluates program outcomes and makes adjustments over time to maximize local benefits.

It is clear that EBCE's substantial projected surplus net revenues present an opportunity to make investments with the potential to yield powerful economic, environmental, and social benefit. It is also clear that in a region as diverse as the EBCE's territory, there will be differences of opinion and priority on how the organization should invest. Determining the priorities for local development, the types of programs and services that the community needs, and the annual allocation of funds to those funds should be an ongoing, open, inclusive, iterative, and data-driven process.

The LDBP Scenario Analysis tool was built to support this living process, and to be adaptable as new technologies emerge, the organization and its revenue base grows, and new program ideas and strategies are proposed. EBCE is the first CCA to analyze the costs and benefits of local clean energy development in such detail and with such sophistication, which is a laudable example of early leadership by EBCE in the rapidly emerging CCA industry in California.

The LDBP Consulting Team strongly suggest that this process be seen as a first step. EBCE board, staff, and stakeholders should continue to work together to establish an ongoing, data-driven, inclusive, and transparent process that evaluates investment options and guides the allocation of funding using the analysis framework developed during the LDBP project.



Meaningful Investments

EBCE can make impactful investments in programs, projects, and innovations that benefit the communities of Alameda County in partnership with local governments, businesses, and community organizations working towards common goals.

LDBP Implementation Timeline

“As the Community Choice process in Alameda County has evolved over time, many local officials and stakeholders have expressed a desire for EBCE to act upon a strong commitment to the development of local renewable energy resources as the way to achieve a host of program goals related to greenhouse gas reductions, business development, job creation and ratepayer savings and local wealth generation. This kind of development requires a transition over time from simply procuring renewable electricity on the wholesale market to creating an optimized system of local distributed energy resources that play a larger and larger role in addressing the energy needs of our communities. But this transition does not happen by accident; the fundamental challenge is to set out a roadmap for making it happen within an aggressive yet achievable timeframe.” —from the Local Development Business Plan RFP

The recommended implementation timeline for the Local Development Business Plan detailed in Figure 65 is designed to support an aggressive roll-out of LDBP programs and pilots over the first five years of EBCE operations. This timeline spans the period from initial launch of the CCA in 2018, to fully established, stable operation of the program in 2023 and beyond.

The recommended implementation timeline follows a pragmatic, flexible, and fiscally responsible sequence in three distinct stages.

Stage 1- LDBP Launch (2018-2020) lays the foundation for data collection and analysis through the creation of an integrated data platform. Once established this platform will enable EBCE to implement the data analytics, resource management, digital customer engagement, and program tracking capabilities needed to implement LDBP programs effectively.

Also appearing early in Stage 1 are an Enhanced Net Energy Metering program, a robust and multifaceted Collaborative Procurement program, a Demand Response pilot, and Transportation Electrification pilot. Finally, a set of Community Investment Fund grants will allow EBCE to invest in local innovation strategies that align with organizational goals for local resilience, economic development, pollution reduction, and other community benefits.

Stage 2- LDBP Expansion (2021-2022) continues implementation and expansion of the LDBP, and establishes the role of program evaluation through a structured mid-term assessment designed to measure actual outcomes and impacts using the tools and frameworks developed for the LDBP project. The robust, data-driven LDBP stakeholder engagement is also extended into Stage 2, to seek community input to support investment allocations as EBCE’s net surplus revenues increase.

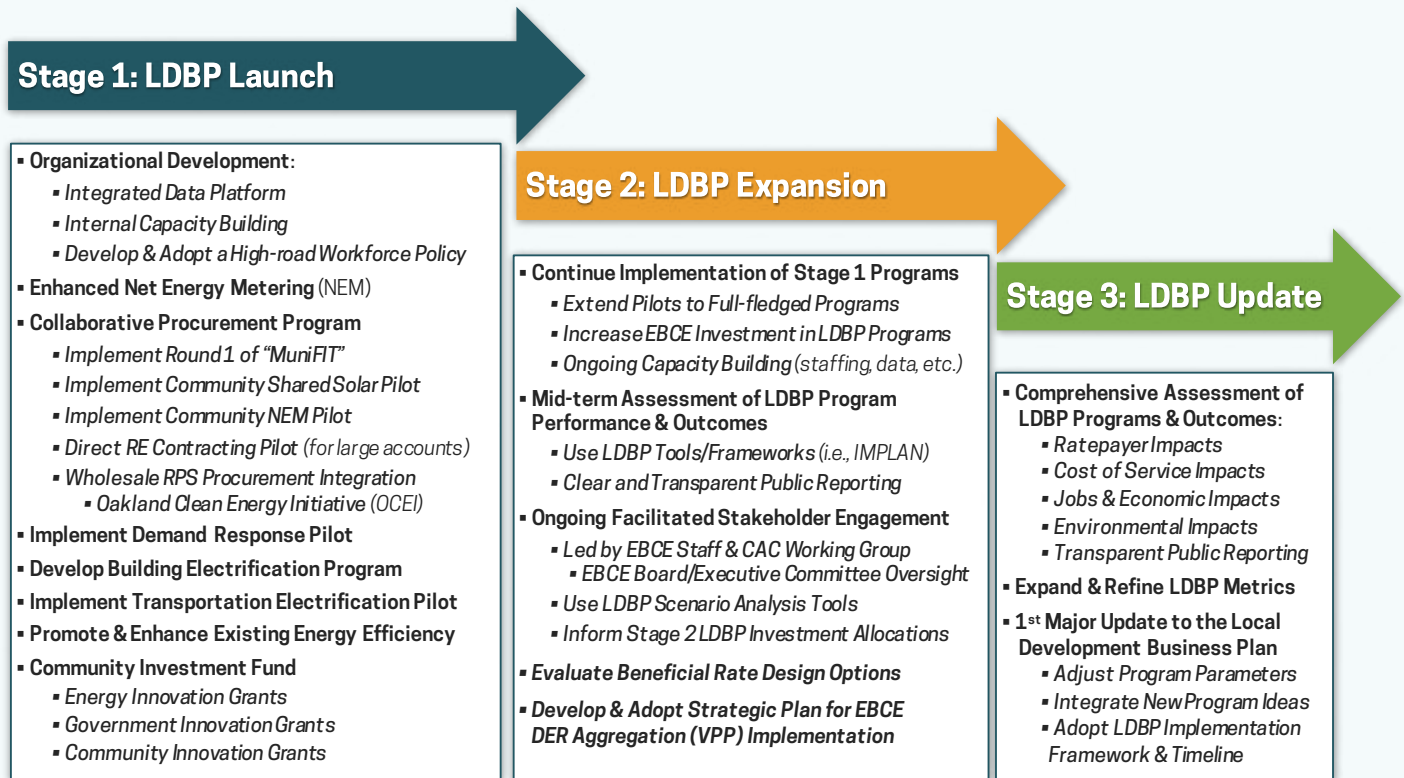


Figure 37: Recommended implementation timeline for the Local Development Business Plan in 3 stages over the first 5 years of EBCE operations.

Stage 1 Pilot programs can be evaluated, refined, and launched as full programs during Stage 2. It is also during this period of time that EBCE seeks to establish a credit rating, which would allow the organization to consider making direct investments in local resource development. EBCE can also begin its evaluation of beneficial rate design options. Throughout Stage 2 EBCE will continue to invest in internal capacity building, and evaluate its options for DER aggregation and Virtual Power Plant implementation.

Stage 3- Update (2023) culminates the first iterative cycle for LDBP implementation. During this third stage, EBCE will complete comprehensive assessment of its programs implemented in Stages 1 and 2, identifying outcomes such as ratepayer impacts, cost of service impacts, job creation, and

environmental and social impacts. These measured outcomes can be used to expand and refine the LDBP performance metrics, and facilitate transparent and public reporting processes. This measurement and verification step is designed to identify opportunities for improved operational efficiency, and support the refinement of program design parameters and integration of new ideas.

Finally, the first major update to LDBP will be completed, program design parameters will be adjusted, and new program frameworks and implementation timelines will be adopted. This iterative process will prepare EBCE to implement a new LDBP cycle, and facilitate the refinement of local program offerings to increase beneficial impacts realized by EBCE and the communities it was established to serve.

EBCE's LDBP Bridges a Gap

The Local Development Business Plan is meant to provide the scaffolding to support EBCE's efforts to deploy clean energy resources locally and maximize local benefits in the early years of CCA operations when access to low-cost capital can be a limiting factor.



LDBP

Conclusion

The unique vision of the East Bay Community Energy Community Choice program sets a new precedent for the democratization of the energy system, which prioritizes the development of local clean energy resources to benefit the communities of Alameda County. This bold vision is the essence of the Local Development Business Plan.

If implemented with appropriate flexibility and sustained commitment, the programs and pilot projects recommended in the LDBP can create meaningful and lasting benefits for EBCE and its community of stakeholders. These benefits range from customer cost savings through low and stable retail rates for electricity, new pathways to equity and ownership in the energy system, job creation and retention, opportunities for prosperity and wealth creation, and pride in place for the residents, workers, and businesses in EBCE's service territory.

The LDBP can also contribute to the accomplishment of ambitious local, state, and national climate and environmental protection goals by decreasing harmful emissions and pollution related to local energy consumption. Taken together, these benefits fulfill the core mission and goals on which EBCE was founded.

The LDBP stands as the culmination of an extensive stakeholder engagement and transparent public planning process that worked to bring the voices of the EBCE community into the process to create a new type of locally

responsive energy provider that seeks to provide maximum benefit to its customers. In that effort business innovators, community organizers, financiers, utility staff, industry experts, and government officials have all been tapped for their collective knowledge, with the goal of tailoring EBCE's design and launch to the unique needs of its local community.

The tools, programs, and projects developed through the LDBP process will become woven into the fabric of EBCE as it moves beyond its launch phase deep into long-term operations, and the dialog started from this process has already informed the decision-making process and early implementation of EBCE's products and services. Collaborative procurement models such as the Oakland Clean Energy Initiative, the adoption of an Enhanced NEM program, and proposal to implement an innovative Demand Response pilots all represent early and impactful examples of what can be achieved when distributed energy resources and local voices meet at the intersection of planning and implementation.

The LDBP has consistently recommended phasing local resources into EBCE's energy mix through the use of programs and pilots, incentives and adders, and collaborative partnerships with customers, energy asset owners and local energy service providers. This phased approach will allow EBCE to build a foundation for continued innovation while mitigating risk and building the stable revenue streams and strong cash reserves needed to ensure stable and reliable operations.

Over time pilots and innovative technologies will inform the creation of customer options that can be scaled into programmatic and standing offers able to provide lasting benefits that bring EBCE closer to its aspirational goals. This tempered and pragmatic application of beneficial local programs will ultimately create a more localized, democratic, resilient, and sustainable operating model able to stand as a pioneering example of best practice in the emerging Community Choice Aggregation industry.

Glossary

of Terms

Aggregator: An entity responsible for planning, scheduling, accounting, billing, and settlement for energy deliveries from the aggregator's portfolio of sellers and/or buyers. Aggregators seek to bring together customers or generators so they can buy or sell power in bulk.

Ancillary Services: The services other than scheduled energy that are required to maintain system reliability and other operating criteria. Such services include spinning, non-spinning, and replacement reserves, voltage control, and black start capability.

Average Cost: The revenue requirement of a utility divided by the utility's sales. Average cost typically includes the costs of existing power plants, transmission, and distribution lines, and other facilities used by a utility to serve its customers. It also included operating and maintenance, tax, and fuel expenses.

Average Demand: The energy demand in a given geographical area over a period of time.

Avoided Cost: The amount of money that an electric utility would need to spend for the next increment of electric generation to produce or purchase elsewhere the power that it instead buys from a small-power producer.

Balance of System (BOS): Components of a renewable energy system (i.e., solar photovoltaic) other than the energy generation component (i.e., the solar PV panels)

Base Load: The lowest level of power production needs during a season or year.

Behind-the-meter (BTM): An energy asset installed on the customer side of the electricity meter, essentially reducing the customer's use of electricity supplied by the grid.

Community Advisory Committee (CAC): A Board-appointed committee representing community interests in CCA Board matters. The EBCE CAC acts as a liaison between key stakeholders and the Board, holding public committee meetings on a regular basis.

California Alternative Rates for Energy (CARE): Assisted rates for income qualified customers.

California Energy Commission (CEC): The state agency for State energy policy.

California Environmental Quality Act (CEQA): An environmental impact assessment requirement for new project development.

California Independent System Operator (CAISO): CAISO oversees California's electric system and energy markets.

California Public Utilities Commission (CPUC): A regulatory agency that regulates utilities in California.

Capacity: The amount of electric power for which a generating

unit, generating station, or other electrical apparatus is rated either by the user or manufacturer.

Carbon Dioxide Equivalent (CO₂e): A standard unit for measuring carbon footprints. The idea is to express the impact of each different greenhouse gas in terms of the amount of carbon dioxide (CO₂) that would create the same amount of global warming.

Climate Zone: A geographical area is the state that has particular weather patterns.

Community Choice Aggregator (CCA): A non-profit energy service provider (typically governed by a Joint Powers Authority) comprised of municipal governments (aka-Community Choice Energy, or CCE), formed to provide retail choice and electricity procurement for customers within a defined service territory.

Commercial and Industrial (C&I): A customer segmentation group within the electricity market.

Day-Ahead (Da) Market: The forward market for energy and ancillary services to be supplied during the settlement period of a particular trading day that is conducted by CAISO and other Scheduling Coordinators. This market closes with CAISO's acceptance of the final day-ahead schedule.

Demand Charge The sum to be paid by a large electricity consumer for its peak usage level.

Demand Response (DR): A programmatic approach to incentivizing load shaping, shifting, shaving, or augmenting energy use behavior based on controls or price signals, typically through financial incentives.

Demand Side Management (DSM): The methods used to manage energy demand including energy efficiency, load management, fuel substitution and load building.

Distributed Energy Resources (DER's): Energy resources distributed across multiple owners, organizations, and often comprised of renewable energy such as solar or energy storage.

Energy Efficiency (EE): Projects and programs used to reduce energy consumption by increasing operational efficiencies of energy-consuming equipment.

Energy Trading And Risk Management (ETRM): A set of policies and systems that support decision making and market execution and actively manage risks using an integrated processes that enable data exchanges among energy traders, operations, credit, contracting and accounting functions.

Electric Vehicles (EV's): Vehicles powered by electric power rather than internal combustion.

East Bay Community Energy (EBCE): Alameda County's Community Choice Aggregator

Energy Storage (ES): Storage of electricity through a dispatchable medium such as a chemical battery, or other form stored potential energy.

Feed In Tariff (FIT): A renewable energy policy that typically offers a guarantee of payments to project owners for the total amount of renewable electricity they produce; access to the grid; and stable, long-term contracts.

Front-of-the-meter (FTM): An energy asset installed on the utility side of the meter, which supplies energy and/or ancillary services to the grid.

Gigawatt (GW): A unit of electrical power capacity.

Gigawatt-hour (GWh): A unit of electrical power with a one hour time component.

Investor Owned Utilities (IOU's): For profit utilities that are publicly traded and owned by shareholders, and regulated by the California Public Utilities Commission.

Investment Tax Credit (ITC): A deduction on tax filings relating to investments in renewable energy equipment installations.

Kilowatt (kW): A unit of electrical power capacity.

Kilowatt-hour (kWh): A unit of electrical power with a one hour time component.

Loan Loss Reserve (LLR): A collateral pool of capital used to secure debt services and credit worthiness sometimes referred to as a “lockbox.”

Power Purchase Agreements (PPA's): A contractual agreement between an energy off taker and an energy provider to buy power at a fixed rate for a fixed term.

Locational Margin Price (LMP): the marginal cost of electricity (MWh) at a specific location (node) on the electric power network, taking into account both supply (generation/import) bids and demand (load/export) offers and the physical aspects of the transmission system including transmission and other operational constraints. It is a mechanism for using market-based prices for managing transmission congestion.

Local Development Business Plan (LDBP): East Bay Community Energy's collection of recommendations to create local benefit through development of local clean energy resources, while maintaining competitive and stable retail rates and reliable service to Alameda County electricity customers.

Integrated Resource Plan (IRP): An energy planning document outlining long-term energy resource requirements and procurement plans, designed to balance supply and demand for a load-serving entity.

Local Portfolio Standard (LPS): A concept within the Renewable Portfolio Standard framework, which indicates a minimum portion of a load-serving entity's energy portfolio that comes from local resources within a designated boundary.

On-bill Financing (OBF): A customer financing program that enables property improvements to be paid off on the customer's utility bill over time. A similar mechanism called On-bill Repayment (OBR) uses third party capital to cover the upfront costs of the project while OBF uses internal IOU or CCA finances to cover upfront costs.

Property Assessed Clean Energy (PACE): A project financing mechanism that ties debt services to the underlying value of the property to be paid off overtime.

Pay-for-performance (P4P): A contracting strategy for energy services (i.e., energy efficiency contracting) that

minimizes operational risks by ensuring that the utility only pays for beneficial outcomes (i.e., targeted load reductions, and/or load shaping) that are cost-effective and deliver value to the utility and its customers

Market Responsive Pricing (MRP): A mechanism that allows for the adjustment of a price for energy services and/or incentives based on market conditions. This can include the increase or decrease of the price paid for electricity (MWh) based on number of bids received, or the increase or decrease of a rebate paid for an energy efficiency upgrade based on the number of rebates paid.

Megawatt (MW): A unit of electrical power capacity.

Megawatt-hour (MWh): A unit of electrical power with a one hour time component.

Microgrid: A group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.

Municipal Electric Utility (MUNI): A power utility system owned and operated by a local jurisdiction.

Net Energy Metering (NEM): A billing structure used to value solar generation installed behind the customer meter.

Operation and Maintenance (O&M): The costs associated with operating and maintaining energy assets over their lifespan (e.g., periodic cleaning of solar panels to maintain operating efficiency).

Pacific Gas & Electric (PG&E): an Investor Owned Utility currently incumbent to Alameda County.

Parting Charge Indifference Adjustment (PCIA): A charge by the incumbent IOU to cover generation costs acquired prior to a customer's change in service provider. This fee is effectively an “exit fee” assessed to customers which receive their generation services from another provider (i.e., a CCA).

Photovoltaic (PV): Solar energy generation technology.

Resource Adequacy (RA): A requirement for energy procurement align energy demand needs with energy supply purchases plus a reserve margin.

Time of Use (TOU) tariffs: an energy valuation based on its time of use or generation.

Renewable Portfolio Standard (RPS): A requirement setting a utilities renewable content standard

Real-Time (RT) Market: The competitive generation market controlled and coordinated by the ISO for arranging real-time imbalance energy.

Value of Distributed Energy Resources (VDER): An emerging tariff structure that monetizes locational, temporal, environmental, and social benefit factors.

Virtual Power Plant (VPP): A distributed power plant comprised of an aggregation of distributed energy resources, allowing for remote control (“dispatch”) of the energy functions and attributes of those resources.

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