Residential New Construction Electrification



TRC
NOVEMBER 2022

Presentation Overview





Objective: Update on draft measure package (MP)

 Overview of the Residential New Construction Electrification Measure Package

Bundled offering approach

Questions or Comments

Purpose of Measure Package





- TRC runs the California Energy Smart Homes Statewide New Construction program focused on all-electric homes
- Started 1/1/2022
- Currently using custom delivery method but it is not conducive to Res NC project timelines or processes
- Goal is to streamline delivery of the program using deemed measures

CPUC Guidance on Implementation





- CPUC Memo (5/13/2020) to clarify the application of the EE Policy Manual for residential electrification new construction.
- Net-to-gross of 0.95 for all-electric new construction.
- Application assumes a standard-practice, mixed-fuel baseline.
- Allowance for jurisdictions with additional requirements (reach codes)
- Included in PG&E's advice letter for SW NC program



Residential New Construction - Electrification

Related/approved residential measure packages in the eTRM for PY2023



- Cooking Appliances
 - × SWAP013-02
- Heat Pump Clothes Dryer
 - × SWAP014-02

HVAC

- Ductless HVAC
 - SWHC044-02 & SWHC050-02
- Heat Pump HVAC (central)
 - SWHC045-01 & SWHC049-02

Domestic Hot Water

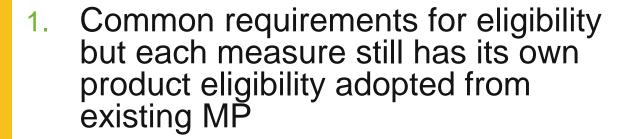
- Heat Pump Water Heater
 - × SWWH025-05
- Large Heat Pump Water Heater,
 Commercial and Multifamily
 - × SWWH028-02





Residential New Construction - Electrification

Unique issues tackled in this "bundled measure" approach



- Various baseline and savings adjustments for vintage and CZ
- Bundled Measure Issues Addressing
 - Separate EULs, impact profiles, tech types, categories, etc. → eTRM data challenges
 - Interactive effects
 - Cost
 - Adopting existing MP labor and material costs
 - ▼ NC Infrastructure costs → CASE 2019 study



1. Common Requirements for Eligibility





- To qualify as an all-electric home, there must be no gas or propane connections.
- Home must pursue Performance compliance pathway, rather than Prescriptive to avoid requiring code for HPs in certain CZs.
 - ~97% new homes go through Performance pathway
- Current Programmatic Requirements
 - EV Ready Electrical infrastructure
 - Battery Ready Electrical infrastructure
 - Individually circuited systems
 -these may not be in the measure package

2. Baseline Considerations - Vintage Impacts





- Fuel Sub Measure Packages created for Ex vintage
- No or negligible vintage impacts found for:
 - Appliances: Induction Cooking and HP Clothes Dryer
 - DHW Storage and Central DHW (per DEER)
- Considerable Vintage Impacts for HVAC systems
 - Vintage differences for kWh and Gas found from SWHC049 and SWHC050
 - Derating factor by CZ to reduce savings for New vintage
 - Factors range:
 - × kWh: 3%-21%
 - × Therms: 38%-59%

2. Baseline Considerations – Electric Equipment Penetration



- 9
- Although all-electric home has low penetration (~5%), individual electric systems can be greater
- Reviewed T24 compliance data for 2019 code cycle
- Very small penetration of electric for DHW (~2%) → no adjustment made
- Considerable HVAC penetration, variable by CZ
- Weighting of mixed fuel vs all electric savings by CZ:
 - Ductless using: SWHC044 and SWHC050
 - Central using: SWHC045 and SWHC049
- Similar weighting will be done for HVAC IE for HPCD

2. Baseline Considerations – Electric Equipment Penetration





Fuel Source	Mixed Fuel		Electric Only		All Fuels
	Ductless: SWHC044		Ductless: SWHC050		
Relavant Measure Packages	Central: SWHC045		Central: SWHC049		CZ % Represented
Climate Zone	% Allocation		% Allocation		
CZ01		67%		33%	0.1%
CZ02		68%		32%	0.5%
CZ03		62%		38%	1.2%
CZ04		73%		27%	1.6%
CZ05		32%		68%	0.6%
CZ06		41%		59%	1.0%
CZ07		76%		24%	1.5%
CZ08		51%		49%	2.6%
CZ09		40%		60%	1.8%
CZ10		43%		57%	19.5%
CZ11		90%		10%	15.9%
CZ12		93%		7%	31.3%
CZ13		83%		17%	14.1%
CZ14		70%		30%	5.3%
CZ15		37%		63%	2.3%
CZ16		92%		8%	0.7%
Total Percent		75%		25%	100.0%

n≈29k new homes

2. Baseline Considerations System Selection





- DHW and HVAC Fuel Sub Measure Packages have various potential code compliant baselines per measure
- Storage HPWH → Tankless Gas WH
 - Most common for NC & used as baseline in compliance software (conservative savings)
- MFm Central HPWH →both central storage and boiler kept for now
 - Looking for Cal TF input on how to direct selection baseline (MFm unit quantity? System storage capacity?)
- HVAC must choose 2 baselines (mixed fuel vs electric only)
 - Ductless: Window AC w/Gas Wall furnace / Ductless Minisplit HP
 - Central: Split AC w/Central Gas furnace / Central Split HP

2. Demand Impacts for Fuel Sub Measures





- Appliance Measures adopt "demand factor" methodology from EE equivalent measures
- Water heating measures have demand impacts found in DEER

- HVAC
 - Peak demand period occurs doing cooling season
 - Adopt peak demand impacts from equivalent EE HP measures

3. Bundled Measure Issues





- Most values are already approved in existing MPs
 - Some savings and costs may need adjusting
- Interactive Effects
 - Only Clothes Dryer measure has HVAC IE included in existing calcs
 - Additional calculation steps required for adjusting for different HVAC IE
- Each adopted measure has different parameters → Lots of eTRM exclusion tables
- Maintain Alignment
 - Measure package will need to watch updates from 8 related measure packages → Modular value tables and calculations
- Future Additions
 - If future offerings are added, watch specifically for
 - Stronger interactive effects
 - Cost implications
 - Differing electric system market penetration
 - Cal TF Input: Any other measure ideas for future offerings?

Questions / Next Steps





- Measure package plan has been submitted to the CPUC for review (waiting on comments)
 - Measure package development in process now

Questions:

Are there additional bundled measure issues that should be considered?