

# Subcommittee Process

## Technical Overview

### Appliance/Plug Load

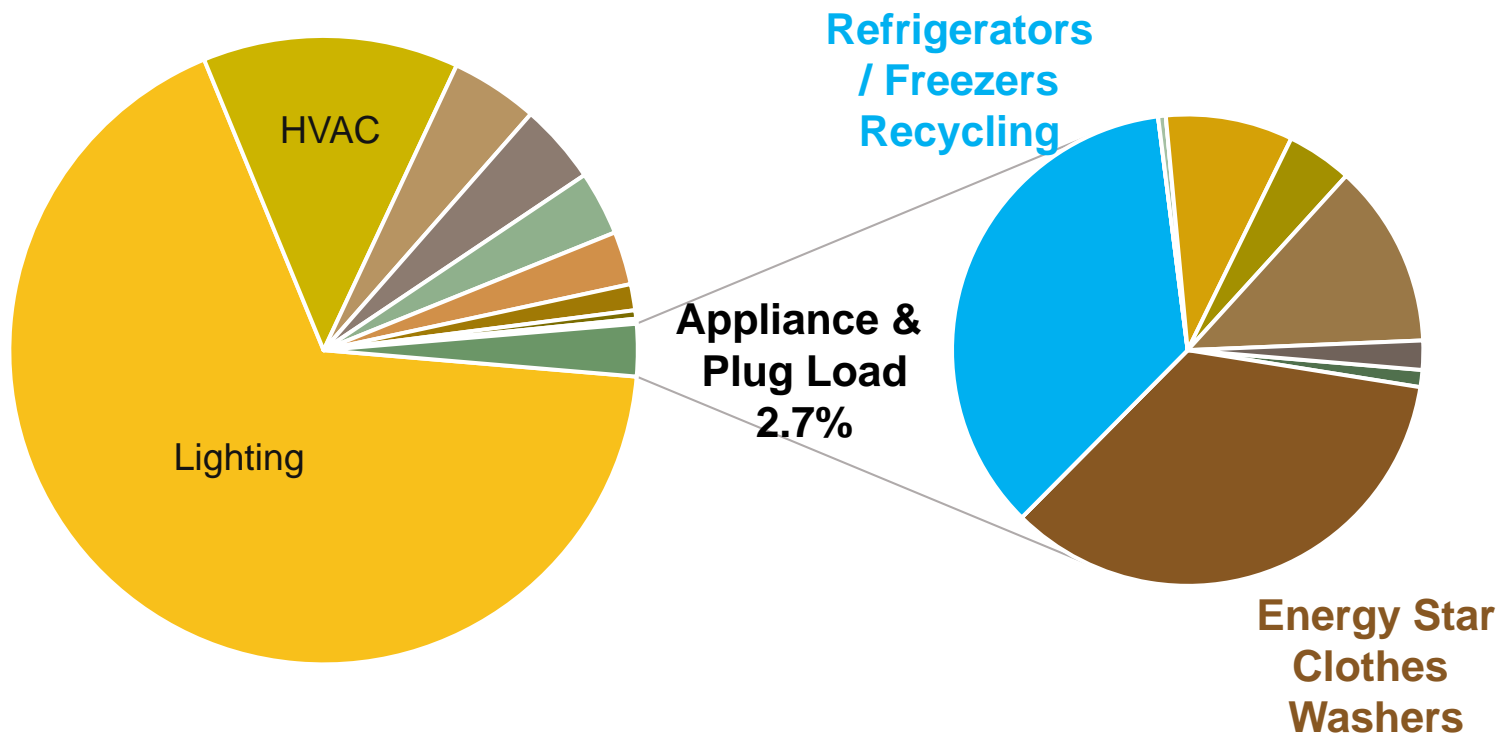


GARY FERNSTROM  
MARTIN VU  
AYAD AL-SHAikh  
JUNE 2017

# Appliance / Plug Load Savings

2

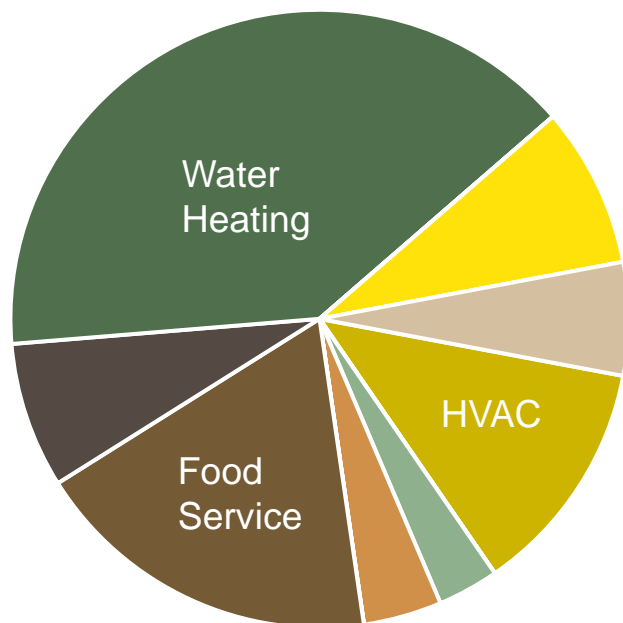
## 2016 CA Deemed Electric Savings (Total = 912 GWh/yr)



# Appliance / Plug Load Savings

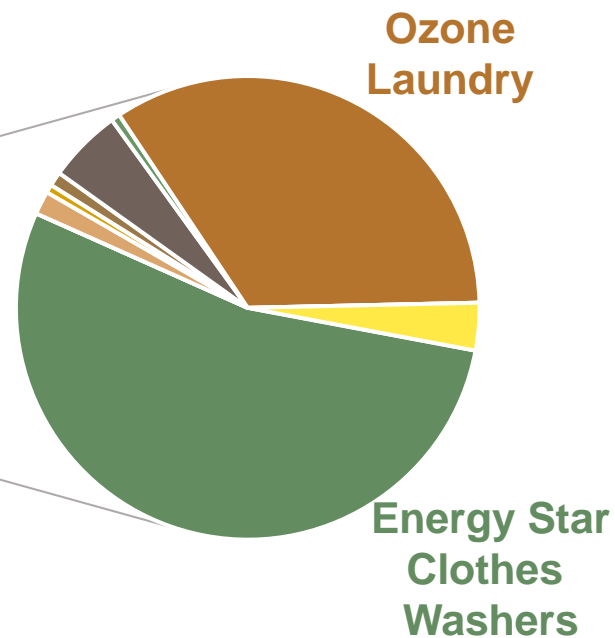
3

2016 CA Deemed Gas Savings  
(Total = 12 MMTh/yr – without penalty)



(Lighting Penalty Removed)

**Appliance &  
Plug Loads  
5.6%**



(Refrigerator-Freezer /  
Power Strip Penalty Removed)

# Appliance / Plug Loads Measures

4

Measure No	Name	Units Installed		Energy (kWh/yr)	Energy (th/yr)
★ 7.01	Energy Star Refrigerator	5,578	Each	286,254	(7,255)
2018 7.02	Smart/Connected Refrigerator				
2018 7.03	Refrigerator and Freezer Recycling	23,536	Each	8,520,565	181,583
★ 7.04	Energy Star Clothes Dryers	6,399	Each	0	37,626
★ 7.05	Energy Star Clothes Washers	83,972	Each	8,679,068	392,551
✖ 7.06	Cold Water Default Clothes Washer	789	Each	0	4,480
✖ 7.07	Non Res High Efficiency Clothes Washer in MF Properties				
✖ 7.08	Clothes Washer Recycling				
★ 7.09	Ozone Laundry Nonresidential	6,322	PROC-LBS	0	248,455
✖ 7.10	Res Ozone Laundry				
✖ 7.11	Industrial CO2 Laundry				
2018 7.12	Residential Energy Star Dishwasher	10,327	Each	(128,190)	24,193
2018 7.13	Under Counter Type Commercial Dishwasher				
★ 7.14	Retail Products Platform	6,648	Each	0	0
★ 7.15	Power Management Software for Networked Computers	16,503	Each	2,130,410	(11,904)
★ 7.16	Smart Power Strips	9,934	Each	1,098,644	(4,233)
★ 7.17	Tier 2 Advanced Power Strip	13,481	Each	3,074,204	(48,628)
★ 7.18	Vending and Beverage Merchandise Controller	506	Each	487,868	0
✖ 7.19	Audio Equipment				
✖ 7.20	Blu-Ray and DVD Players				
✖ 7.21	Energy Efficient TV				
✖ 7.22	Set Top Boxes				
✖ 7.23	Non Res Energy Star UPS				
✖ 7.24	Recycling of Appliances Preventing Continued Use				
		183,995		24,148,823	453,701

★ 2017 Measure

Additional 2018 Measures:

1. Data Analytics Platform
2. Smart/Connected Washer
3. Smart/Connected Whole Home Bundle
4. In-Home Displays
5. Load Monitor
6. Smart/Connected Plugs
7. Smart/Connected Tier 2 Power Strips
8. SmartHub

No workpapers available yet.

✖ No Votes

# Energy Breakdown by Measure Savings Opportunities

6

Ref No	Name	Energy (kWh/yr)				Energy (th/yr)			
		PGE	SCE	SCG	SDGE	PGE	SCE	SCG	SDGE
7.01	Energy Star Refrigerator	96	149,096		137,061	(4)	(3,763)		(3,488)
7.03	Refrigerator and Freezer Recycling		6,904,669		1,615,896		(147,305)		(34,278)
7.04	Energy Star Clothes Dryers			0				37,626	
7.05	Energy Star Clothes Washers	4,232,261	1,801,207	2,306,900	336,375	113,416	1,273	244,434	33,215
7.06	Cold Water Default Clothes Washer			0				4,480	
7.09	Ozone Laundry Nonresidential	0		0	0	27,707		207,504	13,244
7.12	Residential Energy Star Dishwasher			(128,190)				24,193	
7.14	Retail Products Platform	0				0			
7.15	Power Management Software for Networked C	1,183,150	910,188		37,072	(7,334)	(4,450)		(120)
7.16	Smart Power Strips	102,805	995,840			(2,226)	(2,007)		
7.17	Tier 2 Advanced Power Strip	665,249	978,872		1,424,603	(15,601)	(13,833)		(19,064)
7.18	Vending and Beverage Merchandise Controller	155,199	2,227		330,442	0	0		0
		6,338,759	11,742,099	2,178,710	3,881,449	115,958	(170,085)	518,237	(10,492)
					24,141,017				453,618

Little claimed for Refrigerators for PG&E in 2016

No claims for Recycling Refrigerators for PG&E

No claims yet for RPP

# Cross-Cutting Issue

## “Connected” Measures

7

- Background:
  - ❑ Measures linked to AB793 / DR capabilities.
  - ❑ Savings for “connected” Measures matches the savings for standard Measures.
  - ❑ Additional savings are expected, but not yet claimed.
  - ❑ 2017/18 Measure: Refrigerators
  - ❑ 2018 Measure: Power Strips
  - ❑ Future Measures: Clothes Washers, Plugs, Home Bundle, Smart Hub, In-Home Display
- Question(s)
  - ❑ Should these “Smart/Connected” devices use deemed values or AMI data to document savings?
  - ❑ Should these become separate Measures or a new Offering within an existing Measure?

# Cross-Cutting Issue

## Retail Products Platform (RPP)

- Background:
  - PG&E and SMUD are currently offering RPP as a Pilot.
  - Operates as a “Market Transformation” program, not a “Resource Acquisition” program
  - Net-to-Gross – follows a Bass Diffusion Model
  - Cost – re-calculated annually using hedonic price modeling from a web-harvesting tool that runs periodically throughout the year.
  - Savings – methodology matches the methodologies used for a “Resource Acquisition” program.

# Cross-Cutting Issue

## Retail Products Platform (RPP)

- Background (*continued*):

- Includes:
  - ✦ Freezers
  - ✦ Electric Clothes Dryers
  - ✦ Gas Clothes Dryers
  - ✦ Room Air Cleaners
  - ✦ Soundbars
  - ✦ Room Air Conditioners
- Additional Measures up for consideration to be added.
  - ✦ Refrigerators

- Question(s):

- Should RPP Measures be grouped together?  
OR
- Should RPP Measures simply be another market delivery channel (like Direct Install)?



# 7.01 / 7.02 - Energy Star Refrigerator

10

- Refrigerator Offerings
  - SDG&E - not offered in 2017 because not cost effective
  - PG&E – moving to RPP
- DEER Basis Factor history:
  - $kWh\ savings = (federal\ code\ UEC - Energy\ Star\ UEC) * (DEER\ basis\ factor)_{kWh}$
  - $kWh\ savings = (543 - 489) * 0.677 = 36.7\ kWh$
  - Used to convert calculated savings to claimed savings; purpose not clear.
  - From: DEER 2014: “RE-Appl-RefgCond-basis”
- Connected refrigerator only offered through SCE

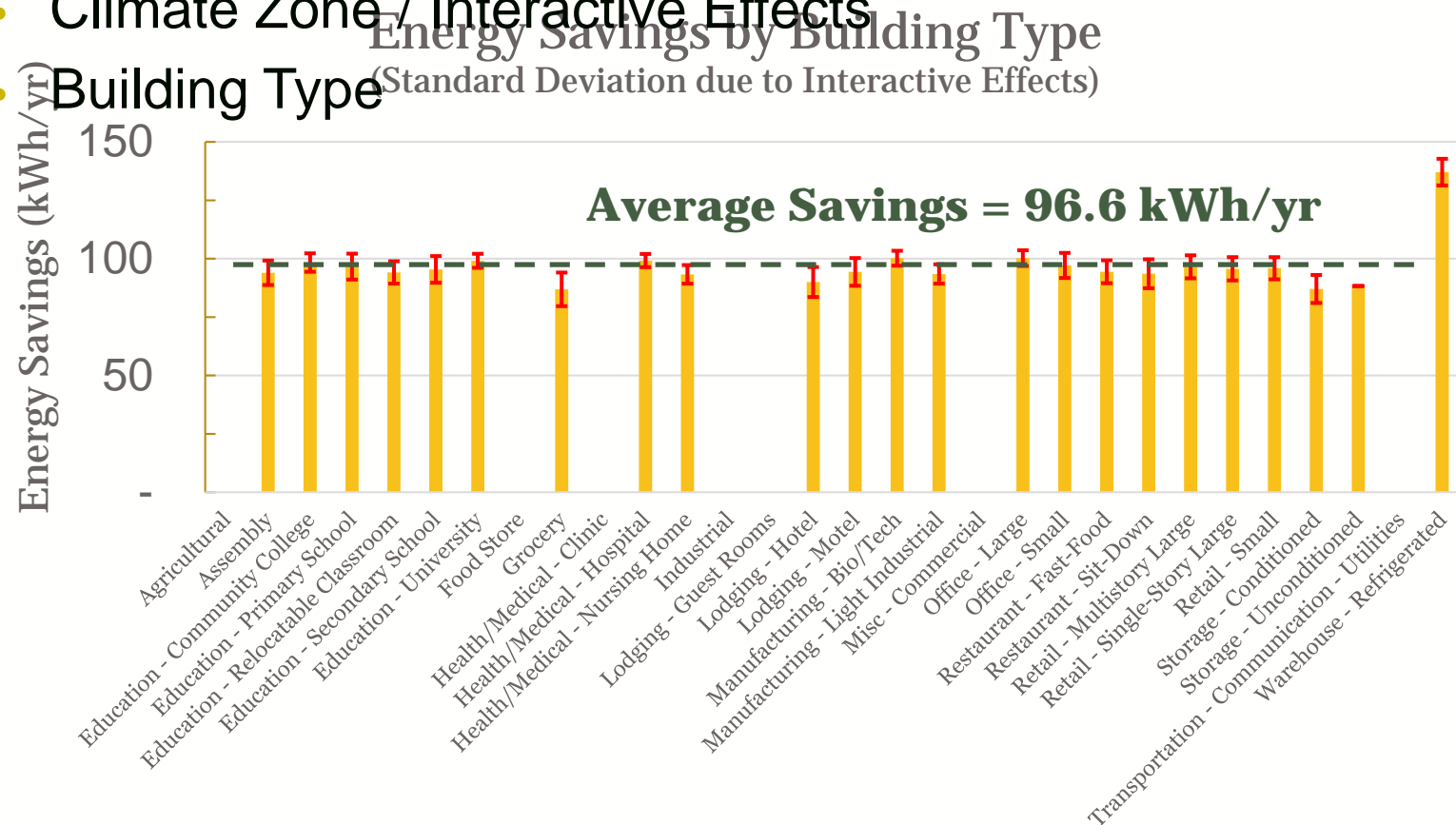
# 7.15 – PC Management Software

11

- Examine parameters that effect savings:

- Climate Zone / Interactive Effects

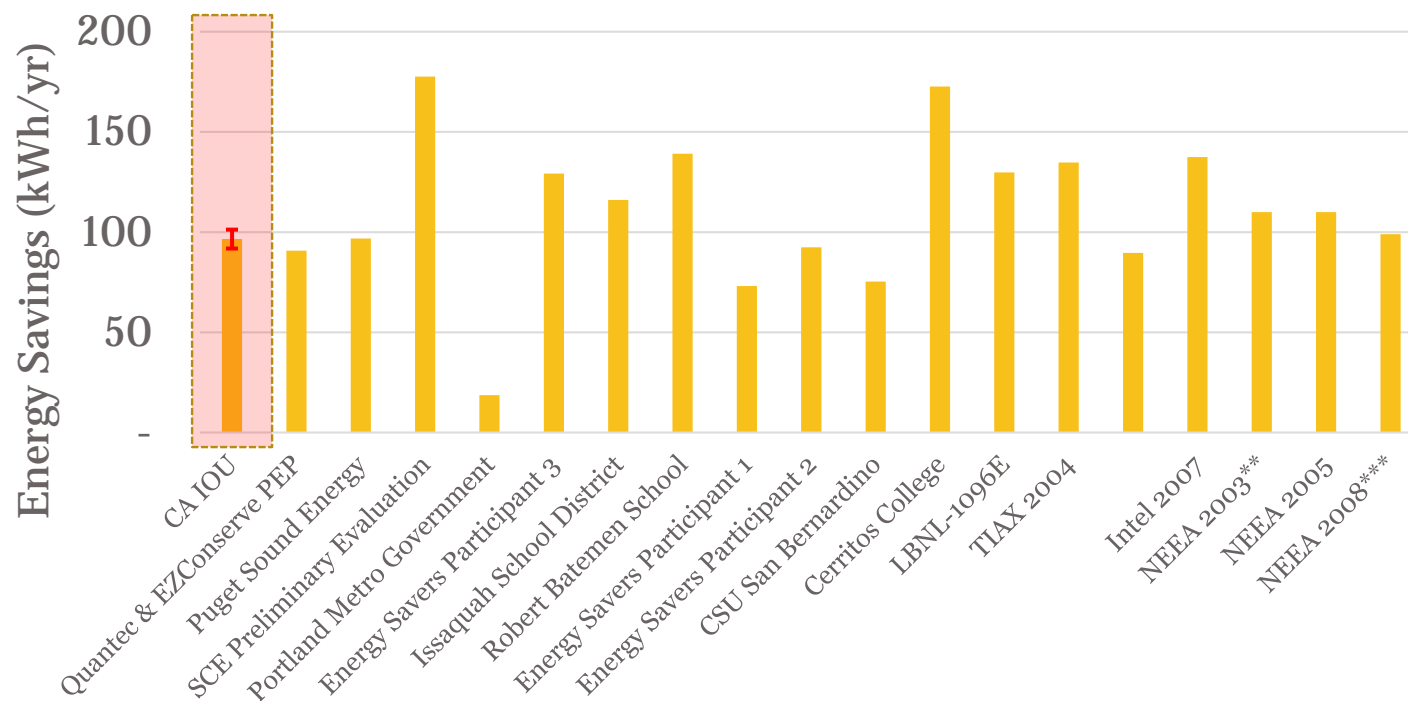
- Building Type



# 7.15 – PC Management Software

12

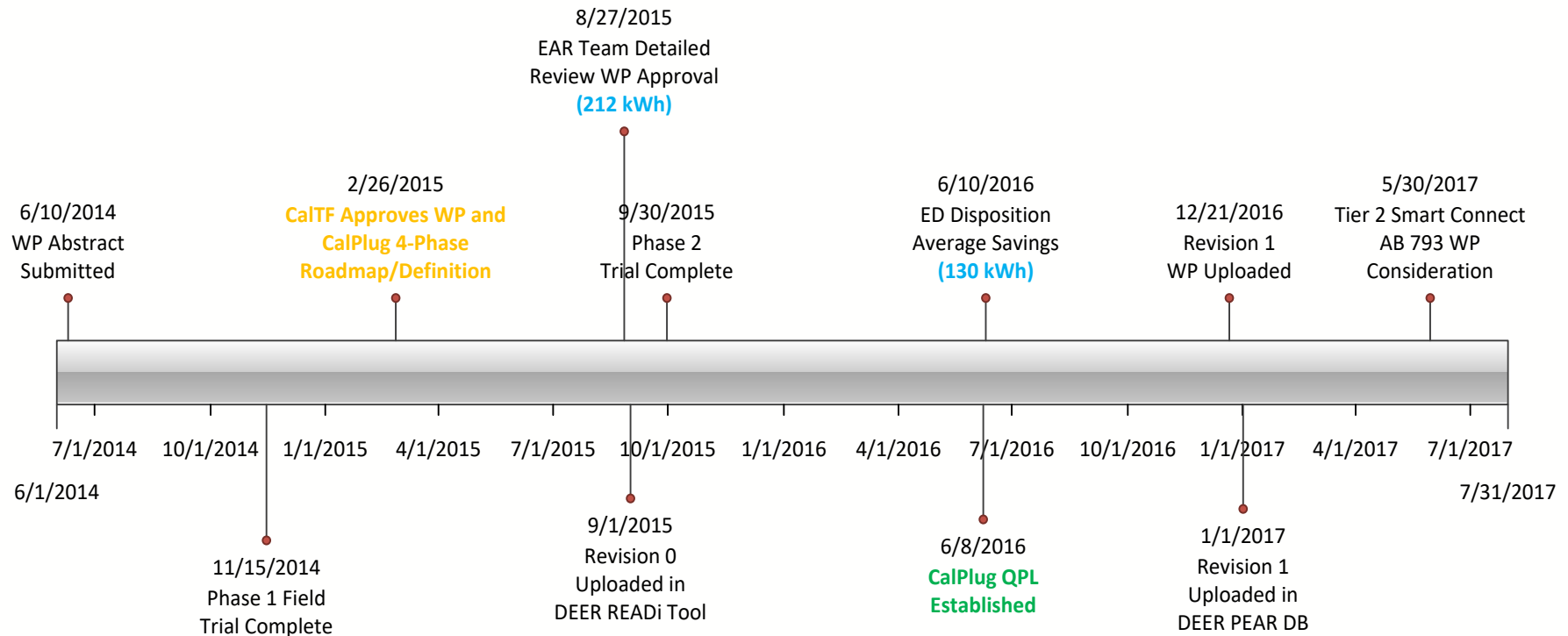
## CPM Energy Savings - Various Programs



# 2.16 / 2.17 - Tier 2 APS History

13

Revision 0 Approval Process  
1 year and 4 months



Revision 1 Approval Process  
1 year and 4 months

# Tier 2 APS 4-Phase Roadmap

14

Manufacturers

SIEMENS

embertec<sup>®</sup>  
ENERGY EFFICIENCY TECHNOLOGIES

valta

TrickleStar<sup>®</sup>  
Conserving energy. Improving life.

smartenit<sup>®</sup>  
Making your world smarter and greener

Neutral  
3rd Parties

WECC

STEP I

Volume 0 - 1

From ideas  
to  
Prototypes

II

1 - 10

Live tests  
and  
Simulation

III

10 - 1000

Pilot study  
and  
Field Test

IV

1000 - 1M

Promotion  
and  
Scale-up

Utilities

SOUTHERN CALIFORNIA  
EDISON  
An EDISON INTERNATIONAL Company

LA  
DWP  
Los Angeles  
Department of  
Water & Power

PG&E

ANAHEIM  
PUBLIC UTILITIES  
ANAHAIM CITY UTILITIES

CalPlug  
CALIFORNIA PLUG LOAD RESEARCH CENTER

# Tier 2 APS 2016 Claims

15

- Measure is residential focus
- Savings are larger than Smart Power Strip measure

				Units	kWh/yr	Th/yr		kWh/unit	Th/unit
7.17	Tier 2 Advanced Pow	PGE	RES	3,053	665,249	(15,601)		217.90	(5.11)
		SCE	DMo	3,174	805,965	(11,158)		253.93	(3.52)
			MFm	815	172,907	(2,675)		212.16	(3.28)
		SDGE	DMo	2,221	540,031	(7,979)		243.15	(3.59)
			MFm	3,979	880,606	(11,006)		221.31	(2.77)
			SFm	18	3,966	(79)		220.33	(4.38)

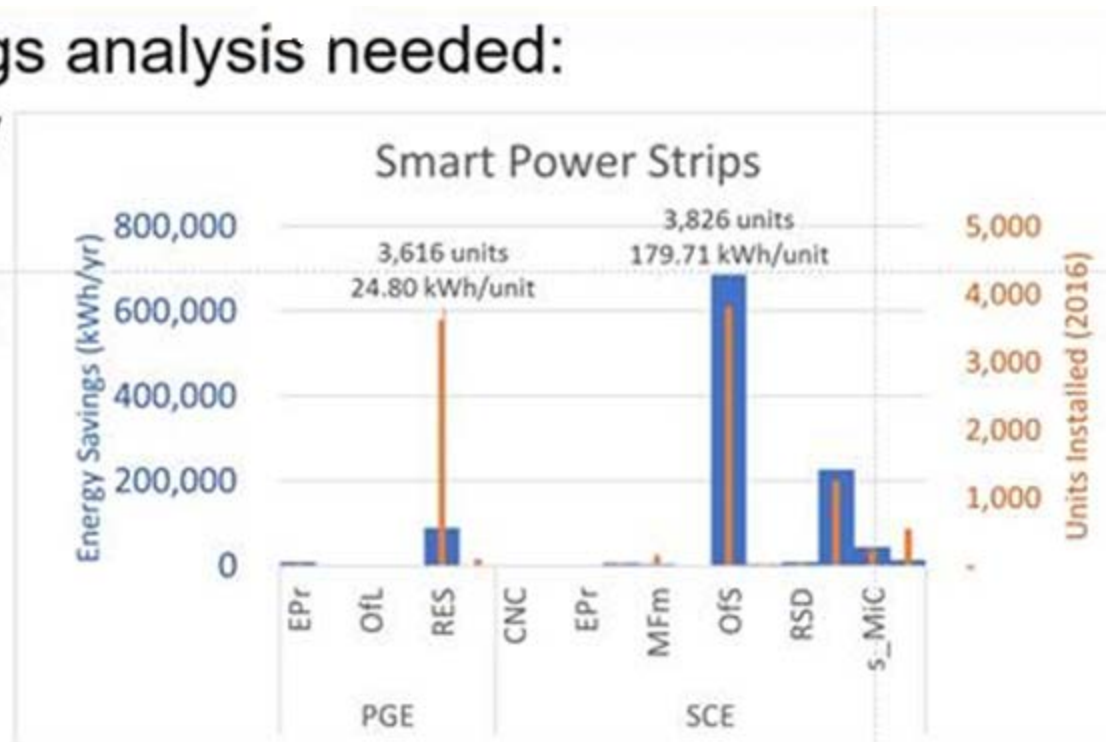
POU savings are 212 kWh/unit

# Tier 2 APS 2016 Claims

16

## Additional savings analysis needed:

- PG&E savings vary Res / Com
- SCE savings vary with Bldg Type and CZ
- Market focus can help savings significantly
- RTF claims 216 kWh/yr/unit
- POU savings
  - COM (100 kWh/yr)
  - Res (24 kWh/yr)



Orange bar = total units installed

Blue bar = total energy savings

Note that market choice is very important.

# Additional Development

17

- CalPlug's Qualifying Products List (QPL)
  - ❑ Established in Summer of 2016
  - ❑ Manage QPL to include models currently available in the market meeting specification.
  - ❑ Proposed Certification Protocol
    - ✦ Establish a certification protocol and procedures for manufacturers to follow in order to qualify their models for the QPL.
    - ✦ Removes field trials from the CalPlug 4-Phase Roadmap Process
- Tier 2 Smart Connect APS (AB 793 driven)
  - ❑ Energy management technologies for use in home or place of business to allow customers to better understand and manage energy use
    - ✦ i.e. Bluetooth, Wi-Fi, ZigBee, etc.





# Questions

18

# Back-up Slides

19

# 7.15 – PC Management Software

20

- Includes an annual reduction factor in savings.

These monitoring studies took place between 2000-06, and were installed primarily on desktop computers with Cathode Ray Tube (CRT) monitors. While the duty cycle data from these studies is likely to be still valid, there have been notable changes in monitor and desktop energy use since 2006. These changes have been primarily driven by the transition from CRT to LCD monitors and improvements in LCD monitor efficiency. Desktop computers have seen significant improvements in Sleep Mode Power, but have had limited gains in Active Mode energy use. Assuming an even stock turnover cycle, the average age of the installed desktop and monitor base is two years, or half of the EUL. This suggests that in the currently installed base, the average computer and desktop were purchased in 2014.

To account for these improvements from 2006 to 2014, we estimated a **5% annual reduction** in savings, which corresponds to a 40% decrease in energy savings over the 2006-2014 period. This 5% figure is derived from average On Mode Power values taken from Energy Star Monitor lists during the 2006-2010 period.

- Is there a disposition on this measure that effects realization rate?