HVAC - Residential
HVAC Controls Measures

1

CALIFORNIA
TECHNICAL FORUM

AYAD AL-SHAIKH
TOMAS TORRES-GARCIA
APRIL 2019

# HVAC Measure Breakdown

- HVAC Measures (53 measures total)
  - ❑ Commercial (29 measures total)
    - 🟦 Service / Quality Installation (6 measures)
    - 🟧 HVAC Units (12 measures)
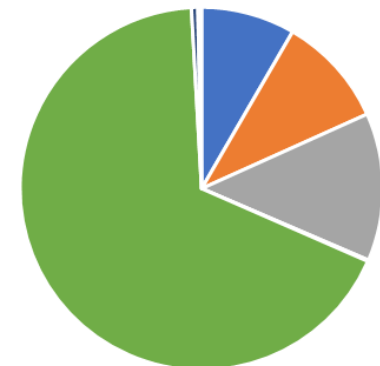   - ⬜ HVAC Controls (11 measures)
  - ❑ Residential (24 measures total)
    - 🟨 Service (6 measures)
    - 🟦 HVAC Units (5 measures) – small savings
    - 🟩 HVAC Controls (5 measures) – large savings
    - 🟦 Evaporative Units (4 measures) – small saving
    - 🟫 Gas Units (3 measures) – small savings
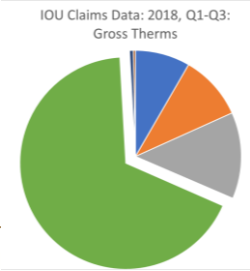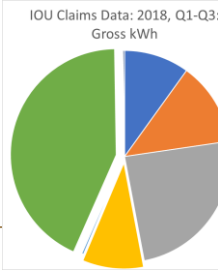
IOU Claims Data: 2018, Q1-Q3: Gross kWh
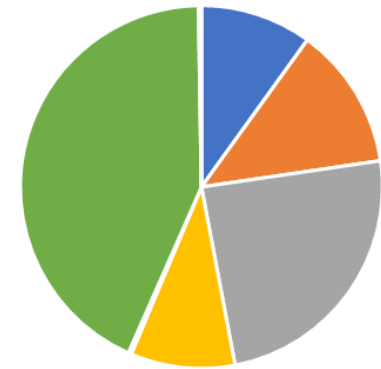
IOU Claims Data: 2018, Q1-Q3: Gross Therms
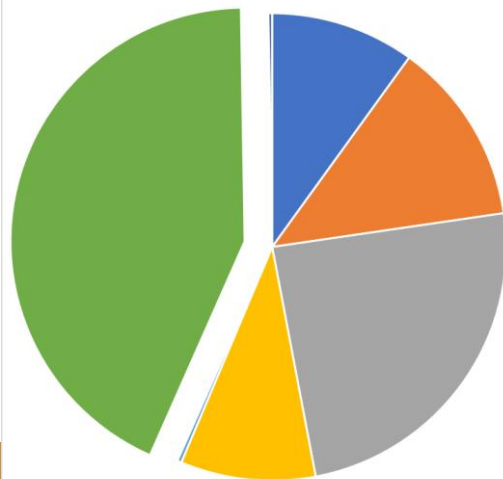
Residential HVAC Measures

IOU Claims Data: 2018, Q1-Q3: Gross kWh

IOU Claims Data: 2018, Q1-Q3: Gross Therms

Ref No	Description	2016 Number of Units	First Year Gross kWh	First Year Gross Therm	2017 Number of Units	First Year Gross kWh	First Year Gross Therm	2018 (Q1-Q3) Number of Units	First Year Gross kWh	First Year Gross Therm
5.10a	Refrigerant Charge, Residential	74,591	7,674,601	(1,066)	36,635	2,451,593	(361)	16,959	671,757	(80)
5.10b	Condenser Coil Cleaning, Residential	25,003	293,835	(16)	24,798	178,457	211	34,790	256,309	(1)
5.10c	Evaporator Coil Cleaning, Residential	7,443	47,596	(1)						
5.10d	Air-flow Adjustment, Residential	22,803	281,798	(1,233)	4,818	379,746	(3,178)	2,587	191,779	(1,728)
5.10e	Duct Seal, Residential	26,538	4,549,294	312,136	225,697	12,132,847	354,286	103,040	554,162	45,383
5.10f	Blower Motor Retrofit	42,107	5,096,485	(65,948)	63,078	7,943,177	(55,843)	34,959	4,200,001	(44,687)
5.23	Evaporative Condenser, Residential	187	6,220	(14)						
5.34	Window Evaporative Cooler, Residential	1,129	405,450	(35,409)	1,058	407,712	(32,704)	391	157,867	(11,274)
5.35	Direct Evaporative Cooler, Residential	576	418,025	-						
5.36	Direct-Indirect Evaporative Cooler, Residential				854	632,929	-	371	-	-
5.11	Split System HVAC Quality Installation, Residential	2,585,468	780,468	8,149	905,152	123,889	4,482	88	6,008	222
5.27	Package Terminal Air Conditioner or Heat Pump, Under 24 kBtu/h	859	245,564	-	1,012	363,184	-	443	145,216	-
5.37	Energy Star Room Air Conditioners	111	4,398	-						
5.38	Portable Room Air Conditioner									
5.40	HVAC Equipment, Upstream, Residential	1,558	75,897	7,949	1,013	33,729	4,250	645	25,902	928
5.13	Fan Controller for Air Conditioner, Residential	85,870	7,256,469	-	100,309	10,577,760	-	65,709	6,597,362	-
5.17	Whole House Fan, Residential							1,110	424,983	(2,331)
5.29	Air Filter Replacement, Residential	5,571	50,663	-						
5.47	Smart Thermostat, Residential	13,244	-	11,046	61,276	3,972,639	486,911	105,935	20,114,851	1,325,012
5.55	Heat Pump Electric Resistance Heater Controls, Residential									
5.18	Furnace, Residential	94,074	-	63,606	15,313	-	31,266	3,080	-	6,305
5.20	Gravity Wall Furnace, Residential	55	-	284	55	-	272			
5.57	Intermittent Pilot Light, Residential									
5.08	Whole-house Upgrade							67	28,721	3,842
	Totals:		27,190,000	300,000		39,200,000	790,000		33,370,000	1,320,000

Residential HVAC Measures

No	Description	Modeled	Submittal	IOU Lead	Rigor	2018 (Q1-Q3) Number of Units	First Year Gross kWh	First Year Gross Therm
5.13	Fan Controller for Air Conditioner, Residential	eQUEST	May	SCE	Low	65,709	6,597,362	-
5.17	Whole House Fan, Residential	DEER	May	SCE	Low	1,110	424,983	(2,331)
5.29	Air Filter Replacement, Residential	Modified DEER	Aug	POU	Low			
5.47	Smart Thermostat, Residential	Modified Model	July	SCE	High	105,935	20,114,851	1,325,012
5.55	Heat Pump Electric Resistance Heater Controls, Residential	Excel	Aug	POU	Low			
5.08	Whole-house Upgrade	eQUEST / scaled	Aug	POU	Low	67	28,721	3,842

IOU Claims Data: 2018, Q1-Q3: Gross kWh
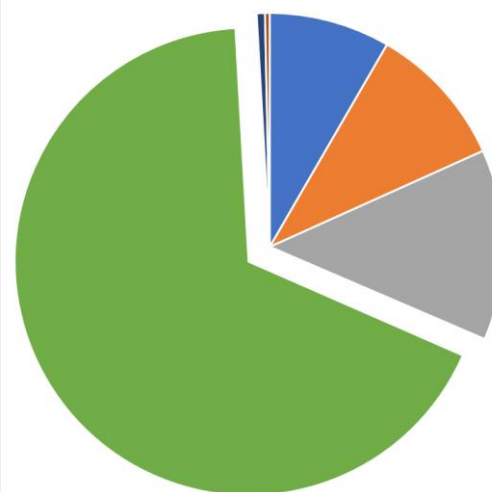
IOU Claims Data: 2018, Q1-Q3: Gross Therms

Offering

- Implementation: <mark>AOE</mark>
- Building Types: DMo,MFm,SFm
- Climate zones: CZ01-CZ16
- Norm Unit: <mark>Each</mark>
- Offerings include:
  - <mark>EFC devices delay the evaporator fan cycle off time to take advantage of the residual liquid refrigerant remaining in the evaporator after the compressor cycles off.</mark>

Stage 1 Issues

- *DEER 2020 Updates: Using the latest building prototypes and new Peak Period*
- Savings from Q3 2018 (6.6M kWh)

Measure Extension

- Add POUs

Stage 2 Issues

- *Consider Normalizing Units*

PA	Measure Description	Sum of First Year Gross kWh
⊟ PGE	Enhanced Time Delay Relay	2,806,840
⊟ SCE	Air Conditioner - Efficient Fan Control	3,547,809
⊟ SDGE	Efficient Fan Control (EFC) w/AC	213,502
	Efficient Fan Controller	29,210
Grand Total		**6,597,362**

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

- Base Case
  - The base case is a 14 SEER AC unit without an EFC.
- Measure Case
  - Efficient fan controller (EFC) device onto a residential single-family, multi-family or double-wide mobile home split-system air conditioner.
  - EFC devices delay the evaporator fan cycle off time to take advantage of the residual liquid refrigerant remaining in the evaporator after the compressor cycles off.
- Savings
  - Modeled measure
    - Minimally above-code SEER 14 split-AC system
    - Cooling capacity varied by building type and climate zone based on the DEER building prototypes for double-wide mobile home, multi-family, and single family residential buildings
    - DEER building prototypes updated in 2014 to include the Title 24 2008 and Title 24 2013 code based vintages
    - Four hourly variables were captured from the eQUEST simulations:
      - Total cooling load (Btu/hr),
      - Condensing unit energy (kWh),
      - Supply (indoor) fan energy (kWh), and
      - AC total cooling capacity (Btu/hr)
    - Hourly performance calculated using ET Study methodology with part-load modeled values
  - Normalizing Unit: per-ton (SCE, PG&E); per-controller (SDG&E)
    - 1.1 tons for MFm; 2.1 tons for DMo

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

- ## Measure Permutations

Measure Data Field	Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	AOE	No Value	REA	No Value	No Value
BldgType	DMo,MFm,SFm	No Value	DMo,MFm,SFm	No Value	No Value
BldgVintage	Any	No Value	Any	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06, CZ07,CZ08,CZ09,CZ10,CZ11,CZ12, CZ13,CZ14,CZ15,CZ16	No Value	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06, CZ07,CZ08,CZ09,CZ10,CZ11,CZ12, CZ13,CZ14,CZ15,CZ16	No Value	No Value
NormUnit	Each	No Value	Each	No Value	No Value
EUL ID	HV-ResAC	No Value	HV-ResAC	No Value	No Value
RUL ID	HV-ResAC	No Value	HV-ResAC	No Value	No Value
NTGR	Res-Default>2	No Value	Res-Default>2	No Value	No Value
DeliveryType	DnDeemed, DnDeemDI	No Value	DnDeemed, DnDeemDI	No Value	No Value
GSIA	Def-GSIA	No Value	Def-GSIA	No Value	No Value
Electric Load Shape	*DEER:HVAC_Eff_AC*	No Value	DEER:HVAC_Eff_AC	No Value	No Value
Gas Load Shape	Annual	No Value	Annual	No Value	No Value
Sector	Res	No Value	Res	No Value	No Value
PA/POU	Any				
BldgHVAC	rDXGF	No Value	rDXGF	No Value	No Value
Use Category	HVAC	No Value	HVAC	No Value	No Value
SubUseCategory	VentAirDist	No Value	VentAirDist	No Value	No Value
TechGroup	dxAC_equip	No Value	dxAC_equip	No Value	No Value
TechType	FlowCtrl	No Value	FlowCtrl	No Value	No Value
Cost Adjustment Type	None	No Value	None	No Value	No Value
EnImpCalcType	Standard	No Value	Standard	No Value	No Value
MeasImpactType	Deem-WP	No Value	Deem-WP	No Value	No Value

Measure Consensus
5.17 – Whole House Fan (WHF), Residential

Low

CALIFORNIA TECHNICAL FORUM

Check if updates needed

- **Offering**
  - Implementation: AOE
  - Bldg Types: SFm
  - Climate Zones: CZ06, 08, 09, 10, 13-16 -> All Climate Zones
  - Motor type (PSC / ECM); Air flow (0.7, 1.5, 2.0, 3.0 CFM/sf)
  - Norm Unit: per Household

- **Stage 1 Issues**
  - DEER 2020 updates: *Peak Period*, Measure App Type, Delivery Type, *Vintage (developed with vintage prototypes)*
  - Normalizing units of "per Household"
  - Climate zone 1 permutations not included

- **Measure Extension**
  - No claims in 2017
  - Add POUs
  - Add SDG&E, PG&E
  - Extend to all CZs

2018 Claims			
Building Type	**Sum of First Year Gross kWh** SCE	**Sum of First Year Gross kW** SCE	**Sum of First Year Gross Therm** SCE
Residential Single Family	424,983	468	(2,331)

- **Stage 2 Issues**
  - *Supporting documentation required for baseline*
  - *Supporting documentation required possibly related to savings*
  - *Check heat exchanger operation*
  - *Potentially additional savings when fan is off*
  - *Cost data should be aligned with offerings*

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

Measure Consensus -
5.17 – Whole House Fan (WHF), Residential

- **Base case**
  - ❑ Includes an HVAC system; however, does not include air-economizing

- **Measure case**
  - ❑ Requires that WHF be sized at least 2 cfm/sqft. of conditioned floor area
  - ❑ Have at least 1 sqft. of attic vent free area for each 375 cfm of rated WHF air flow
  - ❑ May include a control timer (e.g., 30 min. WHF operation) and/or a two speed controller (e.g., low fan speed and high fan speed).

- **Savings Methodology**
  - ❑ DEER values

Measure Name	Impact ID
Whole house fan	D03-441

  - ❑ Normalized units
    - ✕ Translated from "1000 sqft" (measure area) to "per Household"
    - ✕ Translation based upon prototype buildings (per BT and CZ). Example:

Climate Zone	Bldg. Type	Bldg. Vintage	Bldg. HVAC	Square Feet/Home	Num. Unit
6	DMo	Ex	rWtd	1,220	1.22
6	MFm	Ex	rWtd	1,000	1.00
6	SFm	Ex	rWtd	1,710	1.71

HVAC

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

11/25/2019

- ## Measure Permutations

		Measure Data Field			
Measure Data Field	Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	AOE	No Value	ER,REA	No Value	No Value
BldgType	SFm	No Value	DMo,MFm,SFm	No Value	No Value
BldgVintage	1996	No Value	Any	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16	No Value	CZ06,CZ08,CZ09,CZ10,CZ13,CZ14,CZ15,CZ16	No Value	No Value
NormUnit	Household	No Value	Household	No Value	No Value
EUL ID	HV-WHfan	No Value	HV-WHfan	No Value	No Value
RUL ID	HV-WHfan	No Value	HV-WHfan	No Value	No Value
NTGR	Res-Default>2	No Value	Res-Default>2	No Value	No Value
DeliveryType	DnDeemDI DnDeemed	No Value	DirInstall PreRebDown	No Value	No Value
GSIA	Def-GSIA	No Value	Def-GSIA	No Value	No Value
Electric Load Shape	(use Existing)	No Value	SCE:Misc._Commercial:Economy_cycle-Ret	No Value	No Value
Gas Load Shape	Annual	No Value	Annual	No Value	No Value
Sector	Res	No Value	Com, Res	No Value	No Value
PA/POU	Any				
BldgHVAC	rWtd	No Value	Any	No Value	No Value
Use Category	HVAC	No Value	HVAC	No Value	No Value
SubUseCategory	VentAirDist	No Value	VentAirDist	No Value	No Value
TechGroup	HV_Tech	No Value	HV_Tech	No Value	No Value
TechType	WHFan	No Value	WHFan	No Value	No Value
Cost Adjustment Type	None	No Value	HVAC50	No Value	No Value
EnImpCalcType	Standard	No Value	Standard	No Value	No Value
MeasImpactType	Deem-DEER	No Value	Standard	No Value	No Value
MeasQualifierGroup	None	No Value	None	No Value	No Value

Measure Consensus
5.29 – Air Filter Replacement with Alarm

Low

CALIFORNIA TECHNICAL FORUM

Planned to sunset.

- **Offering**
  - Implementation: AOE
  - Air Filter Alarm (SCE)
    - Climate Zones: CZ06, 08-10, 13-16
    - Bldg Types: SFm, MFm, DMo
  - Air Filter Replacement (SDG&E)
    - Climate Zones: CZ07, CA10
    - Bldg Types: Small Office, Restaurant, Retail only
  - Norm Unit: SCE (per Sensor); SDG&E(per Ton)
- **Stage 1 Issues**
  - DEER 2020 updates: *Peak Period*, Measure App Type, Delivery Type, *Vintage (developed with vintage prototypes)*
  - Commercial version of measure to be retired
  - *Update EUL*
- **Measure Extension**
  - No claims in 2017 or 2018
  - Add POUs
  - *Add PG&E, SCG*
- **Stage 2 Issues**
  - *Investigate if more recent data is available to support the measure*
  - *Consider Measure Application Type*
  - *Extend to additional Climate Zones*
  - Consider if the Filter Alarm concept should be included in both measures *(Res and Com)*

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

- Air Filter Alarm
  - ❑ (SCE – Residential only)
  - ❑ An air filter alarm in the form of a hardware that accounts for the differential pressure difference on the filter media notifies the user by means of a sound signal or other signals, that the filter must be cleaned or replaced with a new one.
- Savings
  - ❑ Excel based calculation for savings
    - ✗ Physics model and empirical inputs from studies
  - ❑ Climate Zones: 6, 8-10, 13-16 (SCE)
  - ❑ Bldg Types: SFm, MFm, DMo
  - ❑ Norm Unit: per Sensor

- Air Filter Replacement
  - ❑ (SDG&E – Small Office, Restaurant, Retail only)
  - ❑ Scheduled replacement of air filters saves energy by reducing the workload for the air-handling unit and by protecting the evaporator coils, thus preserving optimal heat transfer.
- Savings
  - ❑ DEER models used to obtain
    - ✗ Primary End Use (kWh/ton)
    - ✗ Number of Tons
    - ✗ Area (square footage)
  - ❑ Estimate of 3.5% based upon an EM&V report (SDG&E 2004-05)
  - ❑ Climate Zones: 7, 10 (SDG&E)
  - ❑ Bldg Types: Small Office, Restaurant, Retail only
  - ❑ Norm Unit: per Ton

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

Input Consensus
5.29 – Air Filter Replacement with Alarm

- ## Measure Permutations

Measure Data Field	Measure Value	Measure Data Field			
		PG&E	SCE	SDG&E	SCG
MeasureAppType	AOE	No Value	REA	No Value	No Value
BldgType	DMo,MFm,SFm	No Value	DMo,MFm,SFm	No Value	No Value
BldgVintage	Ex	No Value	Any	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16	No Value	CZ06,CZ08,CZ09,CZ10,CZ13,CZ14,CZ15,CZ16	No Value	No Value
NormUnit	Each	No Value	Cap-Tons, Each	No Value	No Value
EUL ID	HVAC-FlowCtrl-AirFiltCtrls	No Value	HVAC-FlowCtrl-AirFiltCtrls	No Value	No Value
RUL ID	(host = package unit)	No Value	HVAC-FlowCtrl-AirFiltCtrls	No Value	No Value
NTGR	Res-Default>2	No Value	Res-Default>2	No Value	No Value
DeliveryType		No Value	NonUpStrm	No Value	No Value
GSIA	Def-GSIA	No Value	No Value	No Value	No Value
Electric Load Shape	(use existing)	No Value	SCE:Misc._Commercial:Reduce	No Value	No Value
Gas Load Shape	Annual	No Value	Annual	No Value	No Value
Sector	Res	No Value	No Value	No Value	No Value
PA/POU	Any				
BldgHVAC	rWtd	No Value	Any	No Value	No Value
Use Category	HVAC	No Value	HVAC	No Value	No Value
SubUseCategory	VentAirDist	No Value	VentAirDist	No Value	No Value
TechGroup	dxAC_equip	No Value	dxAC_equip	No Value	No Value
TechType	spltSEER	No Value	spltSEER	No Value	No Value
Cost Adjustment Type	None	No Value	HVAC50	No Value	No Value
EnImpCalcType	Standard	No Value	Standard	No Value	No Value
MeasImpactType	Deem-WP	No Value	Standard	No Value	No Value
MeasQualifierGroup	None	No Value	None	No Value	No Value

HVAC Residential

1/21/2019

Measure Consensus
5.47 – Smart Thermostat, Residential

In Process (following WP Plan)

- **Offering**
  - Implementation: AR and NR
  - Norm Unit: Each (thermostat)

- **Stage 1 Issues**
  - DEER 2020 updates: *Peak Period*, Measure App Type, Delivery Type, *Vintage (Excel-based model)*
  - Update planned in 2019
    - SCE update planned for July 2019
    - SCG update planned for July 2019

- **Measure Extension**
  - Add POUs

- **Stage 2 Issues**
  - *New workpaper is expected*
  - *Confirm NR vs AR savings alignment*

PA	Building Type	2016 Sum of First Year Gross kWh	2017 Sum of First Year Gross kWh	2018 Sum of First Year Gross kWh
⊟ PGE	Residential		113	73
	Residential Mobile Home		22,251	524,825
	Residential Multi-family		82,951	1,127,355
	Residential Single Family		1,091,916	2,407,097
⊟ SCE	Residential Mobile Home			934,581
	Residential Multi-family			5,720,694
	Residential Single Family			1,137,692
⊟ SCG	Residential Mobile Home		-	1,055,640
	Residential Multi-family		15,259	487,158
	Residential Single Family	-	1,021,288	4,800,035
⊟ SDG	Residential Mobile Home		632,511	386,798
	Residential Multi-family			761,738
	Residential Single Family		1,106,351	771,164
		-	3,972,639	20,114,851

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
5.47 – Smart Thermostat, Residential

- ## Measure Permutations

Measure Data Field	Measure Value	Measure Data Field			
		PG&E	SCE	SDG&E	SCG
MeasureAppType	AR,NR	ER,ROB	ER,RobNc	No Value	ER
BldgType	DMo,MFm,SFm	DMo,MFm,SFm	No Value	No Value	SFm
BldgVintage	Ex	Ex	No Value	No Value	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,CZ13,CZ16,CZ14	No Value	No Value	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16,Any
NormUnit	Each	Each	No Value	No Value	Each
EUL ID	HV-ProgTstat	HV-ProgTstat	(blank)	No Value	HV-ProgTstat
RUL ID	HV-ProgTstat	(blank) HV-ProgTstat	(blank)	No Value	No Value
NTGR	Res-Default>2	Res-Default>2	Res-Default>2	No Value	Res-Default>2 All-Default<=2yrs
DeliveryType	DnDeemDI, DnDeemed	DirInstall, PreRebDown	DirInstall, PreRebDown	No Value	DirInstall, PreRebDown
GSIA	Def-GSIA	Def-GSIA	Def-GSIA	No Value	Def-GSIA
Electric Load Shape	(use existing)	PGE:RES:DEER:HVAC_Eff_AC	No Value	No Value	SCG:RES:DEER:Res:HVAC_Eff_AC
Gas Load Shape	Annual	Annual	No Value	No Value	Annual
Sector	Res	Res	Res	No Value	Res
PA/POU	Any				
BldgHVAC	rWtd	rWtd	No Value	No Value	rDXGF
Use Category	HVAC	HVAC	No Value	No Value	HVAC
SubUseCategory	HeatCool	HeatCool	HeatCool	No Value	HeatCool
TechGroup	HV_Tech	HV_Tech	HV_Tech	No Value	HV_Tech
TechType	TStat	TStat	No Value	No Value	TStat
Cost Adjustment Type	None	None	No Value	No Value	No value
EnImpCalcType	Standard	(blank)	Standard	No Value	Standard
MeasImpactType	Deem-WP	NonDEER	Standard	No Value	Deemed
MeasQualifierGroup	None	None	None	No Value	None

Low

Planned to sunset. SDG&E considering

- **Offering**
  - ❑ Implementation: AOE
  - ❑ Norm Unit: per Household

- **Stage 1 Issues**
  - ❑ DEER 2020 updates: *Peak Period*, Measure App Type, Delivery Type, *Vintage (Excel-based model)*

- **Measure Extension**
  - ❑ No claims in 2017 or 2018
  - ❑ Add SCE, SCG, PG&E
  - ❑ Extend to all CZs

- **Stage 2 Issues**
  - ❑ *Extend to additional climate zones*
  - ❑ *Update cost support data*
  - ❑ *Update savings support data*

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

- ## Base Case
  - Existing heat pump system with electric resistance auxiliary heat, without outdoor thermostatic controls.

- ## Measure Case
  - Electric resistance heat controls upgrade by adding an outdoor thermostat and repair for heat pump systems. Includes verification of proper heating control sequencing and correcting systems with improper sequencing causing unnecessary operation of electric resistance auxiliary heat.

HVAC Residential

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

1/21/2019

- Measure Permutations

Measure Data Field	Measure Value	Measure Data Field			
		PG&E	SCE	SDG&E	SCG
MeasureAppType	AOE	No Value	No Value	REA	No Value
BldgType	SFm,MFm,DMo	No Value	No Value	SFm,MFm,DMo	No Value
BldgVintage	Ex	No Value	No Value	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06, CZ07,CZ08,CZ09,CZ10,CZ11,CZ12, CZ13,CZ14,CZ15,CZ16	No Value	No Value	No Value	No Value
NormUnit	Household	No Value	No Value	Household	No Value
EUL ID	HV-RefChrg	No Value	No Value	HV-RefChrg	No Value
RUL ID	HVAC-airHP	No Value	No Value	No Value	No Value
NTGR	Res-Default>2yrs	No Value	No Value	All-Default<=2yrs	No Value
DeliveryType	DnDeemed, DnDeemDI	No Value	No Value	PreRebDown, DirInstall	No Value
GSIA	Def-GSIA	No Value	No Value	Def-GSIA	No Value
Electric Load Shape	(use existing)	No Value	No Value	res:DEER:HVAC_Eff_HP	No Value
Gas Load Shape	Annual	No Value	No Value	No Value	No Value
Sector	Res	No Value	No Value	No Value	No Value
PA/POU	Any				
BldgHVAC	rWtd	No Value	No Value	No Value	No Value
Use Category	HVAC	No Value	No Value	HVAC	No Value
SubUseCategory	Space Heating	No Value	No Value	Space Heating	No Value
TechGroup	HV_Tech	No Value	No Value	HV_Tech	No Value
TechType	Tstat	No Value	No Value	Tstat	No Value
Cost Adjustment Type	None	No Value	No Value	No Value	No Value
EnImpCalcType	Standard	No Value	No Value	No Value	No Value
MeasImpactType	Deem-WP	No Value	No Value	No Value	No Value
MeasQualifierGroup	No Value	No Value	No Value	No Value	No Value

Backup only