

Water Heating

Cal TF Tier 2 Presentation



CALIFORNIA
TECHNICAL FORUM

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Water Heating Measure Affirmation

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“Cal TF affirms the subcommittee recommendations regarding ‘Stage 1 Issues’ for Water Heating Measures.”

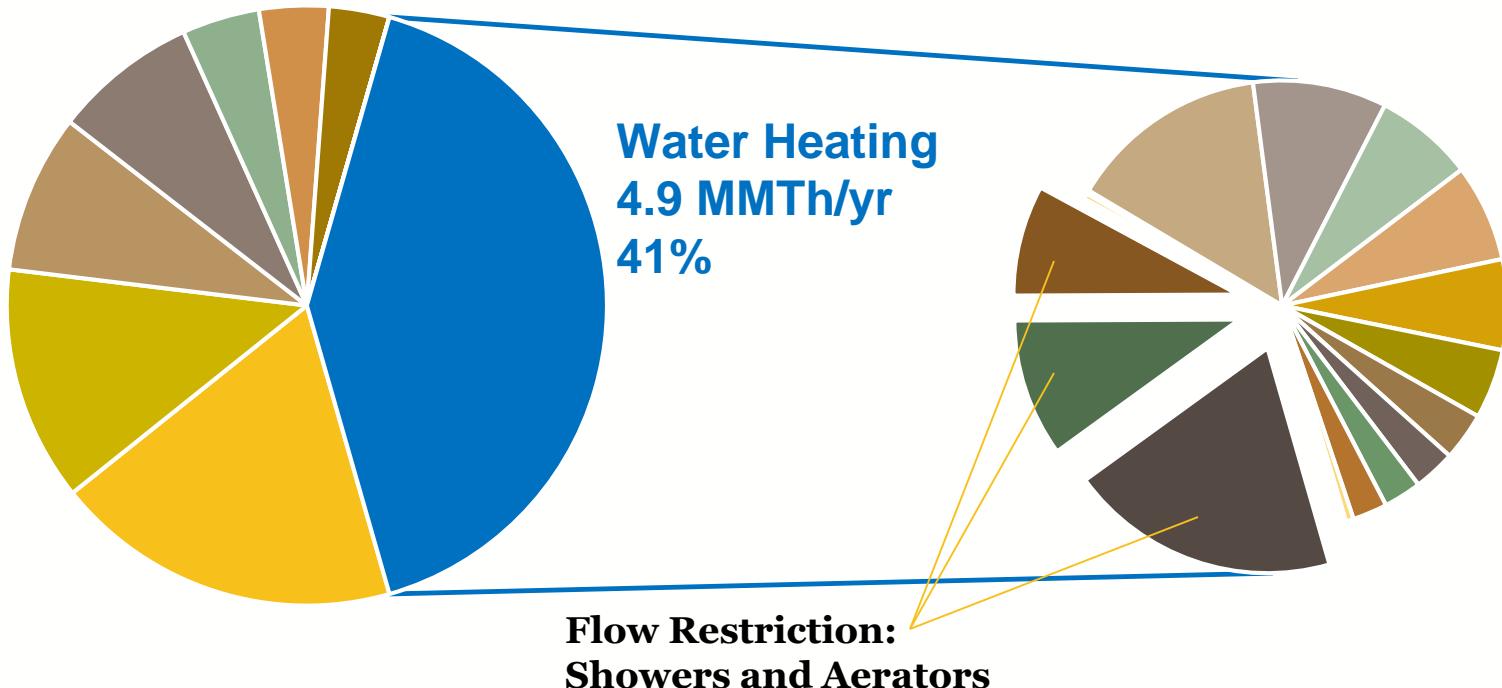
- 6.02, Faucet Aerators, Residential
- 6.03, Low-Flow Showerheads, Residential
- 6.04, TSV with and without an Integrated Low-Flow Showerhead
- 6.05, Laminar Flow Restrictor
- 6.07, Boiler, Commercial
- 6.08, Tankless, Commercial
- 6.09, Storage Water Heater, Commercial
- 6.10, Boiler, Process
- 6.11, Direct Contact Water Heater, Process
- 6.12, Boiler, Multi-Family
- 6.13, Central Storage Water Heater, MF
- 6.14, Storage Water Heater, Residential
- 6.15, Tankless, Residential
- 6.16, Heat Pump Water Heater
- 6.18, Demand Control for Centralized Water Heater Recirculation Pump
- 6.19, DHW Boiler Reset Controller, MF
- 6.21, Hot Water Line Insulation
- 6.22, Tank Insulation
- 6.23, Faucet Aerators, Commercial

Water Heating Category Deemed Savings

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- Savings Perspective

2016 CA Gas Savings (therms/yr)
(Total = 12MMTh/yr, not including negative Lighting effects)



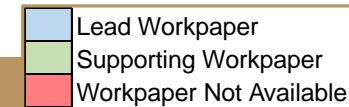
Water Heating Measures - Revised List



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No.	Measure Names		Plan	PG&E	SCE	SDG&E	SCG	POU
6.01	Flow	Faucet Aerator and Low Flow Showerhead	2017					
6.02		Faucet Aerators for Bathroom/Kitchen Sinks in Residential Buildings	2017					
6.03		Low-Flow Showerheads	2017					
6.04		Temp-Initiated Shower Flow Restr. Valve w&w/o LF Showerhead	2017					
6.05		Laminar Flow Restrictor	2017					
6.06		Therm Savings Kit	2018					
6.07	Water Heaters	Boiler, Commercial	2017					
6.08		Tankless, Commercial	2017					
6.09		Storage Water Heater, Commercial	2017					
6.10		Boiler, Process	2017					
6.11		Direct Contact Water Heater, Process	2017					
6.12		Boiler, Multi-Family	2017					
6.13		Central Storage Water Heater, MF	2017					
6.14		Storage Water Heater, Residential	2017					
6.15		Tankless, Residential	2017					
6.16		Heat Pump Water Heater	2017					
6.17	Controls	Multifamily DHW RCx, Training, and Boiler Reset Controller	2017					
6.18		Demand Control for Centralized Water Heater Recirculation Pump	2017					
6.18b		Demand Control for Centralized Water Heater Recirculation Pump, VFD	2018					
6.19		Commercial Boiler Water Heating Control System	2017					
6.20	Insul.	MF Central Recirc System Pipewrap	2018					
6.21		Hot Water Line Insulation Electric/Gas	2017					
6.22		Tank Insulation	2017					
6.23	New	Faucet Aerators for Lavatory Sinks in Commercial Buildings	2017					
6.24		Low-Flow Showerheads, Commercial	2018					
6.25		Recirculation Pump Time Clocks	2018					
6.26		Smart Pump, Residential	2018					

Blue text = Changed item



Flow Restrictors

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Measure Consensus

6.02 – Low Flow Aerators

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- Offering

- Residential (SF and MF); Electric-only and Gas-only
- Kitchens - 1.5 ~~and 1.8~~ gpm
- Lavatories - 0.5, 1.0 and 1.2 gpm
- Implementation: Retrofit Add On (REA/AOE), Direct Install (Typical)

- Stage 1 Issues

- Used CPUC disposition input values in eTRM calculations - savings increase by 2x – 3x
 - ✗ Misapplication of number of aerators in therm kit
 - ✗ Double-counting the recovery efficiency vs energy factor ratio
 - ✗ Harmonize on groundwater temperatures vs dishwasher scaling approach
- Harmonize on base flow of 2.2 gpm
- Peak demand (kW) savings determination used in 2013 CPUC disposition (11% factor)
- Agree on Costs (Actual costs based on DI program costs)
- Electric savings under-estimated
- Removed blended gas/electric permutations

- Measure Extension

- Added measure for POU's (electric measure)
- Added measure for SCE and SDG&E (electric measure)

TRC Change

CZ 09
119%
376%

- Stage 2 Issues

- Add embedded energy in water based upon WEN Calculator (depending on other claims)
- Data collection on pre-existing aerators and flows to determine retrofit type and baseline flow
- Non-DI cost adjustment

Measure Consensus

6.02 – Low Flow Aerators

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Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW	1956%	355%			357%
kWh	1953%	355%			357%
Therms	3513%	-100%		157%	157%
Cost	1057%	-44%		38%	36%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	7.42	175%	3%	0.05	7.37	-	-
kWh	73,873	175%	5%	532	73,341	-	-
Therms	325,947	1729%	6%	2,407	(898)	-	324,438
Cost	\$ 149,968	95%	1%	\$ 4,112	\$ (6,934)	\$ -	\$ 152,789

Savings Comparison

- Cost are all DI related, so eTRM cost will not impact claims
- PG&E savings are lowered to adjust for new code baselines
 - ▣ eTRM is using the existing baseline of 2.2 gpm (REA measure)
 - ▣ Even large changes have a small impact because volume was low
- SCE uses a blended calculation (gas and electric savings that are based on RASS data for electric water heaters (7%))
- SCG is following disposition values
 - ▣ 1.5x increase is typical due to inconsistencies in the disposition

Input Consensus

6.02 – Low Flow Aerators

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- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	DMo,MFm,SFm	Res	DMo,MFm,SFm	DMo,MFm,SFm	MFm,SFm
BldgVintage	Ex	Ex	Any	Ex	Any
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	CZ01,CZ02,CZ03,CZ04 ,CZ05,CZ11,CZ12,CZ1 3,CZ16	CZ06,CZ08,CZ09,CZ10 ,CZ13,CZ14,CZ15,CZ1 6	CZ06,CZ07,CZ08,CZ10 ,CZ14,CZ15,IOU	CZ01,CZ02,CZ03,CZ04 ,CZ05,CZ06,CZ07,CZ0 8,CZ09,CZ10,CZ11,CZ 12,CZ13,CZ14,CZ15,C Z16
BldgHVAC	rWtd	rWtd	Any	Any	rWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	REA	ROB	ER	ROB	RET,REA
NormUnit	Each	Each	Each	Each	Each
EUL ID	WtrHt-WH-Aertr	WtrHt-WH-Aertr WtrHt-WH-Shrhd	WtrHt-WH-Aertr WtrHt-WH-Shrhd	WtrHt-WH-Aertr	WtrHt-WH-Aertr
RUL ID	1/3 of 20 yrs	No Value	No Value	No Value	No Value
NTGR	RES-DEFAULT-HTR-DI Res-mDHWaerator EUC-Default	Res-mDHWaerator Res-sAll-mDHWshwr	Res-mDHWaerator, Res-Default>2, Res-sAll-mDHWshwr	RES-DEFAULT-HTR-DI, Com-Default>2yrs, Res-mDHWaerator, EUC-Default	RES-DEFAULT-HTR-DI, Res-mDHWaerator, Com-Default-HTR-di
DeliveryType	DirInstall NonUpStrm PreRebUp	DirInstall, PreRebUp	DirInstall NonUpStrm PreRebUp	DirInstall, PreRebDown, PreRebUp	DirInstall, PreRebDI
GSIA	Res-LowF-FA-All	Res-LowF-FA-All, Res-LowF-SH-All	Res-LowF-FA-All, Res-LowF-SH-All	Res-LowF-FA-All, Res-LowF-FA-SDG, Res-LowF-SH-SDG	Res-LowF-FA-All, Def-GSIA

Measure Consensus

6.03 – Low Flow Showerheads

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- Offering
 - Residential (SF and MF); **Electric-only and Gas-only**
 - Bathroom Showerheads - **0.5, 1.0, 1.25, 1.5, 1.6 and 1.7 gpm**
 - Implementation: Replace on Burnout (ROB/NR) / NC/NEW or ER/Direct Install (Typical)
- Stage 1 Issues
 - Used CPUC disposition input values in eTRM calculations
 - Double-counting the recovery efficiency vs energy factor ratio
 - Harmonize on groundwater temperatures vs dishwasher scaling approach
 - Add NC to all IOUs
 - Agree on kW savings determination used in 2013 CPUC disposition (11% factor)
 - Agree on Costs - Base Case from DEER (\$14.32); Measure Case from WO017 (\$18.50 Measure Cost, \$15.47 Labor Cost).
 - **Baseline updated to 1.8 gpm (for code starting 4/1/18)**
 - **Removed blended gas/electric permutations**
- Measure Extension
 - Added measure for POUs (electric measure)
 - Added measure for SCE and SDG&E (electric measure)
- Stage 2 Issues
 - *Add embedded energy in water based upon WEN Calculator (depending on other claims)*
 - ★ *Data collection on pre-existing showerhead flows to determine retrofit type and baseline flow*
 - *Update for required flow by CA Title 20 code (7/1/2018) for ROB/NC measures*
 - *Non-DI cost adjustment*

Measure Consensus

6.03 – Low Flow Showerheads

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Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW	-33%	-74%			-74%
kWh	-33%	-74%			-74%
Therms	114%	-100%	31%	30%	30%
Cost	1280%	-13%	-3%	81%	65%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	(4.42)	-104%	-2%	(0.01)	(4.41)	-	-
kWh	(43,951)	-104%	-3%	(74)	(43,878)	-	-
Therms	78,497	416%	1%	4,740	(2,673)	10,798	65,632
Cost	\$ 598,024	377%	4%	\$39,849	\$ (1,719)	\$ (5,842)	\$ 565,735

Savings Comparison

- Cost are all DI related, so eTRM cost will not impact claims
- PG&E savings are lowered to adjust for new code baselines
 - eTRM is using the existing baseline of 2.25 gpm (ER) / 1.8 gpm (ROBNC)
 - Even large changes have a small impact because volume was low
- SCE uses a blended calculation (gas and electric savings that are based on RASS data for electric water heaters (7%))
 - 2017 claims use an older version of their savings; values are similar to eTRM (before the blending)
- SCG/SDG&E are following disposition values
 - 30% increase is typical due to inconsistencies in the disposition

Input Consensus

6.03 – Low Flow Showerheads

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- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	DMo, MFm, SFm	Res	DMo, MFm, SFm	DMo, MFm, SFm	MFm, SFm
BldgVintage	Ex	Ex	Any	Ex	Ex
BldgLoc	CZ01, CZ02, CZ03, CZ04, CZ05, CZ06, CZ07, CZ08, CZ09, CZ10, CZ11, CZ12, CZ13, CZ14, CZ15, CZ16	CZ01, CZ02, CZ03, CZ04, CZ05, CZ11, CZ12, CZ13, CZ16	CZ06, CZ08, CZ09, CZ10, CZ13, CZ14, CZ16	CZ06, CZ07, CZ08, CZ10, CZ11, CZ12, CZ13, CZ14, CZ15, CZ16	CZ01, CZ02, CZ03, CZ04, CZ05, CZ06, CZ07, CZ08, CZ09, CZ10, CZ11, CZ12, CZ13, CZ14, CZ15, CZ16
BldgHVAC	rWtd	rWtd	Any	Any	rWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROBNC, ER	ROB	ER	RET, ROB	RET, ROB, ER, REA
NormUnit	Each	Each	Each	Each	Each
EUL ID	WtrHt-WH-Shrhd	WtrHt-WH-Aertr, WtrHt-WH-Shrhd	WtrHt-WH-Aertr, WtrHt-WH-Shrhd	WtrHt-WH-Shrhd	WtrHt-WH-Shrhd
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	RES-DEFAULT-HTR-DI Res-Default>2 EUC-Default	Res-mDHWaerator, Res-sAll-mDHWshwr	Res-mDHWaerator, Res-Default>2, Res-sAll-mDHWshwr	RES-DEFAULT-HTR-DI, Com-Default>2yrs, Res-Default>2, EUC-Default	RES-DEFAULT-HTR-DI, Res-sAll-mDHWshwr, Res-Default>2, Com-Default-HTR-di
DeliveryType	DirInstall PreRebDown NonUpStrm PreRebUp	DirInstall, PreRebUp	DirInstall, NonUpStrm, PreRebUp	DirInstall, PreRebDown, PreRebUp	DirInstall, PreRebDown, PreRebDI
GSIA	Def-GSIA, Res-LowF-SH-SDG	Res-LowF-FA-All, Res-LowF-SH-All	Res-LowF-FA-All, Res-LowF-SH-All	Def-GSIA, Res-LowF-SH-SDG	Res-LowF-SH-All, Def-GSIA, Res-LowF-SH-SDG

Measure Consensus

6.04 Thermostatic Shut-off Valve (TSV)

13

- Offering

- Residential (SF and MF); **Electric-only and Gas-only**
- TSV w/ and w/o Bathroom Showerheads - **0.5, 1.0, 1.25, 1.5, 1.6 and 1.7 gpm**
- Implementation: Direct Install (Typical)
 - TSV – Retrofit Add On (REA) / Add-On Equipment (AOE)
 - Showerhead - Replace on Burnout (ROB/NR) / NC/NEW or ER,

- Stage 1 Issues

- Used CPUC disposition input values in eTRM calculations
 - Double-counting the recovery efficiency vs energy factor ratio
 - Harmonize on groundwater temperatures vs dishwasher scaling approach
- Behavioral factor used – lower time of wasted flow – 47 seconds based on published research
- Agree on kW savings determination used in 2013 CPUC disposition (11% factor)
- Agree on Costs – TSV costs from SCG. Use updated DI program costs.
- Removed blended gas/electric permutations**

- Measure Extension

- Added measure for POU
- Added measure for SCE and SDG&E (electric measure)

- Stage 2 Issues

- Add embedded energy in water based upon WEN Calculator (depending on other claims)**
- Data collection on pre-existing showerhead flows to determine retrofit type and baseline flow**
- Update for required flow by CA Title 20 code (7/1/2018) for ROB/NC measures**
- Non-DI cost adjustment**



Input Consensus

6.04 Thermostatic Shut-off Valve (TSV)

14

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	DMo, MFm, SFm	Res	DMo, MFm, SFm	DMo, MFm, SFm	MFm, SFm
BldgVintage	Ex	Ex	Any	Ex	Ex
BldgLoc	CZ01, CZ02, CZ03, CZ04, CZ05, CZ06, CZ07, CZ08, CZ09, CZ10, CZ11, CZ12, CZ13, CZ14, CZ15, CZ16	CZ01, CZ02, CZ03, CZ04, CZ05, CZ11, CZ12, CZ13, CZ14, CZ15, CZ16	CZ06, CZ08, CZ09, CZ10, CZ13, CZ14, CZ15, CZ16	CZ06, CZ07, CZ08, CZ10, CZ14, CZ15, IOU	CZ01, CZ02, CZ03, CZ04, CZ05, CZ06, CZ07, CZ08, CZ09, CZ10, CZ11, CZ12, CZ13, CZ14, CZ15, CZ16
BldgHVAC	rWtd	rWtd	Any	Any	rWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROBNC, ER	ROB	ER	RET, ROB	RET, ROB, ER, REA
NormUnit	Each	Each	Each	Each	Each
EUL ID	WtrHt-WH-Shrhd	WtrHt-WH-Aertr, WtrHt-WH-Shrhd	WtrHt-WH-Aertr, WtrHt-WH-Shrhd	WtrHt-WH-Shrhd	WtrHt-WH-Shrhd
RUL ID	1/3 of 20 yrs	No Value	No Value	No Value	No Value
NTGR	RES-DEFAULT-HTR-DI, Res-Default>2, EUC-Default	Res-mDHWaerator, Res-sAll-mDHWshwr	Res-mDHWaerator, Res-Default>2, Res-sAll-mDHWshwr	RES-DEFAULT-HTR-DI, Com-Default>2yrs, Res-Default>2, EUC-Default	RES-DEFAULT-HTR-DI, Res-sAll-mDHWshwr, Res-Default>2, Com-Default-HTR-di
DeliveryType	DirInstall, PreRebDown, NonUpStrm, PreRebUp	DirInstall, PreRebUp	DirInstall, NonUpStrm, PreRebUp	DirInstall, PreRebDown, PreRebUp	DirInstall, PreRebDown, PreRebDI
GSIA	Def-GSIA, Res-LowF-SH-SDG	Res-LowF-FA-All, Res-LowF-SH-All	Res-LowF-FA-All, Res-LowF-SH-All	Def-GSIA, Res-LowF-SH-SDG	Res-LowF-SH-All, Def-GSIA, Res-LowF-SH-SDG

Measure Consensus

6.05 – Laminar Flow Restrictors (LFRs)

15

- Offering

- Healthcare; Gas only
- Kitchens – 0.5, 1.0, 1.2, 1.5 and 1.8 gpm; **removed 2.2 gpm**
- Private Lavatories - 0.5, 1.0 and 1.2 gpm
- Public Lavatories - 0.5 gpm (only)
- Implementation: Retrofit Add-On (REA/AOE)
 - Direct Install (Typical) and PreRebDown

- Stage 1 Issues

- Base case 2.7 gpm
- Groundwater temps used in workpaper (updated DEER data)
- Adjust mixed water temp of 106°F, efficiency at 77% for consistency with other flow measures

- Measure Extension

- Added measure for POUs, PG&E and SDG&E (gas measure)

- Stage 2 Issues

- Add embedded energy in water based upon WEN Calculator (depending on other claims)
- Data collection on more types of facilities (nursing homes, medical office buildings, clinics) to determine base flows
- Savings factor of 0.7 not supported (reduces baseline flow and savings from survey data)

Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW					
kWh					
Therms				1%	1%
Cost				0%	0%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	-		0%	-	-	-	-
kWh	-		0%	-	-	-	-
Therms	537	1%	0%	-	-	-	13
Cost	\$ -	0%	0%	\$ -	\$ -	\$ -	\$ (0)

Water Heating - Tier 2

Black text = Current state of the consolidated measure
Blue text = Changing and / or first time item is mentioned
Italics text = Item that has not been completed



3/22/2018

Input Consensus

6.05 – Laminar Flow Restrictors (LFRs)

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- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Cnc,Hsp,Nrs	No Value	No Value	No Value	Cnc,Hsp,Nrs
BldgVintage	Any	No Value	No Value	No Value	Any
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16,IOU	No Value	No Value	No Value	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16,IOU
BldgHVAC	cWtd	No Value	No Value	No Value	Ex,cWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	REA	No Value	No Value	No Value	REA
NormUnit	Each	No Value	No Value	No Value	Each,Fixture
EUL ID	WtrHt-WH-Aertr	No Value	No Value	No Value	WtrHt-WH-Aertr
RUL ID	1/3 of 20 yrs	No Value	No Value	No Value	No Value
NTGR	All-Default<=2yrs	No Value	No Value	No Value	All-Default<=2yrs
DeliveryType	DirInstall, PreRebDown	No Value	No Value	No Value	PreRebDI, PreRebDown
GSIA	Def-GSIA	No Value	No Value	No Value	Def-GSIA

Measure Consensus

6.23 – Commercial Aerators

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- Offering

- Commercial (except HealthCare); Gas Only
 - ~~Kitchens - 1.5 gpm~~
 - Public and Private Lavatories - 0.5, 1.0 ~~and 1.2~~ gpm
 - Implementation: Retrofit Add-On (REA/AOE), Direct Install (Typical)

- Stage 1 Issues

- Measured 1.67 gpm flow vs. 2.00 gpm flow for residential aerators
 - Measured mixed water temp of 97.9°F vs. 106°F for residential aerators
 - Agree on Measure costs to use SCG WP costs from vendor and 3P installer (\$2.89 Material Cost, \$4.28 Labor Cost); Base cost \$0 (REA/AOE)

- Measure Extension

- Added measure for POUs (gas measure)
 - Added measure for PG&E and SDG&E (gas measure)

- Stage 2 Issues

- *Add embedded energy in water based upon WEN Calculator (depending on other claims)*
 - *Data collection on pre-existing aerators to determine baseline type*

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Input Consensus

6.23 – Commercial Aerators



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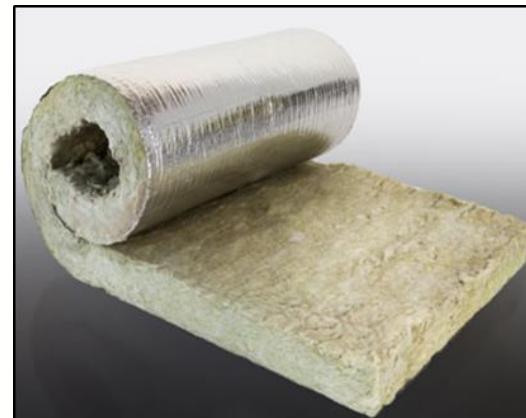
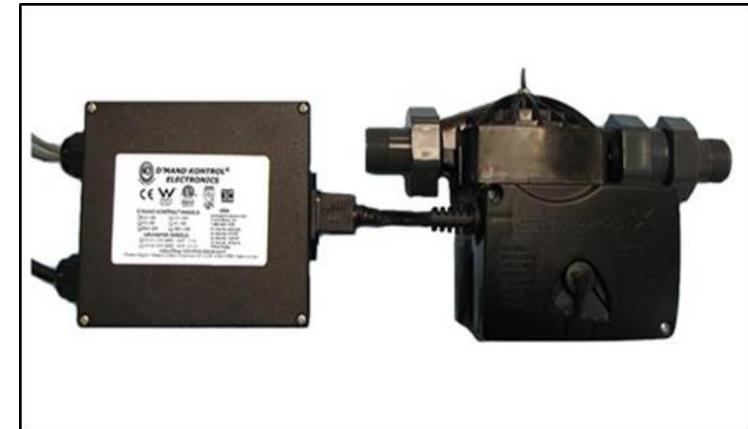
- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com	No Value	No Value	No Value	Cnc,Hsp,Nrs
BldgVintage	Any	No Value	No Value	No Value	Any
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16,IOU	No Value	No Value	No Value	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16,IOU
BldgHVAC	cWtd	No Value	No Value	No Value	Ex,cWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	REA	No Value	No Value	No Value	REA
NormUnit	Each	No Value	No Value	No Value	Each,Fixture
EUL ID	WtrHt-WH-Aerator	No Value	No Value	No Value	WtrHt-WH-Faucet
RUL ID	WtrHt-WH-Faucet 1/3 of 20 yrs	No Value	No Value	No Value	No Value
NTGR	All-Default<=2yrs	No Value	No Value	No Value	All-Default<=2yrs
DeliveryType	PreRebDI, PreRebDown	No Value	No Value	No Value	PreRebDI, PreRebDown
GSIA	Def-GSIA	No Value	No Value	No Value	Def-GSIA

Controls / Insulation

19



Measure Consensus

6.17/6.19 – DHW Loop Temp Control

20

- Offering

- MF and Lodging Only; Gas Only
- Existing Buildings with Gas Water Heating
- Implementation: Retrofit Add-On (REA/AOE), PreRebDown

- Stage 1 Issues

- No expected climate zone (CZ) variation
- Use PG&E methodology

- Measure Extension

- Added measure for POUs (gas measure)

- Stage 2 Issues

- Modify savings from PG&E approach (based on RASS usage and simple equation with assumed reduced loop temperature)
 - SCG used eQUEST models (not available or reviewed)
 - Test case for transition from eQUEST to Open Studio
- *Expand to other commercial building types – hospitals, offices, etc.*



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 Blue text = Changing and / or first time item is mentioned
 Italics text = Item that has not been completed

Input Consensus

6.17/6.19 – DHW Loop Temp Control



21

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	MFm,Htl	MFm,Htl	No Value	MFm	No Value
BldgVintage	Ex	Ex	No Value	Ex	No Value
BldgLoc	Any	Any	No Value	CZ06,CZ07,CZ08,CZ10 ,CZ14,CZ15	No Value
BldgHVAC	rWtd cWtd	rWtd cWtd	No Value	Any	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	REA	REA	No Value	RET	No Value
NormUnit	Household	Each	No Value	Household	No Value
EUL ID	SHW-EMS	SHW-EMS	No Value	WtrHt-HtPmp	No Value
RUL ID	1/3 of 20 yrs	No Value	No Value	No Value	No Value
NTGR	Com-Default>2yrs Res-Default>2	Com-Default>2yrs Res-Default>2	No Value	Res-Default>2	No Value
DeliveryType	PreRebDown	PreRebDown	No Value	PreRebDown	No Value
GSIA	Def-GSIA	Def-GSIA	No Value	No Value	No Value

Measure Consensus

6.18 – MF DHW Pump Control (On/Off)

22

- Offering

- MF Only; Existing Buildings
- Electric and Gas
- Implementation: Retrofit Add On (REA/AOE); Direct Install (DI) and PreRebDown



- Stage 1 Issues

- Agree on Costs – Use SCG / PG&E / SCE WP costs from vendors and RS Means estimates
 - Small and Large Facility Size (\$37.10 and \$18.55/unit materials, \$2.68 and \$1.34/unit labor)
 - SDG&E had higher costs than the other WPs (older WP).
- SDG&E WP savings calculations are by installation and not consistent with other WPs (which reference the CASE study)

- Measure Extension

- Added measure for POU

- Stage 2 Issues

- Consider more granular approach than only small and large (aka low rise and high rise) buildings - currently savings per unit based on facility sizes of 44 and 88 units*
- Extend to commercial – SCG VFD DHW Pump WP in progress (planned for 6.18b)*

Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW				0%	0%
kWh				0%	0%
Therm				0%	0%
Cost				-52%	-52%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	(0.16)	0%	0%	-	-	-	(0.16)
kWh	(22)	0%	0%	-	-	-	(22)
Therm	6	0%	0%	-	-	-	6
Cost	\$ (660,421)	-52%	-5%	\$ -	\$ -	\$ -	\$ (660,421)

Input Consensus

6.18 – MF DHW Pump Control (On/Off)



23

- Measure Permutations

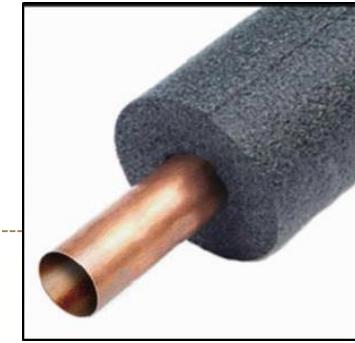
	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	MFm	MFm	No Value	No Value	MFm
BldgVintage	Ex	Ex	No Value	No Value	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	CZ01,CZ02,CZ03,CZ04 ,CZ05,CZ06,CZ11,CZ1 2,CZ13,CZ16	No Value	No Value	Any,CZ04,CZ05,CZ06, CZ08,CZ09,CZ10,CZ13 ,CZ14,CZ15,CZ16
BldgHVAC	rWtd	rWtd	No Value	No Value	Any rWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	REA	RET	No Value	No Value	RET,REA
NormUnit	Household	Household	No Value	No Value	Cap-Tons Each Household
EUL ID	WtrHt-Timeclock	WtrHt-Timeclock	No Value	No Value	Wtr-Ht-Timeclock WtrHt-Timeclock
RUL ID	Motors-pump	No Value	No Value	No Value	No Value
NTGR	Res-Default>2	Res-Default>2	No Value	No Value	Res-Default>2
DeliveryType	DirInstall PreRebDown	Any	No Value	No Value	DirInstall PreRebDown
GSIA	Def-GSIA	Def-GSIA	No Value	No Value	Def-GSIA

Measure Consensus

6.21 – Pipe Insulation

24



- Offering
 - Small / Large Commercial and Industrial
 - Gas Only
 - 1 inch insulation on uninsulated hot water / steam lines (low and high pressure)
 - Pipe diameter: <=1", 1 to <=4", and >4"
 - Pipe or Fitting
 - Indoor or Outdoor
 - Implementation: Retrofit Add-On (REA/AOE); PreRebDown

● Stage 1 Issues

- Use SCG developed calculator
 - Standalone tool based on 2014 / 2015 Itron ESPI Pipe Insulation Reports
 - Disposition requested large pipe additions (>4")

● Measure Extension

- None

● Stage 2 Issues

- Consider damaged insulation (SDG&E WP)

CZ 12	TRC Change
Ind, Pipe, Outdoor, HW, >1" and <=4"	62%
Ind, Pipe, Outdoor, LP Steam, <1"	79%
Ind, Pipe, Outdoor, LP Steam, >1" and <=4"	52%
Sm Com, Pipe, Outdoor, HP Steam, <1"	447%
Lg Com, Pipe, Outdoor, HP Steam, >1" and <=4"	645%

Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW					
kWh					
Therms	28%			-24%	3%
Cost	-48%			28%	-14%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG	Weighted
kW	-		0%	-	-	-	-	468%
kWh	-		0%	-	-	-	-	
Therms	32,728	3%	1%	150,216	-	-	(117,488)	
Cost	\$ (69,763)	-14%	-1%	\$ (132,448)	\$ -	\$ -	\$ 62,685	

Water Heating - Tier 2

Black text = Current state of the consolidated measure
 Blue text = Changing and / or first time item is mentioned
 Italics text = Item that has not been completed

3/22/2018

Input Consensus

6.21 – Pipe Insulation

25

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com, Ind, Ag	SUn,Asm,ECC,EPr,ERC,ESe, EUn,Gro,Hsp,Htl,MBT,MLI, Mtl,Ofl,OfS,RFF,RSD,Rt3,RtL,RtSSCn,WRF	No Value	Com	Com
BldgVintage	Ex	Any	No Value	Ex	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	Any	No Value	CZ06,CZ07,CZ08,CZ10 ,CZ14,CZ15,Any	IOU
BldgHVAC	cUnc	cUnc	No Value	Any	Any

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	REA	REA	No Value	RET,REA	REA,RET
NormUnit	Len-ft Each Fitting	Len-ft	No Value	Len-ft	Len-ft Each Fitting
EUL ID	WtrHt-PipeIns-Gas	WtrHt-PipeIns-Gas	No Value	WtrHt-PipeIns-Elec WtrHt-PipeIns-Gas	WtrHt-PipeIns-Gas
RUL ID	1/3 of 20 yrs	No Value	No Value	No Value	No Value
NTGR	Com-Default>2yrs Ind-Default>2yrs Ag-Default>2yrs	NonRes-sAll-mPipeIns-deemed	No Value	Com-Default>2yrs	Com-Default>2yrs Ind-Default>2yrs
DeliveryType	DirInstall PreRebDown	PreRebDown	No Value	DirInstall PreRebDown	PreRebDown PreRebDI
GSIA	Def-GSIA	Def-GSIA	No Value	Def-GSIA	Def-GSIA

Measure Consensus

6.22 – Tank Insulation

26



Offering

- ❑ Commercial, Industrial, Agricultural
- ❑ Gas Only
- ❑ 1 "or 2" thick insulation on Medium / High Temp Tanks, Low / High Usage, Indoor / Outdoor
- ❑ Implementation: Retrofit Add-On (REA/AOE); PreRebDown

Stage 1 Issues

- ❑ Agree on Costs – Use PG&E / SCG WP costs from vendor and RS Means estimates
 - 1" and 2" thick (\$7.31 or \$9.19/unit materials, \$2.18 or \$2.85/unit labor)
 - SDG&E had lower costs – older WP

Measure Extension

- ❑ None

Stage 2 Issues

- ❑ None

Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW					
kWh					
Therms	-10%			-6%	-6%
Cost	0%			0%	0%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	-		0%	-	-	-	-
kWh	-		0%	-	-	-	-
Therms	(11,792)	-6%	0%	(1,314)	-	-	(10,478)
Cost	\$ (0)	0%	0%	\$ -	\$ -	\$ -	\$ (0)

Input Consensus

6.22 – Tank Insulation



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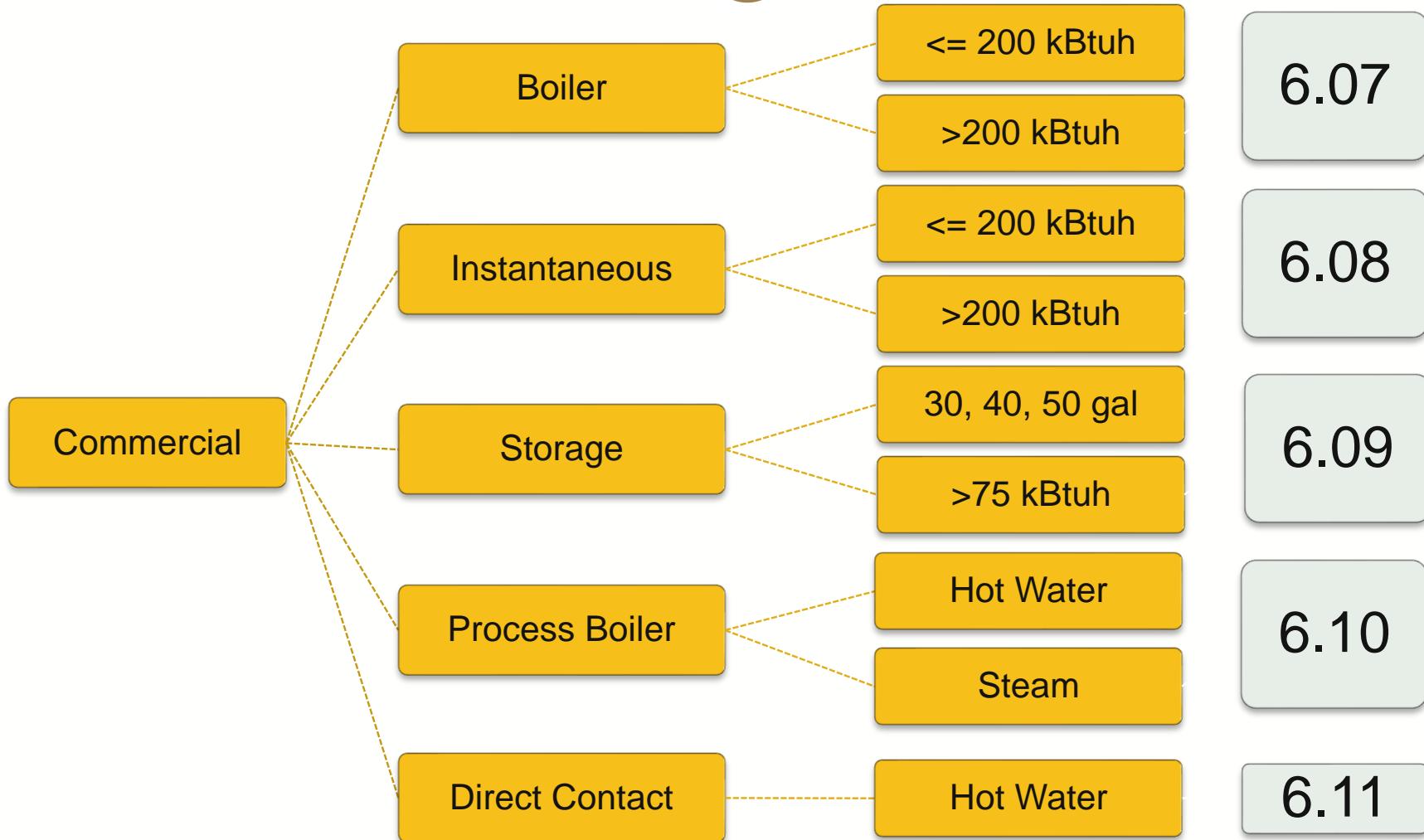
- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Any	Any	No Value	No Value	Com
BldgVintage	Ex	Ex	No Value	No Value	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	Any	No Value	No Value	Any,CZ01,CZ02,CZ03,CZ04, CZ05,CZ06,CZ07,CZ08,CZ09 ,CZ10,CZ11,CZ12,CZ13,CZ1 4,CZ15,CZ16
BldgHVAC	cUnc	cUnc	No Value	No Value	Any

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	REA	REA	No Value	No Value	REA,RET
NormUnit	Area-ft2	Area-ft2	No Value	No Value	Area-ft2
EUL ID	WtrHt-TankIns-Gas	WtrHt-PipeIns-Gas	No Value	No Value	WtrHt-TankIns-Gas
RUL ID	WtrHt-Com	No Value	No Value	No Value	No Value
NTGR	Ind-Default>2yrs Ag-Default>2yrs Com-Default>2yrs	Ind-Default>2yrs	No Value	No Value	Com-Default>2yrs
DeliveryType	PreRebDown PreRebDI	PreRebDown	No Value	No Value	PreRebDown PreRebDI
GSIA	Def-GSIA	Def-GSIA	No Value	No Value	Def-GSIA

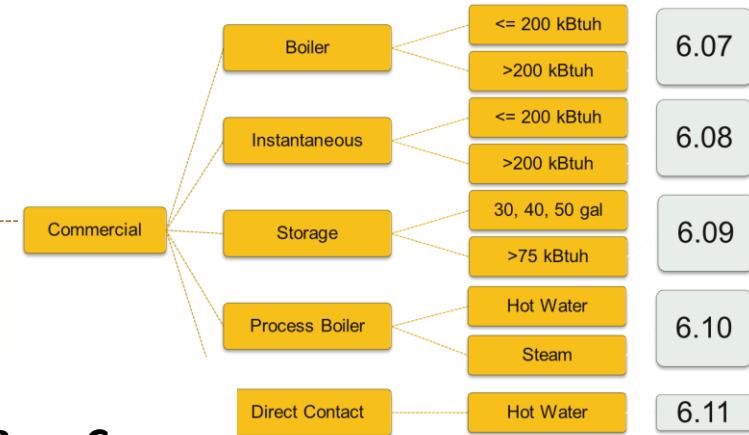
Commercial Hot Water Heaters

28



Commercial Hot Water Heaters

29



Commercial Technology		Measure Capacity	Base Case Efficiency
		Efficiency	Efficiency
6.07	Comm Boiler	$\leq 200 \text{ kBtuh}$	$\geq 0.84 \text{ EF}$ $\geq 0.92 \text{ EF}$
		$>200 \text{ kBtuh}$	$\geq 85\% \text{ TE}$ $\geq 90\% \text{ TE}$
			80% TE
			80% TE
6.08	Comm Tankless	$\leq 200 \text{ kBtuh}$	$\geq 82\% \text{ EF}$ $\geq 90\% \text{ EF}$
		$>200 \text{ kBtuh}$	$\geq 80\% \text{ TE}$ $\geq 90\% \text{ TE}$
			80% TE
			80% TE
6.09	Comm Storage	30 gal	$\geq 0.70 \text{ EF}$
		40 gal	$\geq 0.67 \text{ EF}$
		50 gal	$\geq 0.67 \text{ EF}$
		$\geq 75 \text{ kBtuh}$	$\geq 83\% \text{ TE}$ $\geq 90\% \text{ TE}$
			80% TE
			80% TE
6.10	Process Boiler	Hot Water	$\geq 85\% \text{ CE}$ $\geq 90\% \text{ CE}$
		Steam	$\geq 83\% \text{ CE}$
			80% CE
6.11	Direct Contact	Hot Water	$\geq 98.1\% \text{ CE}$
			82% CE

DOE Code Change for Water Heaters

30

- Federal Register, 10 CFR Parts 429, 430, and 431
 - Energy Conservation Program for Consumer Products and Certain Commercial and Industrial Equipment: Test Procedures for Consumer and Commercial Water Heaters
- In 2012, the American Energy Manufacturing Technical Corrections Act (AEMTCA), Public Law 112–210, was signed into law, amending Energy Policy and Conservation Act (EPCA) to require that DOE publish a final rule establishing a uniform efficiency descriptor and accompanying test methods for consumer water heaters and certain commercial water heating equipment 4 within one year of the enactment of AEMTCA.
- In July 2014 final rule, DOE amended its test procedure for consumer and certain commercial water heaters.
- The effective date of the Federal Trade Commission 2016 Final Rule is June 12, 2017.
 - 1) Testing; (2) labeling; (3) energy conservation standards; and (4) certification/enforcement
- October 2017, CEC-400-2017-012 Water Heater Efficiency Guide

UEF Requirements

31

- The baseline UEF is determined by volume
 - 30 gallon, High draw UEF = 0.65, Medium draw UEF = 0.60
 - 40 gallon, High draw UEF = 0.64, Medium draw UEF = 0.58
 - 50 gallon, High draw UEF = 0.63, Medium draw UEF = 0.57
 - Instantaneous, High/Medium draw UEF = 0.81
- Overlap in measure offerings: Sm/Lg vs. Res/Com

Product class	Rated storage volume and input rating (if applicable)	Draw pattern	Uniform energy factor
Gas-fired Storage Water Heater	<20 gal	Very Small	0.2471 – (0.0002 × V _r).
		Low	0.5132 – (0.0012 × V _r).
		Medium	0.5827 – (0.0015 × V _r).
		High	0.6507 – (0.0019 × V _r).
	≥20 gal and ≤55 gal	Very Small	0.3456 – (0.0020 × V _r).
		Low	0.5982 – (0.0019 × V _r).
		Medium	0.6483 – (0.0017 × V _r).
		High	0.6920 – (0.0013 × V _r).
	>55 gal and ≤100 gal	Very Small	0.6470 – (0.0006 × V _r).
		Low	0.7689 – (0.0005 × V _r).
		Medium	0.7897 – (0.0004 × V _r).
		High	0.8072 – (0.0003 × V _r).
	>100 gal	Very Small	0.1755 – (0.0006 × V _r).
		Low	0.4671 – (0.0015 × V _r).
		Medium	0.5719 – (0.0018 × V _r).
		High	0.6916 – (0.0022 × V _r).
Oil-fired Storage Water Heater	≤50 gal	Very Small	0.1822 – (–0.0001 × V _r).
		Low	0.5313 – (0.0014 × V _r).

DEER-WaterHeater-Calculator-v3.1

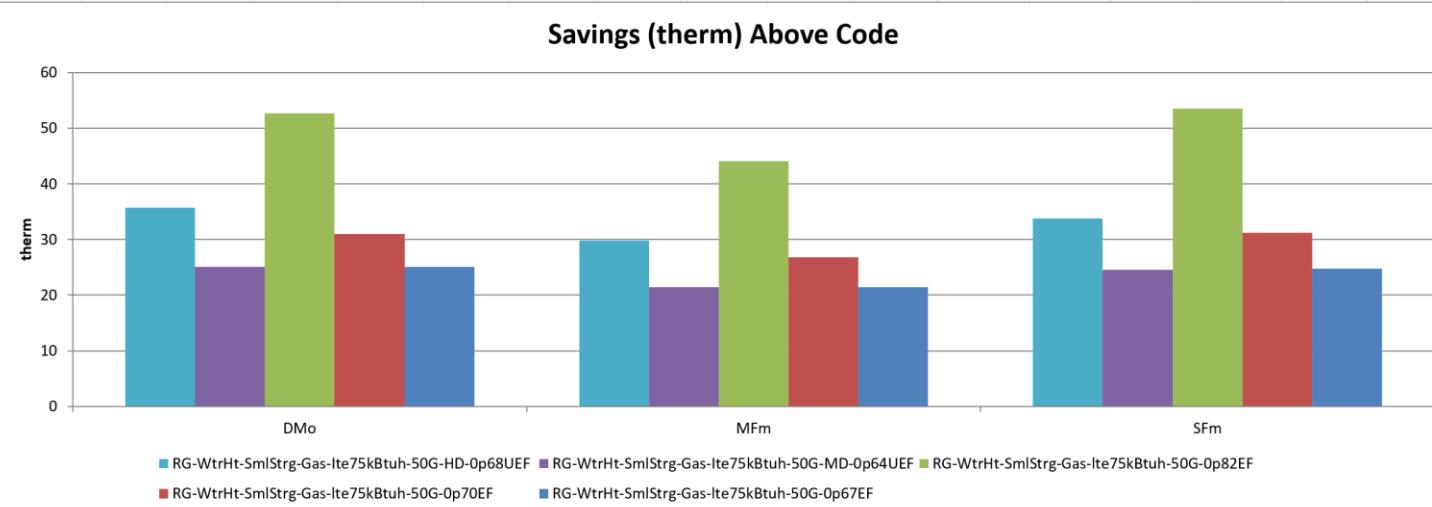
32

- v2.1 (2015)
- SCG Modification (2017)
- v3.1 (2018) – Energy Star, Gas Only

DEER2015 Water Heater Technologies

These technology definitions are referenced in the "TechCalc" worksheet.

TechID	TechType	Fuel_Type	Nom_Gallons	Energy_Factor	BurnCap	RecovEff	TankUA	HP_MinT	HP_MaxT	HPMax_Gal	auxW	auxVentW	pilot_BTUh	pilot_HtgEff
Stor_UEF-Gas-030gal-MD-0.64UEF	Std	Gas	30	0.68	39	0.77	3.59			0	0		350	0.67
Stor_UEF-Gas-040gal-MD-0.64UEF	Std	Gas	40	0.68	39	0.77	3.59			0	0		350	0.67
Stor_UEF-Gas-050gal-MD-0.64UEF	Std	Gas	50	0.68	40	0.78	3.98			0	0		350	0.67
Stor_UEF-Gas-030gal-HI-0.68UEF	Std	Gas	30	0.70	60	0.78	3.02			0	0		350	0.67
Stor_UEF-Gas-040gal-HI-0.68UEF														
Stor_UEF-Gas-050gal-HI-0.68UEF														
Stor_EF-Gas-030gal-0.57EF														
Stor_EF-Gas-030gal-0.58EF														
Stor_EF-Gas-030gal-0.61EF														
Stor_EF-Gas-040gal-0.57EF														
Stor_EF-Gas-040gal-0.58EF														
Stor_EF-Gas-040gal-0.59EF														
Stor_EF-Gas-050gal-0.57EF														
Stor_EF-Gas-050gal-0.58EF														
Stor_EF-Gas-060gal-0.56EF														
Stor_EF-Gas-075gal-0.48EF														
Stor_EF-Gas-075gal-0.53EF														
Stor_EF-Gas-030gal-0.59EF														
Stor_EF-Gas-040gal-0.60EF														
Stor_EF-Gas-050gal-0.59EF														



General Comments

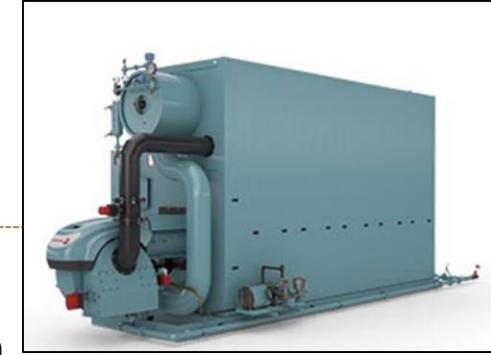
33

- Common Units
 - “kBtu/hr” - consistent with ASHRAE “Units Policy”
- UEF Update
 - Use DEER approved calculator and approach
 - ★ WaterHeater-Calculator v2.1.xlsx; [newer version created in March 2018](#)
 - Convert EF to UEF values – *IOUs expect to update savings in Q2*
 - Maintain Structure
- Climate Zone Values
 - Not PA-specific
 - DEER has PA-specific values for gas water heater measures
 - eTRM averages the PA-specific values for each climate zone when overlap exists

Measure Consensus

6.10 – Process Boilers

34



- Offering

- Industrial, Ag, Com; Gas Only
- Implementation: Replace on Burnout (ROB/NR); Midstream / PreRebDown

- Stage 1 Issues

- Agree on capacity factor (PG&E value of 41.9% based on published source) – which increased savings for SCG
- Agree on baseline hot water boiler efficiency
 - HW boiler baseline CE (82% PG&E – 80% SCG) – which decreased savings for SCG
- Collapse on average measure efficiency across HW boiler sizes (from SCG WP)

- Measure Extension

- Added Measure to POU

- Stage 2 Issues

- Separate steam baseline efficiencies for natural gas draft type
 - Title 20 separates these steam boilers
- Convert to thermal efficiencies to align with other boilers
- Identify current sources (like CASE study) for capacity factor for CA industry
- Revisit and include CZ variation

TRC Change	
CZ 12	
Hot Water, Tier 1	88%
Hot Water, Tier 2	150%
Steam	326%
Weighted	309%

Percent Change Within the Measure

kW	PGE	SCE	SDGE	SCG	Total
Therms	0%			288%	74%
Cost	21%			1%	8%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	-			-	-	-	-
kWh	-			-	-	-	-
Therms	360,120	74%	6%	1,493	-	-	358,627
Cost	\$ 145,557	8%	1%	\$ 139,250	\$ -	\$ -	\$ 6,307

Water Heating - Tier 2

Black text = Current state of the consolidated measure
 Blue text = Changing and / or first time item is mentioned
 Italics text = Item that has not been completed

3/22/2018

Input Consensus

6.10 – Process Boilers



35

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Ind, Ag, Com	Any	No Value	Asm,ECC,EPr,ERC,ESe,EUn, Gro,Gst,Hsp,Htl,MBT,MLI, Mtl,Nrs,OfL,OfS,RFF,RSD,R t3,RtL,RtS,Sun,Wrf	Com
BldgVintage	Ex	Ex	No Value	Ex	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	IOU	No Value	CZ06,CZ07,CZ08,CZ10 ,CZ14,CZ15,IOU	CZ01,CZ02,CZ03,CZ04,CZ 05,CZ06,CZ07,CZ08,CZ09,CZ 10,CZ11,CZ12,CZ13,CZ14,CZ 15,CZ16,IOU
BldgHVAC	cUnc	cUnc	No Value	Any	cWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	No Value	ROB	ROB
NormUnit	Cap-kBTUh	Cap-kBTUh	No Value	Cap-MBTUh	Cap-MBTUh
EUL ID	PrcHt-Blr PrcHt-StmBlr	PrcHt-Blr PrcHt-StmBlr	No Value	PrcHt-Blr	PrcHt-Blr
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Ind-Default>2yrs Ag-Default>2yrs Com-Default>2yrs	Ind-Default>2yrs	No Value	Com-Default>2yrs	All-Default<=2yrs Com-Default>2yrs
DeliveryType	PreRebDown NonUpStrm	Any	No Value	PreRebDown	PreRebDown
GSIA	Def-GSIA	Def-GSIA	No Value	Def-GSIA	Def-GSIA

Measure Consensus

6.11 – Direct Contact Water Heater

36

• Offering

- Industrial, Ag, Com
- Gas only
- Implementation: Replace on Burnout (ROB/NR), Midstream



• Stage 1 Issues

- Use PG&E capacity factor (PG&E value of 41.9% based on published source) for consistency

• Measure Extension

- Added Measure to POUs
- Added Measure to SDG&E / SCG

• Stage 2 Issues

- Convert to thermal efficiencies to align with other boilers
- Identify more current sources (like CASE study) for capacity factor for CA industry
- Revisit and include CZ variation

Black text = Current state of the consolidated measure
Blue text = Changing and / or first time item is mentioned
Italics text = Item that has not been completed

Input Consensus

6.11 – Direct Contact Water Heater

37

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Ind, Ag, Com	Any	No Value	Com	No Value
BldgVintage	Ex	Ex	No Value	Ex	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	Any	No Value	Any	No Value
BldgHVAC	cUnc	cUnc	No Value	Any	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	No Value	ROB	No Value
NormUnit	Cap-kBTUh	Cap-kBTUh	No Value	Area-ft2	No Value
EUL ID	PrcHt-Blr	WtrHt-Instant-Com	No Value	WtrHt-TankIns-Gas	No Value
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Ind-Default>2yrs Ag-Default>2yrs Com-Default>2yrs	Com-Default>2yrs	No Value	Com-Default>2yrs	No Value
DeliveryType	PreRebDown NonUpStrm	Any	No Value	PreRebDown	No Value
GSIA	Def-GSIA	No Value	No Value	Def-GSIA	No Value

Measure Consensus

6.07 – Commercial Boilers

38

- Offering

- Commercial; Gas Only – No Standby Loss claimed
- Offerings: Capacity / Tiers: (Non-Condensing, Condensing)
 - ≤200 kBtu/hr (0.84 EF, 0.92 EF)
 - >200 kBtu/hr (85% TE, 90% TE)
- Implementation: Replace on Burnout (ROB/NR), PreRebDown preferred
 - Midstream / Upstream possible



- Stage 1 Issues

- Adopt two efficiency tiers consistent with SCG WP
- Convert EF to UEF values – *IOUs expect to update savings in Q2*

- Measure Extension

- Added measure for POUs
- Added measure for SDG&E

- Stage 2 Issues

- None

Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW					
kWh				1%	1%
Therm				-1%	-1%
Cost				-46%	-46%

	% of Measure	% of Category	PGE	SCE	SDGE	SCG
Total	(1.57)	-168%	-1%	-	-	(1.57)
	(36)	0%	0%	-	-	(36)
	(1,454)	0%	0%	-	-	(1,454)
	\$ (410,534)	-39%	-3%	\$ -	\$ -	\$ (410,534)

Input Consensus

6.07 – Commercial Boilers



39

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com	SUn,Asm,ECC,EPr,ERC,ESe, EUn,Gro,Hsp,Htl,MBT,MF m,MLI,Mtl,Nrs,Ofl,Ofs,OT R,RFF,RSD,Rt3,RtL,RtS,SCn	No Value	Com	Com
BldgVintage	Ex	Ex	No Value	Ex	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	CZ01,CZ02,CZ03,CZ04 ,CZ05,CZ11,CZ12,CZ1 3,CZ16,IOU	No Value	CZ06,CZ07,CZ08,CZ10 ,CZ14,CZ15,IOU	CZ05,CZ06,CZ08,CZ09 ,CZ10,CZ13,CZ14,CZ1 5,CZ16
BldgHVAC	cWtd	rWtd	No Value	Any	Any

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	No Value	ROB	ROB
NormUnit	Cap-kBTUh	Cap-kBTUh	No Value	Cap-MBTUh	Cap-kBTUh
EUL ID	WtrHt-Instant-Com	WtrHt-Com WtrHt-Res-Gas	No Value	PrcHt-Blr	WtrHt-Instant-Com PrcHt-Blr
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Com-Default>2yrs	Com-Default>2yrs Res-Default>2	No Value	Com-Default>2yrs	All-Default<=2yrs Com-Default>2yrs
DeliveryType	PreRebDown PreRebUp	PreRebDown PreRebUp	No Value	PreRebDown	PreRebDown
GSIA	Def-GSIA	Def-GSIA	No Value	No Value	Def-GSIA

Measure Consensus

6.08 – Comm Instantaneous Water Heaters



40

Offering

- ❑ Commercial, Electric and Gas – Claims Standby Losses
- ❑ Offerings: Capacity / Tiers: (Non-Condensing, Condensing)
 - <=200 kBtu/hr (0.82 EF, 0.90 EF)
 - >200 kBtu/hr (80% TE, 90% TE)
- ❑ Implementation: Replace on Burnout (ROB/NR), PreRebDown
 - PreRebUp

Stage 1 Issues

- ❑ Use DEER approved calculator and approach
 - WaterHeater-Calculator v2.1.xlsx; [newer version created in March 2018](#)
- ❑ Convert *EF* to *UEF* values – *IOUs expect to update savings in Q2*

Measure Extension

- ❑ Added measure for POUs (electric measure)

Stage 2 Issues

- ❑ None



Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW					
kWh				2%	2%
Therms				3%	3%
Cost				22%	22%

Absolute (Absolute Change & Comparison)

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	(3.79)		-2%	-	-	-	(3.79)
kWh	(362)	2%	0%	-	-	-	(362)
Therms	3,629	3%	0%	-	-	-	3,629
Cost	\$ 37,525	45%	0%	\$ -	\$ -	\$ -	\$ 37,525

Input Consensus

6.08 – Comm Instantaneous Water Heaters

41

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com	No Value	No Value	Com,0	Com
BldgVintage	Ex	No Value	No Value	Ex,0	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	No Value	No Value	Any,IOU,0	CZ05,CZ06,CZ08,CZ09 ,CZ10,CZ13,CZ14,CZ1 5,CZ16
BldgHVAC	cWtd	No Value	No Value	Any 0	Any

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	No Value	No Value	No Value	RET,ROB
NormUnit	Cap-kBTUh	No Value	No Value	Cap-MBTUh 0	Cap-kBTUh
EUL ID	WtrHt-Instant-Com	No Value	No Value	No value	WtrHt-Instant-Com WtrHt-MedInst WtrHt-LrgInst-Gas WtrHt-Instant-Com
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Com-Default>2yrs	No Value	No Value	No Value	All-Default<=2yrs Com-Default>2yrs
DeliveryType	PreRebDown PreRebUp	No Value	No Value	No Value	PreRebDown PreRebUp
GSIA	Def-GSIA	No Value	No Value	No Value	Def-GSIA

Measure Consensus

6.09 – Comm Storage Water Heaters

42

Offering

- Commercial Electric and Gas
- Offerings: 30gal, 40gal, 50gal, >75 kBtu/hr (>83% TE, >90% TE)
- Implementation: Replace on Burnout (ROB/NR)
 - PreRebDown / PreRebUp / NonUpStrm

Stage 1 Issues

- Use DEER approved calculator and approach
 - WaterHeater-Calculator v2.1.xlsx; newer version created in March 2018
- Convert EF to UEF values – *IOUs expect to update savings in Q2*
- Calculations for larger heaters use TE

Measure Extension

- Added measure for POUs (electric measure)

Stage 2 Issues

- None



Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW					
kWh					
Therms	31%		-8%	-7%	25%
Cost	102%		622%	0%	82%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	-		0%	-	-	-	-
kWh	-		0%	-	-	-	-
Therms	80,975	25%	1%	84,462	-	(384)	(3,103)
Cost	\$ 815,912	366%	6%	\$ 796,938	\$ -	\$ 18,973	\$ -

Water Heating - Tier 2

Black text = Current state of the consolidated measure
 Blue text = Changing and / or first time item is mentioned
 Italics text = Item that has not been completed

3/22/2018

Input Consensus

6.09 – Comm Storage Water Heaters

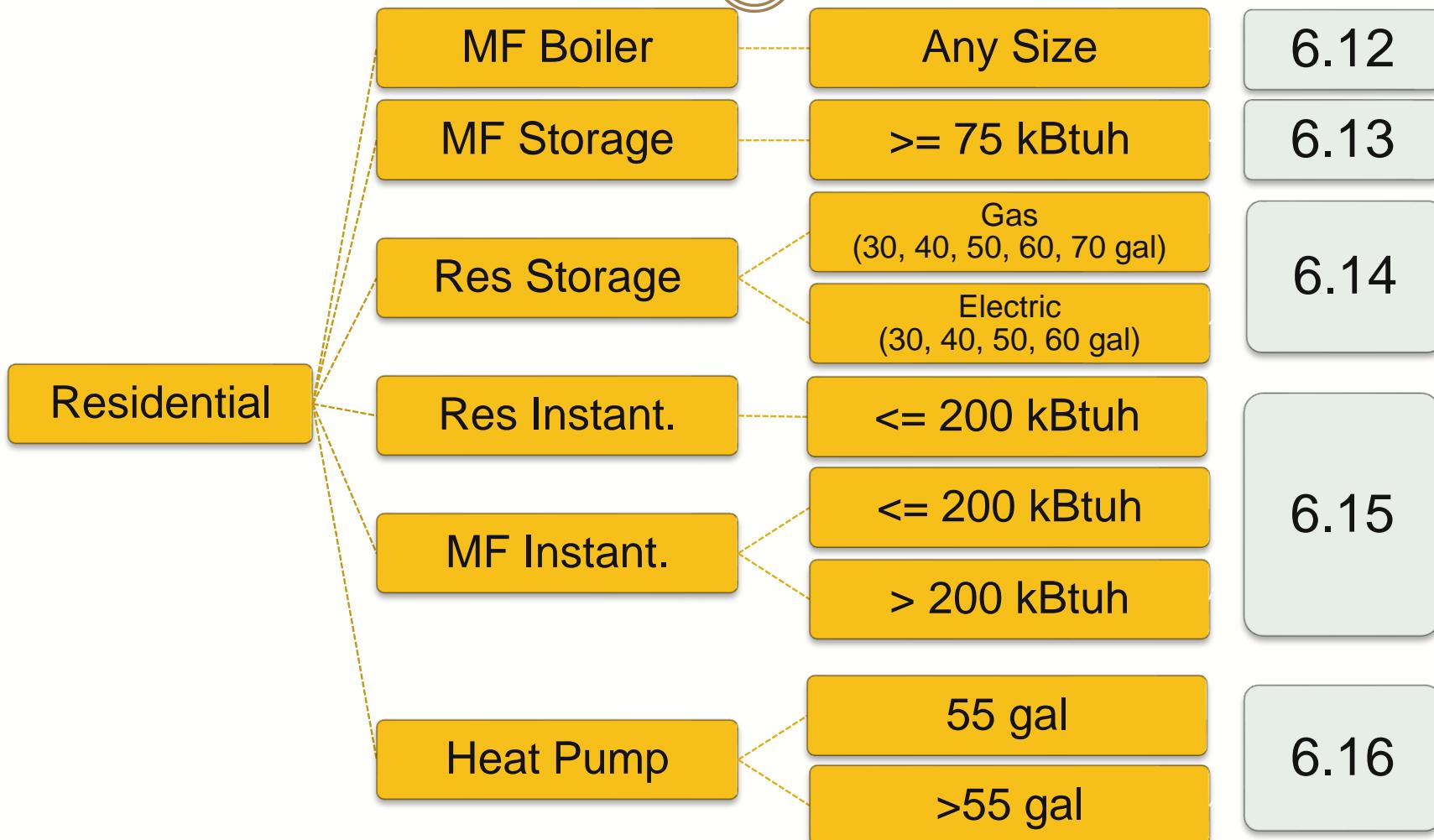
43

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com	SUn,Asm,ECC,EPr,ERC,ESe, EUn,Gro,Hsp,Htl,MBT,MF m,MLI,Mtl,Nrs,OfL,OfS,OT R,RFF,RSD,Rt3,RtL,RtS,Scn, WRF	No Value	Com	Com
BldgVintage	Ex	Ex, New	No Value	Ex	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	CZ01,CZ02,CZ03,CZ04 ,CZ05,CZ11,CZ12,CZ1 3,CZ16,IOU	No Value	Any	IOU,CZ01,CZ02,CZ03,CZ04, CZ05,CZ06,CZ07,CZ08,CZ0 9,CZ10,CZ11,CZ12,CZ13,CZ 14,CZ15,CZ16
BldgHVAC	cWtd	cWtd rWtd	No Value	Any	cWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	No Value	No Value	ROB
NormUnit	Cap-kBTUh	Cap-kBTUh	No Value	Cap-MBTUh Cap-kBTUh	Cap-kBTUh
EUL ID	WtrHt-Com	WtrHt-Com WtrHt-Res-Gas	No Value	No value	WtrHt-Com WtrHt-SmlStrg-Gas- Com
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Com-Default>2yrs	Com-Default>2yrs Res-Default>2	No Value	No Value	All-Default<=2yrs Com-Default>2yrs
DeliveryType	PreRebDown PreRebUp	PreRebUp	No Value	No Value	PreRebDown PreRebUp
GSIA	Def-GSIA	Def-GSIA	No Value	No Value	Def-GSIA

Residential Hot Water Heaters

44

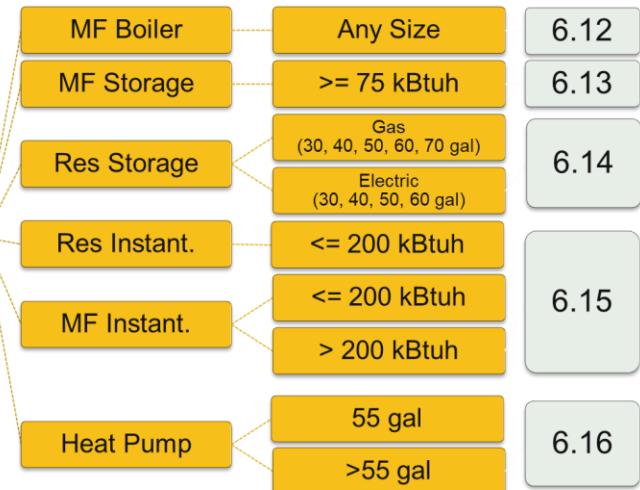


Residential Hot Water Heaters

45

Residential

Residential Technology		Measure Capacity	Base Case Efficiency
6.12	MF Boiler	Any size	>=84% TE >=90% TE
6.13	MF Storage	>=75 kBtuh	>=83% TE >=90% TE
6.14	Res Storage (gas)	30 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
		40 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
		50 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
		60 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
		70 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
6.15a	Res Storage (elec)	30 Gal	>=0.95 EF
		40 Gal	>=0.94 EF
		50 Gal	>=0.93 EF
		60 Gal	>=0.91 EF
6.15b	Res Tankless, SF	<=200 kBtuh	>=82% EF >=94% EF
6.16	Res Tankless, MF	<=200 kBtuh	>=90% TE
		>200 kBtuh	>=85% TE >=90% TE
6.16	Heat Pump	55 Gal	>= 3.24 EF, 3.50 EF >= 3.24 EF, 3.50 EF >= 3.24 EF, 3.50 EF
		>55 Gal	>=3.50 EF >=3.50 EF
			0.95 EF 0.95 EF 0.95 EF 3.00 EF 3.00 EF



Measure Consensus

6.12 – MF Boilers

46

Offering

- ❑ Multifamily only; Gas only – no Standby Losses claimed
- ❑ Offering: Hot Water (84% TE, 90% TE)
- ❑ Implementation: Replace on Burnout (ROB/NR)
 - PreRebDown

Stage 1 Issues

- ❑ None

Measure Extension

- ❑ Added measure for POUs
- ❑ Added measure for PG&E / SDG&E

Stage 2 Issues

- ❑ Consider including Climate Zone variation



Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW					
kWh					
Therms				1%	1%
Cost				-51%	-51%

Absolute | Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	-		0%	-	-	-	-
kWh	-		0%	-	-	-	-
Therms	160	1%	0%	-	-	-	160
Cost	\$ (68,237)	-68%	-1%	\$ -	\$ -	\$ -	\$ (68,237)

Input Consensus

6.12 – MF Boilers



47

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	MFm	No Value	No Value	No Value	MFm
BldgVintage	Ex	No Value	No Value	No Value	Any
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	No Value	No Value	No Value	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16
BldgHVAC	rWtd	No Value	No Value	No Value	Any

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	No Value	No Value	No Value	ROB
NormUnit	Cap-kBTUh	No Value	No Value	No Value	Cap-kBTUh
EUL ID	WtrHt-Instant-Com	No Value	No Value	No Value	WtrHt-Instant-Com
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Res-Default>2	No Value	No Value	No Value	Res-Default>2
DeliveryType	PreRebDown	No Value	No Value	No Value	PreRebDown
GSIA	Def-GSIA	No Value	No Value	No Value	Def-GSIA

Measure Consensus

6.13 – Central Storage Water Heaters

48

- Offering

- Multifamily only; Gas only
- Offering: **Hot Water (83% TE, 90% TE)**
- Implementation: Replace on Burnout (ROB/NR)
 - PreRebDown

- Stage 1 Issues

- Adopt two efficiency tiers consistent with SCG WP
 - Condensing; Non-condensing
- PG&E savings could not be compared because normalizing unit changed from “each” to “cap-kbtuh”

- Measure Extension

- Added measure for POU
- Added measure for SDG&E

- Stage 2 Issues

- Consider including climate zone variation*



Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW					
kWh					
Therms	-100%			0%	-8%
Cost	-100%			0%	-7%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	-		0%	-	-	-	-
kWh	-		0%	-	-	-	-
Therms	(527)	-8%	0%	(522)	-	-	(5)
Cost	\$ (1,125)	-6%	0%	\$ (1,125)	\$ -	\$ -	\$ -

Input Consensus

6.13 – Central Storage Water Heaters

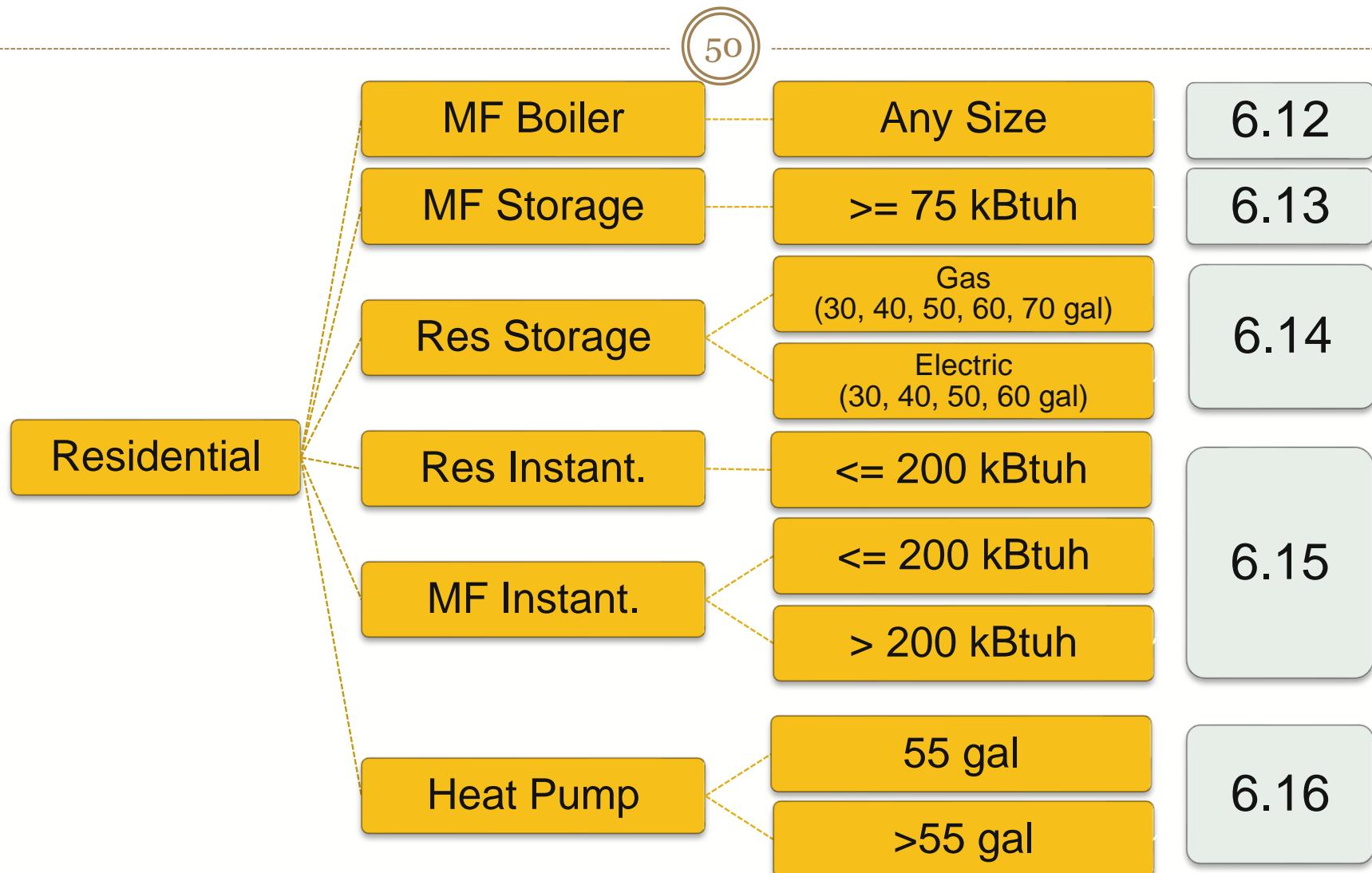
49

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	MFm	MFm	No Value	No Value	MFm
BldgVintage	Ex	Any	No Value	No Value	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	CZ01,CZ02,CZ03,CZ04 ,CZ05,CZ11,CZ12,CZ1 3,CZ16	No Value	No Value	CZ01,CZ02,CZ03,CZ04,CZ0 5,CZ06,CZ07,CZ08,CZ09,CZ 10,CZ11,CZ12,CZ13,CZ14,C Z15,CZ16
BldgHVAC	rWtd	rWtd	No Value	No Value	Any

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	No Value	No Value	ROB
NormUnit	Cap-kBTUh	Each Household	No Value	No Value	Cap-kBTUh
EUL ID	WtrHt-Com	WtrHt-Instant-Res WtrHt-Res-Gas	No Value	No Value	WtrHt-Com
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Res-Default>2	Res-Default>2	No Value	No Value	Res-Default>2
DeliveryType	PreRebDown	DirInstall PreRebDown	No Value	No Value	PreRebDown
GSIA	Def-GSIA	Def-GSIA	No Value	No Value	Def-GSIA

Residential Hot Water Heaters

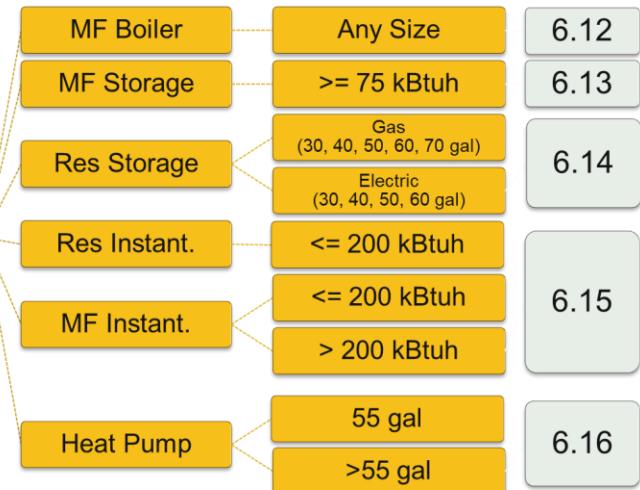


Residential Hot Water Heaters

51

Residential

Residential Technology		Measure Capacity	Base Case Efficiency
6.12	MF Boiler	Any size	>=84% TE >=90% TE
6.13	MF Storage	>=75 kBtuh	>=83% TE >=90% TE
6.14	Res Storage (gas)	30 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
		40 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
		50 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
		60 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
		70 Gal	>=0.62 EF, 0.65 EF, 0.70 EF
6.15a	Res Storage (elec)	30 Gal	>=0.95 EF
		40 Gal	>=0.94 EF
		50 Gal	>=0.93 EF
		60 Gal	>=0.91 EF
6.15b	Res Tankless, SF	<=200 kBtuh	>=82% EF >=94% EF
6.16	Res Tankless, MF	<=200 kBtuh	>=90% TE
		>200 kBtuh	>=85% TE >=90% TE
Heat Pump	55 Gal	>= 3.24 EF, 3.50 EF >= 3.24 EF, 3.50 EF >= 3.24 EF, 3.50 EF	0.95 EF 0.95 EF 0.95 EF
	>55 Gal	>=3.50 EF >=3.50 EF	3.00 EF 3.00 EF



Measure Consensus

6.14 – Residential Storage Water Heaters

52

Offering

- Residential; Electric and Gas
- Offerings: 30gal, 40gal, 50gal, 60gal, 75gal
 - Gas – 3 Tiers; Electric 1 Tier
- Implementation: Replace on Burnout (ROB/NR)
 - PreRebDown

Stage 1 Issues

- Use DEER approved calculator and approach
 - WaterHeater-Calculator v2.1.xlsx; newer version created in March 2018
- Convert EF to UEF values – *IOUs expect to update savings in Q2*
 - Additional missing Climate Zones to be added
 - PG&E savings could not be compared because normalizing unit changed from “each” to “cap-kbtuh”

Measure Extension

- Added measure for POUs (electric measure)

Stage 2 Issues

- None

Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW			0%		0%
kWh			0%		0%
Therms	-1%		4%	18%	13%
Cost	114%		115%	106%	108%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	0.00	0%	0%	-	-	0.00	-
kWh	(0)	0%	0%	-	-	(0)	-
Therms	40,933	13%	1%	(412)	-	728	40,617
Cost	\$ 2,312,671	108%	17%	\$ 183,273	\$ -	\$ 395,777	\$ 1,733,620



Input Consensus

6.14 – Residential Storage Water Heaters

53

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	SFm, MFm, DMo	Com, DMo, MFm, SFm, Res	No Value	SFm, MFm, DMo	No Value
BldgVintage	Ex	Any, Ex, New	No Value	Ex	No Value
BldgLoc	CZ01, CZ02, CZ03, CZ04, CZ05, CZ06, CZ07, CZ08, CZ09, CZ10, CZ11, CZ12, CZ13, CZ14, CZ15, CZ16	Any, IOU	No Value	CZ06, CZ07, CZ08, CZ09, CZ10, CZ14, CZ15	No Value
BldgHVAC	rWtd	cWtd rWtd	No Value	rWtd	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	No Value	ROB	No Value
NormUnit	Each	Each Cap-kBTUh	No Value	Cap-kBTUh	No Value
EUL ID	WtrHt-Res-Gas WtrHt-SmlStrg-Elec-Res	WtrHt-Com WtrHt-Instant-Com WtrHt-Instant-Res WtrHt-Res-Gas	No Value	WtrHt-SmlStrg-Elec-Res	No Value
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Res-Default>2yrs Res-sAll-mDHWgt62	Com-Default>2yrs Res-Default>2	No Value	Res-Default>2yrs Res-sAll-mDHWgt62	No Value
DeliveryType	PreRebDI PreRebDown	Any PreRebDown	No Value	PreRebDI, PreRebDown	No Value
GSIA	Def-GSIA	Def-GSIA	No Value	Def-GSIA	No Value

Measure Consensus

6.15 – Res Instantaneous Water Heaters

54

Offering

- ❑ Residential; Electric and Gas – claims Stand-by Losses
- ❑ Offerings: Capacity / Tiers: (Non-Condensing, Condensing)
 - SFm: <=200 kBtu/hr (0.82 EF, 0.94 EF) (per "each")
 - MFm: <=200 kBtu/hr (90% TE) (per "Cap-kBtuh")
 - MFM: >200 kBtu/hr (80% TE, 90% TE) (per "Cap-kBtuh")
- ❑ Implementation: Replace on Burnout (ROB/NR),
 - PreRebDown / Up

Stage 1 Issues

- ❑ Use DEER approved calculator and approach
 - WaterHeater-Calculator v2.1.xlsx; newer version created in March 2018
- ❑ Convert EF to UEF values – *IOUs expect to update savings in Q2*



Measure Extension

- ❑ Added measure for POUs (electric measure)

Stage 2 Issues

- ❑ None

Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW				-100%	-100%
kWh				-100%	-100%
Therms	0%			79%	16%
Cost	0%			179%	108%

Absolute (Absolute Change & Comparison)

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	0.51	4%	0%	-	-	-	0.51
kWh	4,947	13%	0%	-	-	-	4,947
Therms	73,801	16%	1%	(72)	-	-	73,873
Cost	\$ 2,225,351	134%	16%	\$ (196)	\$ -	\$ -	\$ 2,225,547

Input Consensus

6.15 – Res Instantaneous Water Heaters

55

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	MFm,SFm	SUn,Asm,ECC,EPr,ERC,ESe, EUn,Gro,Hsp,Htl,MBT,MF m,MLI,Mtl,Nrs,OfL,OfS,OT R,RFF,RSD,Rt3,RtL,RtS,Scn, Wrf	No Value	No Value	MFm,SFm
BldgVintage	Ex	Any,Ex	No Value	No Value	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	CZ01,CZ02,CZ03,CZ04 ,CZ05,CZ11,CZ12,CZ1 3,CZ16,IOU	No Value	No Value	Any,CZ01,CZ02,CZ03,CZ04, CZ05,CZ06,CZ07,CZ08,CZ 9,CZ10,CZ11,CZ12,CZ13,CZ 14,CZ15,CZ16,IOU
BldgHVAC	rWtd	cWtd rWtd	No Value	No Value	Any rWtd

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	No Value	No Value	ROB
NormUnit	Each Cap-kBTUh	Cap-kBTUh	No Value	No Value	Each
EUL ID	WtrHt-Instant-Res	WtrHt-Instant-Com WtrHt-Instant-Res	No Value	No Value	WtrHt-Instant-Res WtrHt-SmlInst
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Res-Default>2	Res-Default>2 Com-Default>2yrs	No Value	No Value	Res-Default>2
DeliveryType	PreRebDown PreRebUp	PreRebDown PreRebUp	No Value	No Value	PreRebDown PreRebUp
GSIA	Def-GSIA	Def-GSIA	No Value	No Value	Def-GSIA

Measure Consensus

6.16 – Heat Pump Water Heaters

56

- Offering

- Residential; Electric Only
- Offerings: 2 Tiers
 - 55 gal Heat Pump water heater replacing 30/40/50 gallon electric storage heater (2 Tiers)
 - >55 gal Heat Pump water heater replacing 60/75 gallon electric storage heater (1 Tier)
- Implementation: Replace on Burnout (ROB/NR)
 - PreRebDown/ Up

- Stage 1 Issues

- Adopt SCE approach – new WP approved
- Measure efficiency of 3.24 EF (CPUC)
- Convert EF to UEF values – *IOUs expect to update savings in Q2*

- Measure Extension

- Added measure for POUs

- Stage 2 Issues

- Consider Early Retirement / Accelerated Replacement*
- Consider fuel switching from gas*


TRC Change

CZ 12	74%
SCE	128%
SDG&E	134%

Percent Change Within the Measure

	PGE	SCE	SDGE	SCG	Total
kW	-53%	44%	55%		-38%
kWh	-23%	163%	138%		3%
Therms					
Cost	-44%	-52%	-63%		-51%

Water Heating - Tier 2

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDGE	SCG
kW	(68.51)	-38%	-27%	(82.38)	1.44	12.43	-
kWh	28,519	3%	2%	(161,752)	22,749	167,522	-
Therms	-		0%	-	-	-	-
Cost	\$ (337,942)	-51%	-2%	\$ (177,657)	\$ (17,046)	\$ (143,239)	\$ -

Black text = Current state of the consolidated measure
 Blue text = Changing and / or first time item is mentioned
Italics text = Item that has not been completed

3/22/2018

Input Consensus

6.16 – Heat Pump Water Heaters

57

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	DMo,MFm,SFm	Com,MFm,SFm	DMo,MFm,SFm	DMo,MFm,SFm	No Value
BldgVintage	Ex	Ex	Any	Ex	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	Any,CZ01,CZ02,CZ03, CZ04,CZ05,CZ11,CZ12 ,CZ13,CZ16	CZ01,CZ02,CZ03,CZ04 ,CZ05,CZ06,CZ07,CZ0 8,CZ09,CZ10,CZ11,CZ 12,CZ13,CZ14,CZ15,C Z16	CZ06,CZ07,CZ08,CZ10 ,CZ14,CZ15	No Value
BldgHVAC	rWtd	cWtd rWtd	Any	Any	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	ROBNC	ROB	No Value
NormUnit	Each	Each	Each	Each	No Value
EUL ID	WtrHt-HtPmp	WtrHt-HtPmp	WtrHt-HtPmp	WtrHt-HtPmp	No Value
RUL ID	N/A	No Value	No Value	No Value	No Value
NTGR	Res-Default>2	Com-Default>2yrs Res-Default>2	Res-Default>2	All-Default<=2yrs	No Value
DeliveryType	PreRebDown	Any	PreRebDown	PreRebDown PreRebUp	No Value
GSIA	Def-GSIA	Def-GSIA	No Value	Def-GSIA	No Value

Water Heating Measure Affirmation

58



“Cal TF affirms the subcommittee recommendations regarding ‘Stage 1 Issues’ for Water Heating Measures.”

- 6.02, Faucet Aerators, Residential
- 6.03, Low-Flow Showerheads, Residential
- 6.04, TSV with and without an Integrated Low-Flow Showerhead
- 6.05, Laminar Flow Restrictor
- 6.07, Boiler, Commercial
- 6.08, Tankless, Commercial
- 6.09, Storage Water Heater, Commercial
- 6.10, Boiler, Process
- 6.11, Direct Contact Water Heater, Process
- 6.12, Boiler, Multi-Family
- 6.13, Central Storage Water Heater, MF
- 6.14, Storage Water Heater, Residential
- 6.15, Tankless, Residential
- 6.16, Heat Pump Water Heater
- 6.18, Demand Control for Centralized Water Heater Recirculation Pump
- 6.19, DHW Boiler Reset Controller, MF
- 6.21, Hot Water Line Insulation
- 6.22, Tank Insulation
- 6.23, Faucet Aerators, Commercial

Questions

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- Disposition for Water Heating Flow Reduction Measures
 - February 22, 2013
 - Intent to Standardize Statewide Claims across IOUs
 - Used SCG / SDG&E Therm Saver Kit Measure with SCG / SDG&E Survey Data
 - Calculation Spreadsheet in Disposition
 - Biggest Change with Faucet Aerators
 - Adjusted for number of aerators in kit
 - Adjusted for lower recovery efficiency
 - Adjusted for lower gallons per day usage (also at showerheads)
 - Adjusted all measures for climate zones (groundwater or ‘mains’ temperature)
 - Summary
 - Disposition approach used
 - Climate Zone ‘mains’ temperatures updated for DEER updates (CPUC Guidance)
 - Savings changes in eTRM
 - Showerhead savings somewhat higher / aerator savings much higher



6.01 thru 6.06 – Flow Restriction Measures

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- Overview
 - Separate SF and MF
 - MF in Residential
 - Climate Zone Differences (+/- 15%) – Included per CPUC Disposition
 - Based on dishwasher usage per 2013 CPUC disposition
 - 6.05 – LFR WP used CZ GW / MU water temperatures
 - Recommendation – use GW temperatures – revise as needed
 - Transparent, accurate, and consistent with other measures

