ATTACHMENT A

Standard LSE Plan

Marin Clean Energy

2018 INTEGRATED RESOURCE PLAN

August 1, 2018

Table of Contents

1. Executive Summary

As California's first Community Choice Aggregation ("CCA") program, Marin Clean Energy ("MCE") provides retail electric generation services and complementary energy programs to customers within the municipal boundaries of its member communities (collectively, the "service area"), which include:

- Marin County;
- Napa County;
- Contra Costa County, only the cities of El Cerrito, Lafayette, Richmond, San Pablo, and Walnut Creek; and
- Solano County, only the city of Benicia.

In July 2017, MCE's Board of Directors ("Board") approved inclusion (i.e., membership) of the following Contra Costa County communities and MCE began serving customers in April 2018:

- The cities of Concord, Martinez, Oakley, Pinole, Pittsburg, and San Ramon;
- The towns of Danville and Moraga; and
- The unincorporated areas of Contra Costa County.

MCE Service Area, including expansion in 2018

MCE provides service to more than eighty-five percent of electricity customers within its service area and is the default electric generation provider for any new or relocated customers therein.

As a mission-driven organization, MCE works to reduce greenhouse gas ("GHG") emissions and to expand access to competitively priced renewable energy and energy efficiency ("EE") programs for all customers. With these objectives in mind, MCE plans for and secures commitments from a diverse portfolio of generating resources to reliably serve the electric energy requirements of its customers over the near-, mid-, and long-term planning horizons. This CPUC Integrated Resource Plan ("IRP") documents MCE's compliance with the California Public Utilities Commission ("CPUC") resource planning objectives over the planning period from 2018 through 2030 (the "Planning Period") based upon MCE's public IRP.

Planning Process

Every year, MCE staff updates its public IRP and submits it for approval to MCE's Board or Technical Committee, which includes a subset of MCE Board members. Such approval is made in consideration of applicable regulatory requirements, MCE's resource planning policies, energy market conditions, anticipated changes in electricity sales, planned inclusion of new member communities, ongoing procurement activities, and any other considerations that may affect the manner in which MCE carries out its resource planning activities. This 2018 CPUC IRP reflects information from MCE's 2018 Board approved public IRP which was published in November of 2017 and will be included as an attachment in an update to MCE's 2018 public IRP.

The items outlined below provide an overview of MCE and its planning and procurement strategies which have been adopted by MCE's Board:

- MCE manages a portfolio of power resources to supply a minimum renewable energy content of 57 percent for its Light Green customers. MCE plans to increase its renewable energy content, subject to product availability and rate-related considerations to 80 percent for Light Green customers by 2025. MCE has a long-term goal of supplying 100 percent renewable energy to all of its customers.
- MCE continues to provide its customers with voluntary 100 percent renewable energy service options: Deep Green, which is wholly sourced from various renewable energy projects located in California; and Local Sol, which began supplying participating customers with 100 percent locally sourced (i.e., the supplying generating facilities are located entirely within MCE's service area) solar photovoltaic ("PV") energy in July 2017.
- MCE's energy supply portfolio now includes over sixty contracts with more than fifty-seven energy product suppliers. Through the Planning Period, MCE anticipates continued diversification of its supply portfolio.
- MCE's existing and planned supply commitments throughout the Planning Period will enable MCE to fulfill applicable regulatory mandates and voluntary procurement targets related to renewable, greenhouse gas-free ("GHG-free" or "carbon-free"), and conventional (non-renewable) energy. In particular, MCE has taken important steps to ensure delivery of a reliable, environmentally responsible power supply portfolio, including:
    - Contracting for all projected, state-mandated Renewable Portfolio Standard ("RPS") compliance requirements through 2030;
    - Addressing open renewable energy positions throughout the Planning Period related to MCE's voluntary renewable energy targets (which significantly exceed state-mandated procurement requirements);
    - Addressing conventional energy requirements per MCE's adopted planning guidelines via shorter term contractual commitments that are in place through 2020;
    - Addressing required reserve capacity ("Resource Adequacy" or "RA") and flexible capacity procurement obligations, consistent with applicable compliance mandates, via short-, mid-, and long-term contracts per its contracting guidelines;
    - Increasing energy purchases from new, California-based renewable energy resources throughout the Planning Period;
    - All contracts are evaluated based upon load hedge effectiveness, grid congestion impacts, exposure to negative Locational Marginal Prices ("LMPs"), RA capacity contribution, and Day Ahead vs. Real Time scheduling protocols in order to ensure MCE customers are not subject to any adverse rate impacts; and

    - Finally, in order for MCE rates to be affordable to customers, including disadvantaged customers, any contract under consideration must provide sufficient margin below MCE's portfolio average cost of generation to compensate for any Power Charge Indifference Adjustment ("PCIA").
- MCE continues to provide direct support for the development of local renewable energy projects through the ongoing administration of its Net Energy Metering ("NEM") and Feed-In tariff ("FIT") programs. Notable achievements in this area include the following:
    - In 2017, MCE served approximately 14,700 NEM customers; the smaller-scale renewable generating projects that have been installed by such customers represent more than 128,000 kW (128 MW) of local renewable generating capacity; upon expansion of its service area in 2018, MCE expects to serve nearly 25,000 NEM customers with approximately 340,000 kW (340 MW) of installed, behind-the-meter capacity.
    - MCE is actively considering incentives for NEM customers to install energy storage devices to shift excess generation from customer sited solar installation to super-peak hours of 5PM to 10PM in order to mitigate the steep evening ramp periods.
    - Via partnership with Grid Alternatives, MCE has contributed $155,000 to low-income residential solar installations since 2012; benefiting customers have saved an estimated $1,018,000.
    - In addition to rooftop generating capacity, MCE is planning to develop or purchase energy from 25 MW of locally constructed (within MCE's service area), utility-scale renewable generating capacity by 2021. To this end, MCE has invested staff time and financial resources in various development activities within its service area. For example, Solar One is a 10.5 MW solar PV project in the City of Richmond which achieved commercial operation in December 2017.
    - MCE continues to administer one of California's most generous FIT programs for locally situated, smaller-scale renewable generating resources that supply wholesale electricity to MCE. This program utilizes a standard offer (i.e. non-negotiable) contract that is available on a first-come, first-served basis for up to 45 MW of qualifying renewable energy projects within MCE's service area. Specific terms and conditions for the FIT program, of which approximately 30 MW remain, are available on MCE's website.
- MCE is working toward a long-term goal of offsetting 2 percent of its annual energy and capacity requirements with EE and distributed energy resource ("DER") programs. MCE has received the approval of the CPUC to significantly increase the EE budget for MCE-administered programs while also exploring a number of innovative DER strategies aimed at reducing customer costs and associated GHG emissions. Specific to capacity requirements, MCE's goal is to provide 5 percent of its annual RA capacity via demand response ("DR") programs by the end of the Planning Period.

Integrated Resource Planning: MCE's public IRP and the CPUC's IRP

Since 2012, MCE has developed a voluntary and publicly available IRP in the spirit of transparency into its resource planning objectives. MCE continues to support information sharing with its customers, the public, project developers, and regulators, including the CPUC's IRP effort. However, MCE would like to acknowledge that the tools, models and assumptions provided in the CPUC's IRP proceeding do not align with MCE's tools, procedures and strategies for short-term and long-term resource planning. MCE's voluntary procurement targets continue to exceed state RPS mandates and have achieved California's GHG emission reduction goals. Any volumes, resources, or technologies included as part of this filing that are not yet under contract in MCE's portfolio are for planning purposes only and do not represent a procurement commitment by MCE. MCE recommends that statewide planning processes rely on MCE's

upcoming 2019 IRP, which will be finalized in Q4 2018. In addition to the information provided in this document and the resource templates, MCE's 2019 IRP offers a holistic view of its mission, values, and planning objectives in consideration of statewide mandates as well as local policy requirements.

MCE submits the requested Exhibit A – Standard LSE Plan per the request of the CPUC along with the following documents:

- Completed CPUC Baseline Resource Data Template that includes the RA supply planning assumptions,
- Completed CPUC New Resource Data Template,
- Completed CPUC CNC Calculator for IRP v.1.4.5 for MCE's Conforming Portfolio,
- Completed version of the CPUC CNC Calculator for IRP v.1.4.5 for MCE's Preferred Portfolio.

2. Study Design

Load Assignments for Each Load Serving Entity ("LSE")

On May 11, 2018, MCE filed a motion to change its 2018-2030 load forecast to reflect MCE's recent expansion on April 1, 2018 to include unincorporated Contra Costa County and the cities of Concord, Danville, Martinez, Moraga, Oakley, Pinole, Pittsburg, Richmond, and San Ramon. MCE adjusted its load forecast to reflect the increase of its total energy requirements.

MCE's revised load forecast was approved in R. 16-02-007 "*Administrative Law Judge's Ruling Finalizing Greenhouse Gas Emissions Accounting Methods, Load Forecasts, and Greenhouse Gas Benchmarks for Individual Integrated Resource Plan Filings"* ("ALJ Ruling"). This new load forecast is shown in Table 1 below. Utilizing the revised load forecast, MCE's 2030 GHG Emissions Benchmark was also adjusted to 1.207 MMT based on MCEs 2030 load ratio within PG&E's territory.

Table 1: **MCE's Assigned Load Forecast for IRP (i.e., Managed Retail Sales Forecast)**

Unit	2018	2022	2026	2030
GWh	5,512[1]	5,618	5,858	6,793

Required and Optional Portfolios

MCE has produced one Conforming Portfolio and one Preferred Portfolio for the 2018-2019 CPUC IRP cycle. Both portfolios use the assigned load forecast approved in the ALJ Ruling. MCE uses the LSE-specific 2030 GHG Emissions Benchmark assigned in the ALJ Ruling. MCE used the same supply portfolio assumption inputs for both the Conforming and Preferred Portfolios. The inputs and assumptions as well

[1] MCE used its 2019 forecasted hourly load profile based on actual historic meter data (including Existing Electric Vehicle (EEV) charging and net of Behind the Meter (BTM) solar) as its baseline reference in the Preferred Portfolio to reflect a full year of customer load with its recent April 2018 expansion.

as hourly load shape used to develop the Reference System Portfolio were used in MCE's Conforming Portfolio. The Preferred Portfolio uses MCE's forecasted load shape based on actual historic meter data.

GHG Emissions Benchmark

MCE's assigned emissions benchmark, based on the ALJ Ruling, is 1.207 MMT in 2030. The total emissions attributable to MCE's Conforming Portfolio is 0.809 MMT in 2018 and 0.190 MMT in 2030, both are compliant with MCE's assigned benchmark. MCE's Preferred Portfolio yields 0.773 MMT in 2018 and -0.119 MMT in 2030, both of which are also compliant with MCE's assigned benchmark.

MCE notes that compliance with this benchmark is calculated using the Clean Net Short methodology, which is inconsistent with the California Energy Commission's Power Content Label ("PCL") emissions calculation methodology. The difference in these two emissions calculations is due to differing treatments of emissions associated with contracted RPS qualified resources, conventional specified resources, and unspecified sources. The IRP GHG calculator tool overstates MCE's current GHG intensity as reported in its 2017 PCL in both the Conforming Portfolio and the Preferred Portfolio.

MCE believes that using the CPUC Clean Net Short methodology for resource planning, and a separate California Energy Commission's Power Content Label ("PCL") emissions calculation methodology for reporting actual emissions will be problematic and confusing to customers and will result in higher costs to avoid GHG impacts to MCE's portfolio which is already compliant with the 2039 benchmark.

GHG Accounting in IRP Planning

a. Objectives

MCE's public IRP has four primary purposes:

1. quantify resource needs over the Planning Period;
2. prioritize resource preferences and articulate relevant energy procurement policies;
3. provide guidance to the energy procurement processes undertaken by MCE staff; and
4. communicate MCE's resource planning objectives and framework to the public and key stakeholder groups.

The IRP specifies the energy procurement strategy adopted by MCE's Board and serves as a guideline to MCE staff regarding day-to-day energy planning and procurement activities. The strategy adopted by MCE's Board took into consideration California's mandates for all LSEs, such as the RPS and RA requirements, as well as additional requirements established by SB 350.

MCE policy, established by MCE's founding documents and directed on an ongoing basis by MCE's Board, guides development of its IRP and related procurement activities. MCE's key resource planning policies are as follows:

1. Reduce GHG emissions and other pollutants associated with the electric power sector through increased use of renewable, GHG-free, and low-GHG energy resources.
2. Maintain competitive electric rates and increase control over energy costs through management of a diversified resource portfolio.
3. Benefit the local economy through investments in infrastructure, energy, and workforce development programs within MCE's service area.

4. Help customers reduce energy consumption and electric bills through investment in and administration of enhanced customer EE, cost-effective distributed generation, and other demand-side programs.
5. Enhance system reliability through investment in supply- and demand-side resources.
6. Actively monitor and manage operating and market risks to promote MCE's continued financial strength and stability.
7. Support supplier diversity as permitted by law.

The IRP translates these broad policy objectives into a more specific energy procurement strategy, taking into consideration MCE's projected customer needs and existing resource commitments over the Planning Period.

MCE's 2018 CPUC IRP filing provides the CPUC our Conforming Portfolio and Preferred Portfolio for 2030 and to demonstrate the following:

- MCE has a resource plan to meet its Managed Retail Sales Forecast and Load Shape Forecast pursuant to R. 16-02-007.
- The Conforming Portfolio and Preferred Portfolio are compliant with the 2030 GHG Emissions Benchmark target of 1.2 MMT.
- To convey practical modeling improvements and resource portfolio shaping assumptions for future filings to better align with industry best practice and wholesale markets.

b. Methodology

i. Modeling Tool(s)

To conform with the CPUC's 2018 IRP process, MCE used the tools and templates provided by the CPUC, including:

- The Standard LSE Plan Template [Attachment A]
- Baseline Resource Data Template
- New Resource Data Template
- CPUC GHG Calculator for IRP v.1.4.5
- Load Forecast Pursuant to R. 16-02-007

When developing its own public IRP, MCE uses multiple proprietary modeling and portfolio management tools. These tools include:

- Load and resource balance model
- Pro-forma financial model
- Load and supply visualizer
- Load forecast model

MCE staff has reviewed the RESOLVE model and finds the baseline assumptions to be incompatible with MCE's underlying goals of voluntarily exceeding California's Renewable Portfolio Standard, supporting California Air Resources Board emissions targets, and achieving MCE's more stringent target of a GHG free portfolio. MCE's Preferred Portfolio planning assumptions are centered on the goal of matching hourly deliveries of renewable and carbon free generation to MCE's hourly load shape before contracting for GHG emitting resources. The Clean Net Short methodology does not

properly account for how wholesale energy transactions are scheduled and their associated delivery structures under industry best practices.

The primary difference between MCE's portfolio modeling approach and the RESOLVE model is that MCE does not focus on production cost modeling as the primary objective. MCE prefers to select supply options based first on GHG impacts, secondly on matching CAISO revenue from generation with CAISO load scheduling costs, and then on its experience and forecast of prices offered in the competitive marketplace rather than as determined by a simplified optimization model populated with administratively determined planning assumptions.

ii. Modeling Approach

In accordance with CPUC IRP instructions, MCE developed a Conforming Portfolio using the tools, load shape, supply shapes, and templates provided by the CPUC.

For its public IRP, and its Preferred Portfolio, MCE's modeling process employs a comprehensive, MCE-specific set of considerations, including:

1. A forecast of enrolled customers for its Light Green, Deep Green, and Local Sol programs and their projected aggregate electricity consumption and peak capacity requirements;
2. A forecast of customer count by end-use classification (residential, commercial, etc.);
3. Projections of load modifying impacts such as incremental energy efficiency, behind the meter distributed generation (NEM), and vehicle electrification are added to MCE's baseline electricity and capacity forecast;
4. Board adopted portfolio targets relating to key policy metrics (e.g., renewable energy content, GHG-free energy content, local renewable generation, etc.), MCE quantifies its aggregate requirements for the various energy products, consistent with Board policy and the load forecast;
5. Anticipated energy production and capacity for resources under contract projected forward for the Planning Period;
6. Quantification of net open positions for the various energy and capacity products on various time scales including calendar year, month, hourly and sub-hourly;
7. Resource ability to ensure flexibility and adapt to rapidly changing market dynamics; and
8. Portfolio fit such as load hedge value, relative cost, geographic diversity, Resource Adequacy deliverability and value, and technology diversity, among other considerations.

iii. Assumptions

MCE's Conforming Portfolio and Preferred Portfolio both use the same Managed Retail Sales Forecast. While MCE maintains its own unique view of future renewable energy markets, resource technologies, and scheduling assumptions which may differ from the Commission's assumptions, these assumptions were not directly used in the development of MCE's CPUC IRP. MCE inputted its Managed Retail Sales Forecast into the calculator and the forecast was adjusted using CPUC IRP assumptions to a conforming energy load. This load is significantly higher with the conforming scenario and leads to a larger CNS and GHG emissions intensity factor.

	2018	*2022*	*2026*	*2030*
Conforming Portfolio Energy for Load (GWh)	*6,297*	*6,642*	*7,154*	*8,540*
Preferred Portfolio Energy for Load GWh	*6,169*	*6,174*	*6,159*	*7,083*

GHG Calculator for IRP v.1.4.5 Input Assumptions and General Modeling Improvements

Category	**Conforming Portfolio**	**Preferred Portfolio**
Annual Load Forecast	MCE's Assigned Load Forecast for IRP (i.e., Managed Retail Sales Forecast) Load Forecast pursuant to R. 16-02-007.	MCE's Assigned Load Forecast for IRP (i.e., Managed Retail Sales Forecast) Load Forecast pursuant to R. 16-02-007.
Hourly Load Profile	Provided by CPUC in GHG Calculator for IRP v.1.4.5 Assumes same profile for all LSEs.	Developed internally by MCE using latest metered data and adjusted for BTM and EEV charging and locational trends.
Supply Nameplate Determinations	All annual deliveries were normalized to a nameplate capacity using Resolve capacity factors.	All annual deliveries were normalized to a nameplate capacity using Resolve capacity factors which do not reflect MCE's historic capacity factors.
GHG Emissions Target	1.207 MMT in 2030 per CPUC Benchmark 4/3/18 Order	1.207 MMT in 2030 per CPUC Benchmark 4/3/18 Order
Total GHG Emissions Calculation	.190 MMT in 2030	-.119 MMT in 2030
2018 Resource Supply Plan	All contracted and delivering CEC RPS qualified resources are included in the 2018 supply plan.	All contracted and delivering CEC RPS qualified resources are included in the 2018 supply plan.
IEPR CAISO Load Modifiers	Used the default assumptions	Used the default assumptions
ACS Shaped Supply	There is no input option for ACS shaped supply.	ACS shaped supply used in MCE's custom GHG-Free profile tab. Future calculators should include an option to shape such resources and allow a "specified" emission factor.
Block and Shaped GHG Emitting Supply	There is no input supply option for block and shaped carbon supplies that are more efficient and less carbon intensive than system power.	Future calculators should allow input of block and shaped Specified Source resources that are more efficient and less carbon intensive than system power.

Owned GHG Emitting Resources	The GHG Calculator assumes a base load delivery for any GHG emitting resource. In a clean net short paradigm, GHG emitting resources must be shaped around contracted renewables to reduce GHG impacts. We also note that each Renewable resource type and delivery location has a unique delivery shape while individual GHG emitting resources do not. Furthermore, many GHG emitting resources have higher efficiency and lower "specified" emissions factors that are not captured in the model. All owned GHG emissions are assigned the System emissions factor, effectively socializing any GHG emissions above the system factor to all market participants.	The GHG Calculator assumes a base load delivery for any GHG emitting resource. In a clean net short paradigm, GHG emitting resources must be shaped around contracted renewables to reduce GHG impacts. We also note that each Renewable resource type and delivery location has a unique delivery shape while individual GHG emitting resources do not. Future calculators should allow input of GHG emitting resources that have higher efficiency and lower "specified" emissions factors. All owned GHG emitting resources should be assigned their specified emissions factor instead of socializing any GHG emissions above the system emissions factor.
BTM CHP Emissions Curtailment	The GHG IRP model is not constructed to accommodate curtailment of CHP generation during CAISO over-supplied periods.	The GHG IRP model is not constructed to accommodate curtailment of CHP generation during CAISO over-supplied periods.
BTM PV and Storage	There is no model input for BTM PV with storage which would reduce GHG emissions.	There is no model input for BTM PV with storage which would reduce GHG emissions.
RA RMR/CAM Assumptions	Net RA requirements were forecasted using 2018 PG&E RMR/CAM allocations to MCE.	Net RA requirements were forecasted using 2018 PG&E RMR/CAM allocations to MCE.
NQC/ELCC RA Assumptions	NQC values for solar resources are under stated due to ELCC adjustments.	NQC values for solar resources are under stated due to ELCC adjustments.
Future RA Short Positions	Any future short RA positions will be met with generic resources.	Any future short RA positions will be met with generic resources.

3. Study Results

a. Portfolio Results

MCE is submitting a Conforming Portfolio and a Preferred Portfolio consistent with the resources listed in the Baseline Resource Data Template and in the New Resource Data Template. MCE's 2018 supply portfolio consists of the following types of resources:

Geothermal (RPS Portfolio Content Category 1)
MCE currently has 188,000 MWh of geothermal contracted deliveries in 2018.

Solar (RPS Portfolio Content Category 1)
MCE currently has 375,000 MWh of utility-scale solar contracted deliveries in 2018.

Wind (RPS Portfolio Content Category 1)
MCE currently has 922,500 MWh of utility-scale wind contracted deliveries in 2018.

Small Hydro (RPS Portfolio Content Category 1)
MCE currently has 168,200 MWh of small hydro contracted deliveries in 2018.

Biogas (RPS Portfolio Content Category 1)
MCE currently has 80,000 MWh of biogas contracted deliveries in 2018.

Large Hydro GHG-Free
MCE currently has 325,000 MWh of large hydro GHG-Free contracted deliveries in 2018.

ACS
MCE currently has 414,600 MWh of ACS contracted deliveries in 2018.

Storage
MCE currently has 2 MW of battery storage contracts in 2018.

Wind (RPS Portfolio Content Category 2)
MCE currently has 925,000 MWh of utility-scale wind contracted deliveries in 2018.

CAISO System Power
MCE bids/schedules all of its load and contracted supply into the markets run by the California Independent System Operator (CAISO), the largest of 38 balancing authorities that comprise the Western Interconnection. From a net settlements perspective, this means that MCE buys CAISO system power when its load is greater than its contracted supply, and MCE sells power to the CAISO when its contracted supply is greater than its load. MCE has 3,318,500 MWh of system deliveries in 2018.

Resource Adequacy (RA)
The RA program requires LSEs to demonstrate specific quantities of system, local and flexible capacity in the year-ahead and month-ahead time frames. MCE forecasts net RA requirements using RMR/CAM allocation assumptions and ELCC/NQC capacity adjustments. MCE plans to purchase/sell Resource Adequacy depending on its monthly positions. MCE has provided its current RA-only and Energy plus RA contracts in the Baseline Resource Data Template, but (in accordance with CPUC instructions) MCE has not listed any estimated future RA-only contracts. MCE will continue to fully comply with all RA

requirements, and MCE will continue its practice of procuring long-term, multi-year, year-ahead and month-ahead RA.

2030 GHG Results
MCE's estimated 2030 GHG emissions for both the Preferred and Conforming Portfolios, are significantly less than the CPUC Benchmark emissions rate for MCE.

b. Preferred and Conforming Portfolios

MCE has developed two portfolios:

- Conforming Portfolio- This portfolio utilizes the assigned GHG Emissions Benchmark, as well as the input assumptions used in developing the Reference System Portfolio, and consistent with the 2017 IEPR forecast. However, the 2017 IEPR forecast is outdated as it does not contain MCE's 2030 load forecast pursuant to the Motion to Adjust adopted by the CPUC in R. 16-02-007. Therefore, MCE has included the load forecast pursuant to the ALJ Ruling.
- Preferred Portfolio- This portfolio utilizes MCE's actual historic meter data, which accounts for net energy metered behind-the-meter PV and existing EV charging load. MCE provided a normalized hourly load shape in the custom profile tab. This portfolio also uses MCE's CPUC approved load forecast pursuant to the ALJ Ruling.

MCE seeks Commission certification of MCE's Preferred Portfolio, as it has been developed with MCE's forecasted hourly load shape which is based upon actual historical meter data and the CPUC approved load forecast. The Preferred Portfolio provides higher accuracy for resource planning than the default load shape used to develop the Conforming Portfolio.

i. Local Air Pollutant Minimization

MCE serves 127,357 customers in disadvantaged communities, 9.3 percent of 1,373,185 total MCE customers served. MCE Feed-in Tariff and Local projects that are sited in disadvantaged communities and online deliver renewable energy and minimize localized air pollutants and other GHG emissions to around 5,000 impacted residential customers. MCE has proposed several projects that exceed 100 MW, also in disadvantaged communities, that could serve approximately 45,000 impacted residential customers while minimizing localized air pollutants and other GHG emissions and replace retired conventional generation resources in the area. In addition to these projects sited in disadvantaged communities, MCE has another 11 MW of local landfill waste-to-energy projects in its portfolio that minimize localized air pollutants like methane and GHG emissions while delivering renewable energy to an additional 10,000 customers.

MCE is also planning to develop tariffs for price-responsive demand resources located in disadvantaged communities to ensure that MCE can meaningfully improve air quality. These tariffs will be applicable to existing cogeneration facilities and will allow them to submit price sensitive bids in the day ahead California Independent System Operator ("CAISO") market, incentivize generation curtailment, deliver 100% renewable generation to customer load, and allow for greater absorption of excess renewable generation by the CAISO controlled grid.

Disadvantaged communities served by MCE, as identified by CalEnviroScreen 3.0, are listed below. MCE has also listed local renewable feed-in tariff projects that are located in the most impacted

census tracts. MCE may also use broader screening methodologies to ensure that communities that experience significant air pollution but are not captured by CalEnviroScreen 3.0 also benefit from MCE's programs that aim to reduce local air pollution.

Table 2: **Disadvantaged communities in MCE's service area**

County	City, Town, or Census Designated Place	Census Tracts	CalEnviroScreen 3.0 Percentile	Population	MCE Local Project
Napa	City of Napa	6055200503 & 6055200301	71-75%	7,150	
Contra Costa	Crockett-Rodeo	6013358000	81-85%	5,298	
Contra Costa	Point Pinole	6013392200 & 6013364002	76-80%	16,123	Freethy Industrial Park Feed-in Tariff I & II*
Contra Costa	Wildcat Creek	6013365002	91-95%	5,462	
Contra Costa	West Richmond	6013378000	66-70%	3,435	Solar One*
Contra Costa	Richmond Barret Ave.	6013376000	86-90%	5,962	
Contra Costa	Richmond N. of Cutting Rd	6013377000 & 6013379000	91-95%	13,079	
Contra Costa	Richmond S. of Cutting Rd	6013380000	81-85%	5,706	
Contra Costa	Richmond Annex	6013392200	76-80%	3,521	
Contra Costa	Martinez	6013320001	76-80%	3,615	
Contra Costa	Martinez E. of Pacheco Creek	6013315000	71-75%	3,281	
Contra Costa	Pleasant Hill	6013327000	76-80%	6,695	
Contra Costa	Concord NWS Seal Beach del Concord	6013355200	71-75%	7,444	
Contra Costa	Bay Point	6013314102	71-75%	5,923	
Contra Costa	Pittsburg	6013312000	91-95%	2,292	
Contra Costa	Pittsburg West	6013310000 & 6013311000	86-90%	10,642	

Contra Costa	Antioch	6013305000	81-85%	6,620	
Contra Costa	Antioch East	6013306002	71-75%	2,985	
Contra Costa	Oakley	6013305000	76-80%	6,592	Feed-in Tariff Proposals under consideration
Contra Costa	Brentwood	6013303103	71-75%	10,812	100 MW of local aggregated renewable projects under consideration

*The Freethy Industrial Park Feed-in Tariff ground-mounted solar projects are located in this census tract. Sunstall Inc. and the City of Richmond's RichmondBUILD program provided labor to construct the solar panel installation, which supported 23 jobs. Three permanent jobs were created for Energy Systems Development to maintain the system for ten years.

*MCE's Solar One, the Bay Area's largest public-private solar partnership, was conceived by the Richmond community to integrate renewable energy and solar facilities in the Chevron Modernization Project. MCE teamed up with RichmondBUILD to train and hire its skilled, local graduates for the project.

ii. Cost and Rate Analysis

MCE has modeled the anticipated cost of its planned resources based on known contract costs and forward price assumptions for open positions of the various energy and capacity products specified in the plan. Based on this analysis, MCE projects that its average per MWh portfolio costs will increase by a nominal annual average rate of 3% through 2030, and 0.9% annually in real (inflation adjusted) dollars, while providing the GHG reduction, system reliability, and other benefits described in this narrative. Numerous market factors could change the projected cost trajectory, including but not limited to the following:

- Wholesale energy prices
- Locational marginal prices for CAISO Load and CAISO Generation
- Resource Adequacy costs
- Costs for services provided by the CAISO (e.g., ancillary services)
- CAISO non-energy related costs (costs allocated to all LSEs on a load ration share basis, e.g., Unaccounted for Energy and Congestion Revenue Rights Balancing Account)
- Regulatory changes, such as the Clean Net Short calculator and the implementation of AB 1110, which may limit the types of resources that MCE can procure to meet its statewide and local policy mandates and increase the cost of power resource procurement. Discounting Procurement Content Category ("PCC") 2 product as a GHG free resource could more than double the effective price for PCC 2 products. The problem is exacerbated for California/Oregon Border imports because of transmission import constraints. MCE's current resource planning includes approximately 25% of its retail load from PCC 2 resources and this change will impact retail rates.

- Production from MCE contracted resources and potential curtailment costs
- Costs associated with allocated resources procured by other entities (e.g., CAM, RMR, etc.)

MCE rates are set by MCE's Board of Directors annually, and while rates are influenced by power supply costs, customer rates will not necessarily change in lock-step with the projected change in power supply costs over time, as financial reserves are available to help provide rate stability. MCE rates are below those of the incumbent utility, despite MCE's higher renewable energy content and the imposition of various PG&E surcharges. MCE expects to meet its objective of maintaining competitive rates over time. However, while MCE's costs are expected to be relatively stable due to its forward procurement and price hedging practices, considerable uncertainty exists in the PCIA proceeding and the incumbent utility's generation rates, both of which are relevant to MCE's competitive rates assessment.

c. Deviations from Current Resource Plans

MCE's publicly available IRP uses the comprehensive and MCE-specific considerations outlined in section B.ii, above. MCE's procurement strategies and procurement planning do not deviate from its 2018 IRP, approved by its governing board in November 2017.

d. Local Needs Analysis

MCE meets California's RA standards by procuring qualifying capacity sufficient to meet MCE's projected peak demand plus a 15 percent reserve margin, net of CAM and other capacity offsets. In addition to this general requirement, MCE must ensure that mandated proportions of such capacity resources are procured from local reliability areas defined by the CAISO and that a specified percentage of capacity resources have flexible operating capabilities. MCE meets its RA obligations through standalone RA contracts and with RA capacity associated with many of its long-term renewable energy power purchase agreements.

4. Action Plan

a. Proposed Activities

In order to effectively plan and manage its portfolio, MCE differentiates contracts by their term length as follows:

- Short-term: up to twelve months;
- Medium-term: longer than twelve months, up to five years;
- Intermediate-term: longer than five years, up to ten years; and
- Long-term: longer than ten years.

Based upon the expected contract tenor, MCE may use a variety of methods – including competitive solicitations, standard contract offerings, and bilaterally negotiated agreements – throughout the Planning Period to meet is ongoing resource needs.

Procurement Authorities

MCE's energy procurement throughout the Planning Period will be consistent with the delegation of authorities of the Board, including Resolution 2017-02, Resolution 2017-07, and/or any subsequent delegation of authorities or relevant Resolution of the Board.

Procurement Methods

For long-, intermediate-, and medium-term purchase commitments, MCE typically uses competitive solicitations, like its annual Open Season solicitation, or standard offer contracts, like its FIT. Through a competitive solicitation, MCE issues a Request for Offers ("RFO") and concurrently evaluates multiple proposals in the context of market conditions before entering negotiations with those respondents that provide the most compelling offers. Occasionally, MCE will issue ad hoc competitive solicitations or engage in independent bilateral negotiations to meet specific resource needs for which inclusion in an annual solicitation is not appropriate.

With regard to short-term power purchases, MCE may negotiate bilateral agreements directly, especially for unique or urgent transactions that do not lend themselves to inclusion in a competitive solicitation. Alternatively, particularly in markets with sufficient transparency to ensure competitive outcomes, MCE may negotiate short-term transactions via its scheduling coordinator or independent energy brokers or marketers.

Energy Storage

The California Energy Storage Bill, Assembly Bill ("AB") 2514, was signed into law in September of 2010, and, as a result, the CPUC established energy storage targets for investor-owned utilities ("IOUs"), CCAs, and other load-serving entities ("LSEs") in September 2013. The applicable CPUC decision established an energy storage procurement target for CCAs and electric service providers equal to 1 percent of their forecasted 2020 peak load. Based upon current load forecasts, the decision will require MCE to install 11 MW of energy storage no later than 2024. Beginning on January 1, 2016, and every two years thereafter, MCE must file an advice letter demonstrating compliance with this requirement, progress toward meeting this target, and a description of the methodologies for insuring projects are cost-effective.

In 2018, MCE issued its first standalone energy storage RFO as part of its annual Open Season procurement process. The products being sought included behind-the-meter peak demand management systems to serve MCE's commercial and industrial customers, aggregated community energy storage systems capable of scheduling into the CAISO market, and grid asset systems to shape load and to provide grid services. Other benefits that MCE seeks from its energy storage offers include additional Resource Adequacy capacity, generation shifting to cover MCE's super peak demand, energy arbitrage savings to MCE, reduced congestion costs, and potentially supplying Ancillary Services and Proxy Demand Response to the CAISO market.

Renewable Portfolio Standards (RPS) and Senate Bill (SB) 350

Through 2016, the CPUC has been overseeing implementation of Senate Bill ("SB") 350, which Governor Brown signed in October 2015. Among other GHG-reduction provisions, SB 350 calls for California's RPS targets to increase to 50 percent by 2030. SB 350 includes certain procedural changes that will also impact MCE. With respect to CCAs, SB 350 requires that:

- CCAs must have at least 65 percent of their RPS compliance procurement under contracts of 10 years or longer beginning in 2021;
- CCA EE programs will be eligible to count toward statewide EE targets; and
- while maintaining independent governing authority, CCAs will submit IRPs to the CPUC for certification.

MCE will comply with the applicable planning and procurement requirements reflected in SB 350. Given its existing and planned commitments to long-term renewable energy procurement and EE program administration, MCE does not anticipate the need for significant modifications to its planning or procurement practices to achieve SB 350 compliance.

Resource Adequacy (RA)

The CPUC Decision (D.) 17-06-027 adopted local and flexible capacity obligations for 2018 for electric LSEs and made several changes to the RA program. Two changes impact MCE's procurement and reporting.

First, the CPUC adopted a proposal for an Effective Load Carrying Capacity ("ELCC") for wind and solar energy resources, directed by Public Utilities Code Section 399.26(d). ELCC is a modeling approach that determines the capacity value of different resources relative to "perfect capacity." Monthly ELCC of wind or solar resources in the CAISO balancing area are established by the CPUC's Energy Division based on studies of monthly Loss of Load Expectation ("LOLE") or Loss of Load Hours ("LOLH") and a monthly Portfolio ELCC study. As a result of the ELCC methodology, the RA value of solar PV resources has been reduced by approximately 50 percent relative to previous ratings, forcing MCE to increase its RA purchases and incur additional costs. The impact on wind capacity ratings is less dramatic.

Second, the CPUC modified the annual load update that LSEs submit every August. Previously, this filing has been optional, but it is now mandatory for all LSEs. Due to the growing load served by non-IOU LSEs, the CPUC determined that the August load update is necessary to accurately reflect load migration and improve the accuracy of load forecasts used for RA purposes.

Supplier Diversity

MCE is committed to supporting the economic health and sustainability of communities in its service area and seeks opportunities to contract with businesses that are historically underrepresented in utilities' procurement of energy resources, goods, and services. MCE's guidelines for diversity in procurement support MCE's efforts to procure energy resources, goods, and services from historically underrepresented and/or economically disadvantaged businesses and communities as allowed by law.

Reduce Air Pollution in Disadvantaged Communities

As described above in the Study Results section, MCE plans to site several renewable and GHG-free resources in disadvantaged communities within MCE's service territory. MCE Feed-in Tariff and Local projects that are sited in disadvantaged communities and online deliver renewable energy and minimize localized air pollutants and other GHG emissions to around 5,000 impacted residential customers. MCE is considering up to 100 MW of proposed aggregated renewable projects in disadvantaged communities that could serve approximately 45,000 impacted residential customers while minimizing localized air pollutants and other GHG emissions and replace retired conventional generation resources in the area.

b. Barrier Analysis

MCE has identified some regulatory and market risks associated with acquiring resources to meet the GHG-free and renewable procurement goals established by its local governing board, and the goals set forth by SB 350. The risks and the associated impact analysis are below:

Inconsistent Methodologies for Calculating GHG Emissions

As California's policies shift from a renewable resource focus to GHG emissions reduction, accounting for GHG emissions is creating inconsistencies between various accounting methodologies and the RPS program. These inconsistencies will have an impact on resources preferences as well as rates. For instance, if PCC 2 RPS products are assigned a system emissions factor, then an LSE will likely reduce the amount of Bucket 2 resource procurement to ensure that its total portfolio meets the state's assigned emissions benchmark. The governing boards of CCAs often establish more aggressive emissions targets and Bucket 2 RPS resources may become a costlier resource option to achieve that goal because of pending AB 1110 implementation which may require the use of specified source firming and shaping substitute energy to avoid implied import GHG emissions e-tagged to Bucket 2 RPS resources.

Inconsistent methodologies administered by different energy agencies will create complications in MCE's procurement. It will be challenging for MCE to determine which methodology it should use to help guide its procurement to meet the GHG emissions goal set by its governing board. In addition, MCE will face a significant customer communication challenge in order to explain the complexities and inconsistencies between the various GHG and RPS accounting and reporting methodologies.

Outcome of the Power Charge Indifference Adjustment (PCIA) Proceeding

The uncertainty surrounding the PCIA reform impacts MCE's resource procurement and planning efforts. Depending on the outcome, MCE may need to adjust its procurement and planning to ensure that its rates and procurement will continue to be competitive against PG&E's offerings based on both pricing and GHG-free content.

Resource Adequacy

Mandated, "on behalf of" procurement of capacity resources can undermine CCAs' ability to procure RA resources that can both provide reliability to the grid and satisfy local clean energy preferences and goals. An on behalf of procurement can impact MCE's acquisition of identified resources in a few specific ways:

- Cost: MCE's planning effort assumes that MCE is fully compliant with the CPUC's and the CAISO's RA requirements and is investing significant financial resources in RA resources to achieve those requirements. The on behalf of procurement allocates resources to MCE on top of a fully procured portfolio but does not provide MCE with the flexibility to sell resources that have already been contracted.
- Preferences for clean capacity resources: Many CCAs, including MCE, are exploring new capacity resources that can mitigate the use of fossil fuel resources while meeting RA obligations. On behalf of procurement eliminates the need and procurement incentives for those resources.

A 100% multi-year RA requirement that is being considered by the Commission may further exacerbate the problems and risks identified above. Currently, CCAs have the flexibility to hedge against the risk of receiving credits for on behalf of capacity procurement that could subject CCAs to unanticipated costs. By requiring CCAs to procure 100% of their RA obligations two years out, CCAs will lose the flexibility to adjust their forward RA portfolio to account for the allocations of on behalf of resources.

Additionally, the RESOLVE model fails to account for significant resources located within California that could be scheduled to accommodate the integration of additional renewable energy resources.

- Several thousand Megawatts of behind the meter Combined Heat and Power (BTM CHP) could be available for curtailment to make room for excess renewable generation and thus avoid a large portion of GHG emissions from baseload CHP plants.
- California hosts more than 6,000 MW of federally controlled Central Valley Project large hydro resources that are not modeled in RESOLVE because they are outside the control of the CAISO. These resources need to be optimized to better manage California energy imports.

c. Proposed Commission Direction

This section is not applicable to MCE as MCE's governing board oversees and directs MCE's planning and procurement activities, unless otherwise directed by the legislature.

5. Data

a. Baseline Resource Data Template

MCE has included the Baseline Resource Data Template provided by the Commission staff in this filing. MCE would like to highlight the following:

- The Baseline Resource template does not capture the complexities of the various types of contracting and delivering structures that exist in MCE's portfolio. Therefore, to work within the parameters of the template, MCE had to develop assumptions and inputs for certain contracts that do not accurately reflect how the contracted energy is scheduled and delivered.
- The Baseline Resource Template could benefit from improved naming conventions and additional drop-down menu options, as current names and options do not reflect what is being requested in some cases.
- MCE would encourage the Commission staff to work with the LSE's on the Baseline Resource Template to account for the various contracting, scheduling, and delivering structures in LSE's portfolios.

b. New Resource Data Template

MCE has included the New Resource Data Template provided by the Commission staff in this filing.

c. Other Data Reporting Guidelines

MCE has included the GHG Calculator for IRP v.1.4.5 provided by the Commission staff in this filing for the Conforming and Preferred Portfolios.

MCE will report supplemental or supporting data including annual emissions estimates requested within the Standard LSE Plan Template instruction but is not part of the Excel Workbook Baseline Resource or New Resource Data Templates. MCE will report such data or any other supporting data in one or more Excel-compatible workbooks. The table below reflects MCE's 2017 GHG emissions factor.

MCE 2017 GHG Emissions Statistics	
Total GHG Emissions (lbs, total MCE portfolio)	305,095,140
Total GHG Emissions (MMT, total MCE portfolio)	.138680
Total Portfolio Emission Rate (lbs/MWh)	108.8
Total Portfolio Emission Rate (MMT/MWh)	0.049453
Light Green Portfolio Emission Rate (lbs/MWh)	113.11
Light Green Portfolio Emission Rate (MMT/MWh)	0.051

d. RA Supply Planning Template

MCE has forecasted its net RA requirements using RMR/CAM allocation assumptions and ELCC/NQC capacity adjustments for 2018, 2022, 2026 and 2030. MCE plans to purchase/sell Resource Adequacy depending on its monthly positions. MCE has provided its current RA-only and Energy plus RA contracts in the Baseline Resource Data Template.

6. Lessons Learned

MCE appreciates the time the IRP staff has dedicated to working with LSEs to refine the filing templates during this test cycle. To improve future CPUC IRP cycles, MCE has raised concerns throughout this document and below for consideration by the Commission.

Communication and Coordination with Local Governing Boards of CCAs

MCE encourages the Commission to engage the local governing boards of CCAs during the certification process after all LSEs file their IRPs. All of the IRPs filed by CCAs reflect their compliance with the state environment mandates, as well as environmental and economic mandates established by their local governing boards. While local mandates have been set to complement or to accelerate the achievement of state policy goals, implementing a large and complex state policy, such as SB 350, can potentially reveal where local and state mandates may not be in harmony.

If the Commission staff finds that certain local mandates may be in conflict with certain state policies after all LSEs' Conforming Portfolio and Preferred Portfolios have been aggregated and analyzed, such instances

should be communicated at the decision-making level to respect the jurisdictional authority of local governments. MCE suggests that the process of creating dialogues with local governments can start with informal joint agency workshops with CPUC Commissioners and boards of directors of CCAs to examine the frictions between two sets of policies and provide paths to resolve the differences. Such solutions should be informed by further studies conducted by the CCA staff and the CPUC staff, and staff from both agencies should work together to put forth recommendations for policy changes either at the Commission level, or at the local government level.

Defining the Certification and Self-Procurement Process for CCA IRPs

Along with the California Community Choice Association ("CalCCA"), MCE has repeatedly asked the Commission to provide a process for certifying CCA IRPs and define criteria and metrics that each CCA's IRP should meet in order to be certified. CCAs have also expressed that in the case where the Commission finds there are system or local resource deficiencies in meeting the state's GHG emissions reduction and reliability goals, the CCA governing boards and staff should be informed and provided with the opportunity to procure to address the deficiencies, before the Commission directs the investor owned utilities to procure on behalf of all customers.

MCE understands that it was difficult for the Commission and staff to define a certification process and criteria before all LSEs' portfolios are aggregated to inform any system or local grid reliability and emission reduction needs. MCE looks forward to working with the Commission staff to define certification criteria and process for CCA IRPs after all LSEs' IRPs have been aggregated and analyzed.

MCE also looks forward to refining the self-procurement process with the Commission and sees this as an opportunity for both the Commission and CCAs to creatively collaborate in a decentralized regulatory landscape. The communication and coordination needed to allow CCAs to exercise self-procurement, which provides CCAs the opportunity to procure resources that are needed to either reduce GHG emissions or maintain a reliability grid, can be done through the process MCE recommended above in the communication and coordination section.

Glossary of Terms

***Alternative Portfolio** – LSEs are permitted to submit "Alternative Portfolios" developed from scenarios using different assumptions from those used in the Reference System Plan. Any deviations from the Conforming Portfolio must be explained and justified.*

***Conforming Portfolio** – Each LSE must produce a "Conforming Portfolio" that is demonstrated to be consistent with the Reference System Portfolio according to the following criteria: (1) use of either the GHG Planning Prices or the LSE-Specific 2030 GHG Emissions Benchmark, (2) use of input assumptions matching those used in developing the Reference System Portfolio, and (3) consistent with the 2017 IEPR "mid Baseline mid AAEE mid AAPV" forecast, unless superseded by Administrative Law Judge ruling.*

***Data Template** – Data provided by the LSE should be reported in the "Baseline Resource Data Template" and the "New Resource Data Template" provided by the Commission. "Baseline" means existing resources and costs. "Existing" includes resources on the 3/15/2018 NQC List, or projects not yet online but that have secured a contract and may therefore be identified in the Commission's RPS Contracts Database or an Application filed at the Commission, as of January 1, 2018. "New" means any new (incremental to the baseline) resources and costs associated with a particular LSE portfolio.*

***Disadvantaged Communities** – For the purposes of IRP, and consistent with the results of the California Communities Environmental Health Screening Tool Version 3 (CalEnviroScreen 3.0), "disadvantaged communities" refer to the 25% highest scoring census tracts in the state along with the 22 census tracts that score in the highest 5% of CalEnviroScreen's pollution burden, but which do not have an overall CalEnviroScreen score because of unreliable socioeconomic or health data.*

***GHG Emissions Benchmark** – Each LSE filing a Standard LSE Plan must use either the GHG Emissions Benchmark or GHG Planning Price in developing its Conforming Portfolio. The LSE-specific benchmarks have been provided in an ALJ ruling. If the total emissions attributable to the LSE's preferred portfolio exceed its GHG Emissions Benchmark for 2030, the LSE must explain the difference and describe additional measures it would take over the following 1 - 3 years to close the gap, along with the cost of those measures.*

***GHG Planning Price** –The GHG Planning Price is equivalent to the marginal cost of GHG abatement associated with the 42 MMT Scenario for the years 2018 to 2026 (i.e., a curve that slopes upward from ~$15/ton to ~$23/ton), followed by a straight-line increase from ~$23/ton in 2026 to $150/ton in 2030, as shown in Table A. Each LSE must use either the GHG Planning Price or GHG Emissions Benchmark in developing its Conforming Portfolio.*

***IRP Planning Horizon** – The IRP Planning Horizon will typically cover 20 years. However, for the purposes of this IRP 2017-18 cycle, the IRP Planning Horizon will cover only up to the year 2030.*

***Long term** – 10 or more years (unless otherwise specified)*

***Portfolio** – A portfolio is a set of supply and/or demand resources with certain attributes that together serve a particular level of load.*

Preferred Portfolio *– Among all the portfolios developed by the LSE, the LSE will identify one as the most suitable to its own needs, deemed its "Preferred Portfolio." Any deviations from the Conforming Portfolio must be justified and explained.*

Reference System Plan *– The Reference System Plan refers to the Commission-approved integrated resource plan that includes an optimal portfolio (Reference System Portfolio) of future resources for serving load in the CAISO balancing authority area and meeting multiple state goals, including meeting GHG reduction and reliability targets at least cost.*

Reference System Portfolio *– The Reference System Plan refers to the Commission-approved portfolio that is responsive to statutory requirements per Pub. Util. Code 454.51; it is part of the Reference System Plan.*

Scenario *– A scenario is a portfolio together with a set of assumptions about future conditions.*

Short term *– 1 to 3 years (unless otherwise specified)*

Standard LSE Plan *– A Standard LSE Plan is the type of integrated resource plan that an LSE is required to file if its assigned load forecast is ≥ 700 GWh in any of the first five years of the IRP planning horizon.*

Standard LSE Plan Template *– Each LSE required to file a Standard LSE Plan must use the Standard LSE Plan Template according to the instructions provided herein.*

(End of Attachment A)