



Notes regarding submitting comments on this Draft Work Product:

Comments are Due April 20, 2018.

Comments shall be no longer than 5 pages.

Comments should be submitted to LDBPcomments@ebce.org

Risks and Mitigation Strategies

for

East Bay Community Energy

Prepared by

Optony Inc.

2855 Kifer Road Suite 201

Santa Clara, CA 95051

www.optonyusa.com

March 2018

TABLE OF CONTENTS

Table of Contents	2
Introduction	3
Summary of Risks and Mitigation Strategies.....	4
Volumetric Risk	5
Supplier Risk.....	7
Reputation Risk	7
Model Risk.....	8
Operation Risk.....	9
Market Risk	9
Regulatory Risk.....	10
Financial Risk.....	11
Conclusion	13
References.....	14

INTRODUCTION

As EBCE begins, operational risks will be encountered that bring market, political, or business uncertainty into the picture. These risks can affect EBCE's business model, procurement practices, fiscal health, and if severe enough they can have a negative impact on customer rates and impact EBCE's ability to achieve its mission. If unmanaged, systemic risk has the potential to derail operations, and prevent the organization from reaching its short-term, mid-term, and long-term planning goals. Risk can take on many forms and appear as either a result of internal practices or external forces. Regulation, competition, financial performance, and technological or business innovation within California's energy system can all create risk that if unmanaged can impact EBCE's long-term stability and reliability.

EBCE recently adopted Energy Risk Management (ERM) policies and regulations which *"acts to identify the risks associated with the procurement of power supply, identify those responsible for administering the various elements of the risk management policy from procurement operations to oversight, and set policy parameters for managing risk associated with procuring and hedging the power supply portfolio."*¹ The contents of the document highlight essential considerations and operating practices that will support successful implementation of EBCE's Local Development Business Plan (LDBP), and enhance EBCE's long term stability and reliability as an organization by further reducing exposure to volumetric, price, and counterparty credit risks.

While the ERM is comprehensive and highlights both internal and external risk, it is the recommendation of the LDBP team that risk planning (under the direction of the Risk Oversight Committee) includes consideration of risk management services that can be effectively provided by distributed energy resources (DERs) such as energy storage, demand response, and load shaping and shifting programs. Specifically, DERs with dispatchable capacity have the potential to provide energy traders, portfolio managers, and scheduling coordinators with local resource flexibility that can be used to optimize EBCE's coverage ratio and minimize the risks of costly imbalance fees and volatile locational marginal prices (LMP) on the Real Time (RT) market. By following the foundation laid in EBCE's ERM documents and working to consider the role of local energy resources for their ability to help mitigate or respond to risk factors, EBCE can create conditions that will support the development of strong reserve accounts, allow EBCE to establish an investment grade credit rating, balance environmental considerations and cost effectiveness within their energy mix, maintain a low cost of service (COS), and ultimately stabilize rates and dampen year-to-year variability in procurement costs.

¹ Source: EBCE. February 7, 2018. *Staff report Item 10 Energy Risk Management Policies and Regulations*. Retrieved from: <https://ebce.org/meetings/board-of-directors-meeting-2718/>

SUMMARY OF RISKS AND MITIGATION STRATEGIES

Risk	Mitigation Strategies
Volumetric Risk <ul style="list-style-type: none"> • Power Contract Misalignment • Opt out risk • Procurement 	<ul style="list-style-type: none"> • ERM Policy • Contract Portfolio Manager, Healthy Net Open Position (NOP) and management policy • Accurate and robust energy forecasting • Dispatchable DER network • Electrification and Fuel Switching • Demand Response and Dispatchable local energy resources like Energy Storage
Supplier Risk <ul style="list-style-type: none"> • Suppliers and Contractors 	<ul style="list-style-type: none"> • Procurement planning • Qualification assurance process • At-risk or Pay for Performance contracting
Model Risk <ul style="list-style-type: none"> • Rate forecasts • Volumetric Models 	<ul style="list-style-type: none"> • External validation of forecasts • Maintenance of real time, day ahead, monthly, annual, and long term forecasts • Anticipation of variable model results • Information flow across back, mid, and front office
Operational Risk <ul style="list-style-type: none"> • Human Resource and internal staff policy • Leadership and Management 	<ul style="list-style-type: none"> • Training • Regular performance evaluation and HR resources for staff • Organizational culture, prevention of turnover
Market Risk <ul style="list-style-type: none"> • Macro-economic trends • Changing competitive landscape 	<ul style="list-style-type: none"> • Monitoring and evaluation • Maintenance of reserve accounts • Portfolio Diversity • EBCE Asset Ownership
Regulatory Risk <ul style="list-style-type: none"> • PCIA • Public process 	<ul style="list-style-type: none"> • Advocacy and public process participation • Meet or exceed mandates • Coalition building partnering with other CCAs/CalCCA or local stakeholders
Financial Risk, <ul style="list-style-type: none"> • Counterparty Credit Risk • EBCE Credit Rating • Revenues/Expenses 	<ul style="list-style-type: none"> • Credit Enhancement • Collaborative Procurement • Reserve funds • At-Risk Contracting
Reputation Risk <ul style="list-style-type: none"> • Opt-Out Risk • Customer Dissatisfaction 	<ul style="list-style-type: none"> • Customer Service • Provide Expected Programs (NEM, EE, etc.) • Protect Competitive Rates • Economic, social, and environmental development outcomes

Table 1: Summary of Risks and Mitigation Strategies

VOLUMETRIC RISK

Extreme weather events such as storms, heat waves, or other emergency events can all impact the ability to generate power or create variation in the volume of energy resources on the grid at any one time. Variation in the timing or volume of energy available within the electrical system can result in financial uncertainty for Load Serving Entities like EBCE by creating power scarcity that drives wholesale prices up in the real time market. Volumetric variation can also occur as a result of too much renewable generation occurring at a particular time, which can create a mismatch between supply and demand. Excess load events have been a relevant discussion in California as utilities have begun to generate excess power during late afternoon days, leading to the now-famed “Duck Curve,” which has pushed renewable pricing on the CAISO market negative (as in less than \$0/MWh) during some parts of the day.

Without a market for the extra capacity grid operators and power managers may be forced into curtailment, isolating the renewable energy system from the rest of the grid to prevent electrical damage to appliances or grid infrastructure. According to the National Renewable Energy Lab (NREL,) In California, Some RE contracts are compensated for being forced into curtailment, but reliability issues resulting from over generation are not compensated. NREL states, *“Curtailment occurs largely due to congestion or periods of oversupply, and it is expected to increase as additional wind and solar generation are added. At times, the ISO experiences over-generation and minimum generation levels on its inflexible conventional units at night. For solar, the challenge is in the afternoon from 1:00 p.m. to 2:00 p.m. CAISO has undertaken a process to address curtailment due to over-generation and to estimate how much excess generation could be sold to other balancing areas.”*²

Volumetric risk also impacts power procurement and energy contract structuring for Power Purchase Agreements (PPA) and other energy contracts. By using PPAs to lock in energy prices EBCE can reduce its exposure to volumetric risk, but in doing so is making an active decision not to participate in the energy market, which prevents opportunities for capturing returns from timing market purchases of energy.

Volumetric Risk Mitigation

The mitigation of volumetric risk requires full analysis of events that could result in load variability at both a wholesale and local generation level. Doing so will help prevent disruption to service as well as help identify environmental and financial outcomes. The recent contracting of a portfolio manager (Northern California Power Agency, or NCPA) will provide opportunities for EBCE to enjoy the benefits of having a service provider that offers an integrated suite of power sector services that include (but are not limited to): long-term power planning, origination, contract management, active power market operations and settlements.³ Portfolio managers typically bring in experience defining Energy Trading and Risk Management (ETRM), and put such comprehensive risk management policies into place prior to beginning energy procurement. An experience portfolio manager like NCPA will be able to provide insight into important aspects of EBCE’s procurement activities (i.e., Net Open Position, Coverage Ratios, Hedging Strategies, etc.), and help define risk tolerances for the real time, day ahead, monthly, annual and long-term energy market.

² NREL. Bird, L., Cochran, J., Wang, X. March, 2014. Wind and Solar Energy Curtailment: Experience and Practices in the United States. Retrieved from: <https://www.nrel.gov/docs/fy14osti/60983.pdf>

³ Advanced Energy Risk Management Services for South Bay Clean Power. July 2017.

Now that a Portfolio manager is contracted, EBCE volumetric management through regular reporting and position tracking is possible. This process will create an informed internal staff and leadership, reducing the likelihood of over or under procurement by aligning consumption and supply needs.

The LDBP recommends that in addition to following ERM policies, EBCE consider the value and impact of local dispatchable assets such as energy storage or demand response programs on procurement, scheduling, and settlement. Doing so can enable energy traders and Portfolio Managers to optimize EBCE's coverage ratio and minimize risks of costly imbalances by giving them flexibility from a diverse network of responsive local distributed resources able to assist in the optimization of EBCE's coverage ratio and day-to-day risk management.

Specifically, recommendations from the LDBP's *Recommendations for Optimizing the Integration of DER Development with Procurement and Scheduling* including the use of PPAs, the development of an integrated data platform, TOU and rate pilots, and a virtual power plant aggregation can all be used to mitigate volumetric risk. Energy storage at a wholesale level can also mitigate curtailment risk, and if paired with large generation assets can increase the combined return on investment.

In addition, defining standard communication flows between EBCE, its portfolio manager, and energy traders (or the front, middle, and back office) can also be used to reduce risk. As a result, the LDBP team recommends the following information exchanges should be considered for exchange between the front middle and back office.

- Daily Financial Model and Energy Load and Supply Forecasts (day ahead of delivery)
- Monthly Net Position Report
- Monthly Pass-through Counterparty Credit Exposure
- Monthly Risk Analysis

Activities to Reduce Volumetric Risk

In addition to the methods described in the ERM EBCE can mitigate volumetric risk by:

- Utilizing dispatchable energy storage systems to shift and offset peak load and mitigate curtailment risks
- Diversifying energy sources and limiting exposure to physical risk
- Using rate incentives and price signals to shape and shift customer demand
- Monitor and adjust for non-regulatory factors driving volumetric uncertainty (e.g. weather)
- Monitor trends in customer onsite generation, economic shifts, and other factors that affect electricity customer volume and composition
- Integrate smart and automatic controls to monitor and respond to live energy needs; including demand response programs backed by an integrated data platform
- Pre-identify populations and communities that will be most at risk in the event of a loss of load event and site backup resources accordingly. For example, at hospitals or emergency response facilities.

VENDOR AND SUPPLIER RISK

Risk may occur as a result of EBCE's relationships with vendors, energy providers, consultants, or other outsourced service providers. Failure on the part of a service provider to deliver on agreed upon scope of work, service, or product delivery may delay EBCE's operations or result in accusations of misallocated funding. Failed delivery has the potential to cause EBCE as well as its partners to lose credibility within the community, or if extreme enough elicit legal repercussions and accusation of fraud.

Supplier Risk Mitigation

Mitigating supplier risk can be addressed through a proactive procurement process that effectively vets and selects providers able to do the job efficiently, cost effectively, and to a high-quality standard. RFPs that include vetting for risk of supplier financial default, bankruptcy, or screens with past customers can work to mitigate supplier risk.

For energy service projects, supplier risk can be reduced through the use of Pay-for-Performance (P4P) contracts that award payment based on realized and verified performance (i.e., load shaping, load reduction, cost savings, etc.). Similarly, leasing assets and paying for services, rather than ownership, may provide the best risk/return mix by minimizing the need for upfront capital while still providing energy benefits through energy as a service models. More detail on P4P contracting can be found in the Capacity Building Section.

Activities to Reduce Vendor and Supplier Risk

- Diversify vendor or procurement sources, and balance short term and long term contracting strategies
- Budget reserves for unexpected costs
- Identify and select Pay-for-Performance energy service models
- Work with vendors able to provide savings as a service and bring in their own financing for product or service implementation
- Develop good contracting practice during the RFP/RFO process by working with EBCE's legal team
- Build off best practice proven to work in other communities/municipalities or CCA programs
- Clearly define tolerable risks, and establish contingency plans
- Material Change Clauses in supplier contracts, which provide a means for temporary price reductions in the event of substantial market changes that could threaten EBCE's fiscal health
- Work with EBCE's 'portfolio manager' to establish procurement practical and risk tolerance strategies
- Define clear scope of service agreements and build in vesting or tiered payment structures for completed work

REPUTATION RISK

EBCE's reputation and brand image play a large role in the retention of customers and prevention of opt out risk. Opt-out risk can result from misalignment between customer's service expectations, their rates, or the programs they benefit from. EBCE's reputation can also be affected by its ability to meet stated economic development and environmental goals through the sourcing established levels of renewable or local power.

Reputation Risk Mitigation

Mitigation of reputation risk can come from EBCE's marketing and education efforts, rate competitiveness with PG&E, and through the offering of expected programs such as Net Energy Metering, Energy Efficiency, Demand Response, and Rate Incentives. With a large customer base transitioning into CCA service reputation risk will be especially important during the initial operations of EBCE.

Activities to Reduce Reputation Risk:

- Offer stable and competitive rates as compared to PG&E
- Offer a suite of beneficial local energy programs designed to reduce customer costs and provide new or expanded markets for the local workforce and energy service providers
- Collaborate with existing program and energy service providers in the area to provide EE and DR programs
- Include education and communicate program activities in program design
- Involve the community in planning, and implementation process

MODEL RISK

Inaccurate financial or energy models can introduce risk to EBCE, and while energy models can provide valuable business insight and help inform decisions about the future often, models used to anticipate future costs of energy procurement and service are liable to either under or overshoot real energy needs and/or actual energy costs. As such, EBCE should assume variability in model accuracy and actively build contingency into financing, purchasing, or business decisions.

Model Risk Mitigation

In the context of energy procurement, mitigation of model risk can be in part be achieved by working with EBCE's Portfolio Manager (NCPA) to quantify tolerable ranges of forecast fluctuation at the real time, day ahead, weekly, monthly, annual, and long term time series. The EBCE ERM references to coverage ratios and open position limits presents a strong start for hedging against model risk. In addition, EBCE's ERM policies define the roles of the back, middle, and front office and constant information and data flow across all points of contact in the power purchasing process will improve information quality and support optimal procurement decisions.

Several CCA risk management polices recommend the use of Monty Carlo Simulation⁴ to create variable scenarios off which the organization can track long term performance under varying risk exposure and causations. Scenario modeling that uses Smart Meter (AMI) data, weather data, and CAISO pricing data or other data inputs recommended as part of the integrated data platform proposed by the LDBP can be used to reflect the impacts of outside event on financial and operation performance. Granular load profiles and locational energy factors such as congestion, micro-climates, variations in energy use patterns, etc. should also be considered as a variable in model analysis especially when modeling local distributed generation. Modeling and evaluating the locational value of solar and storage can also be used to provide a rate basis to support EBCE's ability to avoid high imbalance fees by quantifying the value and quantity of local and dispatchable energy capacity.

⁴ Monte Carlo simulations present possible outcomes from a decisions and quantify the impacts at the extremes and middle outcomes.

Activities to Reduce Model Risk:

- Tie forecasts with front office trading practices and define acceptable margin price within power procurement
- Outsource middle office to qualified portfolio manager and validate forecasts with internal and external support (such as being done with NCPA)
- Create comprehensive Energy and Risk Management (ERM) policies and reporting practices (as EBCE has started in 2018)
- Develop the recommended internal integrated data platform to provide robust market and demand intelligence to EBCE staff, consultants, and vendors

OPERATION RISK

Internal operations and the ability of EBCE's executive team, board, staff, and human resources to meet business obligations play a role in the ability for the CCA to meet its near and long term goals. Internal definition of needed scope, programs, and overall direction of the CCA can impact financial performance and brand image. Staff turnover, dispute, or fraudulent activity can all present risk to long term performance and operations. Operational risk is evaluated further in the Stability and Reliability section of the LDBP.

Operation Risk Mitigation

Integrating strong human resource practices, internal dispute resolution, training, culture, and ongoing performance evaluation and audits can improve organization outcomes and build communication and information flow across organization silos.

Activities to Reduce Operational Risk

- Internal training
- Strong board presence
- Engage community stakeholders
- Establish high quality internal HR services and hiring practices

MARKET RISK

EBCE will operate within a larger regional and state energy market. As a result, variation in the competitiveness of incumbent energy providers on rates, suppliers, contracts, and provided services will present evolving threats and risks to EBCE's operations. Macro-economic trends such as recession, state or federal policies, or changes to the cost of goods needed to maintain operations can impact cash flows and present financial risk. For example, the costs of resources, interest rates, equipment costs, and changing macro-economic trends all have the potential to introduce risk to EBCE's long term performance and service.

Market Risk Mitigation

Management of market risk can be accomplished through tracking and participation in industry discussions at a regulatory level, as well as through careful invoice and settlement validation and regular performance and evaluation of ongoing contracts and procurement practices. Financial impacts from market risk can be offset through maintenance of healthy reserve accounts and the inclusion of a diverse investment strategy for any bankable assets.

Activities to Reduce Market Risk

- Participate in industry reporting and monitoring
- Establish healthy reserve accounts designed to weather macro-economic events such as recession
- Plan for changing customer needs
- Contract with suppliers able to adapt to changing market forces

REGULATORY RISK

Changing policy around generation requirements, rate structures, greenhouse gas emissions, renewable portfolio standards, energy efficiency requirements, and other state goals, targets, or incentive can all introduce risk to EBCE. Policy changes can impact implementation timeline, macroeconomics, and EBCE's planning process. Policy risk can also take the form of public perception changes and their subsequent impact on the public process, especially in regards to municipal or county economic development or energy goals.

Regulatory Risk Mitigation

As mentioned in EBCE's ERM Policies, we recommend that EBCE monitor, and in some cases influence, state and local policies that impact their operations. In the near term special attention should be paid to CPUC proceedings and rate structures around policies like the Power Charge Indifference Adjustment (PCIA)⁵ charge which can place additional costs on CCA customers.

"The Power Charge Indifference Adjustment (PCIA) is an exit fee charged by utilities in California on entities that choose to depart from bundled service of the utility and choose another provider of electricity generation service possible through Direct Access and Community Choice. The stated intent of the PCIA is to make remaining bundled utility customers indifferent to the fact that some customers have partially departed from the utility.

The assumption underlying the exit fee is to keep utilities from losing money. When utilities purchase forward contracts for electricity on behalf of its retail customers, and those customers decide instead to buy their own electricity rather than more expensive utility electricity, state law allows the utility to charge the CCA customers for any loss it might experience from not being able to sell that electricity on the open market. The Pacific Gas & Electric (PG&E) definition of the fee is that the PCIA "ensures that customers who purchase electricity (generation) from non-PG&E suppliers pay their share of generation costs acquired to serve them prior to their departure, [emphasis added] unless otherwise exempt."⁶

Any proceedings that impact rate structures and baseline economics, such as the cost of energy, are all material to EBCE's pursuit of rate competitive, renewable-focused, locally produced energy. Proceedings should be monitored and regularly attended by EBCE policy team members. Both internal and outsourced analysts working to define policy risks should be versed in cost-benefit analysis and able to translate both internal policies as well as external factors into quantifiable and monetized narratives that capture the impacts of proposed or pending policies on EBCE business case.

⁵ Source: CPUC. <http://www.cpuc.ca.gov/cpucblog.aspx?id=6442453784&blogid=1551>

Several PG&E service area CCAs are considering how to manage the risks associated with PCIA charges, and the Center for Climate Protection states that concerns around the fee tend to circulate around two main issues, costs incurred by low-income CARE customers and Rate Shock. Although rules adopted by the California Public Utilities Commission now allow low-income CARE customers to be charged, some contend that it is inappropriate to include CARE customers in the PCIA class that must pay the fee. Sonoma Clean Power (SCP)—who helped lead the CPUC PCIA Working Group that recently delved deeply into the issues surrounding the PCIA—estimates that its customers may ultimately experience a 94% increase in the PCIA.⁷ To address this, SCP suggests a re-examination of the underlying methodology for calculating the fee. SCP further suggests that at the very least, Community Choice agencies should be given more lead time about large increases in order to adequately plan for them. LEAN Energy US has proposed a limit of *“any single increase to no more than 15%.”* EBCE should consider devoting resources to engage with the CPUC PCIA reform proceedings that are currently underway, and working in collaboration with other CCAs to advocate for equitable and practice methodologies for calculating the PCIA and to inform ongoing policy development.

Activities to Reduce Regulatory Risk

Between joining other CCA’s in making arguments that the PCIA adversely impacts CARE, EBCE can hedge for rate shock and policy risk either by lowering their costs of operations, building strong reserves able to absorb price shock, or generating new revenue streams to cover unexpected expenses regardless of their origin. In addition, EBCE should consider the following mitigation activities to minimize policy risk:

- Aim and plan to surpass regulation requirements effectively setting the bar rather than responding to it
- Participate and comment in policy proceedings at the CPUC and State level
- Nurture coalitions and messengers able to make their case for a regulatory environment conducive to CCA operations
- Work with peer CCA staffs to align public relation and policy goals.
- Monitor policy proceedings and rulemaking process
- Nurture relationships with state and local regulators and representatives
- Actively propose policy recommendations and proactively create regulatory tailwinds
- Link legal and policy teams and define common goals
- Quantify and monetize policy risk and incorporate into business models and forecasts

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.

Financial risk can also be paired with all the other drivers of risk outlined above, and a strong risk analysis methodology will take steps to monetize risks in order to priorities and rank mitigation options. For example, counterparty credit risk can affect EBCE’s financial performance should a procured service

⁷ A Community Choice Customer Perspective on the Utility Power Charge Indifference Adjustment, Center for Climate Protection, April 2016

provider not meet contracted obligations. Financial risk is also paired with expectations for return and should EBCE take on projects costs and benefits can be evaluated through risk lens to identify variables that affect financial outcomes.

Financial Risk Mitigation

Financial risk can in part be managed by maintaining appropriate reserve funds and clearly defining investment and return expectations for project or program financing. As the credit worthiness of community choice aggregation models is still being developed EBCE should plan to operate using capital from committed county sources, or gathered from rate revenue during the first years of operation to build healthy reserves. During launch when a credit rating is still being established local energy projects and customer programs are still possible through collaborative procurement with community partners such as large commercial organizations able to offer credit enhancement. Once the market for CCA matures and the models prove reliable cash flows and revenues that can act as collateral for loans EBCE should begin to consider the role of debt service financing or access to capital markets to provide financial backing. Additional information on credit enhancements and credit ratings can be found in the *Recommendations for EBCE Capacity Building* Section of the LDBP.

Activities to Reduce Financial Risk

- Secure multiple sources of funding i.e. Grants, Philanthropy, Bonds, and County/local funds.
- Continue to evaluate terms within EBCES revolving line of credit
- Look for projects or financing sources that have wide margins, or low enough a cost of capital to accommodate for unplanned variation in revenue or expenses
- Build reserve funds for emergency use that can cover operational overhead until new revenues or lines of credit can be secured. Include waterfall features in loan loss reserve funds able to fund new project development
- Clearly define investment and return expectations.
- Build and lock in clear pricing schedules into the procurement of wholesale energy purchase agreements, specifically through the use of PPAs for renewable energy
- Have financials for internal operations and external procurement regularly checked or audited by a third party
- Define needed budget goals, expenses, and revenue needs on a regular basis and continue to refine internal accounting system for tracking the flow of financial resources through the organization

CONCLUSION

It is inevitable that EBCE will encounter risk as it works to procure energy to meet its service area's energy resource needs. However, the implementation and maintenance of robust ERM policies and hedging strategies designed to monitor, evaluate, and ultimately act to reduce the probability or impact of risk factors is a necessary and manageable undertaking for the CCA. In addition, the risk planning process directed by the risk advisory committee can continue to identify opportunities for meeting EBCE's resource and financial needs while simultaneously providing local energy benefits.

In the effort to mitigate risks, local energy resources and, specifically dispatchable assets like demand response and energy storage can play a role in EBCE's ability to respond to market volatility and improve procurement outcomes. Energy efficiency and load shaping services can also help EBCE to shape its demand profile and flatten energy use within the service area. If designed appropriately these activities can lower EBCE's exposure to price shock, grid disruption, or unplanned business expenses that may result from extreme weather events, loss of load, or manmade or natural disaster. Risk policies like those in the ERM will help build resilience into EBCE's operations, and if the ongoing development of risk management protocol incorporate DERs 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.

REFERENCES

1. Center for Climate Protection. April 2016. *A Community Choice Customer Perspective on the Utility Power Charge Indifference Adjustment*. Retrieved from:
<http://www.mcecleanenergy.org/wp-content/uploads/PCIA%20and%20FF%20Commercial.pdf>
2. California Alliance for Community Energy (a case against any PCIA)
<http://cacomunityenergy.org/down-with-exit-fees/>
3. CA Public Utilities Commission Hearing 12/17/15 (PCIA on agenda)
http://www.adminmonitor.com/ca/cpuc/voting_meeting/20151217/
4. CA Public Utilities Commission 2015 Proceeding
<http://delaps1.cpuc.ca.gov/CPUCProceedingLookup/f?p=401:56:5927172616085::NO>
5. CPUC Sets Stage to Increase Equitability of Charges that CCA and Direct Access Customers Pay
<http://www.cpuc.ca.gov/cpucblog.aspx?id=6442453784&blogid=1551>
6. Energy Risk Management Policy, Silicon Valley Clean Energy, May 2017.
7. Lean Energy. *PCIA and its Impact on Community Choice Aggregation FAQ*. Retrieved from:
<http://www.leanenergyus.org/wp-content/uploads/2013/10/PCIA-Info-Sheet.pdf>
8. Marin Clean Energy. PG&E PCIA Rates. Retrieved: https://www.mcecleanenergy.org/wp-content/uploads/2015/11/PCIA_FF_Fees-Residential.pdf
9. NREL. Bird, L., Cochran, J., Wang, X. March, 2014. Wind and Solar Energy Curtailment: Experience and Practices in the United States. Retrieved from:
<https://www.nrel.gov/docs/fy14osti/60983.pdf>
10. Redwood Coast Energy Authority. December 12, 2016. *Energy Risk Management Policy*.
11. SF Chronicle. *PG&E Looking to Raise Fee on Green Energy*. December 12, 2015. Retrieved:
<http://www.sfchronicle.com/bayarea/article/PG-E-looking-to-raise-fee-on-green-energy-6690280.php>
12. Sonoma Clean Power. Billing. Retrieved: <http://sonomacleanpower.org/billing/>
13. South Bay Clean Power Draft Business Plan. Feb 2017. Retrieved:
<https://southbaycleanpower.org/2017/02/17/this-is-our-south-bay-clean-power-business-plan/>
14. South Bay Clean Power. July, 2017. *Advanced Energy Risk Management Services for South Bay Clean Power: Questions & Answers with Five Portfolio Managers*. Retrieved from:
<https://southbaycleanpower.org/smart-cca/our-portfolio-managers-qas/>

About Optony

Optony Inc. is a global research and consulting services firm focused on enabling government and commercial organizations to bridge the gap between clean energy goals and real-world results. Optony's core services offer a systematic approach to planning, implementing, and managing commercial and utility-grade renewable power systems, while simultaneously navigating the dramatic and rapid changes in the solar industry; from emerging technologies and system designs to government incentives and private/public financing options. Leveraging our independence, domain expertise and unique market position, our clients are empowered to make informed decisions that reduce risk, optimize operations, and deliver the greatest long-term return on their solar investments. Based in Silicon Valley, Optony has offices in Santa Clara, Chicago, and Beijing.

For more information, visit www.optonyusa.com