

Lighting Subcommittee Meeting #5



CALIFORNIA

TECHNICAL FORUM

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MARCH 2018**

Agenda

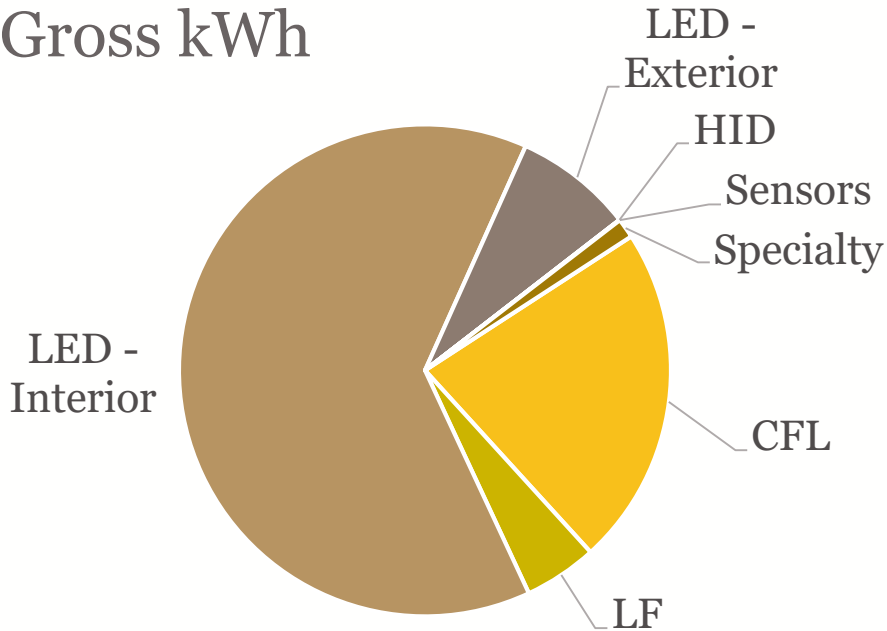
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- Review Deemed Lighting Impact 2017, Q1-Q3
- Discuss Recent Lighting Dispositions (March 1, 2018)
- Review Lighting Summary List for 2018
 - ❑ Do the recent (March 1, 2018) dispositions change the status of any measures on this list?
- Review Four Specific Lighting Measures Being Consolidated in Q1 2018
 - ❑ LED Troffers
 - ❑ LED Landscape
 - ❑ LED Refrigeration, Walk-in
 - ❑ LED Pool and Spa Lighting
- Deemed Lighting Opportunities in the Future

Deemed Lighting 2017 – Q1 – Q3

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Gross kWh



Lighting Total: 361.5M kWh (77%)
Deemed Portfolio: 471.2M kWh

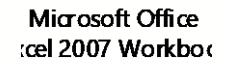
Lighting

Ref No	Category	Measrue Description	Gross kWh
4.01	CFL	CFL, Interior Fixture	342,231
4.02	CFL	CFL, Exterior Fixture	368,143
4.04	CFL	CFL, Integral/Screw-in	77,196,831
4.06	CFL	CFL, 3-Way	3,116,775
4.07	CFL	CFL, Spiral	-
4.09	CFL	CFL, Plug-In	-
4.10	LF	LF, 4' Replace Lamp	432,927
4.12	LF	LF, Ballast Retrofit	331,049
4.13	LF	LF, Replacement Fixture	15,157,034
4.14	LF	LF, HP Fixture	1,500,245
4.16	LED - Interior	LED, Interior Downlight	1,086,284
4.17	LED - Exterior	LED, Exterior Wallpack	129,869
4.18	LED - Interior	LED, High/Low Bay	15,918,225
4.19	LED - Interior	LED, Troffer (2x4, 1x4, 2x2)	7,535,133
4.20	LED - Exterior	LED, Street Light	20,600,706
4.21	LED - Interior	LED, Interior Common, Res	21,538,731
4.22	LED - Exterior	LED, Landscape	3,837
4.23	LED - Exterior	LED, Exterior with Motion	1,369,506
4.24	LED - Exterior	LED, Exterior, Res	5,436,898
4.25	LED - Exterior	LED, Exterior, Pole	484,168
4.26	LED - Interior	LED, MR-16	1,176,779
4.27	LED - Interior	LED, PAR20, 30, 38,	57,083,732
4.28	LED - Interior	LED, Candelabra	1,620,142
4.29	LED - Interior	LED, Globe	35,337
4.30	LED - Interior	LED, A-Lamp	59,934,779
4.31	LED - Interior	LED, Interior Downlight	4,636,357
4.32	LED - Interior	LED, R-BR	52,173,244
4.35	LED - Exterior	LED, Exterior Lamps	164,519
4.36	LED - Interior	LED, Tube LED	7,436,489
4.38	HID	HID, Exterior Fixture	58,425
4.40	Sensor	Sensor, Residential Occ	773
4.41	Sensor	Sensor, Wall or Ceiling Occ	-
4.42	Sensor	Sensor, Integrated Fixture	70,224
4.44	Specialty	LED, Open Sign	17,282
4.47	Specialty	LED, Refrig, Case Door	4,066,387
4.48	Specialty	LED, Refrig, Walk-in	-
4.49	Specialty	LED, Refrig, Reach-in	470,194
9.02	Specialty	LED Pool and Spa Lighting	83,537

March 1, 2018 Lighting Dispositions

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- 2018 Outdoor Lighting Phase 1 Disposition
 - Based on a detailed review of workpaper PGECOLTG151v8 LED Outdoor Lighting
 - Also applies to similar measures (workpapers) including
 - ✦ LED Street Lighting
 - ✦ LED Exterior Landscape Lighting Fixtures (including Pathways & Floodlights)
 - ✦ LED Exterior Light Fixture w/Motion Sensor
 - ✦ LED Exterior Fixture below 24 ft.
 - ✦ Exterior LED Sports & Athletic Field Lighting Fixtures
- 2018 Screw-in Lamp Savings Methods Disposition Addresses
 - A-Lamp Baseline
 - Small Diameter Directional Lamps
 - Other Reflectors
 - Globes & Candelabra Lamp Shapes



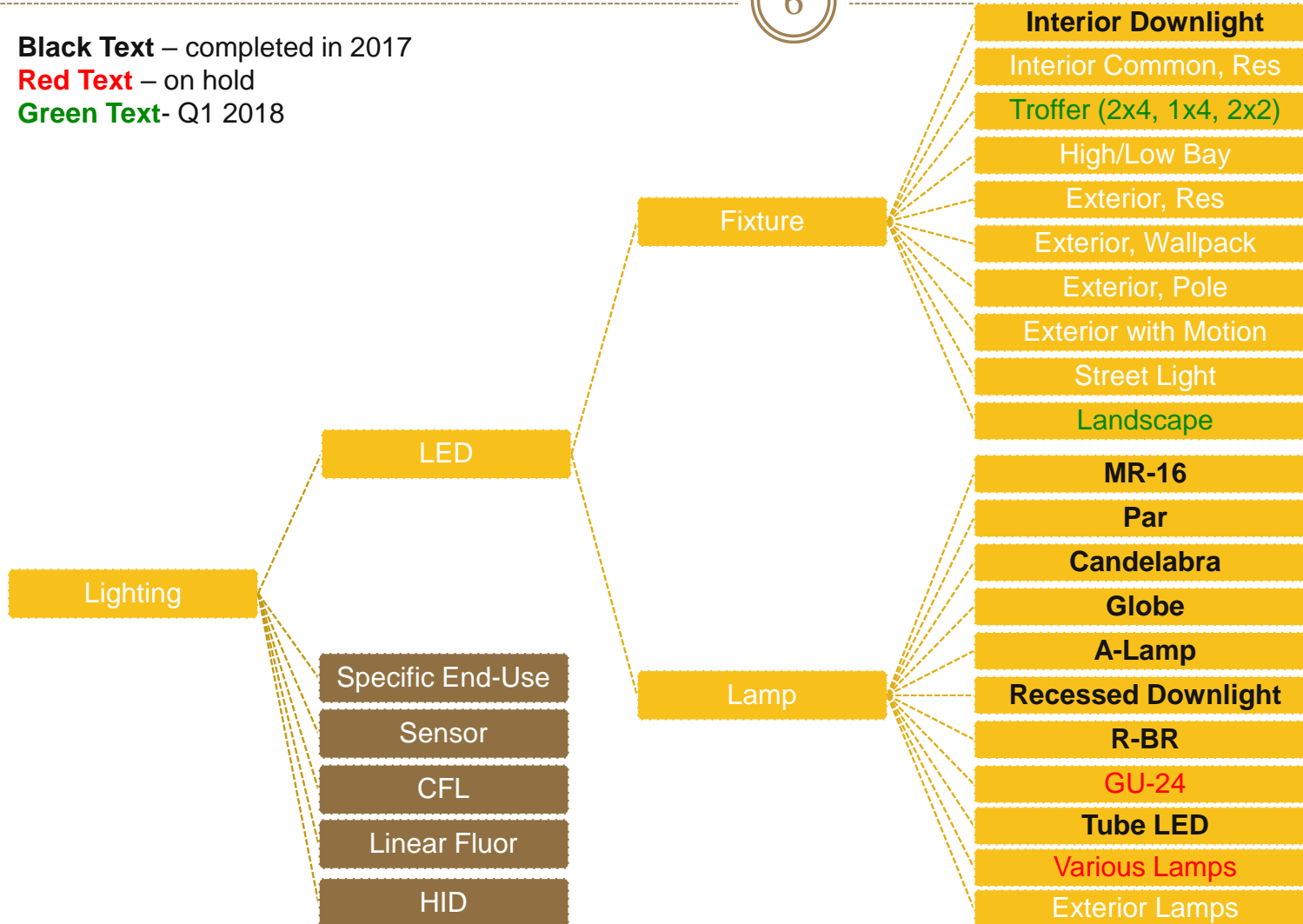
Lighting Measure Tree

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Black Text – completed in 2017

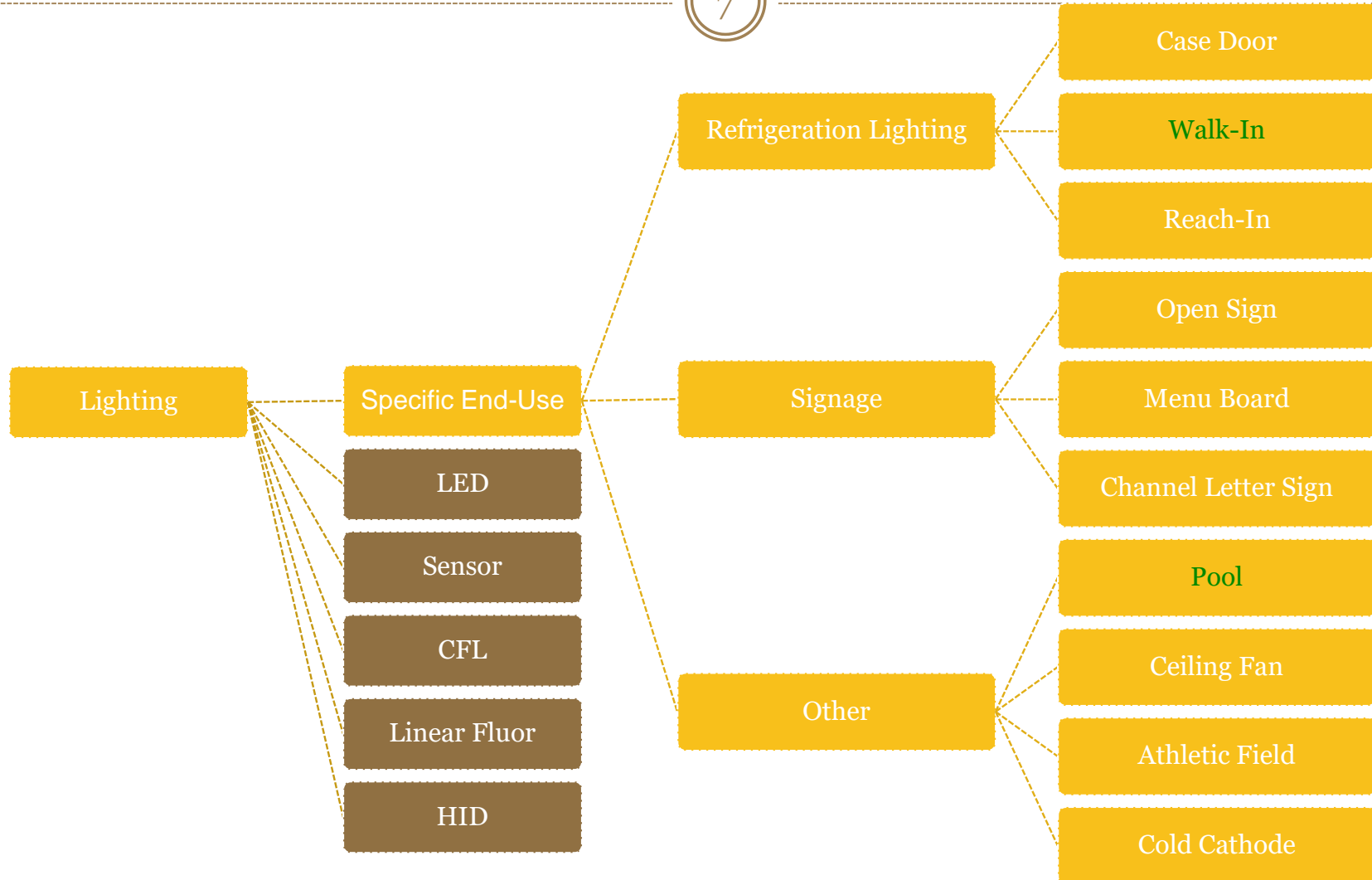
Red Text – on hold

Green Text - Q1 2018



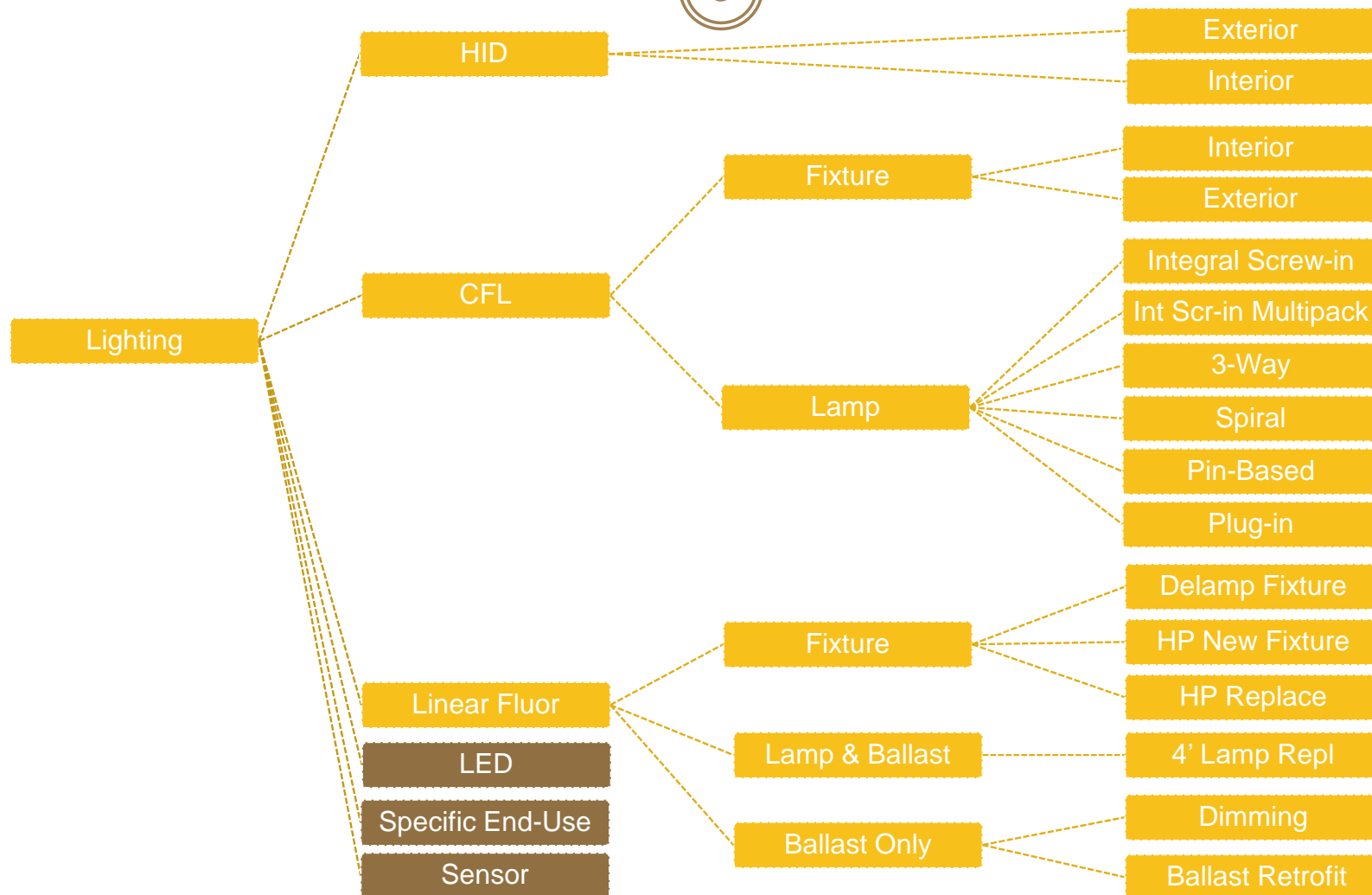
Lighting Measure Tree

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Lighting Measure Tree

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Measure Consensus

4.19 LED, Troffer (2x4, 1x4, 2x2)

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- Offering (WPs Reviewed: PGECOLTG179-R5, SCE17LG118-R0)
 - ❑ Replacement of linear fluorescent fixtures with LED Ambient Commercial Fixtures & Integrated Retrofit Kits (LED panel fixtures)
 - ❑ Cost, wattage and savings are all in units of kilolumen
 - ❑ Building Types: 24 NonRes (Not: OTR) / 1 Res (MFm-Common Area) (Not: MFm)
 - ❑ Measure Application Type: ROB (replace-on-burnout), NC (new construction)
 - ❑ Vintage: Ex, New
 - ❑ Climate Zone: CZ01 – CZ16
 - ❑ Residential Area: Common (Not: In-Dwelling)
 - ❑ Delivery: PreRebDown, PreRebUp, NonUpStrm, DirInstall
- Stage 1 Issues
 - ❑ *Climate Zone specific claims to match across the state*
 - ❑ *Included incremental items added by SCE in their “short form” WP, specifically adding common areas for the Multifamily (MFm) Building Type (and additional calc. template)*
- Measure Extension
 - ❑ Added measure for POUs (electric measure)
- Stage 2 Issues
 - ❑ *Calculation: Review hours of use, interactive effects*
 - ❑ *Baseline: Existing conditions opportunity*
 - ❑ *Permutation collapse*

Measure Consensus

4.22 LED Landscape Lighting Fixtures

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- Offering (WPs Reviewed: SCE17LG105R0, SDGE1057R1)
 - The replacement of a low voltage JC bi-pin lamp halogen landscape lighting fixtures typically ranging from 10-75 watts with LED landscape lighting fixtures in commercial and residential sectors
 - Six measure offerings (3 measure wattages, Commercial & Residential applic's)
 - Building Types: 25 NonRes / 4 Res (Note: Not OTR , Gst/not GsR, add CNC-Clinics)
 - Measure Application Type: ROB (replace-on-burnout)
 - Vintage: Ex (Note: Not New)
 - Climate Zone: CZ01 – CZ16
 - Residential Area: Dwelling only
 - Delivery: PreRebDown, NonUpStrm, PreRebUp
- Stage 1 Issues
 - How does recent (March 1, 2018) Outdoor Lighting Disposition affect the viability of this measure?
 - *Check WRR used in WPs against recent dispositions*
- Measure Extension
 - Added measure for POUs (electric measure)
- Stage 2 Issues
 - *Calculation: Review wattage reduction ratio (WRR) methodology*
 - *Cost: Review/update*
 - *Baseline: Existing conditions opportunity*

Measure Consensus

4.48 LED in Walk-in Coolers & Freezers

- Offering (WPs Reviewed: PGE3PLTG171R2)
 - Replacing a variety of fluorescent and incandescent lighting systems in refrigerated areas of a grocery store with Light Emitting Diode (LED) luminaires
 - Ten iterations of the measure to account for the range of existing lighting technologies and the impact of case temperature (i.e. cooler/freezer) on refrigeration system efficiency
 - ✦ 32W to 24W, 60W to 38W, 75W to 38W, 100W to 38W, 220W to 80W
 - ✦ Each wattage analyzed separately for cooler or freezer savings to account for refrigeration system efficiency
 - Building Types: Grocery (only)
 - ✦ May also be applicable in small business, hospitality, and hospital sector
 - Measure Application Type: ROB (replace-on-burnout) / NR (normal replacement)
 - Vintage: Ex (Note: Not New)
 - Climate Zone: CZ01 – CZ16
 - Delivery: PreRebDown
- Stage 1 Issues
 - Measure didn't report savings in 2017 Q1-Q3, is it still a viable measure?
- Measure Extension
 - Added measure for POUs (electric measure)
- Stage 2 Issues
 - Calculation: Review hours of use, interactive effects, EUL (16 years, 4710 HOU annually)
 - Cost: Review/update

Measure Consensus

9.02 LED Pool & Spa Lighting

- Offering (WPs Reviewed: SCE17LG071R0, SDGE0028R1)
 - Replacement of incandescent pool lamps or luminaires with LED pool lighting in commercial and residential swimming pools and spas
 - 32 measure offerings (4 wattages, 4 scenarios, lamps and luminaires)
 - Base case and measure wattages are the same for both lamps and luminaires
 - Building Types: Hotel / Motel and 3 Residential
 - Measure Application Type: ROB (replace-on-burnout), RET/ER (retrofit/early retirement), NC
 - Vintage: Ex
 - Climate Zone: CZ01 – CZ16
 - Delivery: PreRebDown, DirInstall
- Stage 1 Issues
 - Do recent lighting dispositions have any impact on the future of this measure?
- Measure Extension
 - Added measure for POUs (electric measure)
- Stage 2 Issues
 - *For RET/ER, what data required, outcome of draft Resolution E-4818*
 - *Calculation: residential hours of use are low (pools 48 hrs/yr, spas 66 hrs/yr)*
 - *Cost: Review/update*
 - *Baseline: Existing conditions opportunity*

Future of Deemed Lighting Measures

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- ❑ Currently PG&E has a few measures being developed later in 2018
- ❑ Does Accelerated Replacement (AR) or new DEER peak period represent a possible opportunity to resurrect any lighting measures?
- ❑ What lighting opportunities haven't been addressed?

Appendix: 2017-18 Lighting Measures

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No.	Description	Energy (kWh/yr)	% of Total
4.01	CFL, Interior Fixture	1,639,129	0.3%
4.02	CFL, Exterior Fixture	2,472,772	0.4%
4.03	CFL, BiLevel Fixture	15,128	0.0%
4.04	CFL, Integral/Screw-in	164,363,359	26.7%
4.05	CFL, Integral/Screw-in, Multiple	12,639,624	2.1%
4.06	CFL, 3-Way	14,063,950	2.3%
4.07	CFL, Spiral	82,874	0.0%
4.08	CFL, Pin-Based		
4.09	CFL, Plug-In	3,806	0.0%
★ 4.10	LF, 4' Replace Lamp	11,245,144	1.8%
4.11	LF, Dimming Ballast		
4.12	LF, Ballast Retrofit		
4.13	LF, Replacement Fixture	23,561,653	3.8%
4.14	LF, HP Fixture	7,312,149	1.2%
4.15	LF, Delamping Fixture		
★ 4.16	LED, Interior Downlight	9,762,830	1.6%
4.17	LED, Exterior Wallpack	4,612,086	0.7%
4.18	LED, High/Low Bay	23,523,635	3.8%
4.19	LED, Troffer (2x4, 1x4, 2x2)	46,380,364	7.5%
4.20	LED, Street Light	16,266,823	2.6%
4.21	LED, Interior Common, Res	2,506,851	0.4%
4.22	LED, Landscape	270,207	0.0%
4.23	LED, Exterior with Motion	3,422,230	0.6%
4.24	LED, Exterior, Res	1,687,353	0.3%
4.25	LED, Exterior, Pole		
★ 4.26	LED, MR-16	3,639,850	0.6%

No.	Description	Energy (kWh/yr)	% of Total
★ 4.27	LED, PAR20, 30, 38,	77,757,805	12.6%
★ 4.28	LED, Candelabra	4,150,347	0.7%
★ 4.29	LED, Globe	236,283	0.0%
★ 4.30	LED, A-Lamp	112,402,706	18.2%
★ 4.31	LED, Recessed Downlight	13,090,543	2.1%
★ 4.32	LED, R-BR	40,386,227	6.6%
★ 4.33	LED, GU-24		
4.34	LED, Various Lamps		
4.35	LED, Exterior Lamps	1,194,663	0.2%
★ 4.36	LED, Tube LED	423,546	0.1%
4.37	HID, Interior Fixture	22,981	0.0%
4.38	HID, Exterior Fixture	20,173	0.0%
4.39	HID, Interior Lamp		
4.40	Sensor, Residential Occ	57,408	0.0%
4.41	Sensor, Wall or Ceiling Occ	889,086	0.1%
4.42	Sensor, Integrated Fixture	154,002	0.0%
4.43	Sensor, Photocell		
4.44	Open Sign	130,576	0.0%
4.45	Menu Board		
4.46	Channel Letter Sign		
4.47	Refrig, Case Door	12,515,846	2.0%
4.48	Refrig, Walk-in	15,982	0.0%
4.49	Refrig, Reach-in	2,732,405	0.4%
4.50	Cold Cathode		
4.51	LED, Pool		
4.52	CFL, Ceiling Fan		
4.53	LED, Sports or Athletic Fields	398,406	0.1%