



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 Community Choice Energy Agency serving Alameda County. EBCE will provide cleaner, greener energy at lower rates and other energy services to the East Bay community. 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 the community moves towards 100% renewable energy.

Leadership

The East Bay Community Energy Board of Directors comprises 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 the community 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 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 committed to 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 the EBCE community.

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, customer cost-savings, and community resilience. The LDBP also identifies opportunities for development of local clean energy resources, 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

This Local Development Business Plan represents the beginning of East Bay Community Energy's (EBCE) journey to deliver the benefits of clean energy to Alameda County. The Plan is structured around a series of early actions that cover a broad set of local clean energy solutions. The Plan also lays out a set of community benefit metrics - jobs created, energy costs saved, GHG emissions reduced - that serve as a framework for assessing the impacts of local clean energy options. Finally, the Plan describes a process for on-going community engagement focused on setting EBCE's local clean energy priorities based upon the measured impacts of the Early Actions.

The Plan itself is purposefully not complete because EBCE is itself still a work in progress. Instead, the Plan is a framework for EBCE to broadly invest in a diverse set of local clean energy solutions and use the results of these investments as the basis for setting EBCE's longer term business plan. As EBCE builds organizational capacity, solidifies its financial position and establishes a track record of delivering lower cost, cleaner energy to its customers, the outputs of this Plan will provide EBCE with real world proof points of what local clean energy solutions are best suited to deliver the most impact. This in turn will allow EBCE to develop a follow up to the Plan with a focus on scaling up local clean energy development in those areas that have demonstrated the most actual potential for impact.

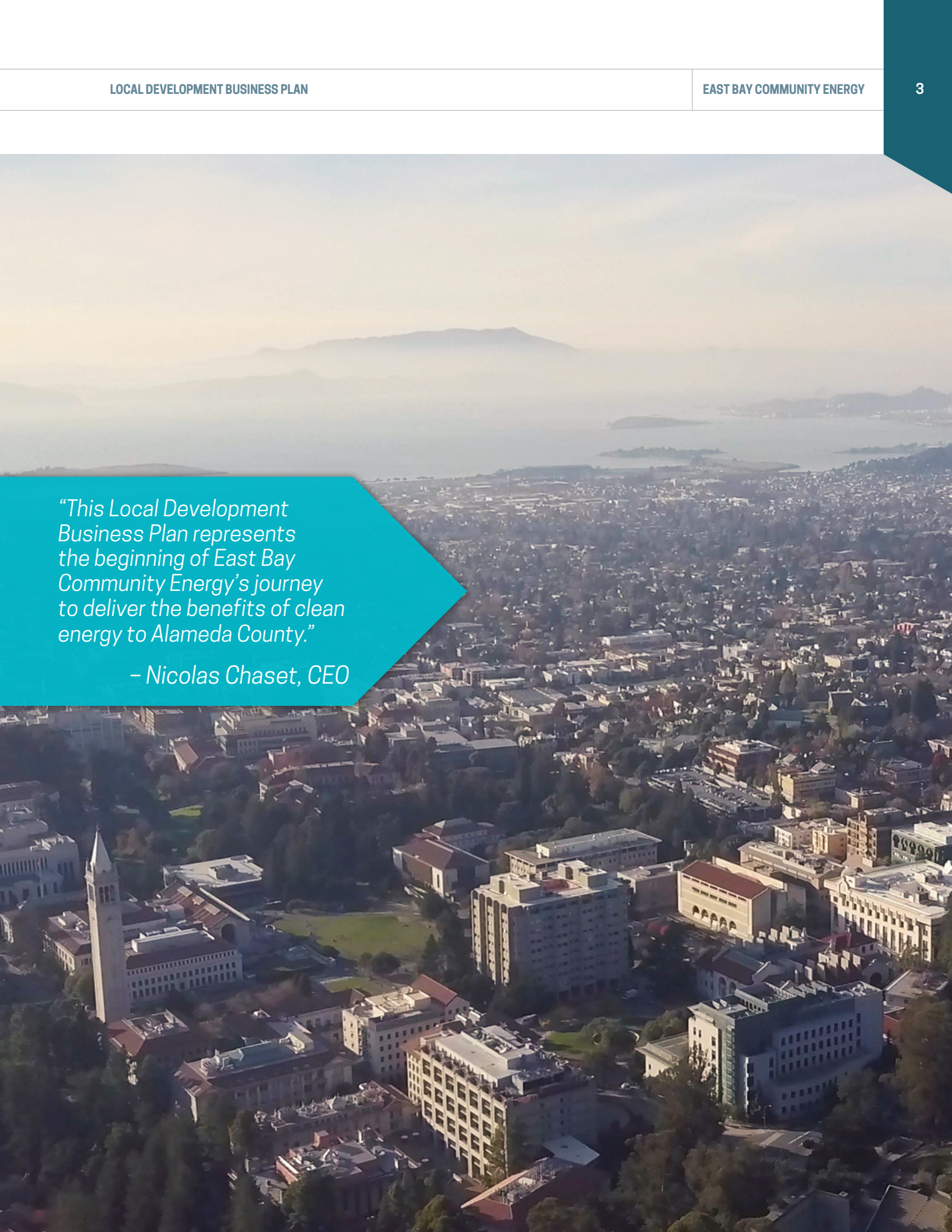


From EBCE's formation onwards, it has been clear that the residents of Alameda County want EBCE to move as quickly as possible to start delivering local clean energy solutions. Finding the balance between early action and organizational development - or said another way - investing directly in Alameda County or in building EBCE - has been one of my greatest challenges since I joined EBCE. I believe that this Local Development Business Plan does an admirable job of finding that balance. Most importantly, the Plan recognizes that on-going community engagement and priority setting are the key to EBCE's success in delivering local clean energy solutions.

The completion of this plan is the starting point of EBCE's local clean energy journey. As EBCE's embarks on this pathway, I want to make a special acknowledgement to community members who have spent countless hours advocating first for the formation of EBCE and, most recently, for the Local Development Business Plan.

Thank you for joining EBCE as we work to support Alameda County's clean energy transition.

– *Nicolas Chaset, CEO*



“This Local Development Business Plan represents the beginning of East Bay Community Energy’s journey to deliver the benefits of clean energy to Alameda County.”

– Nicolas Chaset, CEO

LDBP Executive Summary

Introduction

The East Bay Community Energy (EBCE) Local Development Business Plan (LDBP) 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 various 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 strategies, programs, and mechanisms to create good jobs, provide programs that enhance economic equity, stimulate economic development, and accelerate the integration of local distributed energy resources (DER) in ways that enhance EBCE's long-term stability and reliability as an agency that the Alameda County community will depend on for years to come.

Ultimately, the LDBP is an ambitious and exciting plan because it seeks to strike a balance between the pragmatic and the visionary. 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.

Goals and Priorities for EBCE

- 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.

Overarching Goals and Objectives of the LDBP

- 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 LDBP Concepts and Strategies

- An open, inclusive, and iterative public 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.
- Development of local renewable and/or dispatchable DER's by leveraging EBCE's procurement role and surplus revenues can provide a wide range of important benefits to EBCE and its customers.
- Contractual relationships with EBCE customers and the community can create lasting, mutually beneficial partnerships and outcomes.

Recommended Suite of Early Actions for Local Development

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 early actions 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 up 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 project 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 (EE)**- The LDBP includes a strategic approach to developing EE programming that creates synergy with established EE Program Administrators and community benefit organizations by leveraging customer data to significantly increase participation levels in existing EE programs.
3. **Building Electrification**- The LDBP recommends that EBCE develop an innovative approach to Building Electrification programming (aka- Natural Gas Fuel Switching), 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 project for medium and/or heavy duty fleet vehicle electrification, to determine the costs and benefits, and to 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, as well as residential and nonresidential 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 (FIT) programs recommended by the LDBP Consultants, this approach would involve working collaboratively with EBCE’s member jurisdictions to identify optimal sites for commercial-scale 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 (i.e., 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 project that deploys 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 project would also benefit from grant funding to achieve a greater scale, enabling EBCE to support the development and evaluation of additional 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.
 - e. **Utility-scale Renewable Energy & Storage**- The LDBP recommends strategies for soliciting utility-scale wind, solar, and energy storage through wholesale 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, enhance the value of NEM to EBCE, and maximize 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, values, and objectives.

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 1) 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 public process using the tools and frameworks developed during the preparation of the LDBP.

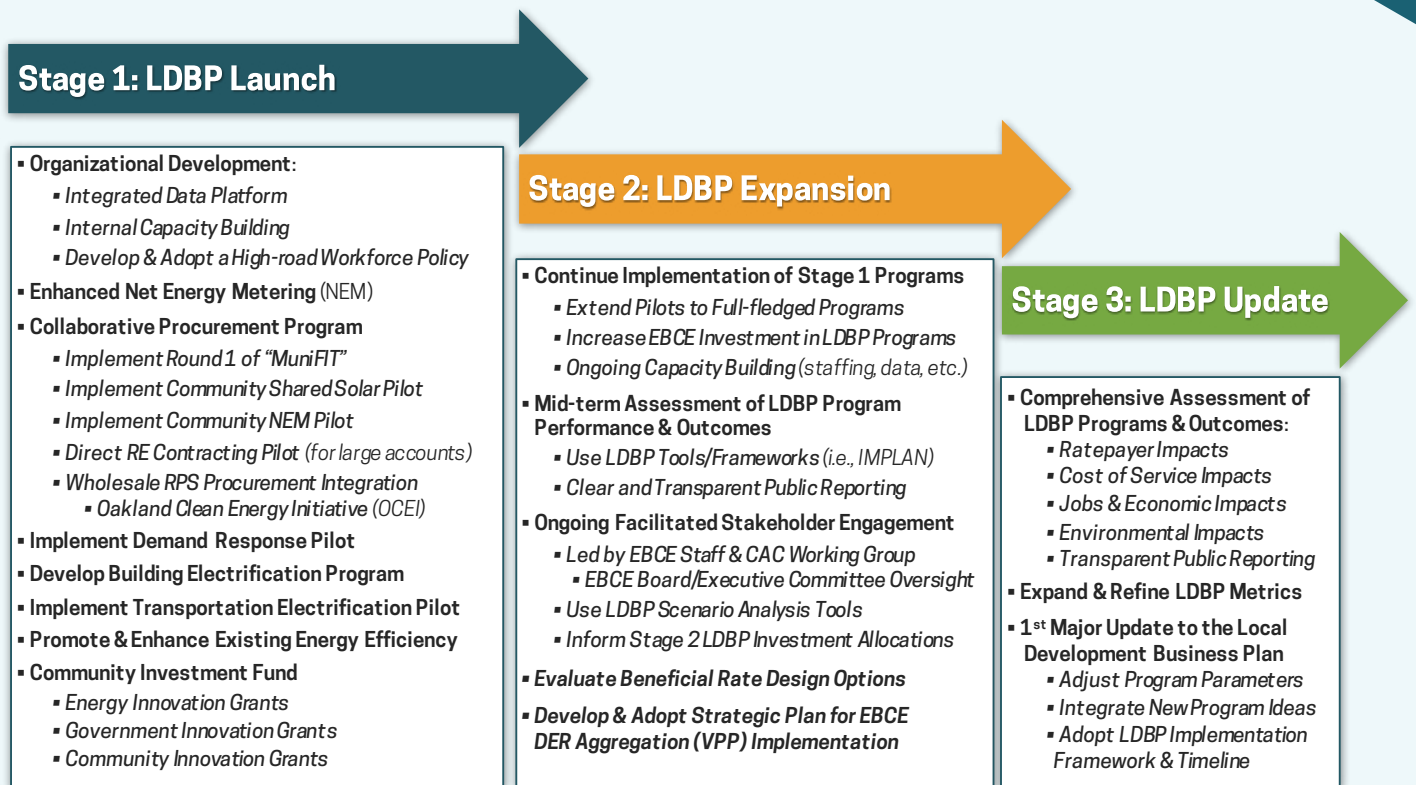


Figure 1: Recommended implementation timeline for the Local Development Business Plan in 3 Stages over the first 5 years of EBCE operations.

LDBP Performance Metrics

The LDBP includes a set of impact metrics to estimate and track the performance of LDBP programs and pilot projects in a number of categories, and an innovative Scenario Analysis tool designed to capture those metrics and estimate LDBP outcomes under user definable scenarios (see Figure 2). An initial scenario analysis was conducted to support the development of this Plan, and subsequent analyses can be conducted to gauge the pros and cons of various investment options and program design parameters, engage the community in the planning process, and inform EBCE's local development priorities with data-driven insights. This approach to using the tools and frameworks developed for the LDBP project underpins the ongoing, inclusive, and iterative implementation process recommended in the LDBP.

Category	Performance Metric (Units)
Direct Annual Jobs Created	Full-time Equivalents (FTE's)
Labor Wage Impacts	Direct Job Wages (\$'s/hour)
Fiscal Impacts	Costs (\$'s spent), Cost Savings (\$'s saved), Surplus Revenue (\$'s/year)
Customer Cost Savings	\$'s saved (Total and by Customer Class)
Local Energy Generation	GWh's Generated per Year
GHG Emission Reductions	Metric Tons of CO ₂ e (MTCO ₂ e) reduced, GHG Intensity (MTCO ₂ e/MWh)
Criteria Air Pollution Reductions	Metric Tons (MT) of Criteria Pollutants reduced

Figure 2: Overview of Performance Metrics for estimating and assessing LDBP impacts using the tools and frameworks developed for the LDBP.



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 to achieve community benefit 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) included language 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 framework and roadmap for developing and procuring local energy resources, and providing a description of how EBCE will foster local economic benefits, such as job creation and innovative community energy programs.

A feasibility 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, greenhouse gas (GHG) reductions, higher renewable content than PG&E, while providing 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 describe 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 the JPA Agreement and the 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 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 Consultants were 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 LDBP, 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 LDBP Consultants 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 various 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 accelerate the integration of local clean energy resources in ways that enhance EBCE's long-term stability and reliability as an agency 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 visionary. 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.

Role of Community Engagement

The importance of the EBCE community's involvement in the establishment of the agency and formation of the bold vision embodied by the LDBP cannot be overstated. Simply put, without the passion, persistence, and sustained efforts of many dedicated members of the East Bay community over a period of many years, neither EBCE nor the LDBP would exist. The centrality of local energy resource development in the vision that emerged for Community Choice in Alameda County was pivotal to the push for a Local Development Business Plan to guide the new EBCE agency.

A coalition that included many local community organizations, CCA advocates, labor and workforce organizations, and dedicated individuals came together to advance the concept of an innovative, locally-focused CCA in the East Bay. A diverse, thirty-five-member Steering Committee was created, with representatives from many community constituencies and interested cities from throughout the Alameda County community. The Steering Committee worked with the Alameda County Board of Supervisors, county staff, and consultants over a period of years, weighing in on the feasibility study that was performed and the priorities that would inform the establishment of EBCE.

In 2016, the coalition of East Bay community organizations, CCA advocates, and local labor and workforce organizations joined forces to successfully advocate for language in the founding EBCE Joint Powers Agreement (JPA), which mandated the creation of the current Local Development Business Plan as a framework for meeting the community benefit goals of EBCE. The coalition also successfully advocated for a provision in the JPA Agreement that established a Community Advisory Committee CAC to inform the new program and provided for the chair of that committee to serve as a non-voting member of the EBCE governing board.

These two examples of successful community engagement in the EBCE development process—which effectively led to the creation of LDBP and CAC role in governance of the agency—are unique, ground-breaking aspects of EBCE, realized through the active and sustained engagement and mobilization of over 60 East Bay community and labor organizations.

With the establishment of EBCE in January 2017, and the subsequent selection of the consulting team to create the LDBP, many community-based advocates and organizations have continued to play a strong role in shaping EBCE—through engagement with EBCE’s Community Advisory Committee, through direct program and policy advocacy at the EBCE Board, and by directly representing community interests in the LDBP process.

In tune with the strong community orientation of EBCE, the LDBP Consultants actively engaged the community in the creation of the LDBP. This began with a series of focus groups organized by the LDBP Consultants in June 2017 to solicit community input. These focus groups attracted more than 100 individuals representing community organizations, businesses, labor, and public officials.

In addition, the LDBP process has involved the publication and public review over the past year of the more than 25 work products and analyses that form the foundation of the recommendations in this LDBP document. This process involved open public review and comment periods and public webinars for each of these work products, as well as an all-day symposium in March 2018 and multiple community review workshops in June 2018. The LDBP work products were also subject to review by industry expert review panels, which included community advocates and local clean energy experts. The community has actively responded to this process of review and commentary, ultimately informing, enhancing, and enriching the work products.

The EBCE Community Advisory Committee has also played a key role in representing community interests in the LDBP process. The CAC participated in all of the LDBP community stakeholder

engagement activities, and hosted multiple special meetings dedicated to review and discussion of LDBP work products and community input.

Community engagement has been a unique and intrinsic characteristic of EBCE’s identity, and it is a foundational element of many of the LDBP recommendations. This strong community engagement will continue to be crucial as EBCE implements the ongoing, iterative, and inclusive LDBP framework recommended herein.

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 agency 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, protect vulnerable customers, 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 LDBP background documents that have been produced and delivered to EBCE (see Index on page 88), which have undergone extensive public and professional review through an unprecedented level of transparency and community 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 underlying background documents are to be considered attachments to the business plan, and are available on EBCE’s LDBP web page. The



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.

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 will work to implement by 2020.

While the LDBP has attempted to take a wholistic 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 LDBP foundation 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 community 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 community members and organizations that advocated for the development of EBCE and engaged with the LDBP process, and endlessly thankful to the EBCE Board and staff for supporting this seminal body of work. It is intended that the LDBP, and all of the underlying work products serve as a springboard for other CCA's that 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 work to implement 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 social impacts.

Local Energy Resources

The Alameda County region has abundant clean energy resources that can be harnessed by EBCE to create local economic benefits and power local homes and businesses with locally generated, carbon-free, renewable energy.



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 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 to EBCE and its customers. Fundamentally, Demand Response is needed to minimize costly mismatches between the supply of and demand for electricity. Demand Response is 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 active load curtailment to reduce peak demand.
2. “Shift” is nudging customer load toward times of high renewable generation.
3. “Shape” is the beneficial re-shaping of customer load profiles.
4. “Shimmy” is harnessing loads to mitigate short-run ramps and disturbances.

The pie chart in Figure 4 shows the relative contribution of the various rate categories 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 information is highly 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 5 shows the total hourly electricity draw in EBCE’s service territory.

Aggregate Demand in Alameda County

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

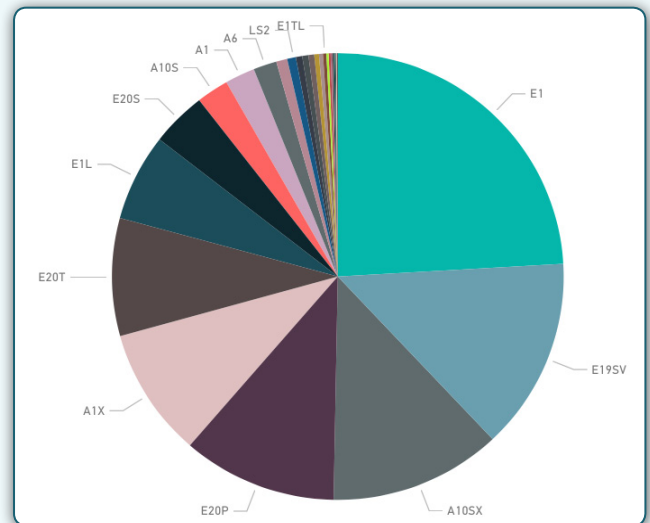


Figure 4: EBCE's account distribution by rate schedule.

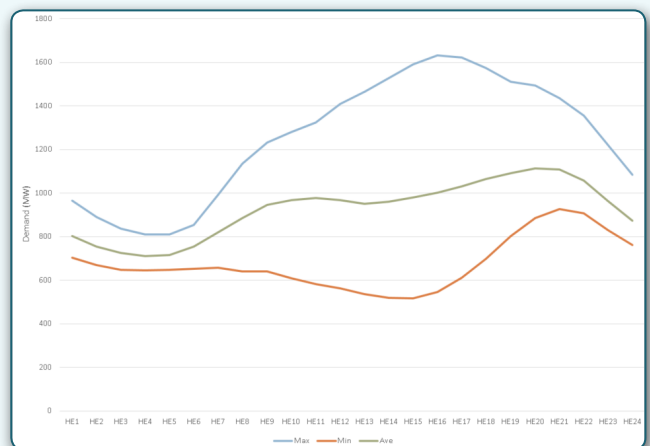


Figure 5: EBCE's annual hourly load curve (Maximum- top, Average- middle, and Minimum- bottom) in 2016. Note the emerging “Duck-curve,” which is less pronounced than the statewide averages.

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.

1. Implement Demand Response Pilot Project

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 it may be cause for some customers to opt-out of EBCE. It is recommended that EBCE pursue an innovative pilot project to explore the potential for a customized CCA DR program to provide similar benefits to EBCE and its customers.

2. 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 that 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 its 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 nine PG&E qualified aggregators.

3. 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 that 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 Community Choice Energy Agency 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 programming 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 validation processes that enable pay-for-performance (P4P) 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 agency 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) and community benefit organizations (CBO'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's service 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 to which it has access. 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) regarding 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 allow EBCE to drive customer participation in any EE program offerings through direct and 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 a Cost of Service (COS) study to provide further granularity to the preliminary cost-causation analysis offered herein, and 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-qualified 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.

1. Support existing programs offered by established CBO's and EE Program Administrators already serving the Alameda County region.
2. 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.
3. Leverage trained Customer Service Representatives and Customer Service Center (including outbound calling).
4. Develop Request for Qualifications (RFQ) for EE technology/service providers, to develop a stable of pre-qualified vendors to streamline program implementation.



Fossil Fuel Switching

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 buildings in Alameda County 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. Solar hot water heating (SHWH) is also of value and interest to stakeholders, and EBCE will consider opportunities to leverage the California Solar Initiative incentives that can support SHWH deployment. Accelerating the electrification of buildings will require broad-based efforts including making Building Electrification a policy priority, implementing effective marketing strategies and consumer education, updating building codes, designing an effective incentive structure, and supporting 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 that 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 project to evaluate program design parameters, appropriate rebate levels, costs, benefits, and consumer interest.

2. Use experience and data gleaned from the pilot project to conduct internal analysis of customer load profiles using the integrated data platform, and to refine program design.
3. Support Fuel Switching strategies and electric heat pump technologies in workforce training initiatives, to foster the local 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 (as detailed in the underlying LDBP background document titled: *Opportunities for Natural Gas Fuel Switching*).

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). However, 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 that focus on supporting fleet electrification.

Taking an active role in supporting the electrification of the transportation system by working with commercial fleet owners, the freight and shipping industry (i.e., the Port of Oakland), 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.

In the near-term, pursuing grant and foundation capital to offer grid-enabled charger pilot projects 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 buildout 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 implement a medium and heavy duty vehicle fleet electrification pilot project. 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 ("smart" EV chargers that enable participation in Demand Response programs.
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., 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 meters, accounts, and contracting agencies.

Due to the relatively small sizes of many of the cities, the burden of staff time and upfront cost of pursuing these projects individually has been a barrier to achieving clean energy goals. Through the aggregation of multiple municipal facilities, feasibility assessment and RFP management tasks can be handled more efficiently than through a "one-off" process, and sites that otherwise would not have been pursued for clean energy development can become viable.

Recent collaborative procurement initiatives have been successful in getting projects constructed, with pricing 12-14% lower than standard prices for individual solar projects on similar government facilities. Additionally, with the increased efficiency and economies of scale that comes with collaborative 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. Collaborative Procurement is a model that can be applied broadly, and the LDBP recommends that EBCE consider the five distinct approaches to implementing the Collaborative Procurement program identified and described below (a-e).

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 solar (and solar + storage) 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 JPA-compliant facilities. 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 by local agencies 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.

With the use of a revolving fund (i.e., the successful SEED Fund model discussed in the *Agency as Developer* underlying LDBP background document), this Collaborative Procurement model could theoretically continue in perpetuity after its initial “seed” 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.

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 community ownership model and meets EBCE’s standards (i.e., workforce, location, integration of energy storage, etc.).

This early pilot project 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 Community Shared Solar pilot project, the LDBP Consultants recommend targeting 1-4 opportunities (500 kW to 1 MW each) that 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 grantees.

c. Community Net Energy Metering

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. This can make beneficial renewable energy and energy storage more inclusive and accessible to a greater number of EBCE customers, and allow EBCE to focus local development efforts in hard-to-reach and/or underserved market segments such as disadvantaged communities, low-to-moderate income homeowners, multi-family residential, non-profit faith-based institutions, or public agencies.

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 10 steps outlined below, according to EBCE’s capabilities and goals, and with some steps expedited or skipped due to previous work completed through prior 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 and LDBP 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

- EBCE could use internal or external funds to start a revolving fund to provide full feasibility assessments at no cost to participating customers. EBCE could use in-house or contracted staff to perform the analyses, leveraging the CCA's unique access to granular customer-level energy consumption data.

Step 4: Public Agency Collaboration

- For public agency collaborative community NEM, EBCE staff will work with local public agency staff to provide resources and expertise that local agency staff often do not have within their agency.

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 for selecting a development partner (or partners) for the CNEM program. 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 prepare the bid documents to solicit developer proposals on behalf of the participating customers, and EBCE staff would organize bidder conferences, site walks, etc.

Step 7: Proposal evaluation

- EBCE staff would evaluate and score proposals and interview selected bidders using readily-available templates and evaluation matrices.

Step 8: Negotiations and awards

- EBCE staff and legal team are skilled in energy contract negotiations and are highly capable of securing favorable terms for participating customers, and finalizing contract terms

and conditions with selected development partners. EBCE would then present the negotiated contracts to public agency staff or customers final approval.

Step 9: Installation project management

- 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: Celebration of success

- When projects are completed, EBCE would organize and participate in celebration events to promote the success of the program and the virtues of community self-reliance, local job creation, customer bill savings, and local GHG emissions reductions.

Benefits to EBCE

1. Encourage and enable 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. Foster 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.

Key Recommendations

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

1. Select target facility types, customer types, or grid locations that provides optimal benefit to both the CCA and the customer. The LDBP Consultants recommend focusing initially on residential customers and public safety buildings for the first round.
2. Target a procurement of 5-10 MW to reduce delays caused by building too big an initiative, while still capturing economies of scale.
3. 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 Collaborative Procurement option for EBCE to explore with a pilot project in Stage 1 would involve working with customers to provide a viable alternative to Direct Access (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.

e. Utility-Scale Renewables and Energy Storage

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. This can enable EBCE to solicit proposals to construct new, utility-scale (i.e., 10-100+ MW projects) wind solar development within its resource-rich service territory.

Local Procurement Standards

It is recommended that EBCE include targets in energy portfolio procurements (i.e., Collaborative Procurements, 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”). It is also recommended that these solicitations include strong preferences and/or incentives for local labor paid at prevailing wages to support EBCE’s local workforce development goals.

Benefits to EBCE

1. Encourage and enable 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. Support economic development in the region.
4. Provide EBCE with baseload power from local resources.
5. Foster good will and credibility by leading community efforts to drive down costs and barriers for large customers.
6. 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.
7. Gain insight into innovative technology types.
8. 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.

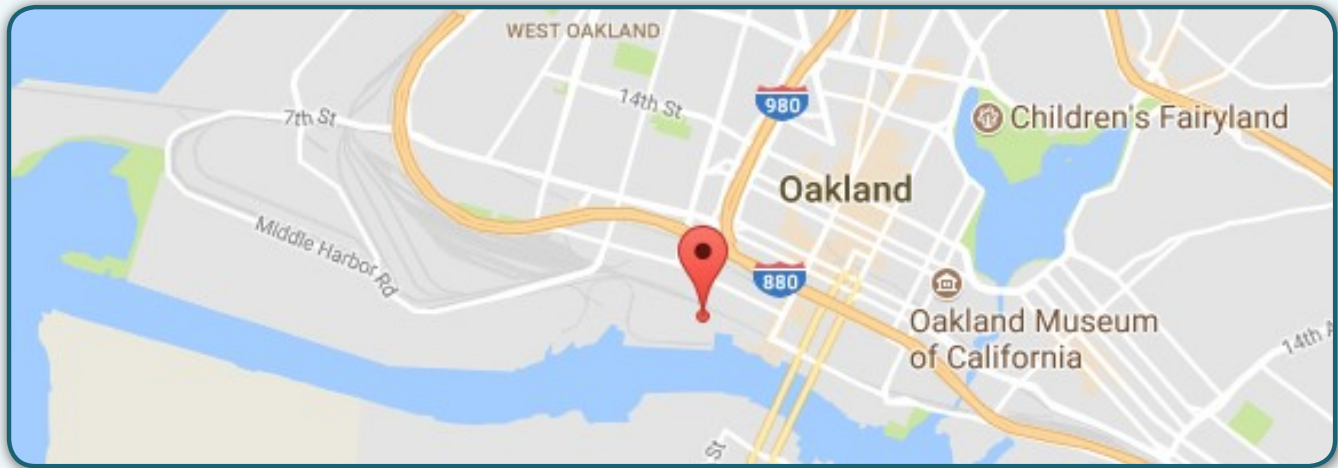


Figure 6: Location of jet fuel-fired ("peaker") power plant to be replaced by the Oakland Clean Energy Initiative.

Key Recommendations

For the Utility-Scale Renewables Collaborative Procurement program outlined here, the following recommendations apply:

1. Actively pursue opportunities for collaborative procurement of utility-scale renewables and energy storage systems.
2. Seek to procure some quantity of local projects in all Requests for Offers.
3. Include strong preferences for local labor paid at prevailing wages.

Example: Oakland Clean Energy Initiative

The Oakland Clean Energy Initiative (OCEI) represents an early implementation of the Collaborative Procurement strategy outlined above. The project involved an RFO process designed to phase out the 165 MW Dynegy Oakland Power Plant, located near Jack London Square that 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 an initiative that EBCE and PG&E are teaming up to find ways to procure reliability services that replace the need for the power plant with DER's and energy storage capacity. CAISO recently approved the proposed solution and EBCE is working through the procurement process to buy local energy and capacity products 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 territory in the form of energy storage and front-of-the-meter renewable generation. New DER deployments 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.
- Reduce GHG emissions and criteria pollutants 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 enhanced value. For example, MCE Clean Energy



Figure 7: Rooftop residential solar is a common application of NEM.

(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.

The recommended adders for the Enhanced NEM program fall into three separate categories: Community Benefit; Workforce; and Supply-Shift. It is also recommended that the adders offered by EBCE be cumulative, meaning that a NEM project can qualify for one adder in each of the three categories (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 that 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 customers 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. For these customers, 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 contribute to 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 incentivize 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 project 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 identify storage capacity, the CCA can utilize a territory wide network of dispatchable resources that provides 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 service territory. Again, the roll-out of this incentive could be paired with other DER programs, 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 and mutually beneficial contractual agreements between EBCE and the participating customers. 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 some level of dispatchable control of charge/discharge times through future voluntary 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 lesser 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 potential customer 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.

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



Figure 8: 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.

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 focus on maximizing community benefits was the basis for development of an innovative programmatic grant-based approach to direct community investments. The Community Investment Fund is a multifaceted grant program designed to accelerate local development of innovative products, services, or programs that are aligned with EBCE's goals and mission.

The LDBP has identified three distinct types of community investment grants that EBCE will 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 foster favorable economic development outcomes and kickstart local entrepreneurship and job opportunities.

B. Government Innovation Grant

The local government municipal members of EBCE often pursue grant funding to develop energy and climate action projects. EBCE can support this effort through delivery of cost-sharing and matching funds when partner jurisdictions seek 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

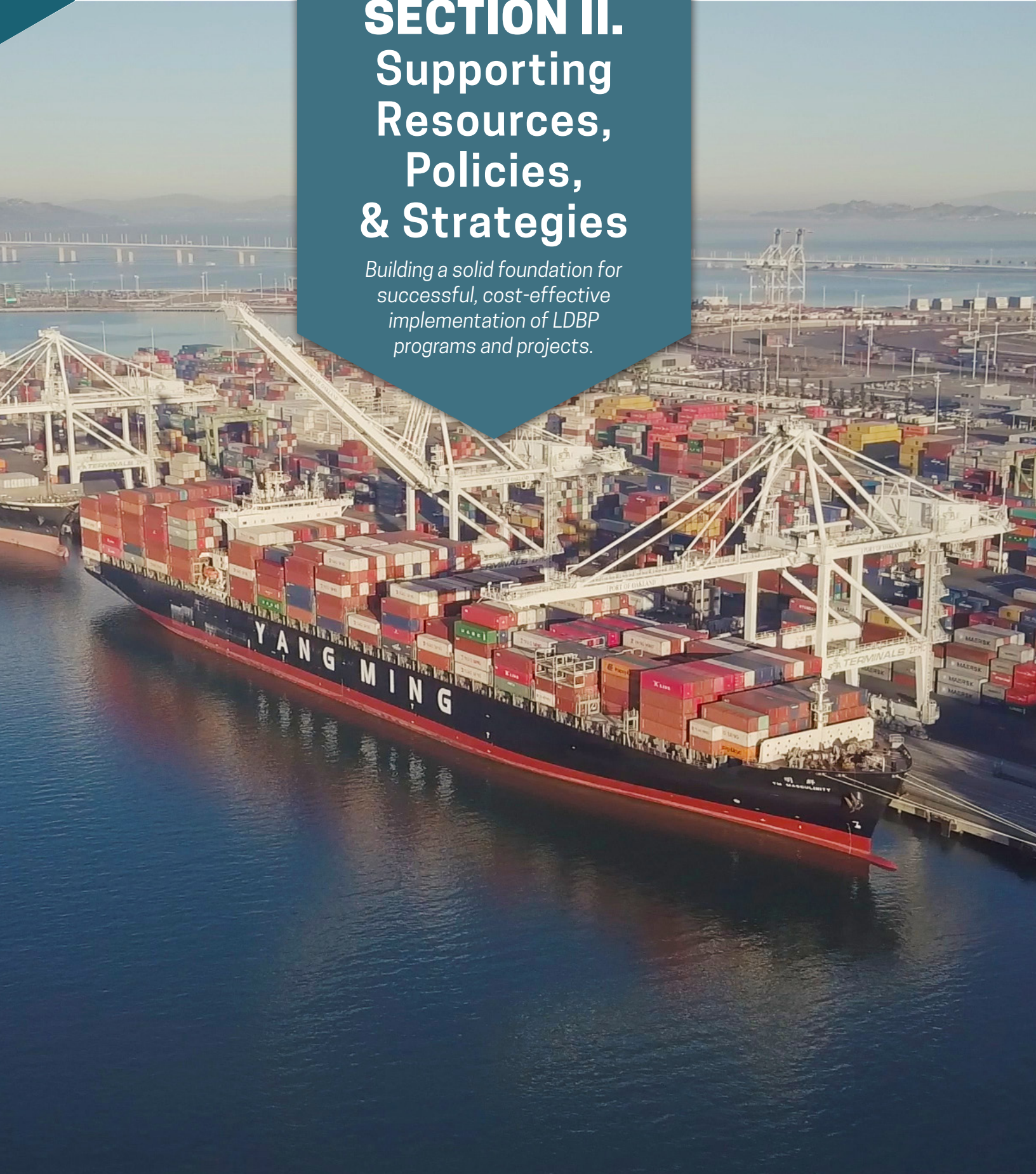
Several non-profits and community organizations are actively pursuing projects designed to deliver social and environmental benefits to Alameda County. Programs such as Community-shared Solar, energy conservation retrofits, projects designed to deliver human health benefits, workforce development efforts 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 in order to support working groups.
3. Finalize Community Investment Fund plan for Board approval at the end of 2018.
4. Commence grant solicitations in 2019.

SECTION II. Supporting Resources, Policies, & Strategies

*Building a solid foundation for
successful, cost-effective
implementation of LDBP
programs and projects.*



Integrated Data Platform

Next to its relationship with its customers, data is a CCA's most valuable resource and mining 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 demonstrate this, the LDBP Consultants assembled a robust integrated data platform using a comprehensive energy data management system that leveraged a massive historical energy consumption dataset provided by PG&E (including two full years of interval meter data). This data was then integrated with historical local weather station data, CAISO market 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 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 working to develop 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 underlying LDBP background documents.

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. Approximately 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.

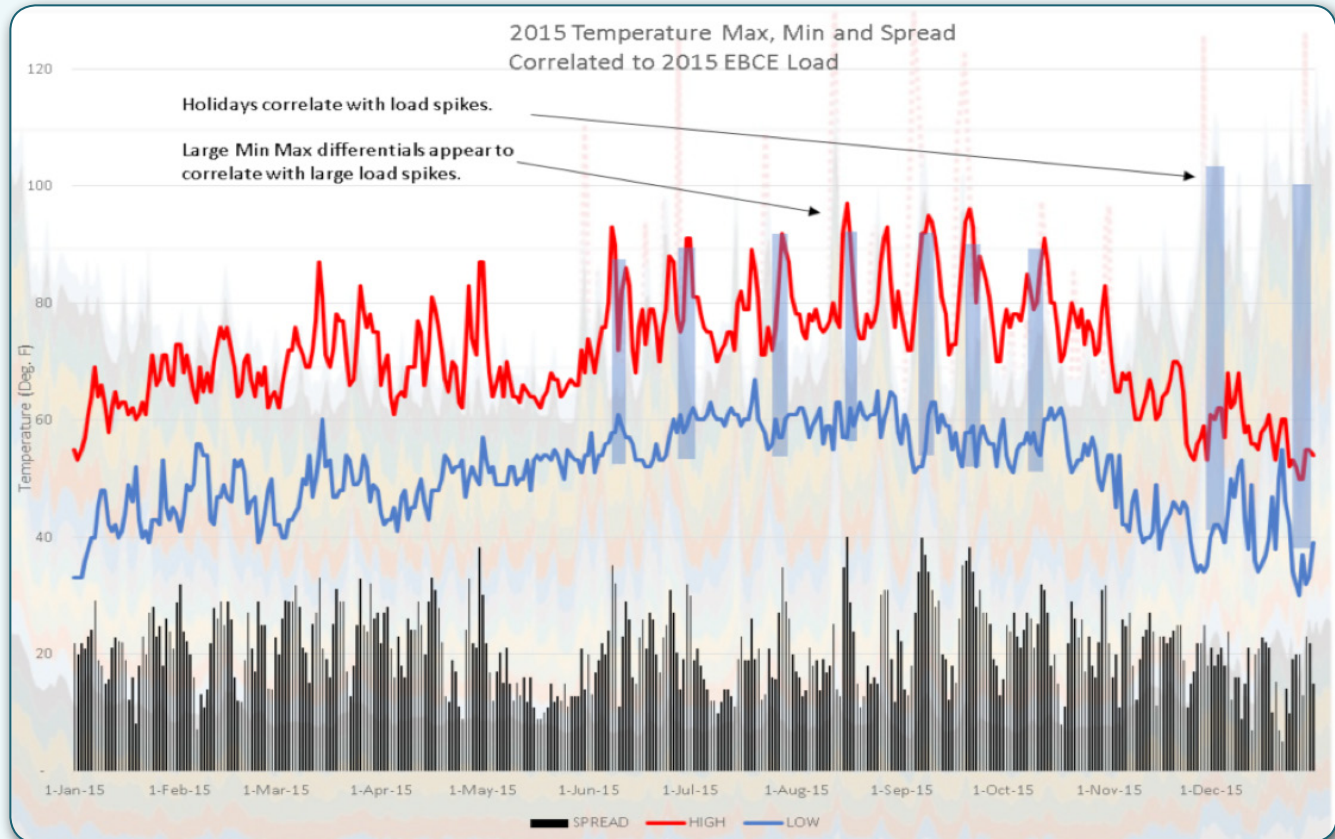


Figure 9: EBCE's 2015 total annual load curve (daily load for 365 days, as indicated by the x-axis) with Maximum and Minimum temperatures and daily temperature differentials overlaid. Note the strong correlation between extreme hot and cold temperatures, especially high swings between high and low temps, (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 socio-economic 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

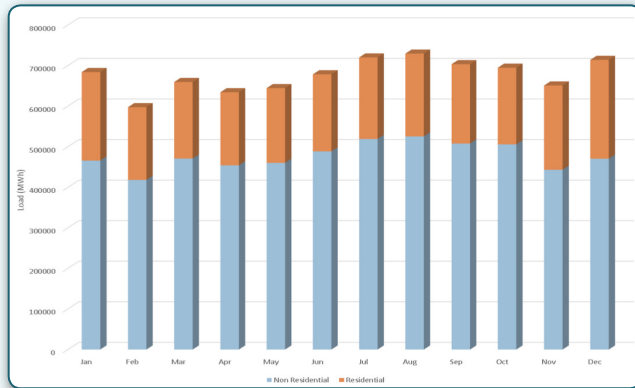


Figure 10: EBCE's monthly loads (GWh) in 2016. Note that the Residential load is shown in orange, and the Non-residential load is shown in blue.

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.

	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.

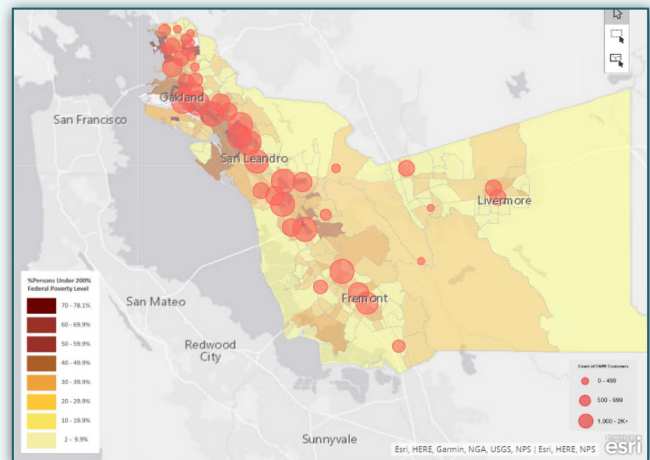


Figure 12: Heat-map showing overlay of high-poverty areas and geographical distribution of CARE customers.

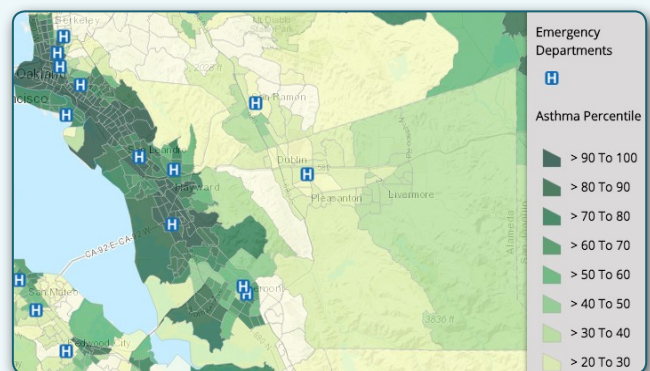


Figure 13: Alameda County Asthma Rates and co-location of emergency facilities (hospitals). Note the correlation with the I-880 corridor and high concentration of low-income customers, where pollution levels tend to be highest.

EBCE Customer Partnerships

Another recurring strategy that was applied in many ways throughout the LDBP is an approach to creating a new partnership dynamic between EBCE and its customers and stakeholders through mutually beneficial contractual agreements. Incentive offerings such as Enhanced NEM, Dispatchability Adders, Fuel Switching rebates, and Demand Response programs are expected to jumpstart the uptake of new distributed energy resources within EBCE's service area. By coupling such program offerings with smart customer contracting strategies, EBCE can enhance LDBP program outcomes and create new and valuable customer relationships.

In essence, the way that this works is that EBCE offers DER programs and incentives (i.e., a financial adder for NEM exports, a free smart thermostat, a no out-of-pocket coast energy storage system, etc.) that provide value to participating customers through cost savings, enhanced reliability and resiliency, etc. In exchange, EBCE would ask the customer to agree to participate in a Demand Response program that would allow the CCA to better manage peak loads and market risk exposure in ways that reduce overall operating costs and helping the agency maintain low and stable rates for all of its customers. EBCE would then reward customers financially for participating in any related DR load-shedding events.

This fundamentally changes the relationship between EBCE and participating customers, providing new opportunities for customers to engage with and benefit from the CCA. These customers can support the overall health and stability of the agency, help keep costs low for all EBCE customers, and be rewarded for their contributions to achieving the bold vision for local clean energy independence that the LDBP is all about.

These contracting strategies can also extend EBCE's ability promote customer adoption of DER's, including Electric Vehicles, Energy Storage, Demand Response, and Energy Efficiency. This is especially effective when contracting terms are tied to future securitized savings or avoided energy procurement costs that can result from the creation of new DER's able to act as a local hedge against high LMP price spikes on the wholesale market.

One clear example of an application of this concept that offers an emerging best practices model for CCA's is relating to the promotion of Electric Vehicles, which involves providing low- or no-cost smart EV charging equipment to customers. In order to receive the free smart charger customers are required to merely enroll in a Demand Response program, which helps the CCA manage peak loads and keep operating costs low. The CCA then shares some of the cost-savings with the customers who participate in load shed events, creating a true win-win scenario for the CCA and its customers.

This concept can be applied in similar ways to other LDBP program areas to create mutually beneficial partnership dynamics with customers in all rate classes, including low-income (i.e., CARE) customers. Another example of this that is recommended by the LDBP Consultants can be found in the CARE customer Energy Storage giveaway, which would provide no-cost energy storage systems to low-income customers to provide valuable benefits such as cost savings, backup power, and protection from changing TOU rate structures. In return, the customers would allow EBCE to control a portion of the energy storage capacity to help manage load and reduce procurement costs and risks.

New models of rate design are also subject to detailed contractual agreements surrounding voluntary participation in elective rate tariffs such as TOU pilots, two-way Transactive Energy (TE) tariff models, that facilitates peer-to-peer energy exchanges. As new business models around energy use, dispatch, storage evolve legal and regulatory structures will need to be evaluated for compatibility and effectiveness.



Local Energy Programs

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

Benefit Adders & Market Responsive Pricing

A recurring mechanism that is applied to many of the recommended LDBP programs is what is referred to as Community Benefit Adders (CBA's). The concept of CBA's is relatively simple; the LSE identifies the types of community benefits it would like to prioritize and cultivate through local clean energy programming, and then creates and applies "adders" to program designs to incentivize projects with these characteristics.

The CBA concept is quite flexible, and it can be applied in a number of ways. One approach is to provide monetary incentives by applying "financial adders," which increase the price paid for energy supplies or services produced by projects that meet certain community benefit criteria (e.g., paying 10% more per kWh produced by a Feed-in Tariff project that is installed on a government facility). It can also take the form of "bid point adders," which are bonus points in a competitive procurement process (i.e., Request for Proposals, Request for Offers, etc.) awarded to proposals that meet certain community benefit criteria (e.g., bonus points for projects that use local and/or union labor).

The LDBP Consultants detailed approaches to applying the CBA mechanism to a range of LDBP programs, including financial adders for the Enhanced NEM and FIT programs, and bid point adders for Energy Storage and Energy Efficiency proposals. The CBA's developed for the LDBP fall into the following three benefit categories:

- 1) Economic- adders designed to reduce EBCE's operating costs and/or procurement risks, and yield cost savings for EBCE and its customers.
- 2) Environmental- adders that incentivize projects in the built environment (protecting green space), and/or projects that reduce fossil fuel consumption and related emissions.

- 3) Social- adders that incentivize projects that protect and/or benefit low-income customers, as well as adders that support local workforce development and career pathways for disadvantaged community members.

Another effective mechanism to maximize beneficial impacts, reduce financial risks, and constrain the costs of various distributed energy resource (DER) and demand-side management (DSM) programs that has been recommended throughout the LDBP is referred to as Market Responsive Pricing (MRP). This is a tool that can help EBCE ensure that it is getting the desired response to a particular program with lower financial risk, as it provides a structure for lowering (or in some cases increasing) the price for a given incentive or rebate based on the market response to the program.

The MRP mechanism can be applied effectively to rebate and incentive structures, such as those recommended for the Energy Efficiency, Building Electrification, and Transportation Electrification programs. MRP could be applied to the rebate incentive dollar amounts to ensure maximum participation in these valuable programs, while effectively managing the financial risks to the CCA's budget. This works by incrementally stepping down the rebate amounts as specified deployment thresholds are reached. This strategy encourages customers to move quickly before the rebate levels drop, extends the impact of the limited pool of funding available for the incentives, and allows more customers to receive some benefit from the program overall.

The LDBP Consultants also recommended applying the MRP mechanism to the baseline and adder pricing for the recommended Feed-in Tariff program (i.e., \$/kWh generated). The essential feature of MRP is to adjust the initial FIT prices offered over time based on the market uptake. With high interest in a FIT, the offered price adjusts downward for future PPA's. With low market interest in a FIT, the offered price adjusts upward for future PPA's. MRP has emerged as a best practice for accurate price discovery, through ongoing polling of the market, over the duration of an energy procurement program.

Energy Storage

Contracting Strategy

Background

Under the AB 2514 (Skinner) energy storage mandate, EBCE is required to secure energy storage (ES) contracts to cover 1% of its peak load by 2020, with any related construction to be completed by 2023. For EBCE, this represents a relatively sizable requirement that necessitates a concerted Energy Storage Contracting Strategy.

Based on EBCE's Implementation Plan, the agency's peak load at full enrollment is expected to be 1,416 MW, which 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), drive EBCE's operational cost savings, provide valuable cost-saving opportunities for EBCE customers (e.g., vulnerable low-income CARE and Medical Baseline customers).

The recommended LDBP 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, see page 57 for more information) 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, see page 29 for more information).
5. Deploy TOU pilots and customized rate structures that provide incentives for customers to install beneficial energy storage systems.
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 14: 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 throughout the service territory. A thoughtful rate design process that leverages the granular analysis of EBCE's Settlement Quality Meter Data (SQMD) can drive customer participation in LDBP programs creating social, environmental, and economic outcomes for ratepayers and financial benefits for the organization.

This section presents a number of recommendations including capacity development and potential innovative pilot rate structures designed to drive program participation and beneficial outcomes, such as:

- 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 benefits that lower EBCE's procurement costs and risks, enhance reliability, and reduce GHG 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.

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, the LDBP Consultants recommend that EBCE conduct a detailed a Cost of Service (COS) study as a way to identify the most costly loads to serve within the service territory, which will greatly inform the development of customized EBCE rate structures. 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 monitor changing load patterns and dynamic market conditions. By leveraging the COS study findings with the in-house integrated data platform, EBCE staff will be able to track important cost drivers and customer energy consumption patterns, and assess the impact of various rate design decisions on energy consumption patterns over time. This baseline will ultimately inform the design and

implementation of equitable rate structures that fairly allocate costs of service to all EBCE customers.

After one full year of operations and a process of data collection and analysis (facilitated by the COS study), EBCE can begin to implement customized rate structures designed to improve EBCE's operational and financial performance, while protecting vulnerable and disadvantaged customers and incentivizing beneficial energy consumption behavior change across its rate classes.

A few potential pilot rate structures 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 experienced an increase in expensive curtailment, or even paid other regional energy system operators (i.e., the State of Arizona) to take excess solar generation at great cost to California ratepayers. EBCE may consider pursuing a rate design program that can prevent power and economic leakage, mitigate solar curtailment, and offer subsidized or free power to low-income CARE customers in its service territory.

A "CARE Free" program that features a customized TOU rate structure that includes zero-cost usage periods for participating CARE customers, was considered by the LDBP Consultants. In essence the program can help flatten EBCE's load, reduce procurement costs, lower the risk of renewable energy curtailment and offer subsidized or free power to customers that are 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 rate structures are not compatible with CCA billing processes, it is possible for EBCE to provide a pilot project that emulates the PDP program and provides similar value 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 territory-wide load profiles. It is expected that TOU rates will become mandatory rate structures statewide 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 new retail electricity sales revenue for EBCE, and simultaneously reduce tailpipe emissions throughout the service territory.

The LDBP Consultants recommend adopting similar programs informed by 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. 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 15.

Illustrative Example: Time-of-use (TOU) Rate-based Incentive

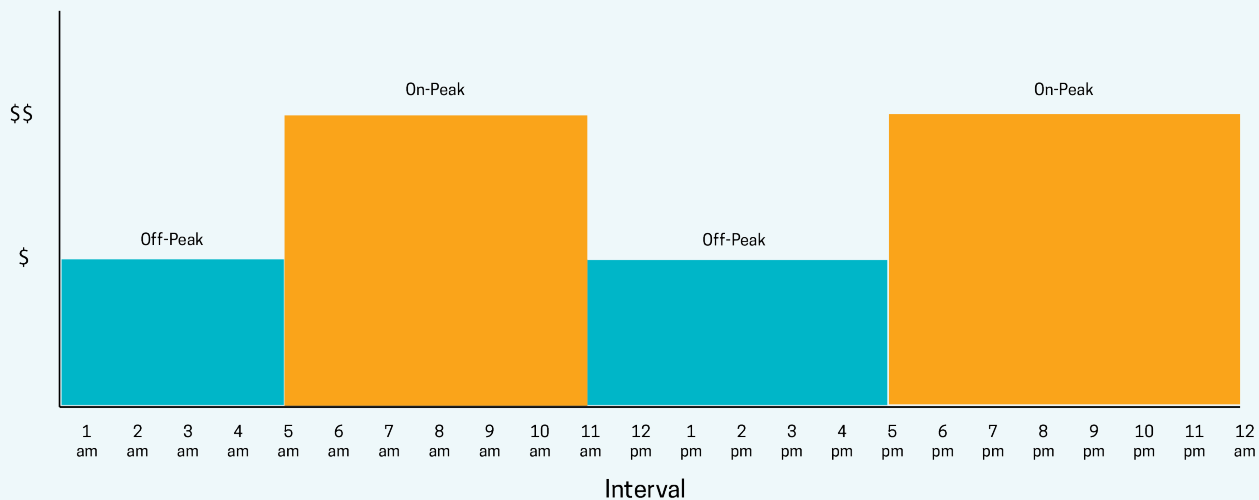


Figure 15: This is an example of a potential non-tiered TOU rate structure that could be offered by EBCE to encourage customers to adopt electric vehicles and energy storage, and use the devices to manage and adjust their charging behavior to avoid peak load times for EBCE, reducing procurement costs and risks. This structure would also encourage charging during peak solar production hours, reducing curtailment risks.

Price Signals and Transactive Energy Models

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 necessary 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 (TE) platforms in the future.

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.

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 that can help reduce EBCE's procurement costs and risk exposure. This can also enable a TE market construct, whereby EBCE customers can trade and sell energy to each other or to the agency, through a digital marketplace platform (i.e., TEMix, LO3, etc.). The rate design and the real-time resource pricing is essential to ensure mutual benefit for EBCE and its customers.

Programmatic Implementation

The LDBP Consultants recommend moving incrementally towards system-wide implementation of customized rate structures by implementing pilot rate designs and building the necessary data systems and infrastructure during Stage 1 of LDBP implementation. It is recommended that EBCE expand successful pilot rate structures during Stage 2, in preparation for broader deployment of customized rate structures in later years.

This incremental approach to implementing custom rate designs will also correspond with the completion of EBCE's current billing service contract, allowing EBCE time to build or contract for the enterprise software tools and/or enhanced billing services needed to efficiently and reliably and accurately bill customers and collect the revenue needed to continue sustainable long-term EBCE operations.

Key Recommendations

1. 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.
2. Conduct a Cost of Service (COS) study to determine how EBCE rate designs can be adjusted to balance and optimize customer savings and CCA financial health.
3. Develop Time-of-use (TOU) and/or Value of Distributed Energy Resource (VDER) pilot rate structures 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, EBCE will need to explore solutions that enable it to build the collateral needed to maintain stable operations and extend relevant 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 that uses Tariff-based repayment is outlined below, which may provide a more inclusive financing model.

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 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 EBCE service territory.

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 ability to repay project cost on their bill.
- 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 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:

1. 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 territory. 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.

2. Develop OBR Offerings for Targeted Energy Efficiency and Fuel Switching

In the mid-term, 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.

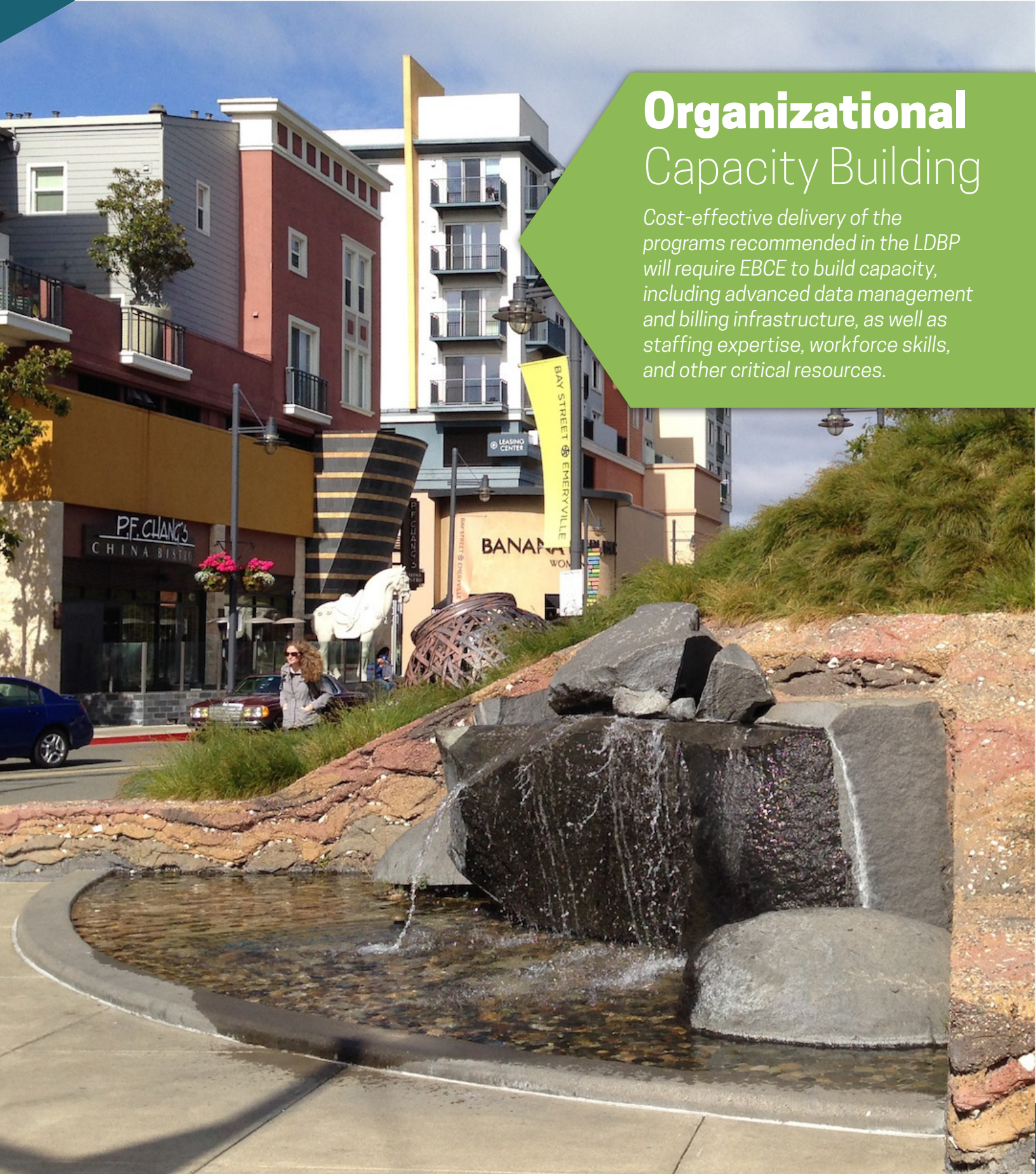
In support of the initial OBR offering, it is recommended that EBCE act as the intermediary between the customer and the financier and use customer bills to repay upfront project costs over time. Through deployment of OBR EBCE can provide favorable customer financing options without needing to take on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

3. Develop In-house OBF Offerings

In the long-term, once a credit rating has been established, it is recommended that EBCE develop in-house On-bill Financing options using its own revenues. It is also recommended that EBCE monitor and engage in the regulatory processes relating to customer financing options, including Tariffed On-bill Financing (i.e., PAYS, Inclusive Financing).

Organizational Capacity Building

Cost-effective delivery of the programs 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 consists of supply side or



Figure 16: 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 career-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 minority and disadvantaged contractors and firms with technical assistance, bonding assistance, training, or other support.

Figure 17: EBCE Local Workforce Development Recommendations.

“push” strategies and demand side or “pull” strategies. “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.



Figure 18: How a Strong Workforce Policy Enhances EBCE's Goals.

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 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, Berkeley, Hayward, Oakland, 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

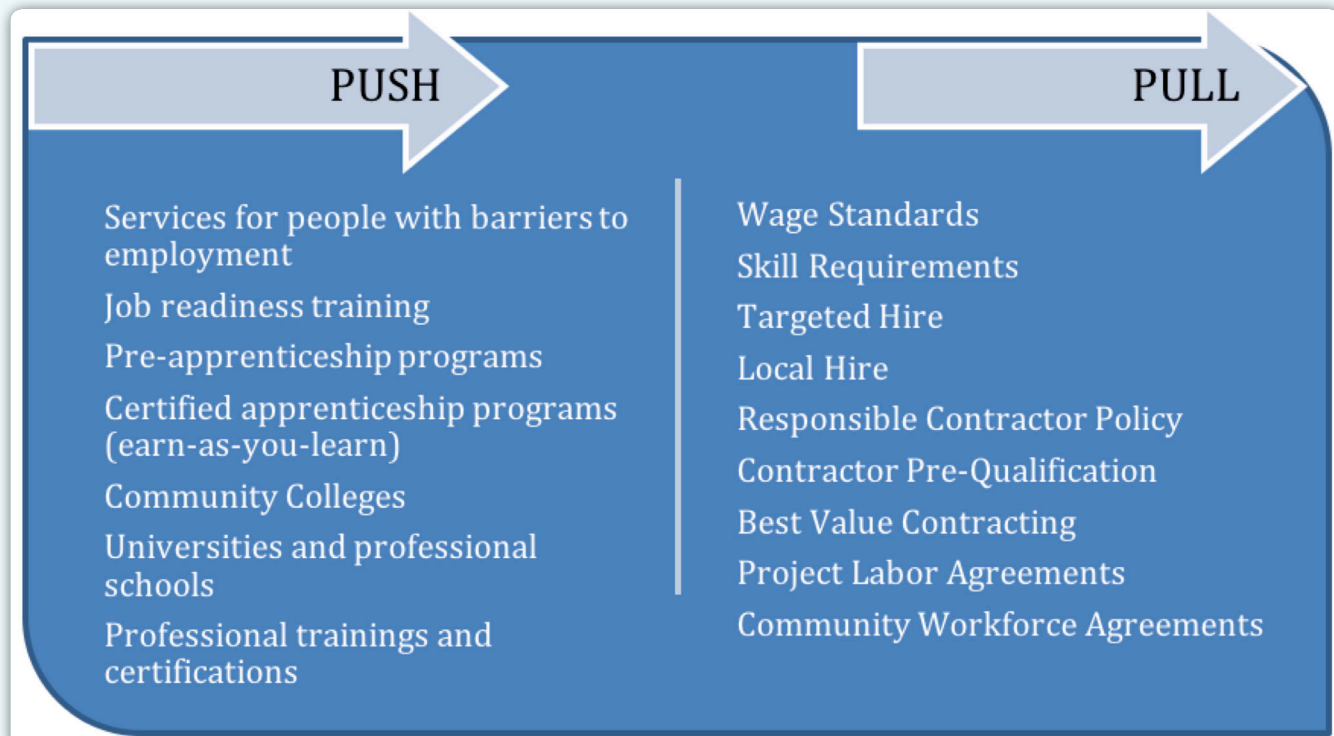


Figure 19: Push and Pull Workforce Development Components.

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

help EBCE meet its transformative goals as an energy provider in California.

It is recommended that EBCE 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 ensures 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 to create 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 County-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 EBCE 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 and pre-apprenticeship or apprenticeship programs.

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

- Partner with programs utilizing the Multi-Craft Core Curriculum (MC3), ensuring 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 MC3.
- Provide program funding to pre-apprenticeship programs in Alameda County using MC3. 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. (Note- EBCE acknowledges that volunteers can play a productive role in career training programs (e.g., GRID Alternatives), and this does not preclude EBCE from working with responsible workforce development partners.



Figure 21: 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 territory. However, these assets will be distributed across ownership models and geographic location, and thus may prove difficult to coordinate to create meaningful outcomes. As a result, aggregation of these distributed resources into a VPP has the potential to 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 emissions reductions and reduced strain on the transmission and distribution infrastructure. This would rely on an integrated data platform and sophisticated enterprise software that is actively monitoring market conditions, weather data, and 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 its daily energy needs into price signals that notify participating customers of opportunities to 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 Consultants believe that VPP platforms will be utilized by California CCA's in the future, it is also important to understand that the market is still maturing and undergoing change. As a result, it is recommended that in the near-term EBCE closely monitor VPP market development and the outcomes of existing VPP pilot projects. It is also recommended that EBCE establish a dialog with VPP technology and service providers, and explore opportunities for near-term pilot projects using grant funding 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) contractual terms that will allow EBCE to aggregate those resources in the mid-term using VPP technologies.

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 procurement practices and strategies of Investor-owned Utilities (IOU's), Publicly-owned Utilities (POU's), and more recently Load Serving Entities (LSE'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 LSE'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 strategies and local clean energy resources for integration with EBCE's IRP.

IRP's comprise 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. Load-serving entities (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 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 7, 2015, and among other things it establishes a goal of reducing GHG emissions to 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 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 ten-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.
- Creating a diversified procurement portfolio with short- and long-term products
- Meeting 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 exceeding RPS standards.
- Preventing economic leakage (keeping money local).
- Encouraging 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) will be 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 agency are likely to increase along with the volume of Distributed Energy Resource (DER) owners seeking to be placed on specialized EBCE rate structures and to 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, and fiscal health. If left unmanaged, systemic risk has the potential to derail operations and prevent the agency from reaching its short-term, mid-term, and long-term planning goals, as well as 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 territory.

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. 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 incentives 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 management of opt-out risk. Opt-out risk can result from misalignment between EBCE customers' service expectations and their rates or availability of programs and services.
- **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:

1. 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).

2. Energy 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.

3. Resource Adequacy 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).



Community 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.
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 outcomes and ultimately competitiveness in the Community Choice Aggregation 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 community 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), and 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, community 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, workers, etc.), 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, and use 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 regarding public reporting on EBCE operations, energy portfolio, and future goals and plans:

GHG Intensity

- Due to the importance of this information to both EBCE stakeholders and the agency itself, the LDBP Consultants recommend adopting 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 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 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 reported on the website that provides more details and context.

Reporting this information every year and following these guidelines is an efficient, yet effective way for EBCE to communicate key information to the customers and communities it serves. 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. 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 its 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.

Key Recommendations

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

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

Local Permitting Standardization

It is recommended that EBCE focus on permit standardizations in the residential small rooftop

sector. According to a 2013 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 the county.
- 1 jurisdiction to serve as convener and to drive the process (Note- this 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 Consultants recommend modifying the permit fee structure for larger solar installations by:

- Basing the fee on cost recovery or the actual cost to administer the permit.
- 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.

If a valuation-based scale is to be used, implement a “cap” or ceiling on the fee amount in accordance with the following limits.

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 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

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 ECAP and a set of public comments on these policies. The end result of such a process would likely be to finalize the Amendment to the ECAP. 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. 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 for those arrays requiring detailed review.
3. Establish “renewable energy zones” 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.

Alameda County 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. Alameda County’s hotspot 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.
- 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 EBCE staff.



Leveraging Local Leadership

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

Figure 22: The Joint Bioenergy Institute (JBEI) in Emeryville, CA is led by the Berkeley-based Lawrence Berkeley National Laboratory (LBNL).

Local 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, Lawrence Berkeley National Laboratory (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 relatively 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.



Figure 23: 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 24: 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.



Community Advocacy: The East Bay Clean Power Alliance

Advocacy for local energy development has a long history in Alameda County, and several organizations and projects have been hard at work to innovate and scale local energy solutions. The following organizations and projects stand as examples of the innovative clean energy leadership in the East Bay.

The establishment of East Bay Community Energy (EBCE) and its focus on the development of local renewable energy resources to achieve economic, environmental, and social justice benefits for East Bay communities is a product of many years of community advocacy. The East Bay Clean Power Alliance (EBCPA), founded in 2014, has been instrumental in the creation and subsequent shaping of the county's Community Choice Aggregation program. The Alliance's


advocacy is the continuation of efforts begun by the Local Clean Energy Alliance ten years earlier, later joined by the Oakland Climate Action Coalition, Sierra Club, a number of environmental justice organizations, and labor organizations.

The centrality of local energy resource development in the East Bay Clean Power Alliance's vision of Community Choice was pivotal to the push for a Local Development Business Plan to guide the efforts of EBCE. In 2016, the East Bay Clean Power Alliance and the Alameda Labor Council successfully advocated for language in the founding Joint Powers Agreement that mandated the current Local Development Business Plan as a framework for meeting the community benefit goals of EBCE.

The more than 30 community-based organizations of the East Bay Clean Power Alliance have continued to play an important role in shaping East Bay Community Energy, directly representing community interests in the LDBP process and throughout the formation and establishment of EBCE's Community Advisory Committee. This community advocacy is a unique characteristic of EBCE and responsible for the community-focused nature of many of the LDBP recommendations.

Summary

These are just a few examples of the outstanding clean energy leadership that exists in EBCE's service territory, which have shown how local economic benefits and energy outcomes can go hand in hand. The advocacy, talent, and services needed to 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.



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 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.

Of the many community benefit investment options/strategies presented in the LDBP and its underlying background documents, the job and labor income impacts were analyzed for the following:

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 Consultants 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 and 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 wind turbine are limited to the installation costs, as well as ongoing annual impacts related to maintenance.

To conduct the analysis, an IMPLAN model was built that is specific to Alameda County. The jobs identified are countywide, 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 ongoing 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 ongoing 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 Consultants 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 ongoing 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 direct investment by EBCE and private investment. This underlying document to the LDBP provides a more detailed accounting of methodologies and findings.

The largest direct and total job impacts will result from Energy Efficiency, Fuel Switching, and Demand Response. All of these programs generate a sizeable number of one-time installation jobs. In addition, NEM and FIT generate a sizeable number of total jobs per million dollars of investment, including direct installation jobs as well as local supplier jobs.

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 Solar and Wind, 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 25. Key findings to facilitate comparison include a Job Creation Metric per \$1.0



million of gross investment and per \$1.0 million of Net Cost to EBCE (i.e., Net EBCE Investment). The jobs referenced comprise the annual number of FTE jobs created per million dollars of investment over the period of active 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 total job impacts per \$1.0 million in initial investment, regardless of the entity making the investment (i.e., Gross Job Creation Metric), is Energy Efficiency programs, which has a high gross job creation metric resulting from installation activity at 10.5 jobs per \$1 million invested. This is followed by Building Electrification (aka-Natural Gas Fuel Switching) programs, with a significant number of jobs from installation activity at 7.5 total jobs per \$1 million invested. These are followed by Demand Response, FIT (solar), NEM, Retail Electricity Rate Reductions, Direct Investment, and Utility-Scale Solar, all with 4.6 or more total local jobs created per \$1.0 million invested. The remaining programs all have 2.0 or lower estimated job generation rates per \$1.0 million invested. Notably, the job impacts associated with Reduced Retail Electricity Rates comprise induced jobs associated with customer

savings on energy costs, and will not be of the same caliber (skills base and earnings) as the direct jobs created by private or EBCE program investments.

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	Direct Annual Job Creation per \$1,000,000 Invested		Total Annual Job Creation per \$1,000,000 Invested (2)		Additional GHG Benefits
	Direct Job Hourly Wage	Gross Investment	Net EBCE Investment	Gross Investment	Net EBCE Investment	
1. Feed-in Tariff						
Solar-Based	\$41.83	3.0	6.8	5.2	11.7	No Replaces other solar
Wind-Based	\$39.63	1.2	2.0	1.9	3.2	No Replaces other wind
2. Net Energy Metering	\$25.00 - \$41.83	2.8	27.6	5.0	50.1	No Replaces other solar/wind
3. Direct Investment in Local Solar/Wind	\$45.00	2.9	NR	4.6	NR	No Replaces other solar/wind
4. Energy Efficiency Programs	\$25.00 - \$49.08	5.8	NR	10.5	NR	Yes Reduces need for natural gas peaker plants
5. Energy Storage Systems	\$25.00 - \$47.56	1.2	NR	1.9	NR	Yes Reduces need for natural gas peaker plants
6. Demand Response Programs	\$25.00 - \$47.56	4.0	NR	6.8	NR	Yes Reduces need for natural gas peaker plants
7. Electric Vehicle Incentives	\$34.11 - \$42.43	1.2	18.4	1.9	28.7	Yes Replaces gasoline/diesel
8. Building Electrification Programs (Natural Gas Fuel Switching)	\$25.00	4.3	22.5	7.5	39.5	Yes Replaces natural gas appliances
9a. Utility-Scale Solar	\$41.83	2.9	NR	4.6	NR	No
9b. Utility-Scale Wind	\$39.63	0.8	NR	1.4	NR	Replaces other solar/wind
10. Reduced Retail Electricity Rates	NA	0.0	0.0	4.8	4.8	No
<p>Note: NR designated Not Relevant, as EBCE will not incur a significant capital investment.</p> <p>(1) These programs comprise options/strategies recommended by the LDBP Consultant Team.</p> <p>(2) This is a metric unique to this analysis that measures direct and total (direct+ indirect+ induced) jobs created per year, 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.</p>						

Figure 25: 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 of local DER's can lead to direct environmental benefit, such as greenhouse gas (GHG) emission and air pollutant reduction. The LDBP Consultants 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 to offset the need for expensive and environmentally damaging fossil fuel combustion.

Figure 26 provides an overview of the benefits provided by each of the local energy programs recommended in the LDBP, including indication of if the program was determined to achieve 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 LOCAL DEVELOPMENT BUSINESS PLAN OPTIONS AND STRATEGIES BY PROGRAM TYPOLOGY				
Option/Strategy	Program Typologies			
	Local Energy Generation	Energy Load Shift	Customer Savings	Additional GHG Benefit (1)
1. Enhanced FIT <i>(Solar, Wind, Energy Storage)</i>	X			
2. Enhanced NEM <i>(Solar, Wind, Energy Storage)</i>	X		X	
3. Direct Investment <i>(Design Build & Own: Solar, Wind, Energy Storage)</i>	X			
4. Energy Efficiency		X	X	X
5. Energy Storage Systems		X	X	X
6. Demand Response		X	X	X
7. Transportation Electrification <i>(Electric Vehicles)</i>		X		X
8. Building Electrification <i>(Natural Gas Fuel Switching)</i>		X		X
9. Utility-scale Solar and Wind <i>(Power Purchase Agreements)</i>	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 26: 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 to help guide the development of the 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 *LDBP Scenario Analysis Report* underlying background document.

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.

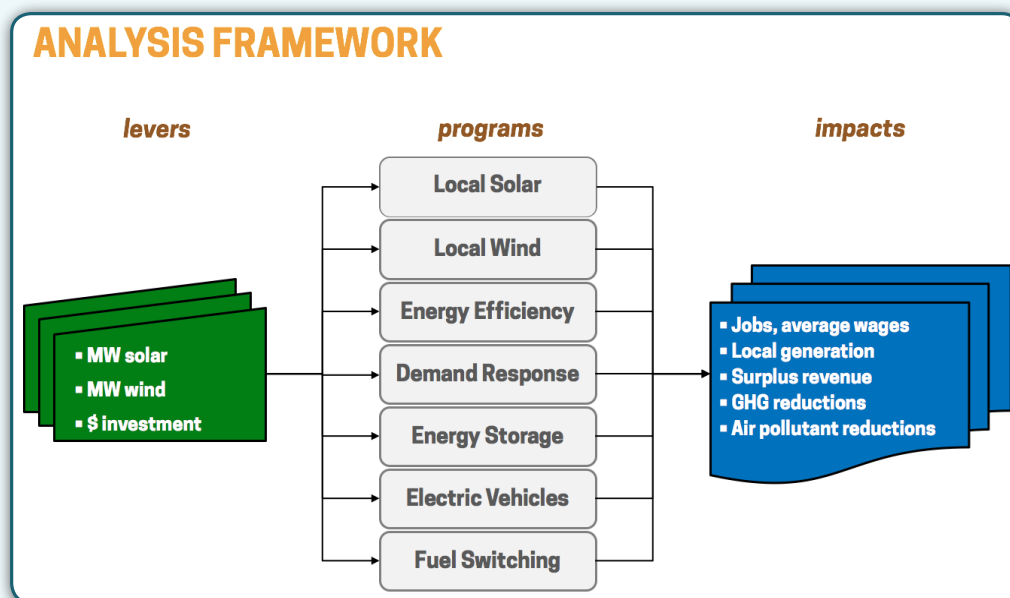


Figure 27: Shows the overall analysis framework, including Programs, Program Inputs ("levers"), and Scenario Model Outputs ("impacts").

COMPARE MULTIPLE SCENARIOS

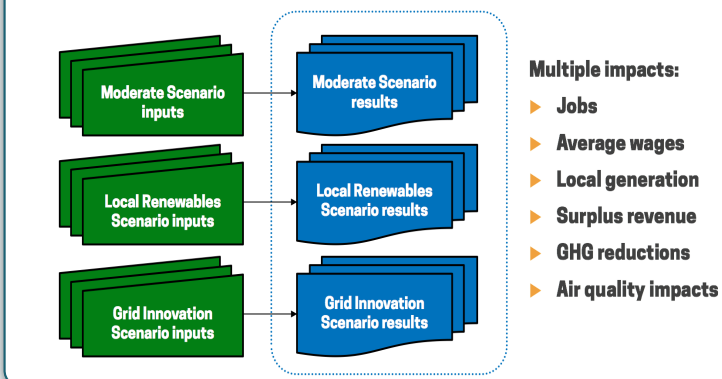


Figure 28: Illustrates the “apples-to-apples” comparison of multiple scenarios that was facilitated by the Scenario Analysis Tool.

LOCAL SOLAR EXAMPLE

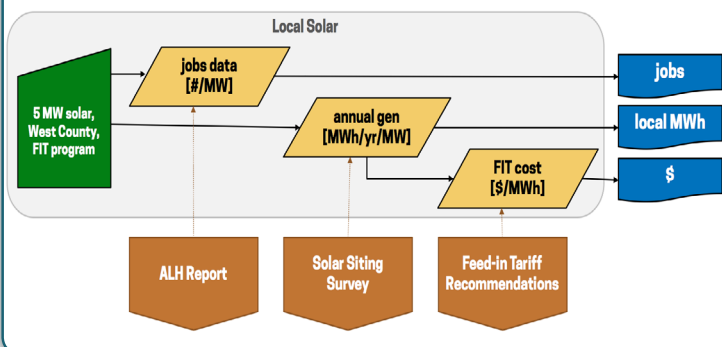


Figure 29: Provides an illustrative example of a program “module” within the Scenario Analysis Tool, including the range of inputs, data sources, and analytical outputs possible within this module.

LDBP Performance Metrics

The LDBP Consultants developed a set of impact metrics to estimate and track the performance of LDBP programs and pilot projects in a number of categories, and the Scenario Analysis tool was designed to capture those metrics and estimate outcomes under user definable scenarios (see Figure 30). The initial analysis helped inform the development of the LDBP, and subsequent analyses can be conducted to gauge the pros and cons of various investment options and program design parameters. This approach to using the tool underpins the ongoing, iterative LDBP implementation process recommended by the LDBP Consultants. It is important to note that additional performance metrics developed by EBCE can be added to the LDBP Scenario Analysis tool, and the existing impact metrics can even be modified as deemed necessary in the future.

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.

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 in the 8-year time period from 2018 to 2025 (or an average of ~400 FTE's per year). 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

Category	Performance Metric (Units)
Direct Annual Jobs Created	Full-time Equivalents (FTE's)
Labor Wage Impacts	Direct Job Wages (\$'s/hour)
Fiscal Impacts	Costs (\$'s spent), Cost Savings (\$'s saved), Surplus Revenue (\$'s/year)
Customer Cost Savings	\$'s saved (Total and by Customer Class)
Local Energy Generation	GWh's Generated per Year
GHG Emission Reductions	Metric Tons of CO ₂ e (MTCO ₂ e) reduced, GHG Intensity (MTCO ₂ e/MWh)
Criteria Air Pollution Reductions	Metric Tons (MT) of Criteria Pollutants reduced

Figure 30: The table provides an overview of the Performance Metrics that the LDBP Scenario Analysis tool is configured to estimate.

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 MTCO₂e 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.

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 (or an average of ~375 FTE's per year). 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 Natural Gas Fuel Switching programs, GHG and air pollutant emission reductions are the same as in the Moderate Scenario: 299,295 MTCO₂e 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, Natural Gas Fuel Switching, and Electric Vehicles). To accommodate higher initial costs, implementation of the Energy Efficiency, Demand Response, Energy Storage, and Natural Gas 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 (or an average of ~470

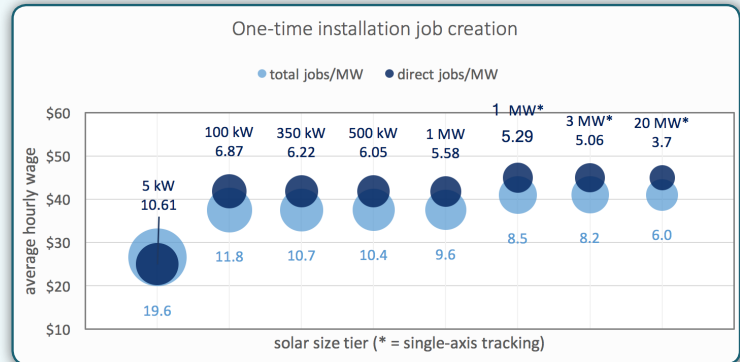


Figure 31: One-time installation jobs per MW by solar size tier.

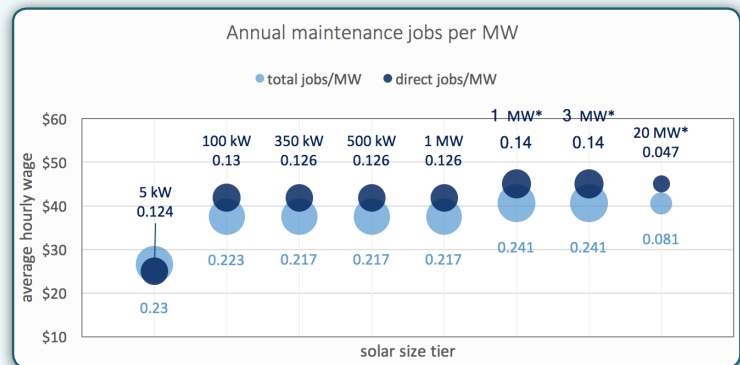


Figure 32: Annual maintenance jobs per MW by solar size tier.

FTE's per year). 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 MTCO₂e 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 comes at a premium of \$16 to \$45 per MWh.

The Municipal FIT (MuniFIT) 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 31 and 32 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 levels. Size tiers with asterisks (*) indicate single-axis tracking systems.

In regard 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 improve 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, and Natural Gas Fuel Switching programs 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 qualitative impacts of all of these programs that cannot be quantified.

Ongoing Scenario Analysis

The Local Development Business Plan is not a static plan, but rather is a living document that supports the ongoing process of analyzing, implementing, and evaluating local development

programs in EBCE's service territory. This plan covers the first five years of EBCE's operations, and demonstrates a strong commitment to local development, innovation, and community benefit. Local development, however, will continue over the long-term and EBCE needs a tool that can support ongoing 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, the EBCE CAC, and the community 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.

The LDBP Consultants recommend using the tools, frameworks, and processes developed for the LDBP to facilitate an ongoing process of refining LDBP program designs, prioritization of local development 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 Working Group will be responsible for setting and advancing the agenda and leading future community engagements. The LDBP Consultants also recommend that this be an open, inclusive, and transparent public process, and that the EBCE community be engaged in the process to build upon the foundation of community stakeholder engagement laid by the LDBP development process.

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 is to provide a high-level summary of the process used by the LDBP Consultants 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.

EBCE's projected surplus net revenues present an opportunity to make investments with the potential to yield powerful economic, environmental, and social benefit. However, in a region as diverse as the EBCE's service territory, there will be differences of opinion and prioritization on how the agency 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 programs 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 agency 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 Consultants strongly suggest that this process be seen as a first step. EBCE Board, staff, and Community Advisory Committee 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 process.



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 LDBP detailed in Figure 33 is designed to support an aggressive roll-out of LDBP programs and pilot projects 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, customer engagement, and program tracking capabilities needed to implement LDBP programs effectively.

Also appearing during this Launch phase, are a broad set of defined Early Actions that are to be implemented during Stage 1 of LDBP implementation, including: an Enhanced NEM

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.

EBCE staff will prepare a budget and implementation plan for each of the listed programs and pilot projects included in the Stage 1 section prior to initiating implementation. Staff will also prepare annual progress reports to keep the Board and community apprised of outcomes.

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. The mid-term assessment is intended to be more rigorous than the annual

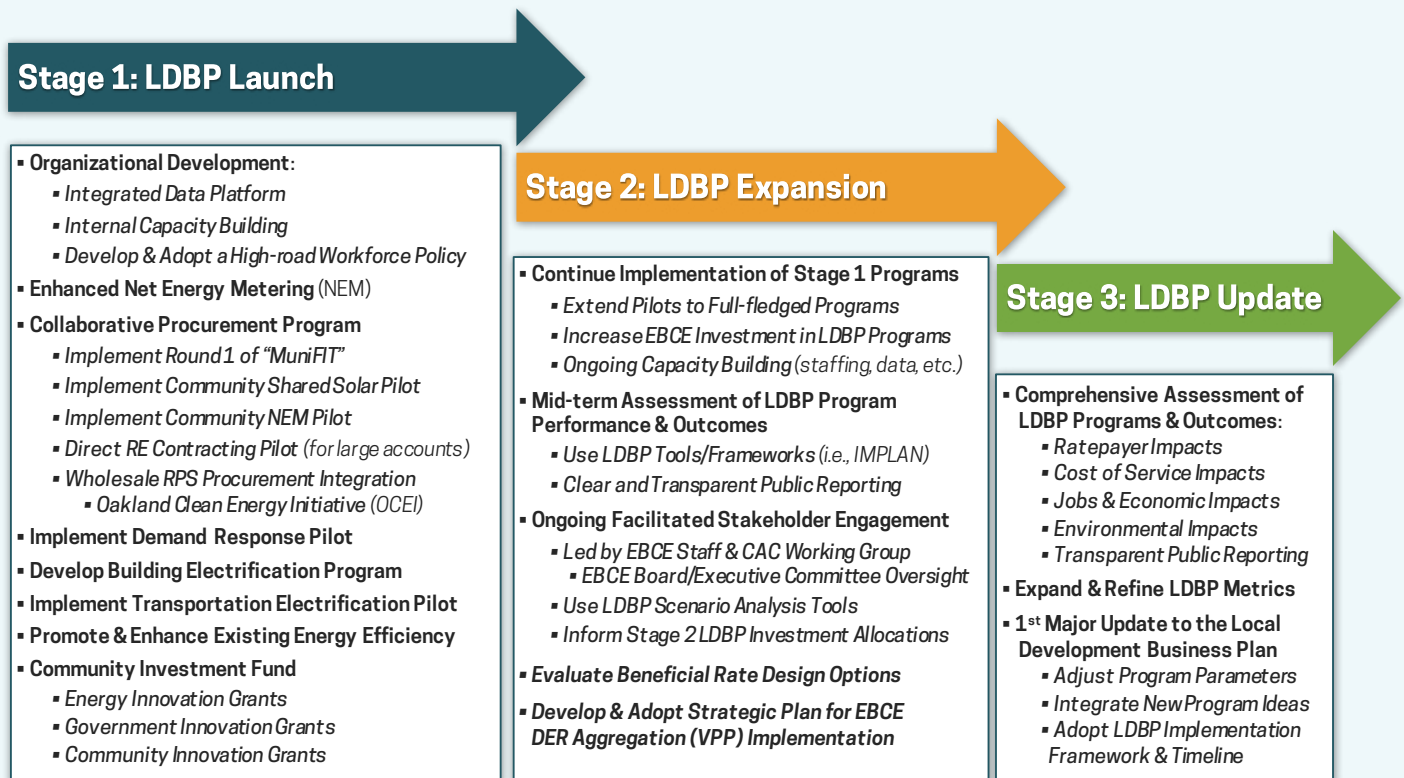


Figure 33: Recommended implementation timeline for the Local Development Business Plan in 3 stages over the first 5 years of EBCE operations.

progress reports, and thus it will be more staffing and resource intensive exercise. The robust, data-driven LDBP community stakeholder engagement is also extended into Stage 2, to provide transparency and to seek community input to support investment allocations as EBCE's net surplus revenues increase.

Stage 1 pilot projects can be evaluated, refined, and launched as full programs during Stage 2. It is also during this period of time that EBCE will seek to establish a credit rating, which would allow the agency 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- LDBP 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 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 to support the refinement of program design parameters and integration of new ideas.

Finally, the first major update to the 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 the diverse East Bay community. 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 community 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. 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 pilot project 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 pilot projects, incentives and adders, and collaborative partnerships with customers and the community, 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 practices in the emerging Community Choice Aggregation industry.

Glossary

of Key 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 includes 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., inverters, conduit, etc.).

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 community 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 in California.

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.

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

Community Choice Aggregator (CCA): A community-focused government energy services agency classified as a Load Serving Entity (LSE)—typically governed by a Joint Powers Authority comprising municipal governments—that provides retail choice and beneficial energy services to customers within a defined service territory (aka- Community Choice Energy, or CCE).

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

Cost of Service (COS): The total amount that must be collected in rates for the utility or Load Serving Entity to recover its costs and be financially sustainable.

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 software, and/or fuel switching measures.

Distributed Energy Resources (DER's): Energy resources distributed across multiple owners, organizations, often comprising 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 process that enables 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 of stored potential energy (i.e., fly wheel).

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.

Load Serving Entity (LSE): An entity that has been granted authority by state or local law, regulation or franchise to provide electric service to end-users and wholesale customers (Note-Community Choice Aggregators are LSE's).

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.

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.

Metric Tons of Carbon Dioxide Equivalent (MTCO₂e): 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. The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by its associated global warming potential GWP.

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 (IOU) providing retail and wholesale energy services in Northern California.

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.

Photovoltaic (PV): Solar energy generation technology.

Pilot project: A small scale preliminary program (or project) conducted in order to evaluate feasibility, time, cost, adverse events, and improve upon the study design prior to performance of a full-scale programmatic approach.

Power 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 that receive their generation services from another provider (i.e., a CCA).

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.

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

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

Renewable Portfolio Standard (RPS): A requirement setting a utility's renewable content standard.

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

Settlement Quality Meter Data (SQMD): Highly accurate ("investment grade") meter data that has been cleaned of errors and submitted to CAISO for final invoice settlement.

Stakeholder: Group, organization or person who has a stake that can be affected by the organization's objectives, policies and actions.

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 comprising an aggregation of distributed energy resources, allowing for remote control ("dispatch") of the energy functions and attributes of those resources.

Index of Underlying Background LDBP Documents

The complete body of work that comprises the LDBP includes dozens of underlying background documents, which contain the detailed analyses, findings, methodologies, formulas, assumptions, source references, citations, case studies, examples, and more. These documents are published in their entirety, and are meant to provide the full depth of material produced for the LDBP project for those who wish to delve deeper into the technical aspects and analysis that underpin the final Plan.

These underlying background documents are listed in alphabetical order below, and they can be accessed and downloaded from the EBCE Local Development Business Plan website here: <https://ebce.org/local-development-business-plan/>.

- **Agency As Developer Strategy**
- **Analysis of Locational Benefit Factors**
- **Analysis of Risks and Mitigations**
- **Capacity Building Recommendations**
- **Considerations for Local Approvals**
- **Energy Efficiency Assessment**
- **Energy Storage Contracting Strategy Recommendations**
- **Enhancing Long-term Stability and Reliability**
- **Feed-in Tariff Design Recommendations**
- **Demand Response Assessment**
- **Illustrative Jobs, Labor Income, and Financial Impacts Report**
- **Integrating LDBP Goals with EBCE's Integrated Resource Plan**
- **Integration of DER Development with Procurement and Scheduling**
- **Levelized Cost of Energy Analysis**
- **Net Metering Strategy Recommendations**
- **New Generation**
- **Opportunities for Natural Gas Fuel Switching**
- **Opportunities for Transportation Electrification**
- **Recommendations for Clear and Transparent Reporting**
- **Scenario Analysis Report**
- **Solar Siting Survey Summary Report**
- **Wind Siting Survey Report**
- **Workforce Policy Recommendations**

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