

Lighting

Cal TF Tier 2 Presentation



CALIFORNIA

TECHNICAL FORUM

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Lighting Measure Affirmation

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

- 4.16, LED, Interior Downlight Fixture
- 4.26, LED, MR-16 Lamp
- 4.27, LED, PAR Lamp
- 4.28, LED, Candelabra Lamp
- 4.29, LED, Globe Lamp
- 4.30, LED, A-Lamp
- 4.31, LED, Recessed Downlight Retrofit Kit
- 4.32, LED, R-BR Lamp
- 4.36, LED, Tube LED

Lighting Introduction

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- Different “Savings Difference” format – for lighting

Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
All kW	-2%				-2%
kWh	-2%				-2%
Therms	6%				6%
Cost	38%				38%

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	(3.46)	0%	(0.005)	(3.46)	-	-	-
kWh	(18,605)	0%	(0.005)	(18,605)	-	-	-
Therms	(727)	1%	(0.000)	(727)	-	-	-
Cost	\$ 333,743	3%	0.051	\$ 333,743	\$ -	\$ -	\$ -

- Includes the same aggregated information, but also...
- Includes break-out of Delivery Channel to show savings and **cost** separately:
 - Direct Install (DI)
 - Non-DI = Upstream, Downstream, and Midstream Channels
- Noticed an issue with the claims data that makes some measures “look” drastically different, but really they are the same
 - DI programs are intended to use actual costs rather than workpaper costs
 - Therefore, DI claims costs vary a lot: some high, some low, some zero

Lighting Introduction

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- eTRM Offerings for Lighting are consistent with IOU workpapers
 - Because of the Wattage Reduction Ratio (WRR) requirement that forces the lowest wattage in a bin to represent the Measure Case wattage, single watt bins are typical to avoid under-claiming savings. For example,
 - ✦ MR-16 LED Lamps
 - ✦ 8 Lighting Bins: <6W, 6W, 7W, 8W, 9W, 10W, 11W, ≥12W
 - Some lamp measures do not follow this strategy in workpapers, but do in DEER
 - ✦ For smaller savings measures, the implementation overhead outweighs the value of the savings
 - 4.28 Candelabra LED Lamps
 - 4.29 Globe LED Lamps
 - ✦ For larger measures, the value of additional bins could be significant
 - 4.32, R-BR LED Lamps
 - Pursuing what it will take to add more offerings / bins now (*Agree?*)

Lighting – Terminology and Acronyms

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- Incentive Methods

Incentive Method	Delivery Type	Description
Direct Install	DirInstall	The program implements energy efficiency measures for qualifying customers, at no cost to the customer.
Down-Stream Incentive	PreRebDown	The customer installs qualifying energy efficient equipment and submits an incentive application to the utility program. Upon application approval, the utility program pays an incentive to the customer. Such an incentive may be deemed or customized.
Mid-Stream Incentive	NonUpStrm	The program gives a financial incentive to a midstream market actor, such as a retailer or contractor, to encourage the promotion of efficient measures. The incentive may or may not be passed on to the end-use customer.
Up-Stream Incentive	PreRebUp	The program gives a financial incentive to an upstream market actor, such as a manufacturer or distributor, to encourage the manufacture, provision, or distribution of an efficient measure. The incentive may or may not be passed on to the end-use customer.

Measure Consensus

4.16 LED Recess Downlight Fixture

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- Offering

- ❑ 20 Lighting Bins: <7W, 7W – 24W, ≥25W
- ❑ Building Types: 24 NonRes / 4 Res (Note: Not OTR = Other)
- ❑ Vintage: Ex, New
- ❑ Climate Zone: CZ01 – CZ16 (Note: Not IOU)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall



- Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*
 - ✦ *Would need to be average*
 - ✦ *Not weighted average since no additional weighting data is available*
- ❑ Did not include 2 commercial EUL's as listed in the SDG&E WP
- ❑ Used base case and measure case cost data from PG&E WP which was based on web-scraping.
- ❑ Used wattage reduction ratio (WRR) from PG&E WP; updated SDG&E

} Input Needed
(following slides
recap the issue)

- Measure Extension

- ❑ Added measure for POUs (electric measure)
- ❑ Added residential areas beyond SCE

- Stage 2 Issues

- ❑ *Calculation: Review savings methodology (WRR vs delta watts), hours of use, interactive effects*
- ❑ *Cost: Review variation due to CZ / Delivery / Offering, methodology for keeping costs up-to-date*
- ❑ *Baseline: Existing conditions opportunity, document baselines*
- ❑ *Permutation collapse*

How can we consolidate CZ across IOUs

7

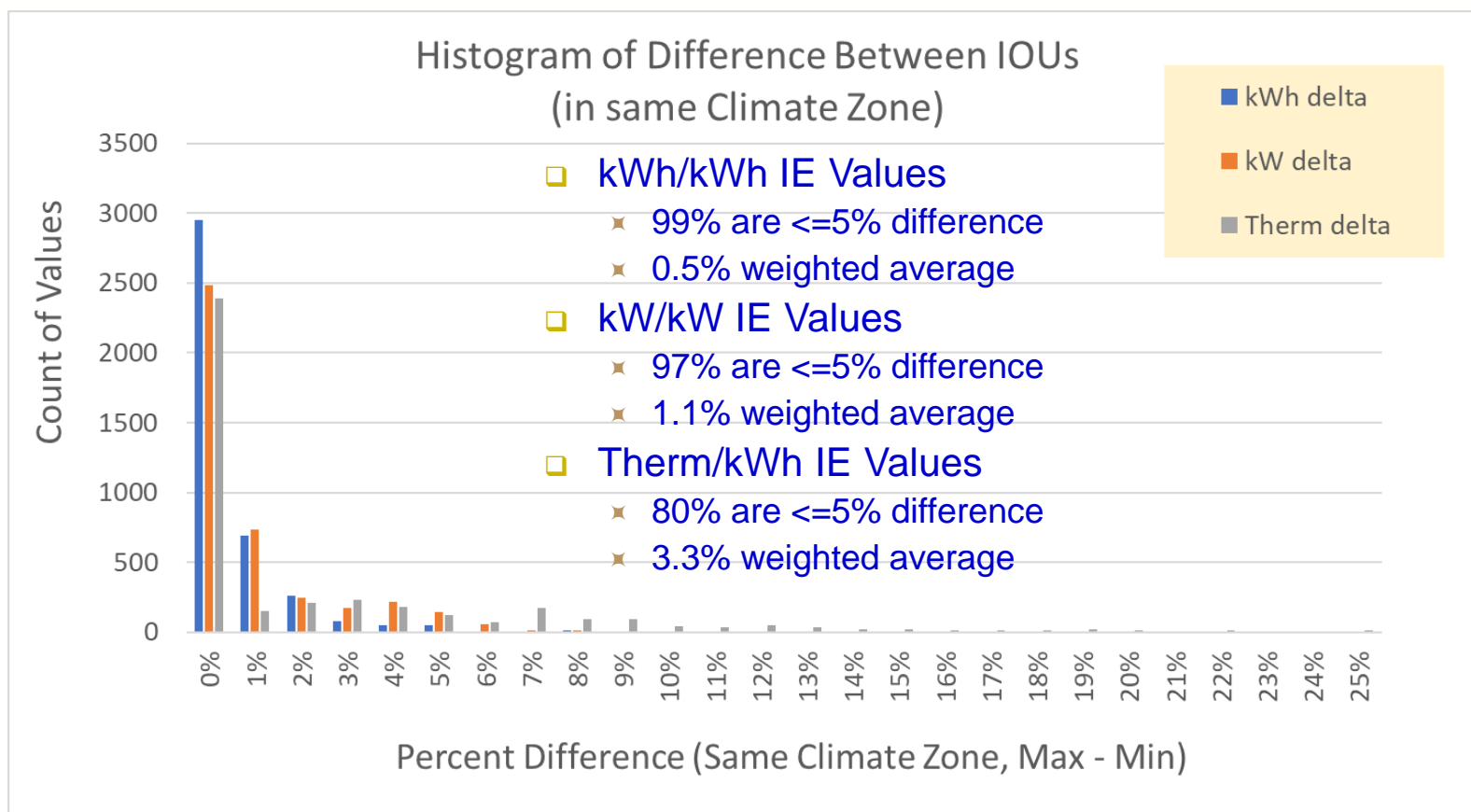
- Question

- If my short term goal is to have an interactive effect table that is not dependent upon PA,
- And we do not have all of the support tables to fully deconstruct the current interactive effects table,
- Should we:
 1. Use the Building Stock Area weighting file that we do have (from 2014) to combine interactive effect values from within a climate zone
 - Better mathematical approach
 2. Take simple averages (first combine SCE/SCG values since areas overlapping)
 - Simpler process to follow for the future
 - Easy to re-trace steps, if needed
 - Answers are very close

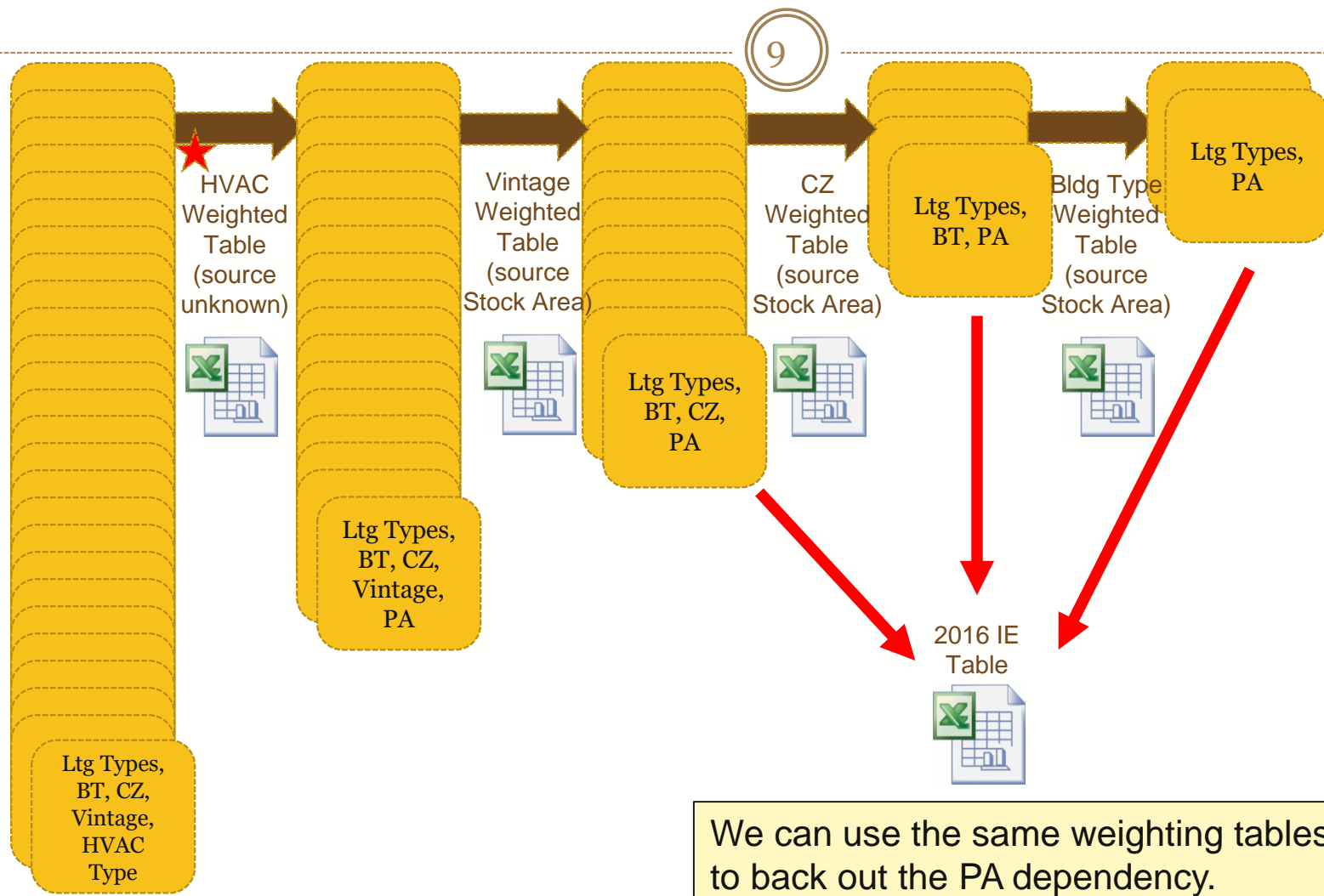
Can we consolidate CZ across IOUs

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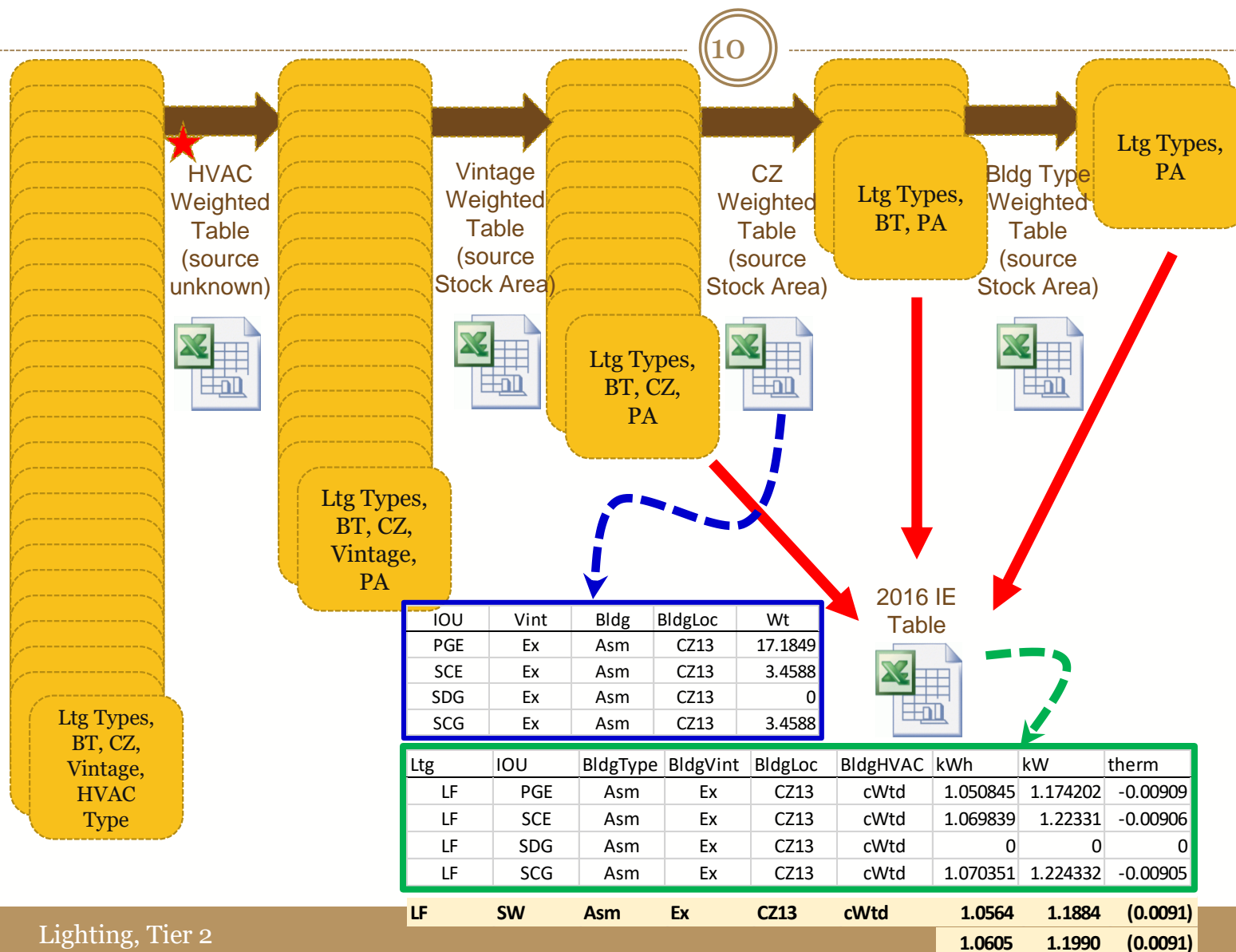
- About 50% of the values do not overlap
- 4,600 overlapping IE values between IOUs (removed IOU weighted averages)
- Consider Max – Min difference (most conservative)



Interactive Effects



Interactive Effects



How can we consolidate CZ across IOUs

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- Reason that we are looking for a solution now:
 - This issue of creating PA-specific values is not Lighting only
 - Several Appliance / Plug Load measures
 - Several Water Heating measures
 - Want to address this issue before Stage 2
- Question
 - If my short term goal is to have an interactive effect table that is not dependent upon PA,
 - And we do not have all of the support tables to fully deconstruct the current interactive effects table,
 - Should we:
 1. Use the Building Stock Area weighting file that we do have (from 2014) to combine interactive effect values from within a climate zone
 - Better mathematical approach
 2. Take simple averages (first combine SCE/SCG values since areas overlapping)
 - Simpler process to follow for the future
 - Easy to re-trace steps, if needed
 - Answers are very close

Measure Consensus

4.16 LED Recess Downlight Fixture

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● Offering

- ❑ 20 Lighting Bins: <7W, 7W – 24W, ≥25W
- ❑ Building Types: 24 NonRes / 4 Res (Note: Not OTR = Other)
- ❑ Vintage: Ex, New
- ❑ Climate Zone: CZ01 – CZ16 (Note: **Not IOU**)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall



} Also used for planning purposes;
therefore keeping within the tables.

● Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*
 - ✦ *Would need to be average*
 - ✦ *Not weighted average since no additional weighting data is available*
- ❑ Did not include 2 commercial EUL's as listed in the SDG&E WP
- ❑ Used base case and measure case cost data from PG&E WP which was based on web-scraping.
- ❑ Used wattage reduction ratio (WRR) from PG&E WP; updated SDG&E

} Input Needed
(following slides
recap the issue)

● Measure Extension

- ❑ Added measure for POU's (electric measure)
- ❑ Added residential areas beyond SCE

● Stage 2 Issues

- ❑ *Calculation: Review savings methodology (WRR vs delta watts), hours of use, interactive effects*
- ❑ *Cost: Review variation due to CZ / Delivery / Offering, methodology for keeping costs up-to-date*
- ❑ *Baseline: Existing conditions opportunity, document baselines*
- ❑ *Permutation collapse*

Measure Consensus

4.16 LED Recess Downlight Fixture

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Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
All					
kW	-2%				-2%
kWh	-2%				-2%
Therms	6%				6%
Cost	38%				38%
DI					
kW	-5%				
kWh	-3%				
Therms	-5%				
Cost	402%				
Non-DI					
kW	-1%				
kWh	-1%				
Therms	7%				
Cost	-1%				

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	(3.46)	0%	(0.005)	(3.46)	-	-	-
kWh	(18,605)	0%	(0.005)	(18,605)	-	-	-
Therms	(727)	1%	(0.000)	(727)	-	-	-
Cost	\$ 333,743	3%	0.051	\$ 333,743	\$ -	\$ -	\$ -



Notes:

- 'Savings Difference' based on 2017 claims data
 - ✦ Effect of wattage reduction ratio (WRR) revision eliminated by comparing against 2017 data
- Claims only identified by PG&E in 2017
- Large cost difference
 - ✦ Direct Install can use actual cost, rather than workpaper cost
- PG&E savings difference due to IOU-Weighted CZ rather than actual CZ (which impacts interactive effects values)

Input Consensus

4.16 LED Recess Downlight Fixture

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- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com,Sun,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,WRf,Res,DMo,MFm,SFm	SUn,Asm,Com,ECC,EPr,ERC,ESe,EUn,Gro,Hsp,Htl,MBT,MFm,MLI,Mtl,Nrs,OfL,OfS,OTR,Res,RFF,RSD,Rt3,RtL,RtS,SCn,WRf	DMo,MFm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRf	No Value	No Value
BldgVintage	Ex, New	Ex	Any	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16, IOU	IOU	CZ06,CZ08,CZ09,CZ10,CZ13,CZ14,CZ15,CZ16	No Value	No Value
BldgHVAC	cWtd rWtd	cWtd rWtd	Any	No Value	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROBNC	ROB	ROBNC	No Value	No Value
NormUnit	Lamp	Lamp	Lamp	No Value	No Value
EUL ID	ILtg-Res-LED-50000hr ILtg-Com-LED-50000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	No Value	No Value
NTGR	NonRes-sAll-MLtgLED-Deemed Res-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	NonRes-sAll-MLtgLED-Deemed Res-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	Com-Default>2yrs Res-sAll-MLtgLED-Deemed Res-Default>2	No Value	No Value
DeliveryType	DirInstall NonUpStrm PreRebDown PreRebUp	Any DirInstall PreRebDown PreRebUp	DirInstall NonUpStrm PreRebDown PreRebUp	No Value	No Value
GSIA	Com-LED-PGE Def-GSIA	Com-LED-PGE Def-GSIA	Def-GSIA	No Value	No Value

Measure Consensus

4.26 LED MR-16 Lamp



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- Offering

- ❑ 8 Lighting Bins: <6W, 6W – 11W, ≥12W
- ❑ Building Types: 25 NonRes / 4 Res (Note: Not OTR , Gst/not GsR)
- ❑ Vintage: Ex (Note: Not New)
- ❑ Climate Zone: CZ01 – CZ16 (Note: Not IOU)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall

- Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*

- Measure Extension

- ❑ Added measure for POUs (electric measure)
- ❑ Added residential areas beyond SCE

- Stage 2 Issues

- ❑ *(Common Lighting Issues)*

Measure Consensus

4.26 LED MR-16 Lamp

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Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
All	kW	-1%	0%	-4%	-4%
	kWh	-1%	0%	-4%	-4%
	Therms	3%	0%	-8%	-2%
	Cost	35%	-23%	16%	14%
DI	kW	0%	-1%	-4%	
	kWh	0%	-1%	-4%	
	Therms	4%	0%	-8%	
	Cost	48%	-33%	16%	
Non-DI	kW	-1%	0%	0%	
	kWh	-2%	0%	0%	
	Therms	2%	0%	0%	
	Cost	0%	0%	0%	

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	(10)	-2%	(0.015)	(0.85)	(0.14)	(1.55)	-
kWh	(38,208)	-1%	(0.010)	(4,013)	(491)	(7,967)	-
Therms	114	-1%	0.000	(103)	1	64	-
Cost	37,165	5%	0.006	\$ 50,867	\$ (15,375)	\$ 7,046	\$ -



Notes:

- 'Savings Difference' based on 2017 claims data
- Large cost difference all seen in Direct Install programs
- ✱ Direct Install can use actual cost, rather than workpaper cost
- PG&E savings difference due to IOU-Weighted CZ rather than actual CZ (which impacts interactive effects values)

Input Consensus

4.26 LED MR-16 Lamp

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- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com,Sun,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,WRF,Res,DMo,MFm,SFm	SUn,Asm,Com,ECC,EPr,ERC,ESe,EUn,Gro,Hsp,Htl,MBT,MFm,MLI,Mtl,Nrs,OfL,OfS,OTR,Res,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRF	SUn,Asm,ECC,EPr,ERC,ESe,EUn,Gro,GsR,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRF	No Value	No Value
BldgVintage	Ex	Ex	Ex	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16, IOU	IOU	,CZ06,CZ08,CZ09,CZ10,CZ13,CZ14,CZ15,CZ16	No Value	No Value
BldgHVAC	cWtd rWtd	cWtd rWtd	Wtd	No Value	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	ROBNC	No Value	No Value
NormUnit	Lamp	Lamp	Lamp	No Value	No Value
EUL ID	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	No Value	No Value
NTGR	NonRes-sAll-MLtgLED-Deemed Res-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	NonRes-sAll-MLtgLED-Deemed Res-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	NonRes-sAll-MLtgLED-Deemed Res-sAll-MLtgLED-Deemed	No Value	No Value
DeliveryType	DirInstall NonUpStrm PreRebDown PreRebUp	Any PreRebUp	DirInstall NonUpStrm PreRebDown PreRebUp	No Value	No Value
GSIA	Com-LED-PGE Def-GSIA	Com-LED-PGE Def-GSIA	Com-LED-PGE Def-GSIA	No Value	No Value

Measure Consensus

4.27 LED PAR Lamp



● Offering

- ❑ 4 Lamp Types: PAR16, 20, 30, 38
- ❑ Multiple Lighting Bins:
 - ✦ PAR16 (<6, 6, ≥7W), PAR 20 (≤11W), PAR30 (<10, 10-19, ≥20W), PAR38 (<12, 12-26, ≥27W)
- ❑ Building Types: 25 NonRes / 4 Res (Note: Not OTR)
- ❑ Vintage: Ex (Note: Not New)
- ❑ Climate Zone: CZ01 – CZ16 (Note: Not IOU)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall

● Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*
- ❑ Added special hours for Dwelling Areas & Common Areas for the Multi-Family and Double-Wide Mobile Homes.

● Measure Extension

- ❑ Added measure for POU's (electric measure)
- ❑ Added residential areas beyond SCE

● Stage 2 Issues

- ❑ *(Common Lighting Issues)*

Measure Consensus

4.27 LED PAR Lamp

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Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
All	kW	-16%	-12%	-24%	-17%
	kWh	-17%	-13%	-24%	-17%
	Therms	-16%	-16%	-17%	-17%
	Cost	60%	125%	-22%	81%
DI	kW	-17%	-9%	-20%	
	kWh	-18%	-9%	-21%	
	Therms	-19%	-18%	-21%	
	Cost	143%	-30%	-6%	
Non-DI	kW	-14%	-12%	-27%	
	kWh	-15%	-14%	-26%	
	Therms	-13%	-16%	-16%	
	Cost	0%	137%	-27%	

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	(367)	-14%	(0.528)	(240.77)	(65.74)	(40.66)	-
kWh	(1,693,005)	-13%	(0.430)	(996,389)	(428,548)	(178,299)	-
Therms	12,021	-9%	0.005	4,690	6,211	629	-
Cost	2,570,897	35%	0.397	\$ 831,360	\$ 1,836,454	\$ (73,065)	\$ -



Notes:

'Savings Difference' based on 2017 claims data

- ✦ SCE, PG&E and SDG&E reporting two versions of savings
- ✦ Cannot easily compare because WRR changed part way through 2017

PG&E savings diff (partly) due to IOU-Weighted CZ rather than actual CZ (IE related)

SDG&E savings difference (partly) due to:

- ✦ Uses COM instead of SFm for Upstream
- ✦ Uses IOU instead of specific CZ for Upstream

Large cost difference

- Direct Install can use actual cost, rather than workpaper cost
- SCE: Midstream cost matches; Upstream cost very different

Input Consensus

4.27 LED PAR Lamp

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- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com,Sun,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,WRF,Res,DMo,MFm,SFm	SUn,Asm,Com,ECC,EPr,ERC,ESe,EUn,Gro,Hsp,Htl,MBT,MFm,MLI,Mtl,Nrs,OfL,OfS,OTR,Res,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRF	SUn,Asm,ECC,EPr,ERC,ESe,EUn,Gro,GsR,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRF	No Value	No Value
BldgVintage	Ex	Ex	Ex	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16, IOU	IOU	,CZ06,CZ08,CZ09,CZ10,CZ13,CZ14,CZ15,CZ16	No Value	No Value
BldgHVAC	cWtd rWtd	cWtd rWtd	Wtd	No Value	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	ROBNC	No Value	No Value
NormUnit	Lamp	Lamp	Lamp	No Value	No Value
EUL ID	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	No Value	No Value
NTGR	NonRes-sAll-MLtgLED-Deemed Res-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	NonRes-sAll-MLtgLED-Deemed Res-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	NonRes-sAll-MLtgLED-Deemed Res-sAll-MLtgLED-Deemed	No Value	No Value
DeliveryType	DirInstall NonUpStrm PreRebDown PreRebUp	Any PreRebUp	DirInstall NonUpStrm PreRebDown PreRebUp	No Value	No Value
GSIA	Com-LED-PGE Def-GSIA	Com-LED-PGE Def-GSIA	Com-LED-PGE Def-GSIA	No Value	No Value

Measure Consensus

4.28 LED Candelabra Lamp

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- Offering

- ❑ 2 Lighting Bins: <3W, 3W – ≤5W
- ❑ Building Types: 25 NonRes / 4 Res (Note: Not OTR, Gst/not GsR)
- ❑ Vintage: Ex (Note: Not New)
- ❑ Climate Zone: CZ01 – CZ16 (Note: Not IOU)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall

- Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*

- Measure Extension

- ❑ Added measure for POUs (electric measure)
- ❑ Added residential areas beyond SCE

- Stage 2 Issues

- ❑ *(Common Lighting Issues)*

Measure Consensus

4.28 LED Candelabra Lamp

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Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
All	kW	1%	0%	-3%	-1%
	kWh	0%	0%	-3%	-1%
	Therms	-2%	0%	-1%	-2%
	Cost	50%	47%	7%	42%
DI	kW	2%	0%	-3%	
	kWh	0%	0%	-3%	
	Therms	-2%	0%	-1%	
	Cost	62%	58%	7%	
Non-DI	kW	-1%	0%		
	kWh	-2%	0%		
	Therms	-2%	0%		
	Cost	0%	0%		

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	(1.05)	0%	(0.002)	0.71	(0.00)	(1.25)	-
kWh	(11,801)	-1%	(0.003)	(1,460)	0	(6,469)	-
Therms	123	-1%	0.000	95	0	11	-
Cost	\$ 112,920	34%	0.017	\$ 77,381	\$ 32,923	\$ 3,222	\$ -



Notes:

- 'Savings Difference' based on 2017 claims data
- PG&E savings difference due to IOU-Weighted CZ rather than actual CZ (which impacts interactive effects values)
- SDG&E uses DEER measures (C-In-LED-Candle(5w)-dWP31)
 - ✦ 5W measure case value typically included in 3-5W bin
- Large cost difference
 - ✦ Direct Install can use actual cost, rather than workpaper cost
 - ✦ PG&E – already updated zero DI cost to the workpaper value; additional DI variation exists

Input Consensus

4.28 LED Candelabra Lamp

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- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com,Sun,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,WRf,Res,DMo,MFm,SFm	SUn,Asm,Com,ECC,EPr,ERC,ESe,EUn,Gro,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,OTR,Res,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRf,MFm	SUn,Asm,ECC,EPr,ERC,ESe,EUn,Gro,GsR,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRf,DMo,MFm	No Value	No Value
BldgVintage	Ex	Ex	Ex	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16, IOU	IOU	,CZ06,CZ08,CZ09,CZ10,CZ13,CZ14,CZ15,CZ16	No Value	No Value
BldgHVAC	cWtd rWtd	cWtd rWtd	Wtd	No Value	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	ROBNC	No Value	No Value
NormUnit	Lamp	Lamp	Lamp	No Value	No Value
EUL ID	ILtg-Com-LED-15000hr ILtg-Res-LED-15000hr	ILtg-Com-LED-15000hr ILtg-Res-LED-15000hr	ILtg-Com-LED-15000hr ILtg-Res-LED-15000hr	No Value	No Value
NTGR	Res-sAll-MLtgLED-Deemed NonRes-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	Res-sAll-MLtgLED-Deemed NonRes-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	Com-Default>2yrs Res-sAll-MLtgLED-Deemed	No Value	No Value
DeliveryType	DirInstall NonUpStrm PreRebDown PreRebUp	Any DirInstall PreRebUp	DirInstall NonUpStrm PreRebDown PreRebUp	No Value	No Value
GSIA	Def-GSIA Com-LED-PGE	Def-GSIA Com-LED-PGE	Def-GSIA Com-LED-PGE	No Value	No Value

Measure Consensus

4.29 LED Globe Lamp



24

- Offering

- ❑ 2 Lighting Bins: <3W, 3W – ≤10W
- ❑ Building Types: 25 NonRes / 4 Res (Note: Not OTR, Gst/not GsR)
- ❑ Vintage: Ex (Note: Not New)
- ❑ Climate Zone: CZ01 – CZ16 (Note: Not IOU)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall

- Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*

- Measure Extension

- ❑ Added measure for POUs (electric measure)
- ❑ Added residential areas beyond SCE

- Stage 2 Issues

- ❑ *(Common Lighting Issues)*

Measure Consensus

4.29 LED Globe Lamp

(25)

Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
ALL					
kW	-2%	0%	-63%		-30%
kWh	-1%	0%	-63%		-32%
Therms	9%	0%	-63%		-35%
Cost	61%	-48%	-13%		-38%
DI					
kW	-2%	0%	-63%		
kWh	-1%	0%	-63%		
Therms	9%	0%	-63%		
Cost	61%	-48%	-13%		
Non-DI					
kW					
kWh					
Therms					
Cost					

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	(1.88)	-3%	(0.003)	(0.01)	0.00	(1.83)	-
kWh	(7,681)	-3%	(0.002)	(16)	(0)	(7,089)	-
Therms	21	-2%	0.000	(1)	0	8	-
Cost	\$ (5,332)	-14%	(0.001)	\$ 367	\$ (5,417)	\$ (281)	\$ -



Notes:

- 'Savings Difference' based on 2017 claims data
- Large cost difference
 - Direct Install can use actual cost, rather than workpaper cost
 - ✦ eTRM cost matches the workpaper values
 - ✦ Typical for same offering to have different costs
- PG&E savings difference due to IOU-Weighted CZ rather than actual CZ (which impacts interactive effects values)
- SDG&E uses DEER measures (C-In-LED-Glb(8w)-dWP31)
 - ✦ 8W measure case value typically included in 3-10W bin, (which will result in a reduced savings credit)

Input Consensus

4.29 LED Globe Lamp

26

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com,Sun,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,WRF,Res,DMo,MFm,SFm	SUn,Asm,Com,DMo,ECC,EPr,ERC,ESe,EUn,Gro,Hsp,Htl,MBT,MFm,MLI,Mtl,Nrs,OfL,OfS,OTR,Res,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRF	SUn,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,WRF	No Value	No Value
BldgVintage	Ex	Ex	Any	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16, IOU	IOU	,CZ06,CZ08,CZ09,CZ10,CZ13,CZ14,CZ15,CZ16	No Value	No Value
BldgHVAC	cWtd rWtd	cWtd rWtd	Any	No Value	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	ROBNC	No Value	No Value
NormUnit	Lamp	Lamp	Lamp	No Value	No Value
EUL ID	ILtg-Com-LED-15000hr ILtg-Com-LED-20000hr ILtg-Res-LED-15000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-15000hr ILtg-Com-LED-20000hr ILtg-Res-LED-15000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-15000hr ILtg-Com-LED-20000hr ILtg-Res-LED-15000hr ILtg-Res-LED-20000hr	No Value	No Value
NTGR	Res-sAll-MLtgLED-Deemed NonRes-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	Res-sAll-MLtgLED-Deemed NonRes-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	Com-Default>2yrs Res-sAll-MLtgLED-Deemed Res-Default>2	No Value	No Value
DeliveryType	DirInstall NonUpStrm PreRebDown PreRebUp	Any DirInstall PreRebUp	DirInstall NonUpStrm PreRebDown PreRebUp	No Value	No Value
GSIA	Def-GSIA Com-LED-PGE	Def-GSIA Com-LED-PGE	Def-GSIA	No Value	No Value

Measure Consensus

4.30 LED A Lamp



- Offering

- ❑ 4 Lumen Equivalents: 40W, 60W, 75W, 100W
- ❑ 3-4 Lumen Bins Each:
 - ✦ 40W-(68,80,90,100 LPW), 60W-(80,90,100,110 LPW),
 - ✦ 75W-(90,100,110,120 LPW), 100W-(90,100,110 LPW),
- ❑ Building Types: 25 NonRes / 4 Res (**Note: Not OTR, Gst/not GsR**)
- ❑ Vintage: Ex (**Note: Not New**)
- ❑ Climate Zone: CZ01 – CZ16 (**Note: Not IOU**)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall

- Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*
- ❑ Added special hours for Dwelling Areas & Common Areas for the Multi-Family and Double-Wide Mobile Homes.
- ❑ SDG&E “short form” added LED reflector lamps (BR/R). This lamp type is addressed in measure 4.32.
- ❑ SDG&E “short form” included a long list of requirements but it was not clear if they are incremental to the lead WP or just explicitly broken out here (e.g. PF, CRI, standby power, etc).
- ❑ The consolidated measure reflects the web scraping methodology costs from the PG&E WP.

- Measure Extension

- ❑ Added measure for POUs (electric measure)
- ❑ Added residential areas beyond SCE

- Stage 2 Issues

- ❑ (*Common Lighting Issues*)

Measure Consensus

4.30 LED A Lamp

28

Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
All					
kW	1%	0%			0%
kWh	1%	0%			0%
Therms	6%	0%			0%
Cost	1%	29%			26%
DI					
kW	0%	0%			
kWh	0%	0%			
Therms	-4%	0%			
Cost	2%	36%			
Non-DI					
kW	1%	0%			
kWh	1%	0%			
Therms	8%	0%			
Cost	0%	28%			

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	(1)	0%	(0.001)	0.50	0.22	-	-
kWh	(8,017)	0%	(0.002)	2,407	47	-	-
Therms	(332)	0%	(0.000)	(365)	0	-	-
Cost	1,245,945	4%	0.192	\$ 2,918	\$ 1,246,534	\$ -	\$ -



Notes:

- 'Savings Difference' based on 2017 claims data
 - ✦ Removed claims for prior to lumen bin methodology
- Cost difference
 - ✦ eTRM cost matches the workpaper values
 - SCE cost shows
 - Midstream: Matches
 - DI and Upstream: Residential cost too low and Commercial cost higher than eTRM
 - ✦ Typical for same offering to have different costs
- PG&E savings difference due to IOU-Weighted CZ rather than actual CZ (which impacts interactive effects values)

Input Consensus

4.30 LED A Lamp

- Measure Permutations
 - eTRM measure matches the lumen bin methodology from PG&E

	eTRM Measure Value
BldgType	Com,Sun,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,WRf,Res,D
BldgVintage	Ex
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16, IOU
BldgHVAC	cWtd rWtd

	eTRM Measure Value
MeasureAppType	ROB
NormUnit	Lamp
EUL ID	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr
NTGR	NonRes-sAll-mLEDARefl Res-sAll-mLEDARefl Com-Default>2yrs Res-Default>2
DeliveryType	DirInstall NonUpStrm PreRebDown PreRebUp
GSIA	Com-LED-PGE Def-GSIA

Measure Consensus

4.31 LED Recessed Downlight Kit

30

- Offering

- ❑ 3 Lighting Bins: <10W, 10W – 12W, 13-25W
- ❑ Building Types: 25 NonRes / 4 Res (Note: Not OTR)
- ❑ Vintage: Ex (Note: Not New)
- ❑ Climate Zone: CZ01 – CZ16 (Note: Not IOU)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall



- Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*
- ❑ PG&E had three measure offerings, while SCE had one measure offering which overlapped with the most conservative of the PG&E measure offerings.
- ❑ Base, measure and labor costs used in the two WPs vary significantly. The consolidated measure currently includes the PG&E values but the data needs to be reviewed to determine which WP includes better cost data/represents the better methodology.

- Measure Extension

- ❑ Added measure for POU's (electric measure)
- ❑ Added residential areas beyond SCE

- Stage 2 Issues

- ❑ *(Common Lighting Issues)*

Measure Consensus

4.31 LED Recessed Downlight Kit

31

Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
ALL	kW	2%	37%		7%
	kWh	1%	54%		9%
	Therms	8%	55%		11%
	Cost	0%	52%		3%
DI	kW		20%		
	kWh		14%		
	Therms		13%		
	Cost		14%		
Non-DI	kW	2%	47%		
	kWh	1%	63%		
	Therms	8%	57%		
	Cost	0%	63%		

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	43.14	3%	0.062	12.15	30.99	-	-
kWh	409,524	3%	0.104	44,703	364,820	-	-
Therms	(8,659)	3%	(0.004)	(5,635)	(3,024)	-	-
Cost	\$ 277,516	1%	0.043	\$ (0)	\$ 277,517	\$ -	\$ -



Notes:

- ‘Savings Difference’ based on 2017 claims data
- PG&E savings difference due to IOU-Weighted CZ rather than actual CZ (which impacts interactive effects values)
- SCE
 - 2016 ExAnte Common Areas use lower hours
 - Uses one bin of <=15W (uses 8W as measure value); this analysis assumes these lamps could fit into higher wattage bins, but not enough information to tell how much more

Input Consensus

4.31 LED Recessed Downlight Kit

32

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	Com,Sun,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,SCn,Wrf,Res,D Mo,MFm,SFm	Com,MFm,Res	SUn,Asm,ECC,EPr,ERC,ESe,EUn,Gro,Hsp,Htl,MBT,DM o,MFm,MLI,Mtl,Nrs,OfL,OfS,OTR,RFF,RSD,Rt3,RtL,RtS,SCn,SFm,Wrf	No Value	No Value
BldgVintage	Ex	Ex	Ex	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16	IOU	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16	No Value	No Value
BldgHVAC	cWtd rWtd	cWtd rWtd	cWtd rWtd	No Value	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	ROBNC	No Value	No Value
NormUnit	Each	Each	Each	No Value	No Value
EUL ID	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	No Value	No Value
NTGR	Res-sAll-mLEDSpcl Com-Default>2yrs Res-Default>2 Agric-Default>2yrs Ind-Default>2	Res-sAll-MLtgLED-Deemed Com-Default>2yrs Res-Default>2	Com-Default>2yrs Res-Default>2 Agric-Default>2yrs Ind-Default>2	No Value	No Value
DeliveryType	PreRebDown PreRebUp DirInstall NonUpStrm	PreRebDown PreRebUp	DirInstall PreRebDown NonUpStrm	No Value	No Value
GSIA	Def-GSIA	Def-GSIA	Def-GSIA	No Value	No Value

Measure Consensus

4.32 LED R/BR Lamp

33



- Offering

- ❑ 3 Lighting Bins: <11W, 11W – 13W, 14-22W
- ❑ Building Types: 25 NonRes / 4 Res (Note: Not OTR, Gst/not GsR)
- ❑ Vintage: Ex (Note: Not New)
- ❑ Climate Zone: CZ01 – CZ16 (Note: Not IOU)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall

- Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*
- ❑ Added special hours for Dwelling Areas & Common Areas for the Multi-Family and Double-Wide Mobile Homes.
- ❑ *SDG&E used DEER measures that included smaller range wattage bins*

- Measure Extension

- ❑ Added measure for POUs (electric measure)
- ❑ Added residential areas beyond SCE

- Stage 2 Issues

- ❑ *(Common Lighting Issues)*

Measure Consensus

4.32 LED R/BR Lamp

34

Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
ALL					
kW	-11%	-6%	-23%		-8%
kWh	-12%	-6%	-25%		-8%
Therms	-6%	-6%	-17%		-6%
Cost	7%	57%	-9%		43%
DI					
kW	-15%	-2%	-27%		
kWh	-15%	-1%	-26%		
Therms	-13%	0%	-26%		
Cost	54%	50%	13%		
Non-DI					
kW	-10%	-6%	-22%		
kWh	-11%	-6%	-25%		
Therms	-5%	-6%	-17%		
Cost	0%	57%	-11%		

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	(626.07)	-11%	(0.901)	(153.59)	(351.36)	(109.17)	-
kWh	(4,164,297)	-10%	(1.057)	(1,024,883)	(2,338,898)	(759,947)	-
Therms	49,641	-7%	0.022	7,861	35,878	5,617	-
Cost	\$ 7,417,734	37%	1.144	\$ 208,499	\$ 7,314,232	\$ (99,760)	\$ -

8,539,300	40,594,416	2,998,960
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Notes:

- Too many changes occurring to make detailed conclusions
- 'Savings Difference' based on 2017 claims data
 - SCE, PG&E and SDG&E reporting two versions of savings
 - Cannot easily compare because WRR changed part way through 2017
 - PG&E savings difference due to IOU-Weighted CZ rather than actual CZ (which impacts interactive effects values)
- SDG&E savings discrepancy:
 - Claims DEER wattage bins that has options for 10, 11, 12, 13, and 16W
 - More bins creates more accurate savings; this is a large Measure, so this could be important
- Large cost difference
 - Direct Install can use actual cost, rather than workpaper cost
 - PG&E costs used for eTRM values

Input Consensus

4.32 LED R/BR Lamp

35

- Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	SUn,Asm,Com,ECC,EPr,ERC,ESe,EUn,Gro,Gst,Hsp,Htl,MBT,MFm,MLI,Mtl,Nrs,OfL,OfS,OTR,Res,RFF,RSD,Rt3,RtL,RtS,Scn,SFm,WRf,DmO	SUn,Asm,Com,ECC,EPr,ERC,ESe,EUn,Gro,Hsp,Htl,MBT,MFm,MLI,Mtl,Nrs,OfL,OfS,OTR,Res,RFF,RSD,Rt3,RtL,RtS,Scn,SFm,WRf,DmO	SUn,Asm,ECC,EPr,ERC,ESe,EUn,Gro,GsR,Hsp,Htl,MBT,MFm,MLI,Mtl,Nrs,OfL,OfS,RFF,RSD,Rt3,RtL,RtS,Scn,SFm,WRf,DmO	No Value	No Value
BldgVintage	Ex	Ex	Ex	No Value	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05,CZ06,CZ07,CZ08,CZ09,CZ10,CZ11,CZ12,CZ13,CZ14,CZ15,CZ16, IOU	IOU	CZ06,CZ08,CZ09,CZ10,CZ13,CZ14,CZ15,CZ16	No Value	No Value
BldgHVAC	cWtd rWtd	cWtd rWtd	cWtd rWtd	No Value	No Value

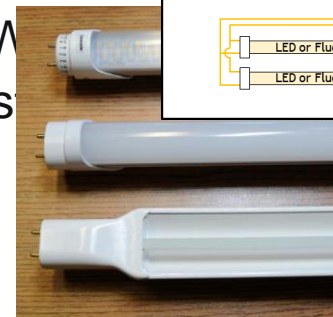
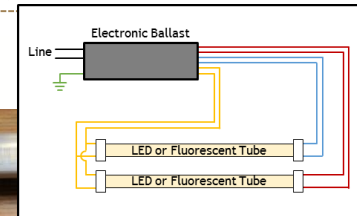
	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	ROB	ROB	No Value	No Value
NormUnit	Lamp	Lamp	Lamp	No Value	No Value
EUL ID	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	ILtg-Com-LED-20000hr ILtg-Res-LED-20000hr	No Value	No Value
NTGR	NonRes-sAll-mLEDAREfl Res-sAll-mLEDAREfl	NonRes-sAll-mLEDAREfl Res-sAll-mLEDAREfl	NonRes-sAll-mLEDAREfl Res-sAll-mLEDAREfl	No Value	No Value
DeliveryType	DirInstall NonUpStrm PreRebDown PreRebUp	DirInstall Any PreRebUp	DirInstall NonUpStrm PreRebDown PreRebUp	No Value	No Value
GSIA	Com-LED-PGE Def-GSIA	Com-LED-PGE Def-GSIA	Def-GSIA	No Value	No Value

Measure Consensus

4.36 LED T8 Replacement Lamp

36

UL Type A Configuration



● Offering

- ❑ 1 Lighting Bin: weighted average of 25, 28, 30, and 32W
- ❑ Building Types: 25 NonRes / 4 Res (Note: Not OTR, Gs)
- ❑ Vintage: Ex (Note: Not New)
- ❑ Climate Zone: CZ01 – CZ16 (*Note: Not IOU*)
- ❑ Residential Area: Dwelling/Common
- ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall

● Stage 1 Issues

- ❑ *Climate Zone specific claims to match across the state*

● Measure Extension

- ❑ Added measure for POUs (electric measure)
- ❑ Added residential areas beyond SCE

● Stage 2 Issues

- ❑ (*Common Lighting Issues*)

Measure Consensus

4.36 LED T8 Replacement Lamp

37

Percent Change Within the Measure

	PGE	SCE	SDG	SCG	Total
ALL					
kW		7%			7%
kWh		9%			9%
Therms		18%			18%
Cost		-55%			-55%
DI					
kW		8%			
kWh		12%			
Therms		33%			
Cost		-41%			
Non-DI					
kW		7%			
kWh		8%			
Therms		6%			
Cost		-68%			

Absolute Change & Comparison

	Total	% of Measure	% of Category	PGE	SCE	SDG	SCG
kW	167.41	134%	0.241	-	167.41	-	-
kWh	702,062	166%	0.178	-	702,062	-	-
Therms	(2,621)	311%	(0.001)	-	(2,621)	-	-
Cost	\$ (4,803,770)	-877%	(0.741)	\$ -	\$ (4,803,770)	\$ -	\$ -

Notes:

- 'Savings Difference' based on 2017 claims data
- SCE reporting two versions of savings (ie, savings changed in the middle of the year)
- Cost varies significantly in claims data for Midstream and DI
 - ✦ eTRM cost data taken from SCE workpaper

Input Consensus

4.36 LED T8 Replacement Lamp

38

• Measure Permutations

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
BldgType	SUn,Asm,Com,ECC,EPr,ERC, ESe,EUn,Gro,Hsp,Htl,MBT,M Fm,MLI,Mtl,Nrs,OfL,OfS,Res, RFF,RSD,Rt3,RtL,RtS,SCn,SFm ,WRf	No Value	SUn,Asm,DMo,ECC,EPr,ER C,ESe,EUn,Gro,Gst,Hsp,Htl, MBT,MFm,MLI,Mtl,Nrs,Of L,OfS,RFF,RSD,Rt3,RtL,RtS, SCn,WRf	SUn,Asm,DMo,ECC,EPr,ER C,ESe,EUn,Gro,Hsp,Htl,MB T,MFm,MLI,Mtl,Nrs,OfL,Of S,RFF,RSD,Rt3,RtL,RtS,SCn, WRf, SFm, Com	No Value
BldgVintage	Ex	No Value	Any	Ex	No Value
BldgLoc	CZ01,CZ02,CZ03,CZ04,CZ05, CZ06,CZ07,CZ08,CZ09,CZ10, CZ11,CZ12,CZ13,CZ14,CZ15, CZ16, IOU	No Value	CZ06,CZ08,CZ09,CZ10,CZ1 3,CZ14,CZ15,CZ16	CZ06,CZ07,CZ08,CZ10,CZ1 4,CZ15	No Value
BldgHVAC	cWtd rWtd	No Value	Any	Any	No Value

	eTRM Measure Value	PG&E	SCE	SDG&E	SCG
MeasureAppType	ROB	No Value	ER,ROBNC	ER,ROB	No Value
NormUnit	Lamp	No Value	Lamp	Lamp	No Value
EUL ID	ILtg-Lfluor-Elec LtgFixture-Default	No Value	ILtg-Lfluor-Elec LtgFixture-Default	ILtg-Lfluor-Elec	No Value
NTGR	Com-Default>2yrs Res-Default>2	No Value	All-Default<=2yrs ET-Default	All-Default<=2yrs Com-Default>2yrs	No Value
DeliveryType	DirInstall NonUpStrm PreRebDown PreRebUp	No Value	DirInstall NonUpStrm PreRebDown	DirInstall PreRebUp PreRebDown	No Value
GSIA	Def-GSIA	No Value	Def-GSIA	Def-GSIA	No Value

Lighting Measure Affirmation

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

- 4.16, LED, Interior Downlight Fixture
- 4.26, LED, MR-16 Lamp
- 4.27, LED, PAR Lamp
- 4.28, LED, Candelabra Lamp
- 4.29, LED, Globe Lamp
- 4.30, LED, A-Lamp
- 4.31, LED, Recessed Downlight Retrofit Kit
- 4.32, LED, R-BR Lamp
- 4.36, LED, Tube LED

Back-up Materials

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4.32 LED R/BR Lamp Example

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			Com		Res			
PA	Bin	Measure Wattage	No of Units	Gross kWh	No of Units	Gross kWh	Total No of Units	Total kWh
MCE	< 11 W	6	297	26,029			297	26,029
	≥ 11 W to < 14 W	11	92	12,088			92	12,088
	≥ 14 W to ≤ 22 W	14			103	2,451	103	2,451
PGE	< 11 W	6	33,561	2,162,246	218,655	3,431,980	252,216	5,594,227
	≥ 11 W to < 14 W	11	7,894	778,457	62,119	1,418,265	70,013	2,196,722
	≥ 14 W to ≤ 22 W	14	3,152	288,748	19,274	459,603	22,426	748,352
SCE	< 11 W	6	60,872	2,612,201	880,783	13,336,102	941,655	15,948,303
	≥ 11 W to < 14 W	11	47,137	2,741,174	715,232	15,093,304	762,369	17,834,478
	≥ 14 W to ≤ 22 W	14	13,841	1,019,768	216,427	5,791,867	230,268	6,811,635
SDGE	< 11 W	10	2,085	265,232	9,408	222,017	11,493	487,249
	≥ 11 W to < 14 W	11	3,812	500,664			3,812	500,664
		12	4,014	433,290	61,401	1,559,580	65,415	1,992,871
		13	33	3,856		521	14,321	554
Grand Total			176,791	10,843,753	2,183,923	41,329,491	2,360,713	52,173,244

Yellow highlights are examples of additional savings because Measure wattage is great than typical minimum value

Green highlights are example of opportunities for other IOUs