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CALIFORNIA ENERGY COMMISSION

Energy Efficiency Savings from Utility Programs

2017 Integrated Energy Policy Report
Docket No. 17-IEPR-06

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California Energy Commission, Arthur Rosenfeld Room
Sacramento, CA
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Topics

- Utilities and SB 350
- IOU and POU Potential Studies
- Adjustments to Projections
- CVR and Fuel Substitution

UTILITIES AND SB 350

Targets for Responsible Entities

- Draft Commissioner Report incorporates the essence of the staff *Framework* Report
  - Responsible entities are those for which reasonably firm savings projections can be established
  - Each such responsible entity will have an individual target
- Given their history, utilities are the most obvious category of responsible entities

Utility Pursuit of the Doubling Goal

- Enhancing existing activities
  - Traditional or enhanced versions of rebate, incentive or financing programs
  - New programs encouraged by AB 802
  - Efforts to encourage tighter standards, to enhance compliance with standards, or to exceed standards
- New conservation voltage reduction (CVR) and fuel substitution programs
- SB 350 encourages utilities to do more, but does not require it

EE POTENTIAL STUDIES

IOU and POU Potential Studies

- CPUC and CMUA conducted studies of traditional EE programs
- Each contracted with a unit of Navigant Consulting, Inc. using similar approaches but different software packages and input assumptions
- Neither addressed the full set of options enumerated in PRC 25210(d) – especially CVR and fuel substitution

CPUC Potential & Goals Proceeding

- CPUC's intent was an update of traditional EE goals in the context of increasing emphasis on GHG emission reductions
- Principal issues:
  - AB 802 BROs analysis
  - Which C/E test to use
  - Whether or not to adopt a GHG cost adder
- SB 350 concern – timing of CPUC rulemaking means that this draft SB 350 report must be updated

CMUA Potential Study for POUs

- CMUA contracted with POUs to conduct an electricity potential study
- Study covered 2018 to 2027
- Study design allowed POU control over:
  - what measures to include in assessment
  - whether to have emerging technologies
  - whether to include attributable savings from codes and standards
  - net vs gross basis for savings projections

Adjustments to Studies for SB 350

- Staff believes some aspects must be uniform for SB 350 purposes even in this initial cycle
  - Savings years: 2015-17, 2018 -2027, and 2028-2029
  - Net savings, not gross savings
  - Exclude utility contribution to more stringent standards requirements, due to staff non-utility savings projections
  - Cumulative savings, not annual incremental savings
- Consider further standardization in future cycles

Establish Targets for 2015 to 2029

IOUs

- Estimate 2015-2017 savings since EM&V studies not yet released
- Use 2018-2029 projections from the study

POUs

- Use reported savings for 2015-2016
- Estimate savings for 2017
- Linear extension of the last two years (2025-2027) to compute POU savings out through the end of 2029

Savings from Statewide Code & Standards

IOUs

- CPUC has formal C&S program with several elements
- Large C&S savings
- C&S advocacy to count as part of non-utility wedge

POUs

- POU savings from individual C&S are not reported to CEC
- LADWP, SMUD, Anaheim, Glendale Imperial, Turlock, Vernon, Azusa, Colton, and Moreno Valley chose to include C&S projections in their annual targets
- C&S to count as part of non-utility wedge

Net vs. Gross Savings

IOUs

- CPUC requires IOU targets to be derived from "net" market potential
- No adjustments needed

POUs

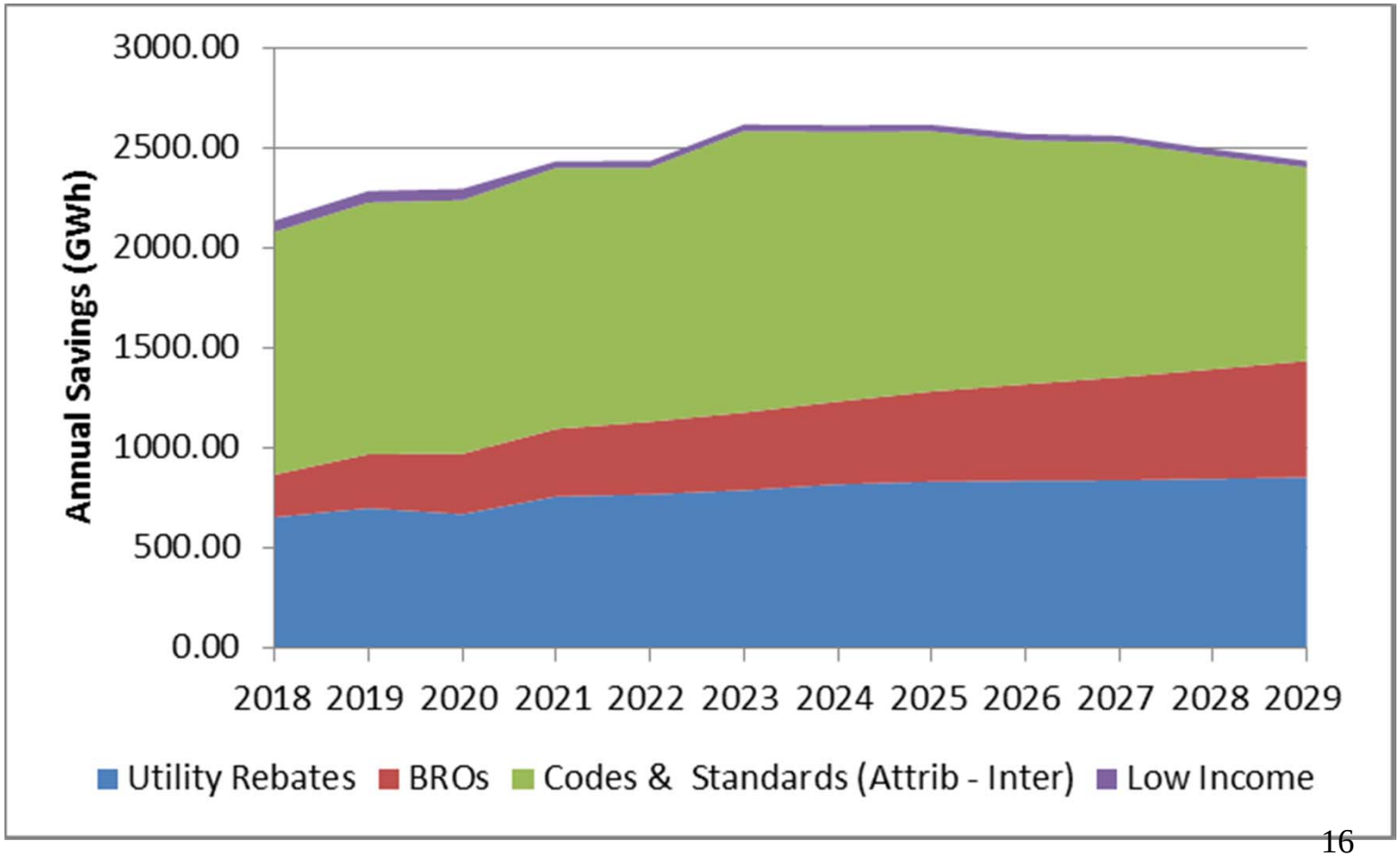
- Most POUs report both net and gross savings, so choosing net creates no analytic issues for them
- LADWP, Anaheim, and Burbank only report gross savings, so staff estimated net-to-gross factors

Cumulative Savings

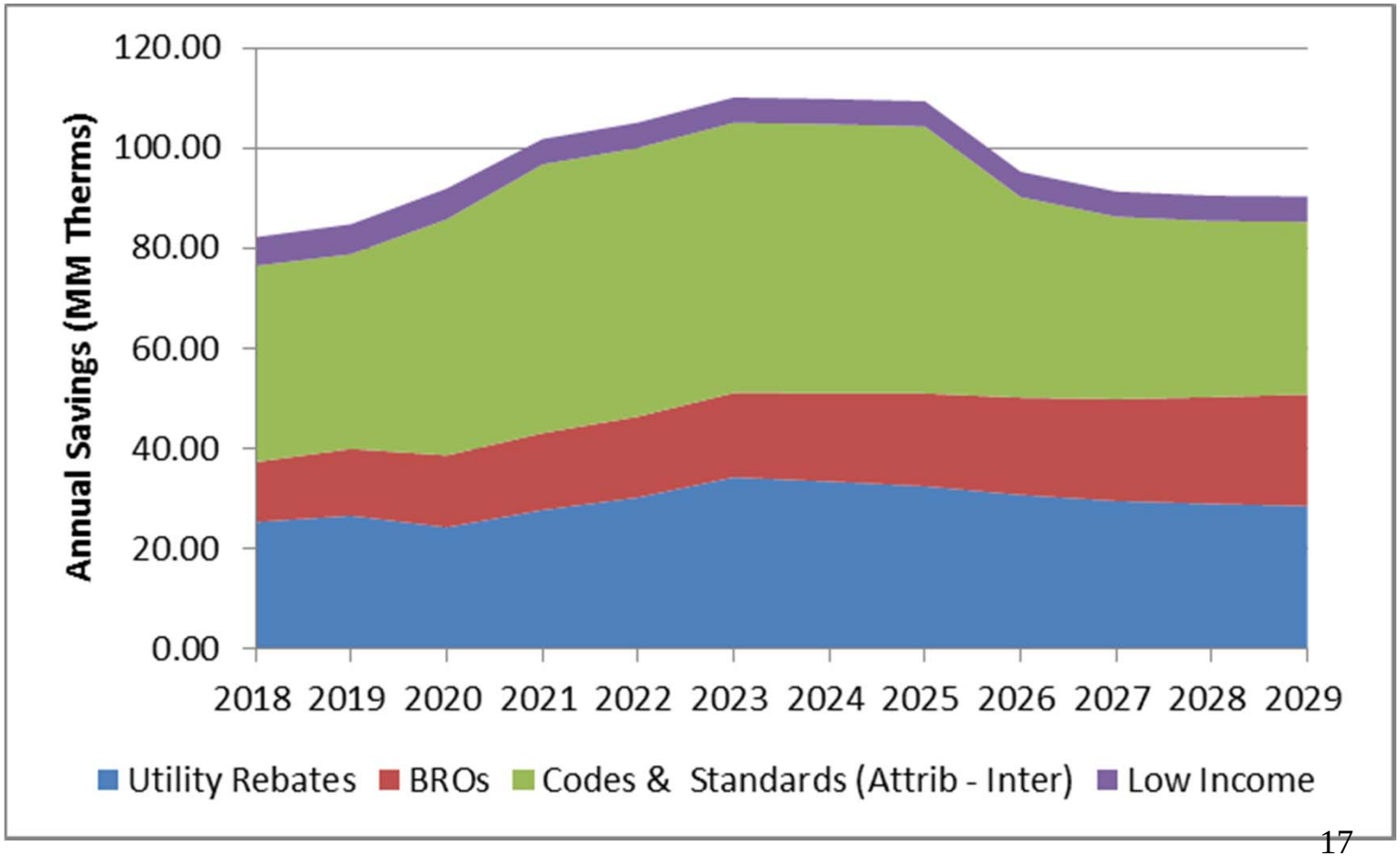
- Both CPUC and CMUA studies focus on annual incremental savings
- Decay and replacement of annual savings is not addressed in detail in either report
- Cumulative savings is the basis for the doubling goal, so cumulative savings should be the basis for utility targets
- Staff has created cumulative savings by adding up annual savings

PROJECTIONS AND ADJUSTMENTS

CPUC Electricity Goals: mTRC GHG Adder #1 Scenario

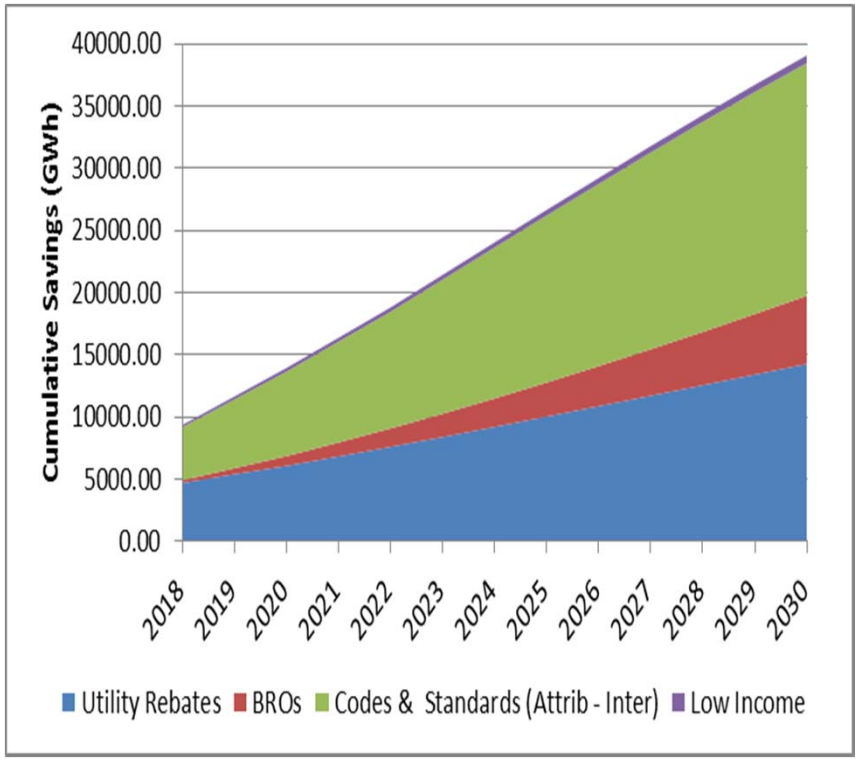


CPUC Natural Gas Goals: mTRC GHG Adder #1 Scenario

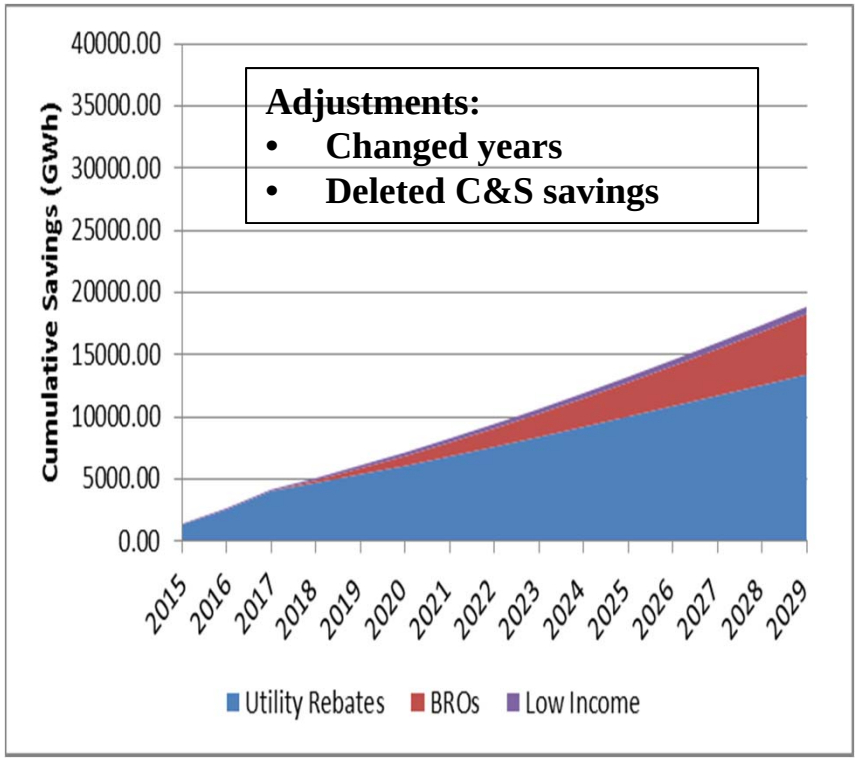


IOU Savings vs. Proposed Targets

IOU Savings by Program



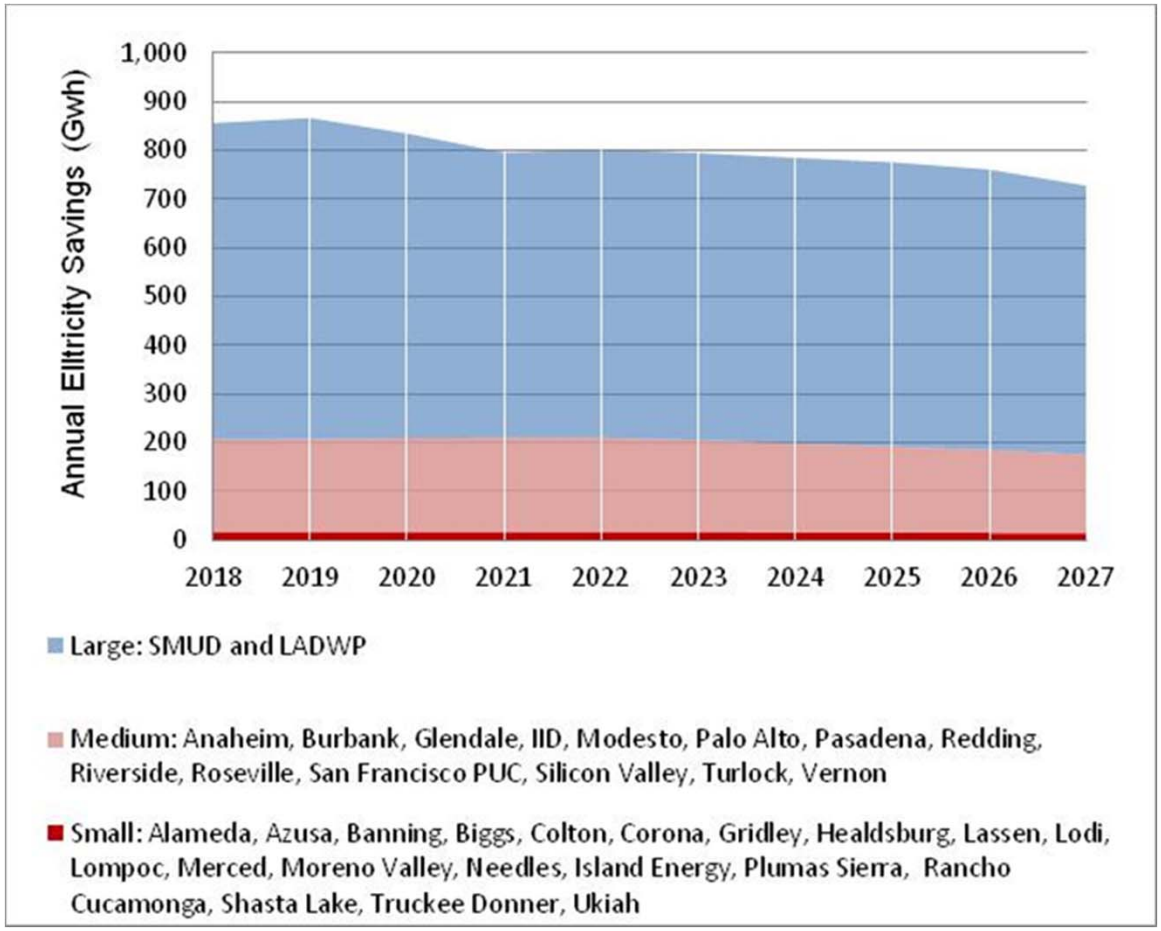
IOU Targets by Program



POU Size Diversity

Utility	Type	2018 Projected Savings (GWh)
LADWP	IRP	499
SMUD	IRP	150
Medium Group (14)	IRP	190
Small Group (22)	Non-IRP	13
Total (38)	--	852

Annual POU Electricity Savings



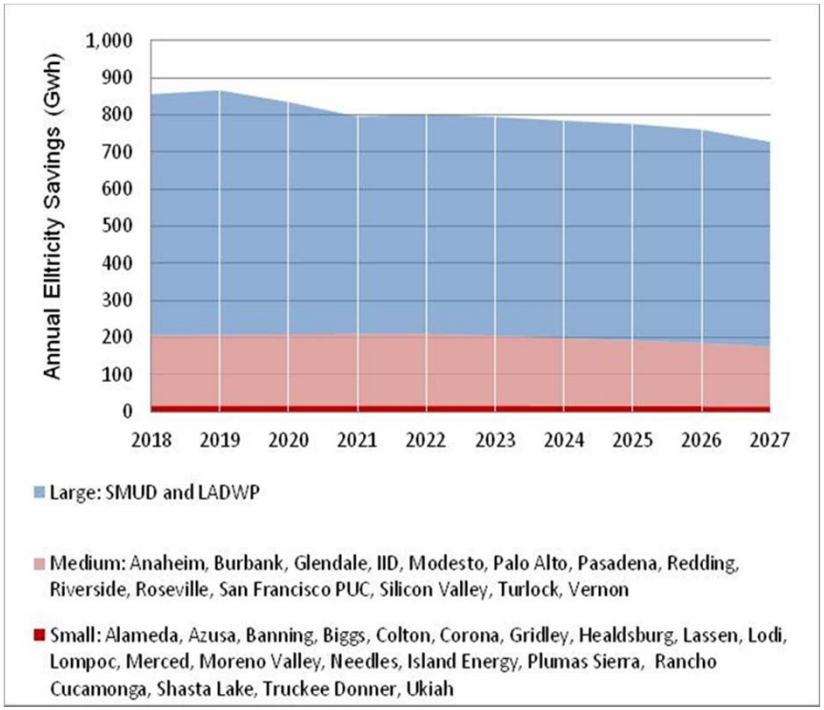
Source: Energy Efficiency in California's Public Power Sector Status Reports, http://www.ncpa.com/policy/reports/energy-efficiency/

Which POUs Were Adjusted?

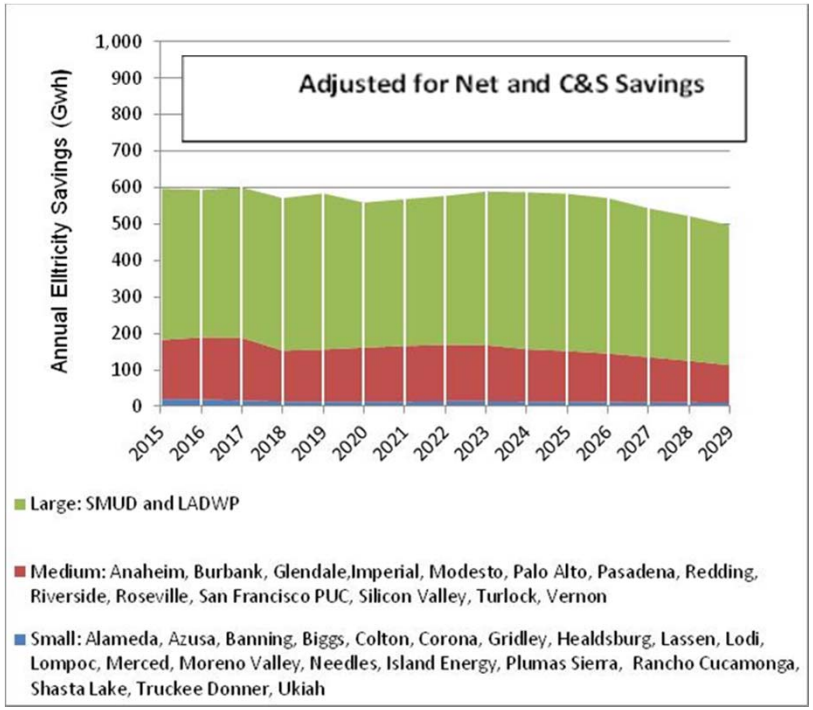
	Description of POU Targets Submitted	Adjusted for Net	Adjusted for C&S	Added Years
Los Angeles	Market Gross+C&S	✓ .	✓ .	✓ .
Sacramento	Market Gross+C&S	✓ .	✓ .	✓ .
Imperial	Market Net+C&S		✓ .	✓ .
Anaheim	Market Gross+C&S	✓ .		✓ .
Riverside	Market Gross: 1% Avg. Annual	✓ .		✓ .
Turlock	Market Net+C&S		✓ .	✓ .
Glendale	Market Net+C&S		✓ .	✓ .
Pasadena	Market Gross:1.25% Avg.Annual	✓ .		✓ .
Santa Clara	Market Net			✓ .
Burbank	Market Gross	✓ .		✓ .
Modesto	Market Net			✓ .
Roseville	Market Gross	✓ .		✓ .
Palo Alto	Market Net			✓ .
Vernon	Market Net+C&S		✓ .	✓ .
Redding	Market Gross	✓ .		✓ .
San Francisco	Market Net			✓ .

Annual Electricity Savings by POU Size

POU Program Targets



With Adjustments



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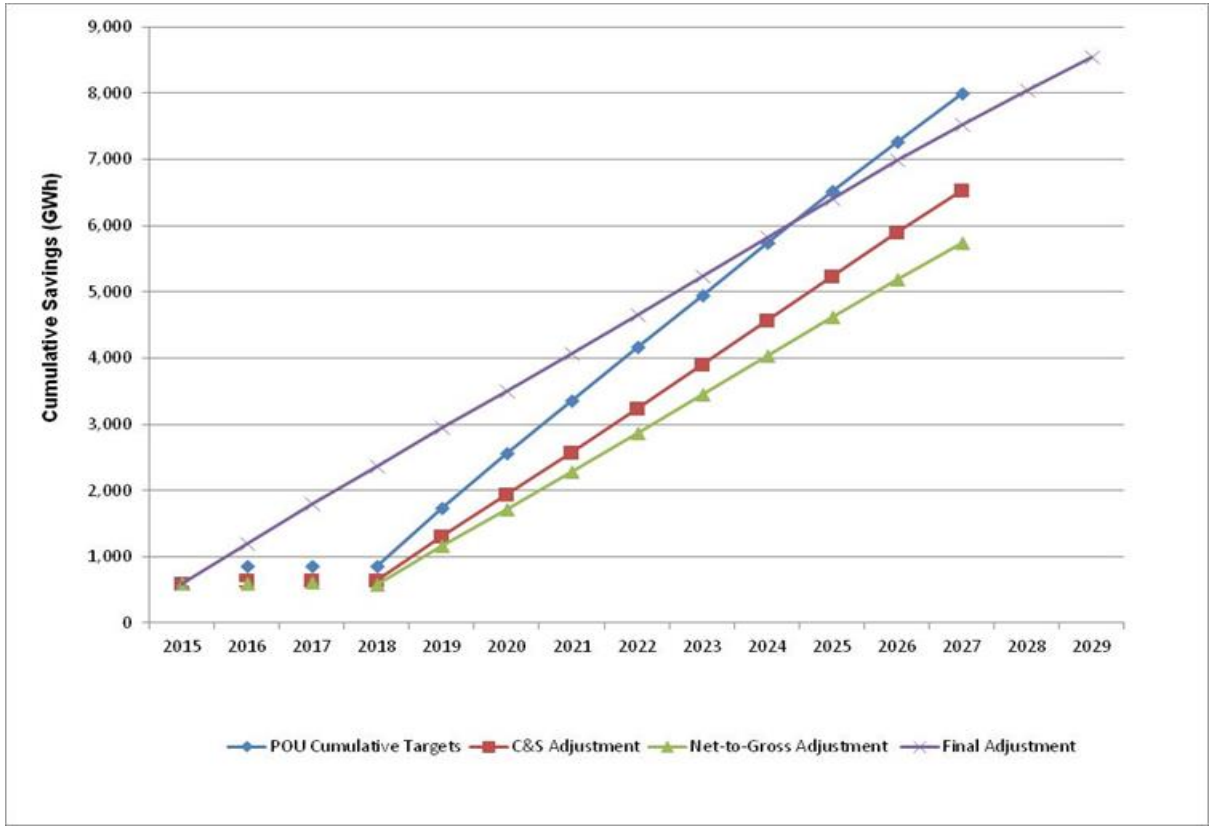
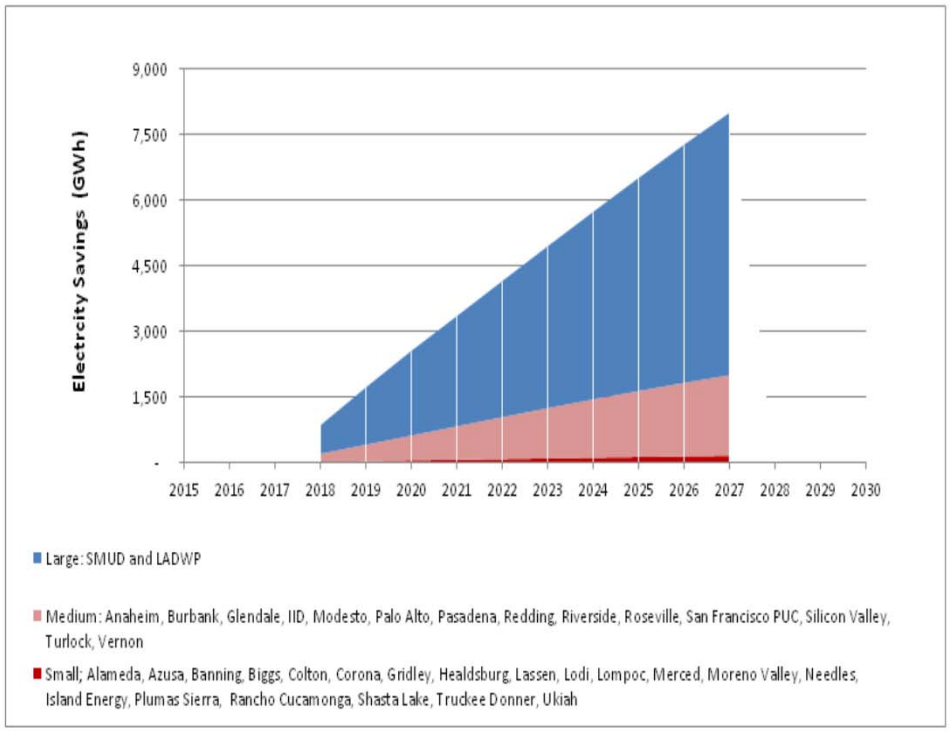
Adjustments to POU Cumulative Savings Projections



Cumulative Targets by POU Size

POU Program Targets



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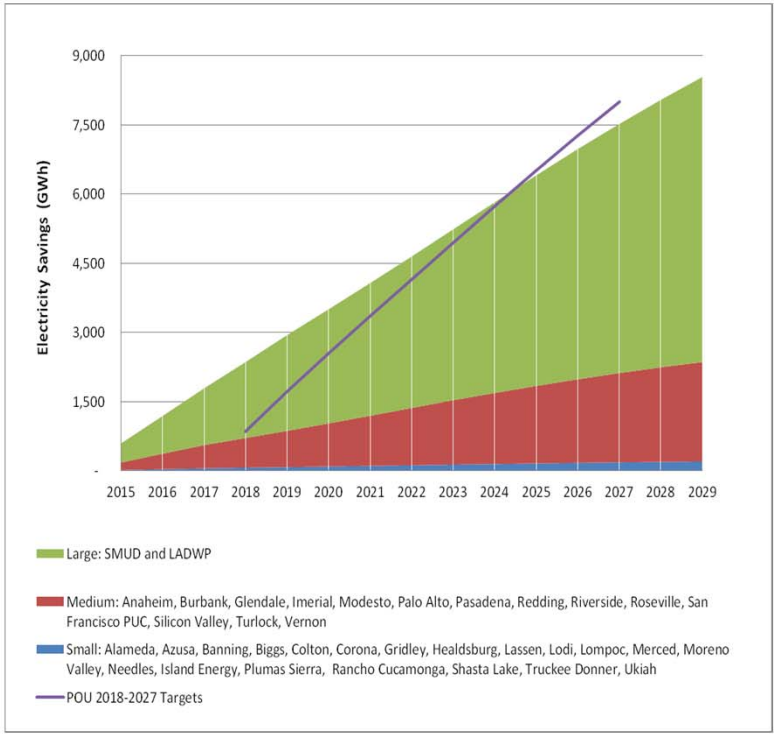

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Implications for POUs

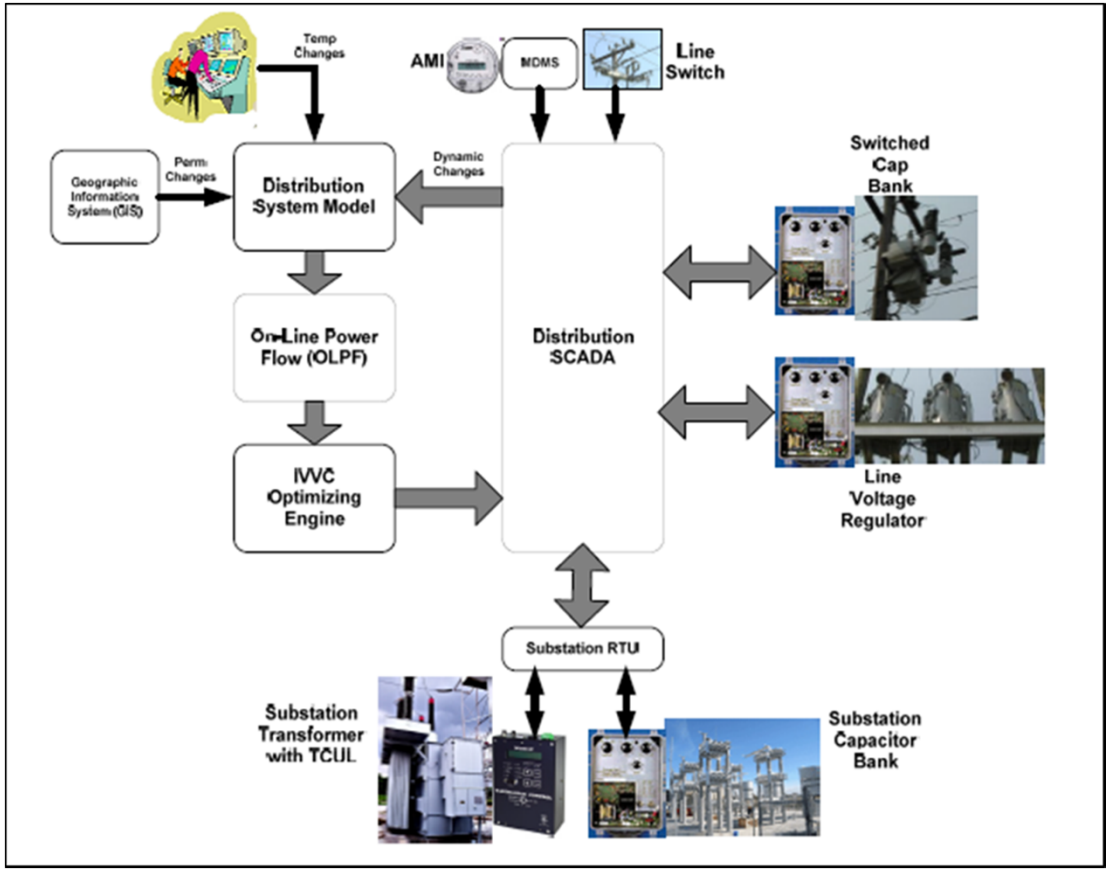
- CEC adoption of SB 350 targets for POUs does not require any POU to change its projected savings or modify its programs
- SB 350 creates a new accounting system that can operate in parallel with other systems
- Future cycles of SB 350 target setting will refine numerous aspects of EE planning

CVR AND FUEL SUBSTITUTION

Conservation Voltage Reduction

- Explicitly included in PRC 25310(d)(9) as a compliance option
- CVR has evolved over time to be better described as CVR/Volt-Var Optimization (CVR/VVO)
- Only one utility deploying CVR/VVO at scale although several have conducted pilots

Modern CVR/VVO



Policy Issues/Next Steps

- Policy Questions:
  - ***Is additional research/demonstration needed to determine whether various CVR/VVO technologies are cost effective in loading conditions for specific feeder configurations?***
  - ***Are further statutory changes warranted to encourage CVR/VVO, when it appears to be cost-effective, but is not being implemented?***
- Next Steps:
  - *Highlight potential focus for further effort in the next utility target setting cycle*

Fuel Substitution

- January 2017 *Framework* paper defined:
  - Fuel substitution to mean end-use device shifts from natural gas to electricity
  - Fuel switching to mean non-utility fuels shifting to electricity
- PRC 25310(a) excludes fuel switching, e.g., transportation electrification

Fuel Substitution Requirements

- PRC 25310(d)(10) requires both end-user energy savings and GHG emissions
- Means site energy savings and source GHG emission reductions
- Does not align directly with CPUC 3-prong test for fuel substitution programs
- No utility proposed savings from fuel substitution programs – further study needed

Some Implementation Questions

- *Should the resource mix used to assess GHG savings be utility-specific or statewide?*
- *What process should be used to develop minimum heat pump performance standards and performance of displaced gas devices?*
- *What process should be used to reconcile the existing CPUC 3-prong test versus SB 350 EE requirements?*
- *Which utility obtains credit towards SB 350 EE target compliance – the natural gas utility with departing load or the electric utility gaining load?*

Major Issues for the Future

- Collaborative study of savings decay/replacement
- Review of Utility Codes & Standards programs and overlaps with other quantification efforts
- Improve forecasting post-processing to extract savings from C&S, price response, and private market efforts
- CVR/VVO assessments
- Fuel substitution assessments

Questions?