



**Marin Clean Energy
Technical Committee Meeting
Monday, June 1, 2015
5:00 P.M.**

Kathrin Sears, Chair
County of Marin

Tom Butt, Vice Chair
City of Richmond

Bob McCaskill
City of Belvedere

Alan Schwartzman
City of Benicia

Greg Lyman
City of El Cerrito

Sloan C. Bailey
Town of Corte Madera

Barbara Coler
Town of Fairfax

Kevin Haroff
City of Larkspur

Garry Lion
City of Mill Valley

Brad Wagenknecht
County of Napa

Denise Athas
City of Novato

Carla Small
Town of Ross

Ford Greene
Town of San Anselmo

Genoveva Calloway
City of San Pablo

Andrew McCullough
City of San Rafael

Ray Withy
City of Sausalito

Emmett O'Donnell
Town of Tiburon

1125 Tamalpais Avenue
San Rafael, CA 94901

1 (888) 632-3674
mceCleanEnergy.org

**The Barbara George Conference Room
1125 Tamalpais Avenue, San Rafael, CA 94901**

Agenda Page 1 of 1

1. Board Announcements (Discussion)
2. Public Open Time (Discussion)
3. Report from Chief Executive Officer (Discussion)
4. Approval of 5.4.15 Meeting Minutes (Discussion/Action)
5. Potential Adjustments to Deep Green Product (Discussion/Action)
6. MCE Battery Storage Rate and Pilot Program (Discussion/Action)
7. Kisensum: Electric Vehicle Smart Charging (Discussion)
8. Energy Efficiency Update (Discussion)
9. Members & Staff Matters (Discussion)
10. Adjourn



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**MARIN CLEAN ENERGY
TECHNICAL COMMITTEE MEETING
May 4, 2015
5:00PM**

**The Barbara George Conference Room
1125 Tamalpais Avenue, San Rafael, CA 94901**

Roll Call

Present:

Kate Sears, County of Marin, Chair
Kevin Haroff, Town of Larkspur
Carla Small, Town of Ross
Emmett O'Donnell, Town of Tiburon
Greg Lyman, City of El Cerrito

Absent:

Ford Greene, Town of San Anselmo
Ray Withy, City of Sausalito

Staff:

Dawn Weisz, Chief Executive Officer
Greg Brehm, Director of Power Resources
Rafael Silberblatt, Program Specialist

Action taken:

Agenda Item #4 – Approval of Minutes from 3.9.15 Meeting (Discussion/Action)

M/s O'Donnell/Small (passed 4-0) approval of minutes from 3.9.15 meeting. Director Lyman abstained and Directors Greene and Withy were absent.

Kate Sears, Chair

ATTEST:

Dawn Weisz, Chief Executive Officer



MCE Deep Green Program Review

June 1, 2015

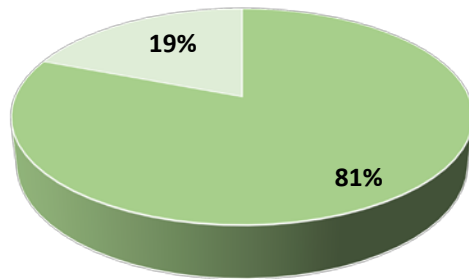


MCE Deep Green: 2014 Status Update

- Customers: 2,610 as of December 31, 2014
 - Residential: 2,110 (81%)
 - Commercial: 500 (19%)

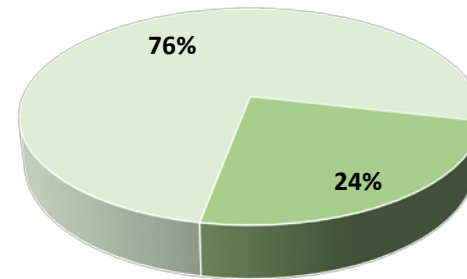
- Annual Energy Usage: 35 million kWh (35,000 MWh)
 - Residential: 8,626,577 kWh (24%)
 - Commercial: 26,874,179 kWh (76%)

2014 Deep Green Customer Composition



■ Residential ■ Non-Residential

2014 Deep Green Customer Usage



■ Residential ■ Non-Residential

- 100% Renewable Energy Supply
 - 21.7% bundled, RPS- and Green-e Energy-eligible wind, produced by the Alta 10 wind facility in Kern County, California (Seller: Constellation)
 - 78.3% unbundled, RPS- and Green-e Energy-eligible wind, produced by the Wild Horse wind facility in Kittitas County, Washington (Seller: Puget Sound Energy)



2014 Deep Green Power Content Label


DEEP GREEN PRODUCT CONTENT LABEL ¹		
This product matches 100% of your estimated electricity usage. The product will be made up of the following new renewable resources averaged annually.		
Green-e Energy Certified New ² Renewables in Marin Clean Energy's Deep Green Service Option		Generation Location
Energy Source	2014 Calendar Year (Actual)	
-Biomass	0%	
-Geothermal	0%	
-Small or low impact hydroelectric	0%	
-Solar	0%	
-Wind	100%	Kern County, California Kittitas County, Washington
Total Green-e Energy Certified New Renewables	100%	
-Other Renewables	0%	
-Large Hydroelectric	0%	
-Coal	0%	
-Natural Gas	0%	
-Oil	0%	
-Other	0%	
Total	100%	

1. These figures reflect the power that MCE has contracted to provide. Actual figures may vary according to resource availability. MCE will annually report to you the actual resource mix of the electricity you purchased during the preceding year.

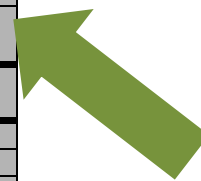
2. New Renewables come from generation facilities that first began commercial operation on or after 1/1/00.

For comparison, the 2012 average mix of resources supplying California customers includes: Renewables (15%), Coal (8%), Nuclear (9%), Oil (0%), Natural Gas (43%), Hydroelectric (8%), and Other (16%).

For specific information about this electricity product, please contact Marin Clean Energy at 1 (888) 632-3674 or visit www.mceCleanEnergy.org.




Green-e Energy certifies that MCE's voluntary Deep Green (100% renewable energy) product meets the minimum environmental and consumer protection standards established by the non-profit Center for Resource Solutions. For more information on Green-e Energy certification requirements, call 1-888-63-GREEN or log on to www.green-e.org.



2014 is the first year in which MCE's Deep Green portfolio has included California-based supply



MCE Deep Green: Key Program Details

- Pricing:
 - +\$0.01/kWh premium (relative to otherwise applicable tariff rate)
 - ≈\$355,000 in Deep Green premiums collected by MCE (CY 2014 sales)
 - Deep Green premium collected to: 1) offset program-specific procurement and administration costs; and 2) create local project development fund (which was used to initiate MCE Solar One project development)
- Certification:
 - Green-e Energy Certified Product:  Green-e Energy CERTIFIED
 - Center for Resource Solutions (located in San Francisco) oversees Green-e Energy program and maintains National Standard
 - Annual audit is required to maintain certified status (2014 audit in-progress)
 - Periodic review/audit of Deep Green marketing materials to ensure compliance
- Supply Objectives:
 - Increased use of bundled, in-state renewable energy (local, if possible)
 - Increased diversification of renewable fuel sources



Deep Green: Key Considerations

- Pricing:
 - Flat pricing (i.e., a fixed monthly charge) may minimize perceived cost uncertainty/risk and yield increased customer participation
 - The Sacramento Municipal Utility District observed significant participatory increases (Greenenergy program) following flat pricing transition: $\approx 4x$ increase
 - Transition to flat pricing may benefit some customers while marginally increasing costs for others
- Deep Green Supply:
 - Increased use of bundled renewable energy will generally add to supply costs
 - General alignment of delivery and usage profiles:
 - May improve perception of Deep Green program
 - Base + peak + intermittent energy delivery: more intuitively aligns with typical customer usage patterns
 - Timing: allocating additional bundled renewable energy supply to Deep Green may impact near-term RPS reporting and general resource planning
 - Not all supply sources will be Green-e Energy eligible: fuel source, location and age of generator



Deep Green: Near-Term Transitions (2015)

- Flat Pricing, \$3/Month Option (Residential Customers Only):

2014 Deep Green Residential Participation								
Rate Class	Customer Count	Total Annual Deep Green Sales (kWh)	Monthly Avg Cust Premium (\$/Month)	Total Annual Deep Green Revenues @ \$0.01/kWh	Annual Deep Green Revenues @ \$3 Monthly	Annual Deep Green Revenues @ \$4 Monthly	Annual Deep Green Revenues @ \$5 Monthly	
E1	1,915	7,739,060	\$ 3.37	\$ 77,391	\$ 68,940	\$ 91,920	\$ 114,900	
E6	78	190,269	\$ 2.03	\$ 1,903	\$ 2,808	\$ 3,744	\$ 4,680	
E7	123	594,005	\$ 4.02	\$ 5,940	\$ 4,428	\$ 5,904	\$ 7,380	
E8	23	159,171	\$ 5.77	\$ 1,592	\$ 828	\$ 1,104	\$ 1,380	
E9	17	112,182	\$ 5.50	\$ 1,122	\$ 612	\$ 816	\$ 1,020	

- Annual Deep Green premium revenues are expected to decrease by \approx \$10,000
- Approximately half of all residential Deep Green customers would pay less; half would pay more
- Commercial customers continue to pay \$0.01/kWh premium
- Future procurement flexibility may be limited (additional bundled renewables)



Deep Green: Near-Term Transitions (2015)

- Flat Pricing, \$5/Month Option (Residential Customers Only):

2014 Deep Green Residential Participation								
Rate Class	Customer Count	Total Annual Deep Green Sales (kWh)	Monthly Avg Cust Premium (\$/Month)	Total Annual Deep Green Revenues @ \$0.01/kWh	Annual Deep Green Revenues @ \$3 Monthly	Annual Deep Green Revenues @ \$4 Monthly	Annual Deep Green Revenues @ \$5 Monthly	
E1	1,915	7,739,060	\$ 3.37	\$ 77,391	\$ 68,940	\$ 91,920	\$ 114,900	
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E8	23	159,171	\$ 5.77	\$ 1,592	\$ 828	\$ 1,104	\$ 1,380	
E9	17	112,182	\$ 5.50	\$ 1,122	\$ 612	\$ 816	\$ 1,020	

- Deep Green premium revenues would increase by \approx \$41,000 (by nearly 50%)
- Approximately three quarters of all residential Deep Green customers would pay more; one quarter would pay less
- Increased premium would minimize the need for future premium adjustments
- Increased premium would also accommodate additional bundled renewable supply
- Premium amount generally aligns with average residential use \approx 500 kWh/month



Deep Green: Near-Term Transitions (Cont.)


DEEP GREEN PRODUCT CONTENT LABEL ¹		
This product matches 100% of your estimated electricity usage. The product will be made up of the following new renewable resources averaged annually.		
Green-e Energy Certified New ² Renewables in Marin Clean Energy's Deep Green Service Option		Generation Location
Energy Source	2015 Calendar Year (Prospective)	
-Biomass	0%	
-Geothermal	0%	
-Small or low impact hydroelectric	0%	
-Solar	23.3%	Kings County, California
-Wind	76.7%	Columbia County, Washington
Total Green-e Energy Certified New Renewables	100%	
-Other Renewables	0%	
-Large Hydroelectric	0%	
-Coal	0%	
-Natural Gas	0%	
-Oil	0%	
-Other	0%	
Total	100%	

1. These figures reflect the power that MCE has contracted to provide. Actual figures may vary according to resource availability. MCE will annually report to you the actual resource mix of the electricity you purchased during the preceding year.

2. New Renewables come from generation facilities that first began commercial operation on or after 1/1/00.

For comparison, the 2012 average mix of resources supplying California customers includes: Renewables (15%), Coal (8%), Nuclear (9%), Oil (0%), Natural Gas (43%), Hydroelectric (8%), and Other (16%).

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2015 RPS procurement mandate

Proposed 2015 Deep Green supply portfolio to include additional in-state power content

Proposed 2015 Deep Green supply portfolio to include PV solar sourced from new generators under contract with MCE



Deep Green: Understanding Tradeoffs

- Pricing – Impacts of Flat Premium to Residential Rate Class:
 - Balancing rate/premium stability and near-term customer impacts
 - Incorporating additional bundled renewable energy supply may be challenging, if Deep Green premium revenues are reduced
- Deep Green Supply:
 - Green-e Energy rules dictate that “voluntary” renewable energy purchases (i.e., renewable energy purchases in excess of applicable RPS mandates) may not be used to demonstrate regulatory compliance
 - To the extent that MCE includes additional voluntary in-state, bundled supply (Bucket 1, for example) in its Deep Green portfolio, such supply may not be included in its annual RPS report
 - MCE will also incur additional obligations related to the retirement of emissions allowances associated with voluntary renewable energy purchases (participation in CARB’s VRE Program)
 - Supply allocated to Deep Green will not be included in the Light Green Power Content Label



Deep Green: Beyond 2015...

- Continuing to “improve” Deep Green supply:
 - Increased use of in-state, bundled resources
 - Coordination with resource planning processes
 - Evaluation of impacts to MCE’s Light Green portfolio (solar PV, in particular)
 - Coordination with budget and ratesetting processes
 - Familiarization with ancillary reporting requirements, including CARB’s Voluntary Renewable Energy Program
 - Increased resource diversification
 - Assembling a portfolio of resources with energy delivery profiles generally resembling customer usage patterns
 - Base + Peak + Intermittent
 - Use of baseload resources, particularly biogas, will require coordination with generator owners (to ensure Green-e Energy resource eligibility)
 - Many existing baseload resources will not meet Green-e Energy’s generator age requirements: for example, Calpine Geyser units have CODs that precede the current eligibility cutoff
 - Increased use of local resources
 - Potential inclusion of output from MCE Solar One



Questions & Comments





Electric Schedule PBST - Pilot Battery Storage Tariff

Applicability: This Pilot Battery Storage Tariff (PBST) schedule is applicable to any MCE residential customer who has installed a fully operational residential battery storage unit with a qualifying micro-inverter providing MCE with remote control and dispatch capability (for purposes of this tariff, a “battery” or in aggregate “batteries”).

This optional schedule is available on a first-come, first-served basis to the first twenty customers with batteries who have provided MCE with a completed MCE Battery Storage Application.

Territory: The entire MCE service area.

Rates: All rates charged under this schedule will be in accordance with the customer’s otherwise-applicable MCE rate schedule, noting the following exceptions:

Customers served under this schedule must choose Partial Cycle Participation or Full Cycle Participation:

- a) Full Cycle Participation: MCE shall have the option to fully discharge the battery during each 24 hour discharge cycle. Customers electing Full Cycle Participation will receive a credit of \$10/billing cycle.
- b) Partial Cycle Participation: MCE shall have the option to discharge the battery to 50% of its available storage capacity during each 24 hour discharge cycle. Customers electing Partial Cycle Participation will receive a credit of \$5/billing cycle.

Program Requirements:

1. A participating customer must have an installed and fully operational battery with a qualifying micro-inverter. The battery must provide a minimum of 7 kWh of storage capacity per 24 hour discharge cycle and provide a minimum discharge rate of 2 kW per hour. Qualifying micro-inverters are listed on Attachment A. The aforementioned specifications related to battery capacity and discharge rate shall be applicable at the time of battery installation.

2. A participating customer must take electric service under an MCE residential rate schedule.
3. A participating customer must provide MCE with internet-based remote access to the inverter, enabling control of the battery for charging and discharging by MCE. Bill credits provided pursuant to this tariff schedule shall be reduced on a pro rata basis for any hours during which MCE is unable to remotely access and control the battery. Participating customers must provide any information reasonably requested by MCE that is necessary for MCE to administer this tariff.
4. A participating customer must allow MCE to charge/discharge the battery at its discretion, subject to the following limitations:
 - a) During each 24 hour cycle, MCE may charge the customer's battery up to one time prior to discharging the battery; charging of the battery shall occur at any time of day selected by MCE.
 - b) During each 24 hour cycle, MCE may discharge the customer's battery (fully or partially, depending upon the option selected by the customer under this tariff) up to one time prior to charging the battery; discharging of the battery shall occur at any time of day selected by MCE.
 - c) The hours during which MCE charges and discharges the battery need not be continuous.
 - d) The 24 hour discharge cycle shall generally coincide with each calendar day, beginning at hour ending 1:00 AM and continuing through hour ending 12:00 AM.
5. In the event that available storage capacity is less than the Minimum Storage Capacity due to circumstances other than failure of MCE to fully charge the battery, the monthly bill credit may be reduced by an Availability Adjustment. For purposes of applying the Availability Adjustment, the otherwise applicable monthly bill credit shall be multiplied by the ratio of the total kWh available for dispatch by MCE during the billing month divided by the monthly Minimum Storage Capacity. Monthly Minimum Storage Capacity shall equal the number of billing days during the month multiplied by:
 - a. For Full Cycle Participation: 7 kWh
 - b. For Partial Cycle Participation: 3.5 kWh

Electric Schedule PBST – Pilot Battery Storage Tariff

Attachment A: Qualifying Micro-Inverters

SolarEdge DC-AC PV Models SE3000A-US, SE3800A-US, SE5000A-US,
SE6000A-US, SE10000A-US, SE11400A-US

2016 Energy Efficiency Planning: Savings Target Methodology

Step 1: Define and Quantify Target Population

We used account information to determine the number of customers in our service territory by sector and climate zone. See Attachment A for a map of California Climate Zones.

TABLE 1. TARGET POPULATION BY CLIMATE ZONE AND SECTOR

Sector	Climate Zone 2	Climate Zone 3A	Climate Zone 3B	Climate Zone 12	Total
Residential	97,399	73,118	49,627	14,241	234,385
Small and Medium Business	13,545	5,959	5,930	2,055	27,489
Large Commercial and Industrial	320	295	165	51	831
Street and Outdoor Lighting	358	415	-	52	826
Agriculture	2,052	-	39	-	2,090
Total	113,675	79,787	55,760	16,399	265,622

Step 2: Estimate Participation Rate

The level of ratepayer participation is a big assumption when predicting energy savings. MCE estimated participation rates based on current energy efficiency program participation and past program data.

TABLE 2. ASSUMED MCE PARTICIPATION RATES

SECTOR	2-year interval	5-year interval	10-year interval	Zero Net Energy (ZNE) program ¹
Residential	0.25%	1.00%	3.00%	0.004%
Small and Medium Business	0.25%	1.00%	3.00%	0.01%
Large Commercial and Industrial	0.50%	2.00%	6.00%	0.10%
Street and Outdoor Lighting	1.00%	5.00%	15.00%	0.10%
Agriculture	0.50%	2.00%	6.00%	0.05%

¹Anticipated ZNE participation is not cumulative for the whole ten year interval.

Step 3: Estimate Savings Potential

While customer participation is expected to rise over the ten-year interval as shown in Table 2, MCE also anticipates mixed levels of actual energy savings from these customers due to their varying depth of their individual projects. For non-zero net energy (ZNE) participants our per participant savings estimates range from an estimated 5% savings (low) to 10% savings (medium). For ZNE participants we estimate that savings will range from 30-50%. **The total savings potential for the program is**

determined by applying the percentage savings estimates to the average customer usage by sector at the assumed participation rates.

TABLE 3. TOTAL ELECTRIC SAVINGS (MWH)

Sector	2016-2017 (2 year forecast)	2016-2020 (5 year forecast)	2016-2025 (10 year forecast)	ZNE 10 year forecast
Residential	165 – 330	660 – 1,320	1,981 – 3,961	16 – 26
Small and Medium Business	105 – 209	419 – 838	1,257 – 2,513	25 – 41
Large Commercial and Industrial	121 – 242	483 – 966	1,449 – 2,898	145 – 242
Street and Outdoor Lighting	7 – 14	35 – 70	105 – 210	4 – 7
Agriculture	6 – 12	24 – 48	72 – 144	4 – 6
Total	404 – 807	1,621 – 3,242	4,863 – 9,727	194 – 323

Note: Savings ranges represent the low to medium energy savings scenarios.

TABLE 4. TOTAL GAS SAVINGS (THERMS)

Sector	2016-2017 (2 year forecast)	2016-2020 (5 year forecast)	2016-2025 (10 year forecast)	ZNE 10 year forecast
Multifamily	887 – 1,774	3,548 – 7,096	10,664 – 21,289	85 – 142
Residential	14,219 – 28,438	56,876 – 113,753	170,629 – 341,258	1,365 – 2,275
Small and Medium Business	3,909 – 7,818	15,636 – 31,271	46,907 – 93,814	938 – 1,564
Large Commercial	1,961 – 3,921	7,842 – 15,684	23,527 – 47,053	2,353 – 3,921
Total	20,976 – 41,951	83,902 – 167,805	251,707 – 503,414	4,741 – 7,902

Note: Savings ranges represent the low to medium energy savings scenarios.

Step 4: Develop Measure List

MCE developed a set of measures for inclusion into the portfolio based on the DEER database, the Commercial End-Use Survey (CEUS)¹ and Residential Appliance Saturation Survey (RASS)² data on appliances and energy use, the age and types of buildings in the service territory, and past program data on the most common measures. See Attachment B for the draft measure list.

¹ CEUS is a comprehensive study of commercial sector energy use, primarily designed to support the state's energy demand forecasting activities. The data was published in 2006 and the study was funded by the California Energy Commission.

² RASS is a residential mail survey that requested information on appliances, equipment, and general consumption patterns from California households. The most recent round of data collection was completed in 2010. The survey was funded and administered by the California Energy Commission.

Step 5: Develop Incentive Structure

We chose to use a declining incentive structure designed to achieve market transformation. Market transformation envisions a future in which public subsidy is no longer necessary to influence consumer behavior towards energy efficiency. MCE plans to reduce incentives over time, following market trends indicating that customers no longer need financial incentives as motivation to implement specific energy efficiency measures and upgrades. Program participation benchmarks will trigger reductions in rebates according to the schedule in Table 5.

TABLE 5. REBATE LEVEL REDUCTIONS BY PROGRAM GOAL BENCHMARK

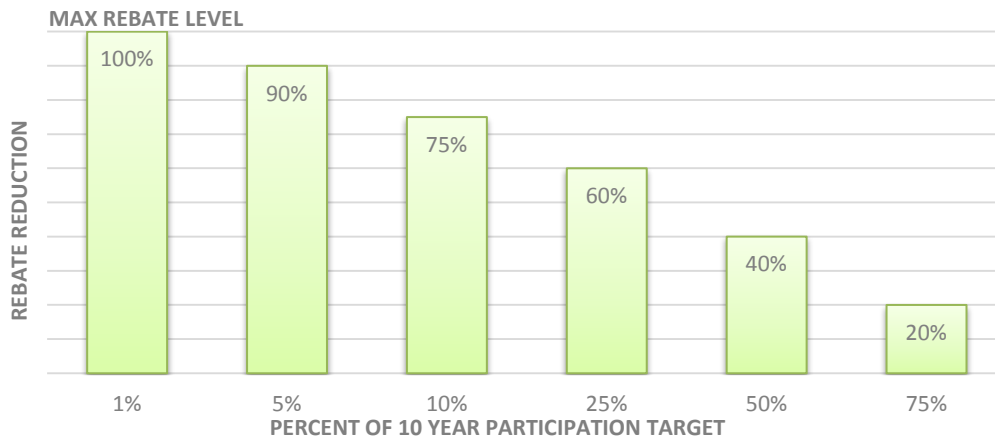
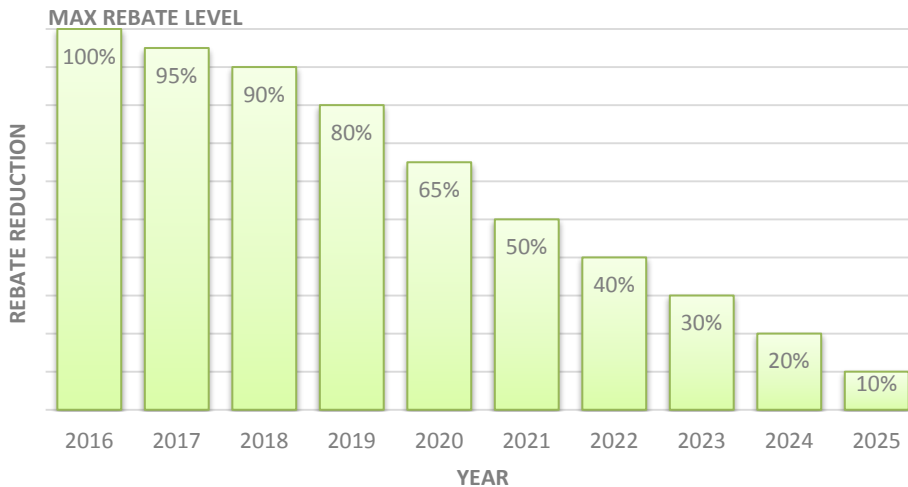


TABLE 6. REBATE LEVEL REDUCTIONS OVER TIME (ESTIMATED)



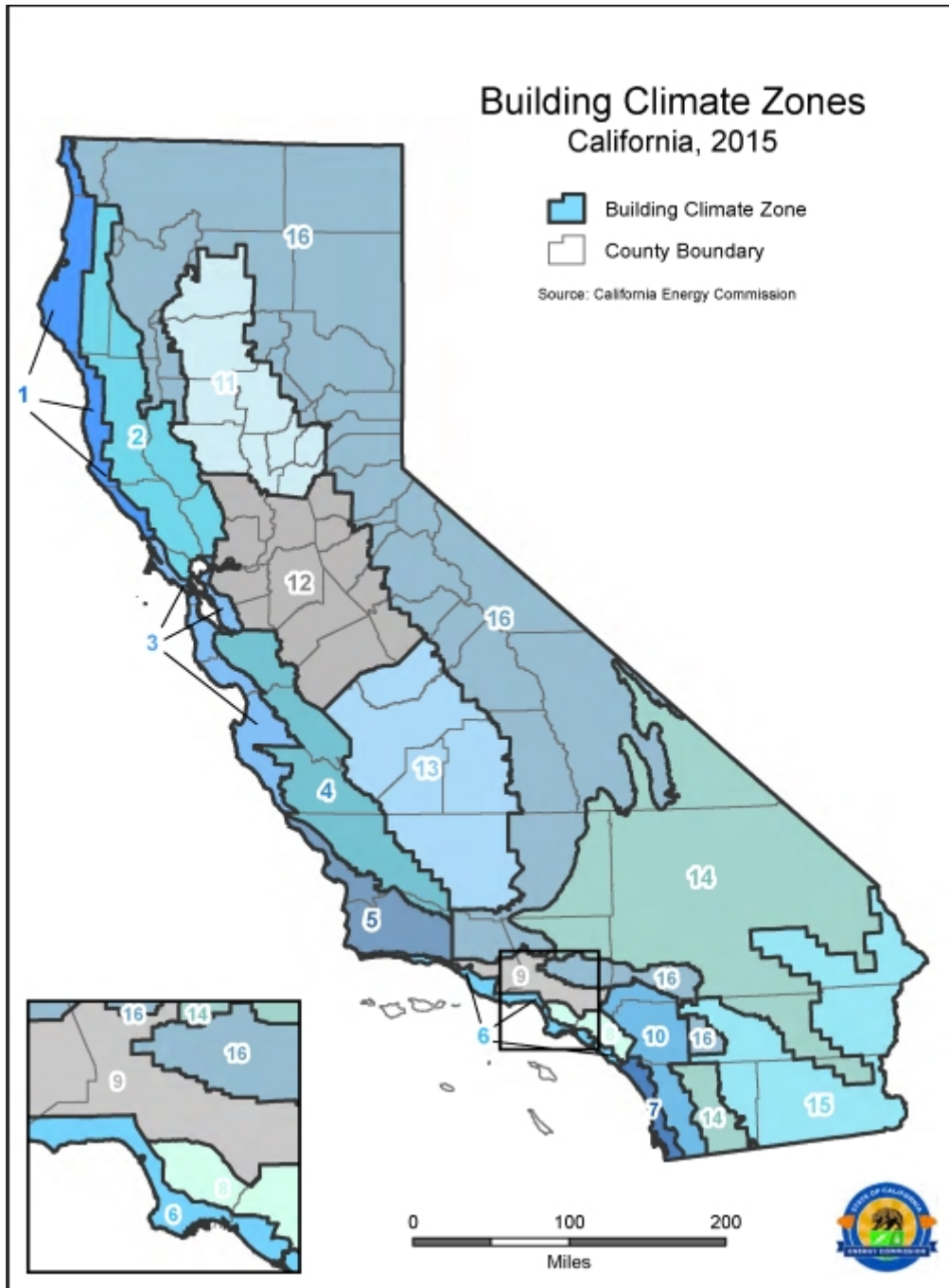
Step 6: Calculate Savings Targets and Cost Effectiveness

As a final step we input the measure list, participation rates and incentive levels into the E3 calculator³ and utilized the assumed participation rates and types of measures to arrive at the energy savings

³ The E3 calculator is a spreadsheet-based tool developed by the CPUC that calculates the cost effectiveness of energy efficiency program portfolios according to several cost effectiveness tests including the TRC.

targets that allow us to achieve a cost effective portfolio within the first two years. We are still finalizing the E3s, but we expect an initial Total Resource Cost (TRC) close to 1.0 for the initial years of implementation with improving cost effectiveness over time as participation rates increase and rebates decrease.

Attachment A: Map of California Climate Zones



Attachment B: Measure Lists

Single Family
AC--central
Attic insulation
Central furnace
Refrigerators
Lighting
Hot water heater (instant)
Hot water heater (storage)
Dishwashers
Low flow aerators
Low flow showerhead
AC--room
Wall furnace
Washing machines
Pipe insulation
Pool covers
Pool pumps
Thermostatic control valve
Windows
Comprehensive Retrofits

Multifamily
Common Area LEDs
Exterior LEDs
Water Heating Boiler
Aerators
Showerheads
Variable Speed Pump (Central Boiler Heating)
Water Heating Controls
Pool Pump VFD
Comprehensive Multifamily Measure

Agricultural
Refrigeration Controls Floating Suction Pressure
Refrigeration Compressor
Refrigeration Ice machine
Refrigeration Other

Tank Insulation Cold Application
Lighting Outdoor Controls Photocell
Lighting Outdoor Linear Fluorescent
Process Pumping VFD
Comprehensive Agricultural Program

Commercial
Refrigeration Controls Evaporator Fan
Appliance Refrigerator
Refrigeration Controls Floating Suction Pressure
Water Heating Boiler
Water Heating Storage Water heater
Water Heating Tankless Water heater
HVAC Chiller Air Cooled
HVAC Controls Fan
HVAC Economizer Addition
HVAC Economizer Repair
HVAC Evap Cooler
Lighting Indoor Cold Cathode
Lighting Indoor Controls Other
Lighting Indoor LED Signage
Lighting Indoor Other
Lighting Indoor LED Fixture
Lighting Indoor LED Lamp
Lighting Indoor LED Other
Lighting Indoor LED Reflector Lamp
Refrigeration Case LED Lighting
Refrigeration Case Lighting Other
Refrigeration Controls ASH
Refrigeration Door Closer
Refrigeration Evaporator EC Motors
Water Heating Controls
Commercial Custom Measures
Lighting Indoor Controls HI-Lo
Lighting Indoor HID
Lighting Indoor High Bay Fluorescent
Lighting Indoor LED Exit Sign
Lighting Indoor Linear Fluorescent Delamping

Industrial
Appliance Refrigerator
Refrigeration Door Closer
Tank Insulation Hot Application
Water Heating Storage Water heater
Lighting Outdoor Controls Photocell
Lighting Outdoor HID
Lighting Outdoor LED Signage
Pipe Insulation Hot Application
Process Boiler Stack Heat Recovery
Process fan
Food Service
Lighting Indoor Controls Other
Refrigeration Compressor VFD
Refrigeration Ice machine
Refrigeration Other
Water Heating Boiler
Lighting Outdoor Controls Other
Lighting Outdoor Induction
Lighting Outdoor LED Fixture
Lighting Outdoor LED Other
Industrial Comprehensive Custom