

# Subcommittee Process Technical Overview Lighting

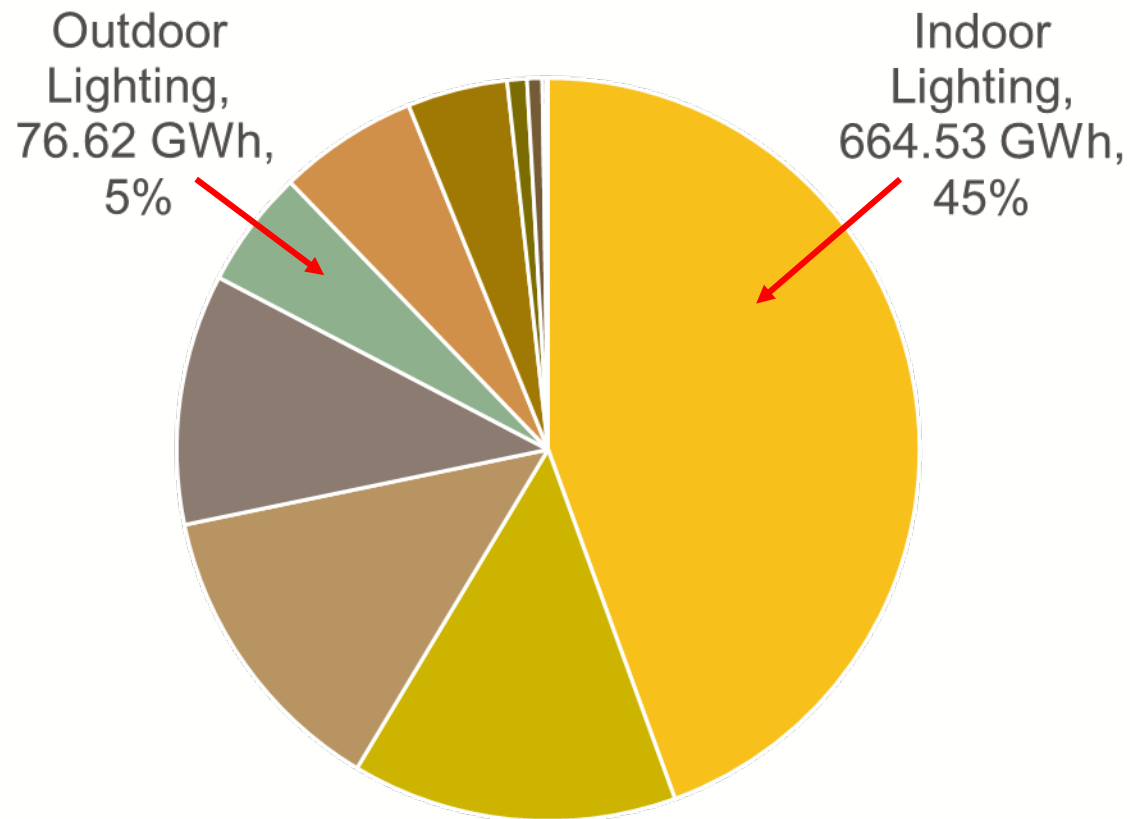


**TIM MELLOCH**  
**JUNE 2017**

# 2016: Lighting Savings Perspective

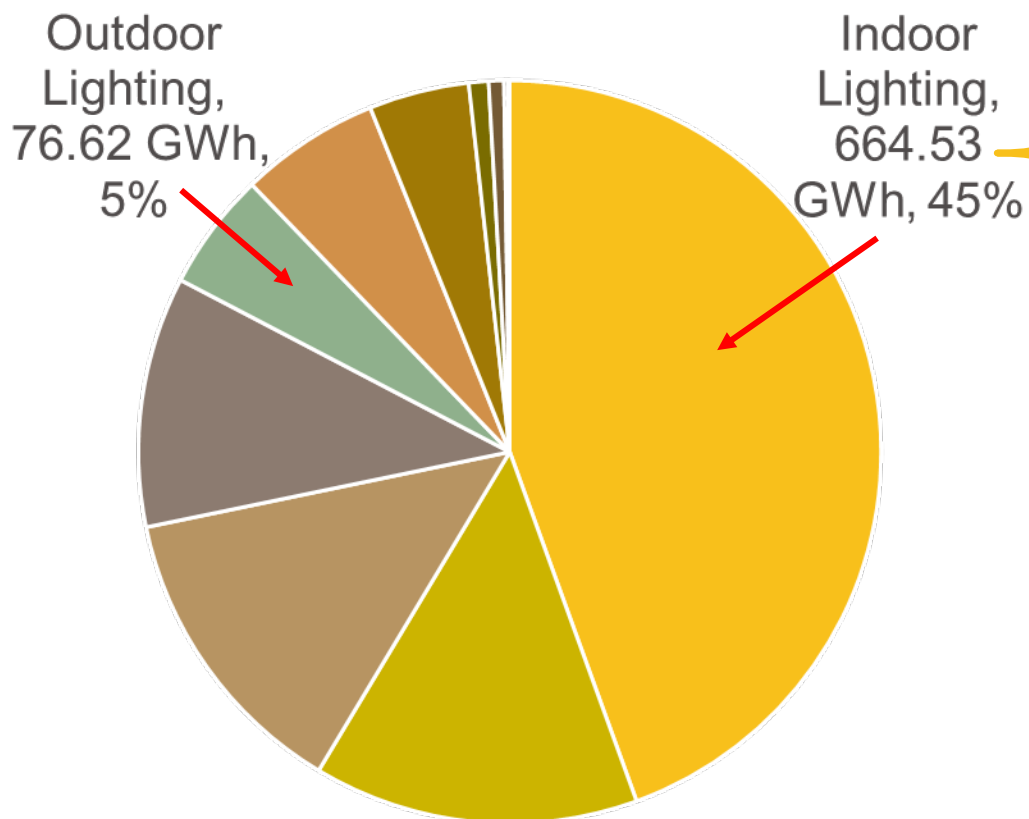
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2016 Q1-Q4 - EESat Data  
Total: 1,494.88 GWh



# Indoor Lighting

2016 - EESat Data  
Total: 1,494.88 GWh



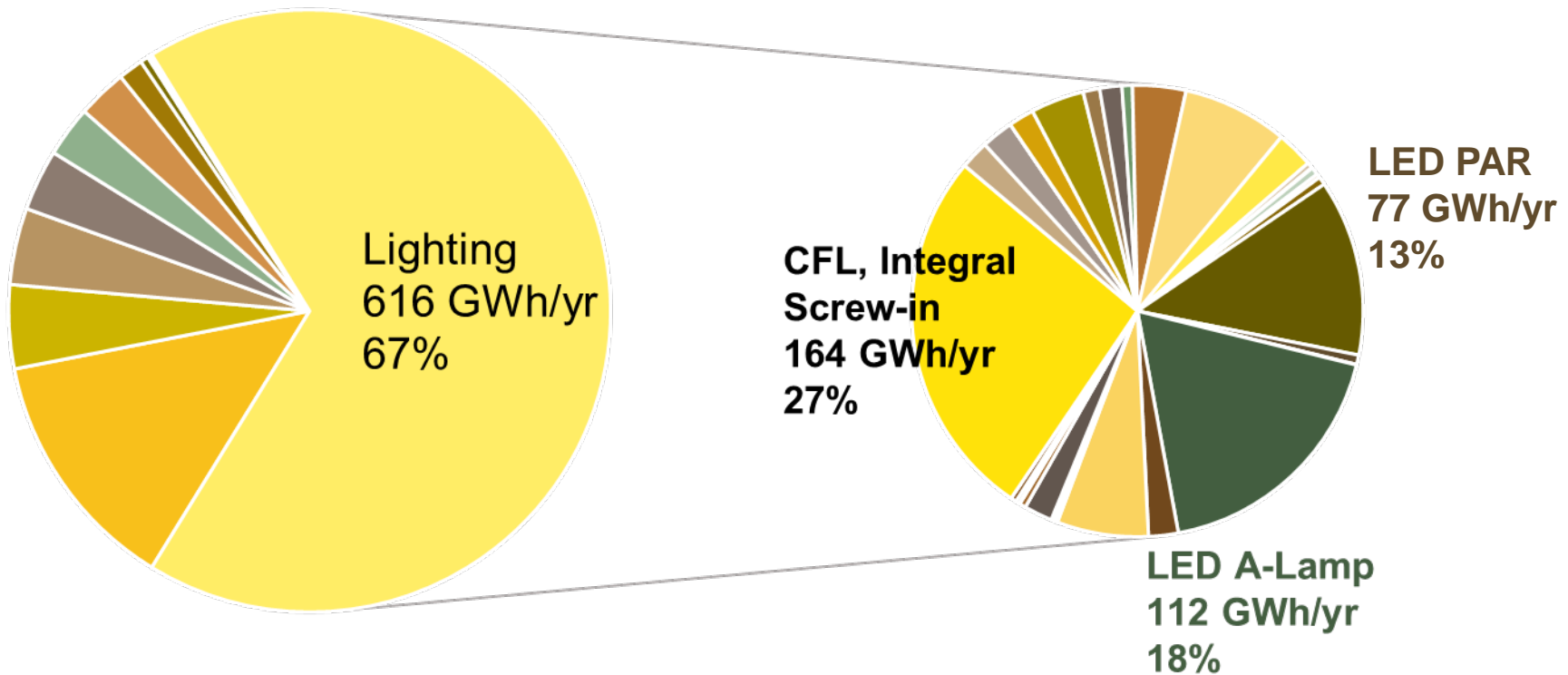
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Indoor Lighting	
Lighting Indoor CFL > 30 Watts	2.58
Lighting Indoor CFL 3 Way	13.54
Lighting Indoor CFL A Lamp	31.46
Lighting Indoor CFL Basic	138.87
Lighting Indoor CFL Fixture	1.76
Lighting Indoor CFL Globe	0.00
Lighting Indoor CFL Other	0.00
Lighting Indoor CFL Reflector	4.65
Lighting Indoor Controls Daylighting	0.17
Lighting Indoor Controls Other	1.40
Lighting Indoor Controls Wall Or Ceiling	1.30
Lighting Indoor Fixture Integrated Occu	0.17
Lighting Indoor HID	0.18
Lighting Indoor High Bay Fluorescent	2.21
Lighting Indoor Induction	0.02
Lighting Indoor LED Fixture	125.80
Lighting Indoor LED Lamp	123.43
Lighting Indoor LED Night Light	0.20
Lighting Indoor LED Other	19.97
Lighting Indoor LED Reflector Lamp	124.17
Lighting Indoor LED Signage	0.13
Lighting Indoor Linear Fluorescent	42.10
Lighting Indoor Linear Fluorescent Dela	3.96
Lighting Indoor Other	26.09
Lighting Outdoor LED Fixture	0.03
Lighting Outdoor LED Streetlight	0.28
Other	-
Retrocommissioning Lighting	0.06
<b>Indoor Lighting Total</b>	<b>664.53</b>

# Lighting Savings Perspective

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2016 CA Deemed Electric Savings  
(Total = 912 GWh/yr)



# 2017 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%

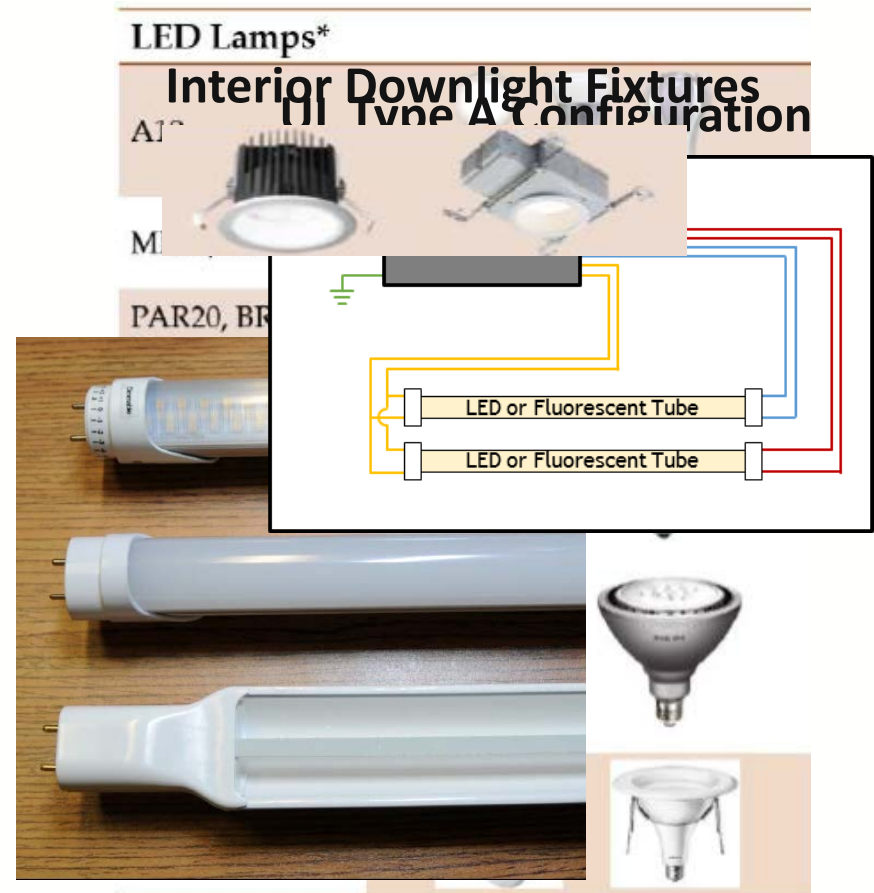
No.	Description	Energy (kWh/yr)	% of Total
★ 4.27	LED, PAR20, 30, 38,	77,757,805	12.6%
★ 4.28	LED, Candelabra	4,150,347	0.7%
★ 4.29	LED, Globe	236,283	0.0%
★ 4.30	LED, A-Lamp	112,402,706	18.2%
★ 4.31	LED, Recessed Downlight	13,090,543	2.1%
★ 4.32	LED, R-BR	40,386,227	6.6%
★ 4.33	LED, GU-24		
4.34	LED, 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%

# Lighting Measures for 2017

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## Lighting Measures for 2017

- LF, 4' Replace Lamp
- LED, Interior Downlight
- LED, Tube LED
- LED, A-Lamp
- LED, Candelabra
- LED, MR-16
- LED, PAR20, 30, 38,
- LED, R-BR
- LED, Globe
- LED, GU-24
- LED, Recessed Downlight



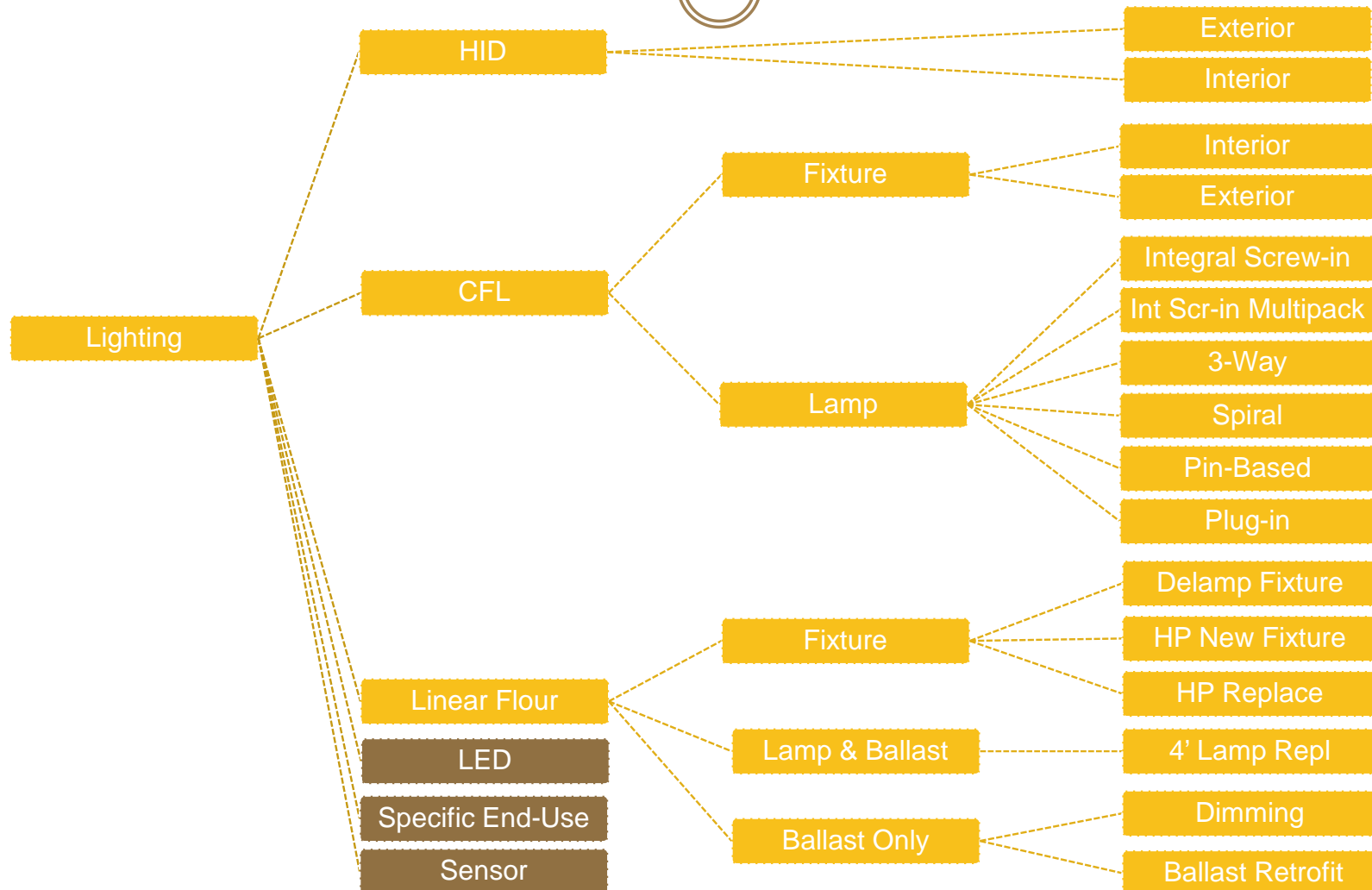
# Lighting – Cross Cutting Issues

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- Savings methodology
  - Wattage Reduction Ratio vs Wattage Range vs Lumen Bins
  - Interactive effects
  - Hours of Use support
  - Baseline
  - Existing Conditions – AB802
- Cost variation due to Climate Zone
- Permutation collapse
- Categorization

# Lighting Measure Tree

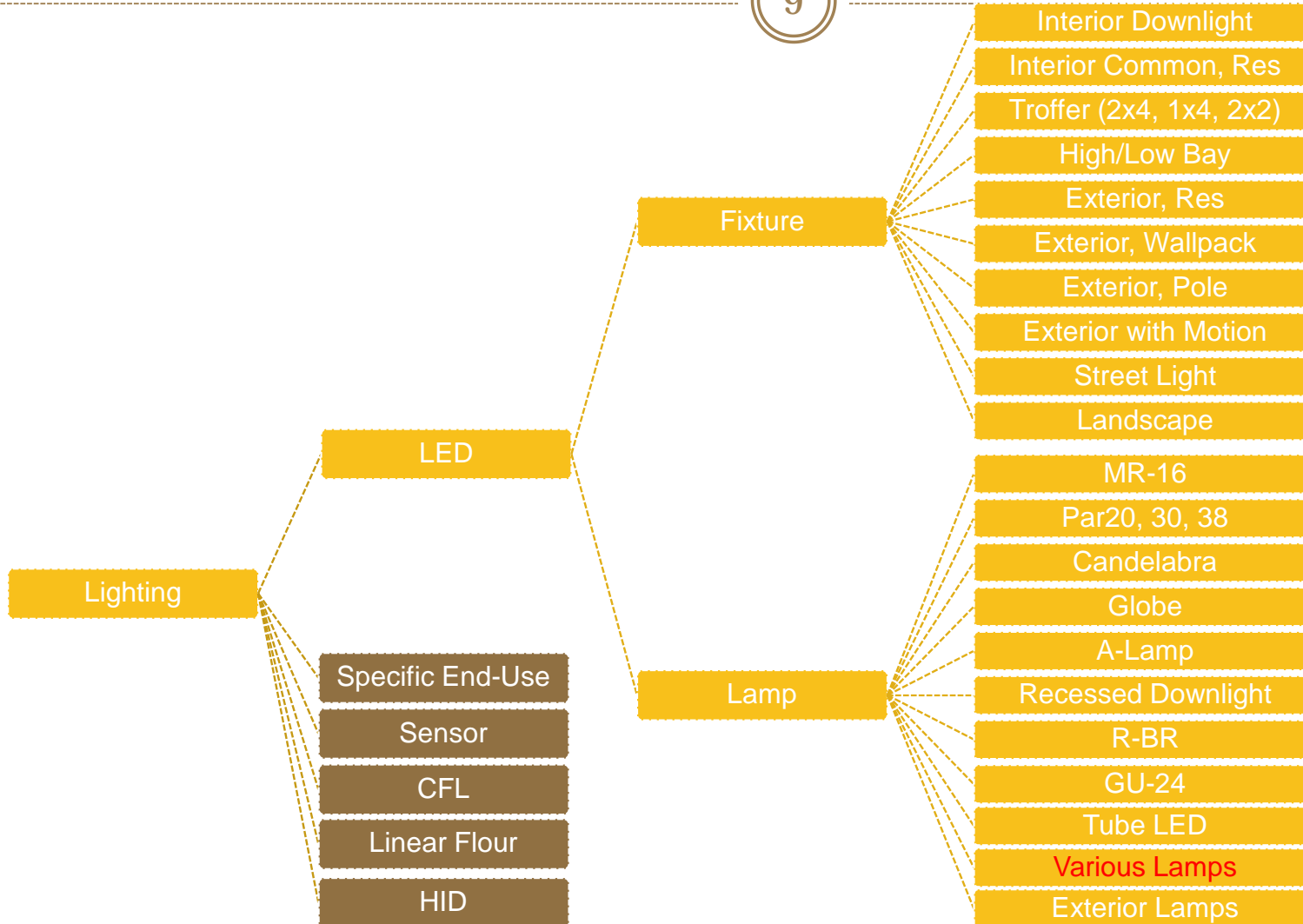
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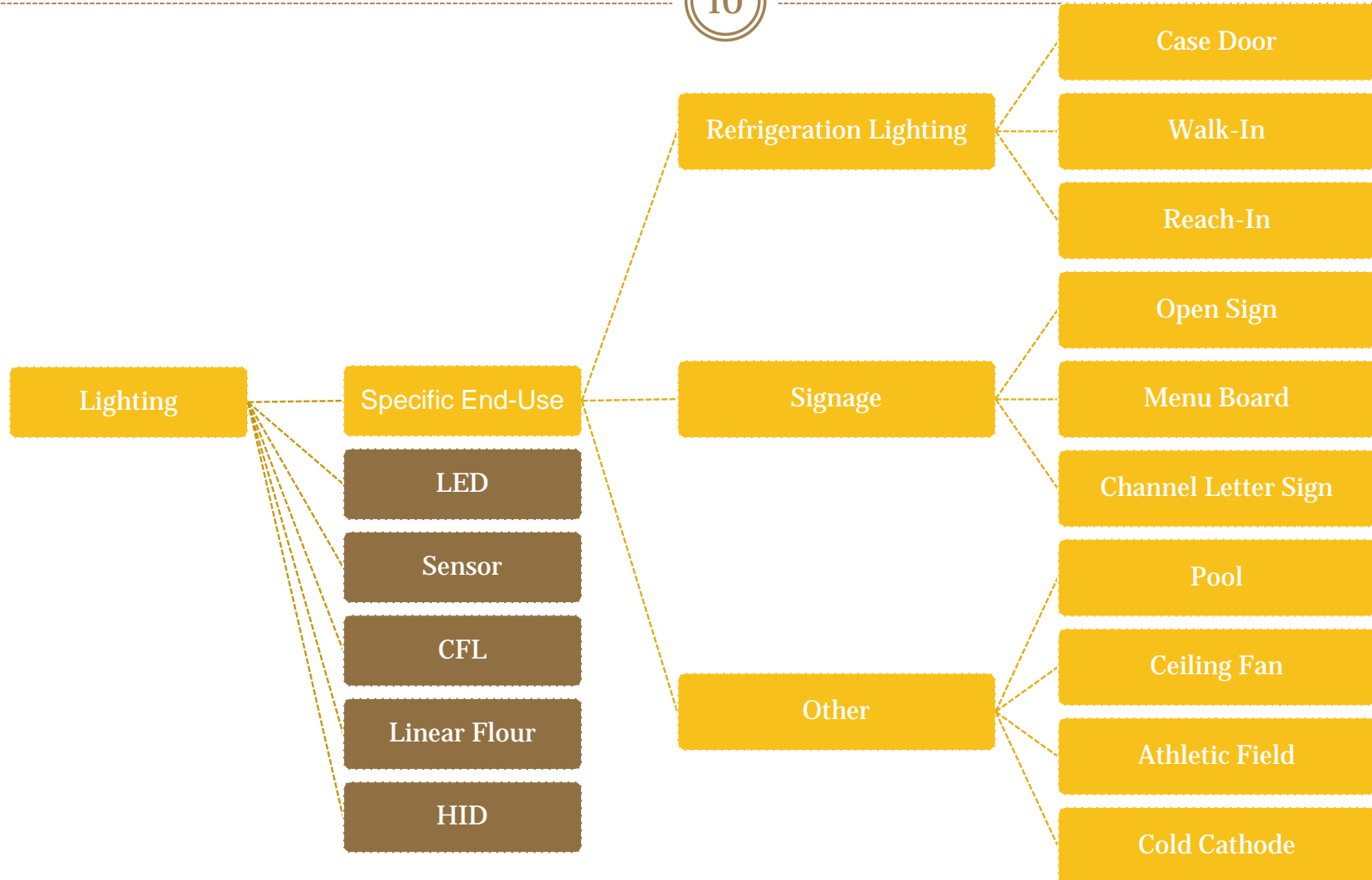
# Lighting Measure Tree

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# Lighting Measure Tree

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# Backup Slides

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