Southern California REGIONAL ENERGY NETWORK

ICF MF Contractor Training

Measure Eligibility and Data Collection Requirements

June 2022

Agenda and Training Objectives

- Review and Discuss Measure Minimum Requirements for Commonly Installed Measures
- Discuss General Post-install Requirements and Measure Specific Data Collection Requirements
- Summary of Eligible Measures
- Summary of References for Measure Eligibility Requirements

Southern California REGIONAL ENERGY NETWORK

Interior (Dwelling and Common Area) LED Lighting

- Efficiency/Rating Requirements

Measure	Efficiency Rating for Program Eligibility	Minimum Efficiency Source
Interior (Dwelling and Common Area) LED Lighting	Installed lighting must be an LED with a lower wattage rating than existing lighting replaced. Installed LED must meet ISP lumens per watt efficacy according to luminaire type and application.	Resolution E-5009, Table A-3 Title 20 Chapter 4 Article 4 Section 1601, Table K-9

Southern California REGIONAL ENERGY NETWORK

Interior (Dwelling and Common Area) LED Lighting

- Minimum efficacy for linear LED fixtures - Resolution E-5009, Table A-3

Table A-3 - Linear Fixture Baseline Technology Mix

Tech Type	Current Workpaper (LPW)
High/Low Bay	105
Linear Ambient	105
Troffer	100
TLED	111

- Minimum lumen efficacy for LED lamps - Title 20 / Section 1605.3, Table K-9
  - Lumens per Watt (LPW) > 80
  - Or 70 > LPW < 80 and Compliance Score > 165
    - Compliance is calculated as the sum of the efficacy and 2.3 times the color rendering index (CRI) of the lamp

Southern California REGIONAL ENERGY NETWORK

Exterior (Dwelling and Common Area) LED Lighting

- Efficiency/Rating Requirements

Measure	Efficiency Rating for Program Eligibility	Minimum Efficiency Source
Exterior (Dwelling and Common Area) LED Lighting	Installed lighting must be an LED with a lower wattage rating than existing lighting replaced. Installed LED must meet ISP lumens per watt efficacy according to luminaire type and application.	Resolution E-5009, Table A-3 Title 20 Chapter 4 Article 4 Section 1601, Table K-10

Southern California REGIONAL ENERGY NETWORK

Exterior (Dwelling and Common Area) LED Lighting

- Minimum efficacy for linear LED fixtures - Resolution E-5009, Table A-3

Table A-3 - Linear Fixture Baseline Technology Mix

Tech Type	Current Workpaper (LPW)
High/Low Bay	105
Linear Ambient	105
Troffer	100
TLED	111

- Minimum lumen output for medium screw base and GU24 base LED lamps - Title 20 / Section 1607, Table K-10

Table K-10
Incandescent Wattage Equivalences for State-regulated LED Lamps

Incandescent wattage equivalence	Minimum Lumen Output
40W	310
60W	750
75W	1050
100W	1490
150W	2500

Southern California REGIONAL ENERGY NETWORK

Interior and Exterior LED Lighting

- Presentation of Requirements in Assessment Report (AR)
  - AR Section 3.0 Proposed Energy Efficiency Measures - Lighting Equipment Recommendations

Lighting Equipment Recommendations

EEM	Location	Proposed System	Quantity
EEM 1: Upgrade In-Unit Lighting	*See Lighting Location Table Appendix A	5W LED	44
		2L T8 2Ft 10W LED	160
		12W Flush Mount LED	271
EEM 2: Upgrade Common Area Lighting	*See Lighting Location Table Appendix A	95W Corn Cob LED	5
		5W LED	1
		2L 4Ft T8 13W LED	2
		2L 2Ft 10W LED	6
		1L GU24 9W LED	1

Southern California REGIONAL ENERGY NETWORK

Interior and Exterior LED Lighting

- Presentation of Requirements in Assessment Report (AR)
  - APPENDIX A – Table A1: Proposed Lighting and Locations

Table A.1: Specifications and Locations for Proposed Lighting

		Proposed Lighting Systems			
No.	Location Notes	Lighting System	Quantity	Minimum Lumens	Wattage
1	Kitchen Ceiling Type 1	12W Flush Mount LED	15	66	12
2	Kitchen Ceiling Type 2	No Change Recommended	29	N/A	36
3	Dining Ceiling	No Change Recommended	44	N/A	14.5
4	Range	5W LED	44	90	5
5	Living Rm Ceiling Type 1	12W Flush Mount LED	15	66	12
6	Living Rm Ceiling Type 2	12W Flush Mount LED	29	66	12
7	Bedroom	12W Flush Mount LED	124	66	12
8	Hallway	12W Flush Mount LED	44	66	12
9	Bathroom	2L T8 2Ft 10W LED	160	125	10
10	Patio Ceiling	12W Flush Mount LED	44	66	12
11	Doorway Area	No Change Recommended	44	N/A	5.5
12	Leasing Community Manager Rm	No Change Recommended	16	N/A	13
13	Leasing Side Office	No Change Recommended	8	N/A	13
14	Leasing Entry	No Change Recommended	8	N/A	13
15	Leasing Community Rm	No Change Recommended	36	N/A	11

Southern California REGIONAL ENERGY NETWORK

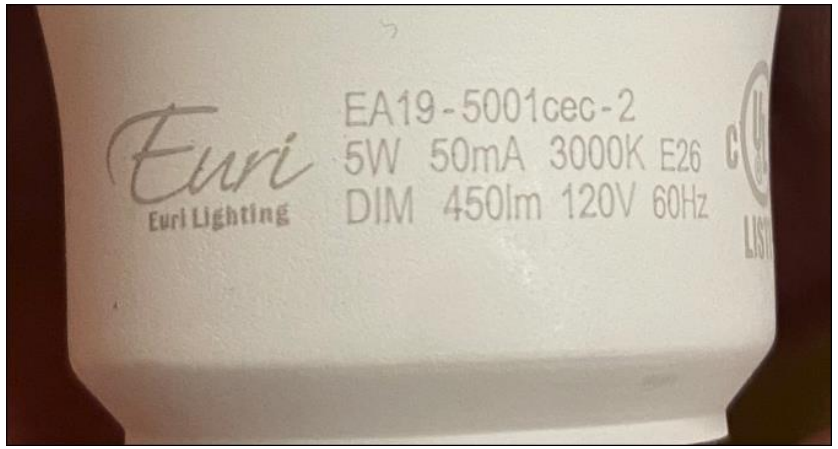
General Program Requirements & Post-Install Data Collection – All Measures

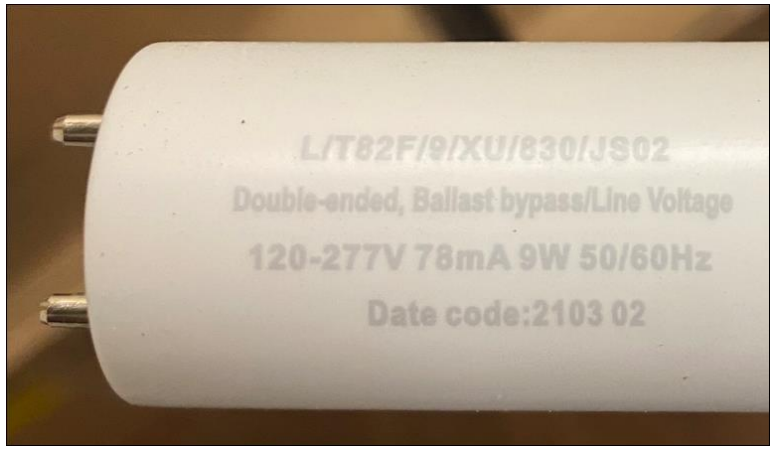
- Building Permit Sign-Off Form
- Incentive Assignment Form
- Customer Signed Itemized Invoice
  - Material, labor, and make/model for each equipment installed
- Installation Report
- Post-Install Inspection
  - Geo-tagged and dated photos of installed equipment
  - Clear nameplate/or tag

Southern California REGIONAL ENERGY NETWORK

Interior and Exterior LED Lighting

- Post-Install Data Collection
  - Quantities and wattages of a statistically acceptable sample of installed lamps and sensors may be collected during post-inspection
  - Appendix B in assessment report outlines additional program documentation requirements and measure specific post-installation verification requirements





Southern California
REGIONAL ENERGY NETWORK

Determining Eligibility for Proposed Interior and Exterior Lighting Equipment

- Manufacturer measure equipment packaging and/or specification sheets
- Refer to applicable code (CA Title 20 and/or CA Title 24) and program requirements to verify that proposed measure equipment specifications exceed minimum program and code requirements
- References and links to applicable program and code requirements will be provided in assessment report

Southern California REGIONAL ENERGY NETWORK

Low Flow Bathroom Aerators, Low Flow Kitchen Faucet Aerators, and Low Flow Showerheads

- Efficiency/Rating Requirements

Measure	Efficiency Rating for Program Eligibility	Minimum Efficiency Source
Low-Flow Showerhead - Residential	Efficient showerhead: ≤ 1.7gpm (gas or electric)	T20 (2016): Section 1605.3(h), Table H-5
Faucet Aerator, Residential	kitchen aerator: ≤ 1.5 gpm (electric or gas) lavatory aerator: ≤ 1.2 gpm (electric or gas);	T20 (2016): Section 1605.3(h), Table H-3

Southern California REGIONAL ENERGY NETWORK

Low Flow Bathroom Aerators, Low Flow Kitchen Faucet Aerators, and Low Flow Showerheads

- Sample Presentation of Requirements in Assessment Report (AR)
  - AR Section 3.0 Proposed Energy Efficiency Measures - Equipment Recommendations

EEM	Location	Proposed System	Quantity
EEM 3: Low Flow Bathroom Faucet Aerators	In-Unit Bathrooms	1.0 gpm Low Flow Faucet Aerator / Bathroom	80
EEM 4: Low Flow Kitchen Faucet Aerators	In-Unit Kitchens	1.5 gpm Low Flow Faucet Aerator / Kitchen	44
EEM 5: Low Flow Showerheads	In-Unit Showers	1.25 gpm Low Flow Showerhead	80

Southern California REGIONAL ENERGY NETWORK

Low Flow Bathroom Aerators, Low Flow Kitchen Faucet Aerators, and Low Flow Showerheads

- Post-Install Data Collection
  - Quantities and flow rates of a statistically acceptable sample of installed aerators and showerheads may be checked during post-inspection
  - Printed flow rate readings or flow bag measurements

Southern California REGIONAL ENERGY NETWORK

Domestic Hot Water (DHW) Replacement - Continued

- Efficiency/Rating Requirements

Measure	Efficiency Rating for Program Eligibility	Minimum Efficiency Source
MF Boiler, Hot Water, 84% TE (Tier 1), 90% (tier 2) condensing	≥ 84% Thermal efficiency for Tier 1 ≥ 90% Thermal efficiency for Tier 2	T20 (2012): Section 1605.3(f), pg.111
Residential tankless water heater ≤200 kBtu/hr	Tier 1: UEF= 0.81 (high/med/low draw) Tier 2: UEF=0.87 (High/med/low draw) Tier 3: UEF=0.95 (High/med/low draw)	T20 (2019): Section 1605.1(f)(2), pg.300

Southern California REGIONAL ENERGY NETWORK

Domestic Hot Water (DHW) Replacement

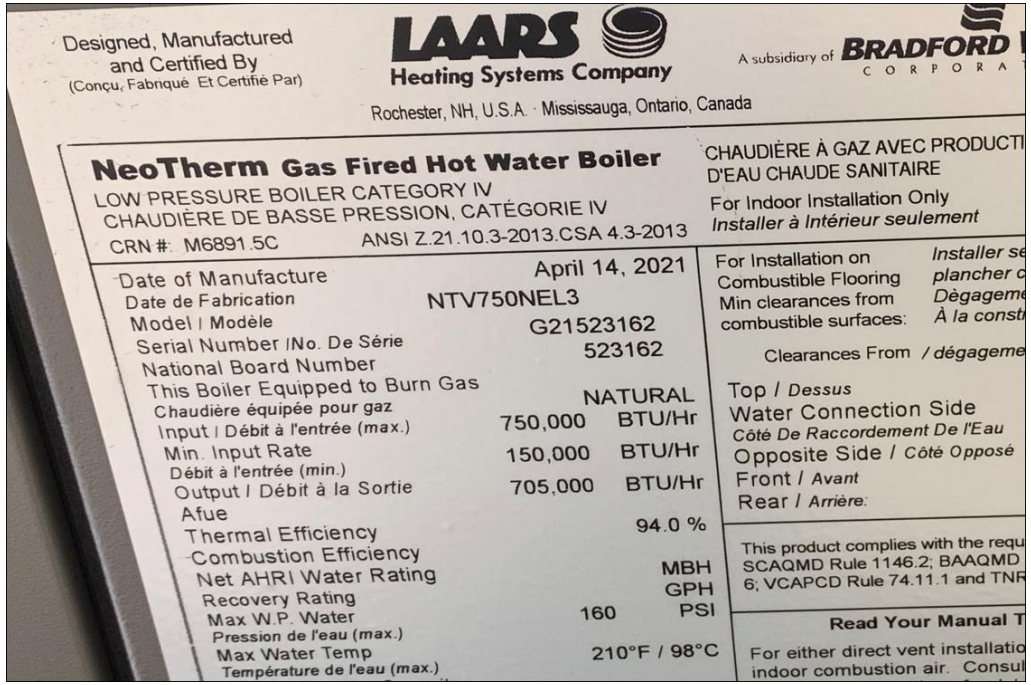
- Sample Presentation of Requirements in Assessment Report (AR)
  - AR Section 3.0 Proposed Energy Efficiency Measures - Equipment Recommendations

EEM	Location	Proposed System	Quantity
EEM 13: Install High Efficiency Central Domestic Hot Water Heaters	Boiler Closet	Hot Water Boiler, > 90% TE	5

Southern California REGIONAL ENERGY NETWORK

Domestic Hot Water (DHW) Replacement

- Post-Install Data Collection
  - Quantities, make and model, and process water temperature readings of installed DHW units may be checked during post-installation inspection



Southern California REGIONAL ENERGY NETWORK

Demand Control for Centralized Water Heater Recirculation Pump

- Efficiency/Rating Requirements

Measure	Efficiency Rating for Program Eligibility	Minimum Efficiency Source
Demand Control for Centralized Water Heater Recirculation Pump, Multifamily & Commercial	Includes variable frequency drives (VFDs), integrated or remote sensors, and control systems that respond to demand by controlling the hot water recirculation loop temperature	Not applicable to T24 or T20

Southern California REGIONAL ENERGY NETWORK

Demand Control for Centralized Water Heater Recirculation Pump

- Sample Presentation of Requirements in Assessment Report (AR)
  - AR Section 3.0 Proposed Energy Efficiency Measures - Equipment Recommendations

EEM	Location	Proposed System	Quantity
EEM 9: Install DHW Recirculation Pump Controls	Boiler Closet	Domestic Hot Water Recirculation Pump Controls	5

Southern California REGIONAL ENERGY NETWORK

Demand Control for Centralized Water Heater Recirculation Pump

- Post-Install Data Collection
  - Quantities, make and model, and functionality of installed controllers may be checked during post-installation inspection.

Southern California REGIONAL ENERGY NETWORK

Variable Speed Drive (VSD) for Pool and/or Spa Pump

- Efficiency/Rating Requirements

Measure	Efficiency Rating for Program Eligibility	Minimum Efficiency Source
Variable Speed Drive (VSD) for Pool and/or Spa Pump	Pump motor capacity ≥ 1 HP w/ at least two speeds w/ low speed having rotation rate no more than one-half the motor's maximum rotation rate; control mechanism set or programmed to run only during off-peak hours or min. time; system should meet 6-hour turnover rate as specified by T24: Section 3124B, Ch. 31B "Public Swimming Pools." The pool filtration flow rate may not be greater than the rate needed to turn over the pool water volume in 6 hours or 36 gallon per minute (gpm), whichever is greater.	T20 (2019): Section 1605.3(g)(5)(B) T24 (2019): Section 110.4(b)3ii

Southern California REGIONAL ENERGY NETWORK

Variable Speed Drive (VSD) for Pool and/or Spa Pump

- Post-Install Data Collection
  - Quantities, certification, and functionality of installed Programmable VSDs may be checked during post-installation inspection.

Southern California REGIONAL ENERGY NETWORK

Variable Speed Drive (VSD) for Pool and/or Spa Pump

- Post-Install Data Collection
  - Only main filtration pumps are eligible for this measure.
  - Appendix B in assessment report outlines additional program documentation requirements and measure specific post-installation verification requirements including:
    - Requirement for existing pump(s)
    - Proposed VSD pump equipment certification requirements
    - Quantities, certification, and functionality of installed Programmable VSDs may be checked during post-installation inspection.

Southern California REGIONAL ENERGY NETWORK

Residential Smart Thermostat - DX w/ Gas Heat or Heat Pump

- Efficiency/Rating Requirements

Measure	Efficiency Rating for Program Eligibility	Minimum Efficiency Source
Residential Smart Thermostat - DX w/ Gas Heat or Heat Pump	Must be capable of two-way communication, occupancy detection (using occupancy sensors, geofencing, etc.), and at least two of the features below: -Schedule learning -Heat pump auxiliary heat optimization -Upstaging / downstaging optimization -Humidity control -Weather-enabled optimization -Free cooling / economizer capability	Work Paper SCE17HC054 (Not Subject to T24)

Southern California REGIONAL ENERGY NETWORK

Residential Smart Thermostat - DX w/ Gas Heat or Heat Pump

- Sample Presentation of Requirements in Assessment Report (AR)
  - AR Section 3.0 Proposed Energy Efficiency Measures - Equipment Recommendations

EEM	Location	Proposed System	Quantity
EEM 9: Install DHW Recirculation Pump Controls	Boiler Closet	Domestic Hot Water Recirculation Pump Controls	5

Southern California REGIONAL ENERGY NETWORK

Residential Smart Thermostat - DX w/ Gas Heat or Heat Pump

- Post-Install Data Collection
  - Quantities and function of installed SMART Thermostats may be checked during post-installation inspection.

Southern California
REGIONAL ENERGY NETWORK

Residential Smart Thermostat - DX w/ Gas Heat or Heat Pump

- Post-Install Data Collection
  - The smart thermostat must be in full compliance with the ENERGYSTAR® Program Requirements and Product Specification for Connected Thermostats products Version 1.0 or later.
  - ENERGYSTAR® References will be listed in Appendix B in assessment report

Southern California REGIONAL ENERGY NETWORK

How to Determining Eligibility for Proposed Measure Equipment

- Manufacturer measure equipment packaging and/or specification sheets
- Refer to applicable code (CA Title 20 and/or CA Title 24) and program requirements to verify that proposed measure equipment specifications exceed minimum program and code requirements
- References and links to applicable program and code requirements will be provided in assessment report for each proposed measure

Southern California REGIONAL ENERGY NETWORK

Eligible Measures and Descriptions

Measure	Description and Details
Attic insulation (per cubic ft)	R-11, R-19, R-30, R-38 Insulation
Wall insulation (per square ft)	Blow-in R-0 to R-13 insulation
Floor insulation (per square ft)	Wood-framed floors, ≥ R-19 or U-factor ≤ 0.037.
High Performance Windows	Multiple Pane and Low-E Glass - U-factor ≤ 0.30 and Solar Heat Gain Coefficient SHGC ≤ 0.25
Duct Sealing	Total Leakage Reduced for high leakage tierz: (40/35%) to (12/15%), and medium tier: (24/25%) to (12/15%)
Insulation of air conditioner ducts	≥ R-8 in unconditioned spaces or ≥ R-4.2 in conditioned spaces
Efficient Fan Controller for Residential Air Conditioners and Furnaces	Automated fan controller or manually-set time-delay fan controller that is set and commissioned by a trained contractor.
Residential Smart Thermostat	DX w/ Gas Heat or Heat Pump
Central brushless fan motor (BFM, or DC Motor)	Specifically configured as a drop-in retrofit for a standard permanent split capacitor (PSC) residential fan (blower) motor serving a central HVAC system
≤24 kBtu/hr High Efficiency Package Terminal Air Conditioner (Res) DX Equipment, or ≤ 24 kBtu/hr package terminal HP (common area) DX equipment	Varying efficiency EER requirement per size and type between EER ≥ 9.13 and EER ≥ 11.29
Efficient room air conditioner; 10,000 Btu	ENERGY STAR (basic tier, and advanced tier exceeding ENERGY STAR by +10%) - Varying efficiency EER requirement per size and type between EER ≥ 9.6 and EER ≥ 13.3
Mini-split ductless HP	SEER ≥ 14 and HSPF ≥ 8.2
Water Source Heat Pump	Varying efficiency EER requirement per size and type between EER ≥ 12.2 and EER ≥ 13.0
Room (or through the wall) Heat Pump	Varying efficiency EER requirement per size and type between EER ≥ 9.13 and EER ≥ 14.28
High-Efficiency furnace	AFUE ≥ 95%
Wall furnace	Gravity ≥ 82% AFUE Fan ≥ 70% AFUE
Residential Split AC and HP	SEER 15-21

Southern California REGIONAL ENERGY NETWORK

Eligible Measures with Descriptions - Continued

Measure	Description and Details
Combined hydronic heating system	≥ 0.93 UEF
Efficient storage water heaters; gas or electric	Varying efficiency UEF requirement per size and type between UEF ≥ 0.64 and UEF≥ 0.83
High Efficiency Domestic Hot Water (DHW) Boilers (central including tankless)	90% (tier 2) condensing
Exterior insulation of storage tanks	R-Value higher than R-12
Residential tankless water heater	≤200 kBtu/hr, Varying efficiency UEF requirement per size and type between UEF ≥ 0.81 and UEF≥ 0.95
High Performance Circulation Pump	Properly sized, high-efficiency ECM pump for domestic hot water (DHW) recirculation with variable speed controls to accommodate demand. Can accommodate external controls that limit operating hours.
Demand Control for Centralized Water Heater Recirculation Pump, Multifamily & Commercial	Includes variable frequency drives (VFDs), integrated or remote sensors, and control systems that respond to demand by controlling the hot water recirculation loop temperature
Thermostatic Valve (TSV), Residential	TSV w/o LF showerhead = 2.25GPM TSV with LF showerhead = 1GPM, 1.25GPM, 1.5GPM, 1.6GPM, and 1.7GPM
Pool and spa heater in residential building	Tier 1: 84% or above; Tier 2: 90% or above
Installation of a on/off Timer for pool and spa heaters	-
VSD for Pool & Spa Pump	Main filtration pumps only
Solar Thermal Water Heating System, Multifamily	-
Space Heating Boiler, Commercial & Multifamily	AFUE ≥ 85%
Refrigerator or Freezer, Residential	ENERGY STAR
Clothes Washer, Residential	ENERGY STAR
Standard-size, electric heat pump clothes dryer	Varying efficiency CEE requirement per size and type between CEE ≥ 2.08 and CEE≥ 3.73
Efficient ≤ 199 kWh (AEU), residential dishwasher	AEU ≤ 199 kWh
Residential Cool Roof	Varying requirement per roof type, solar reflectance of 0.2-0.63, thermal emittance of 0.75, or standard reflectance index of 16-75
Interior and Exterior (Dwelling and Common Area) LED Lighting	Installed lighting must be an LED with a lower wattage rating than existing lighting replaced. Installed LED must meet ISP lumens per watt efficacy according to luminaire type and application.
Low-Flow Showerhead - Residential	1.0, 1.25, 1.5, 1.6, or 1.7gpm
Faucet Aerator, Residential	kitchen aerator: 1.5 gpm (electric or gas) lavatory aerator: 0.5, 1.0, or 1.2 gpm (electric or gas);
Smart Connected Power Strip	Tier 2 Advanced Smart Connected Power Strip – occ sensor and external comm capabilities

**Other measures can be eligible, and eligibility and data requirements will be determined on a case-by-case basis*

Southern California REGIONAL ENERGY NETWORK

Measure Requirement Sources

- DEER Workpapers
- Title 20 Appliance Efficiency Regulations - CA Title 20
- Building Energy Efficiency Standards - CA Title 24
- ENERGYSTAR®

**Detailed references and links to applicable program and code requirements will be provided in assessment report for each proposed measure*

Southern California REGIONAL ENERGY NETWORK