

PG&E

Market Assessment and Gap Analysis

Residential Sector

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February 23, 2016





Agenda

Topic

PG&E Residential Sector Data Overview

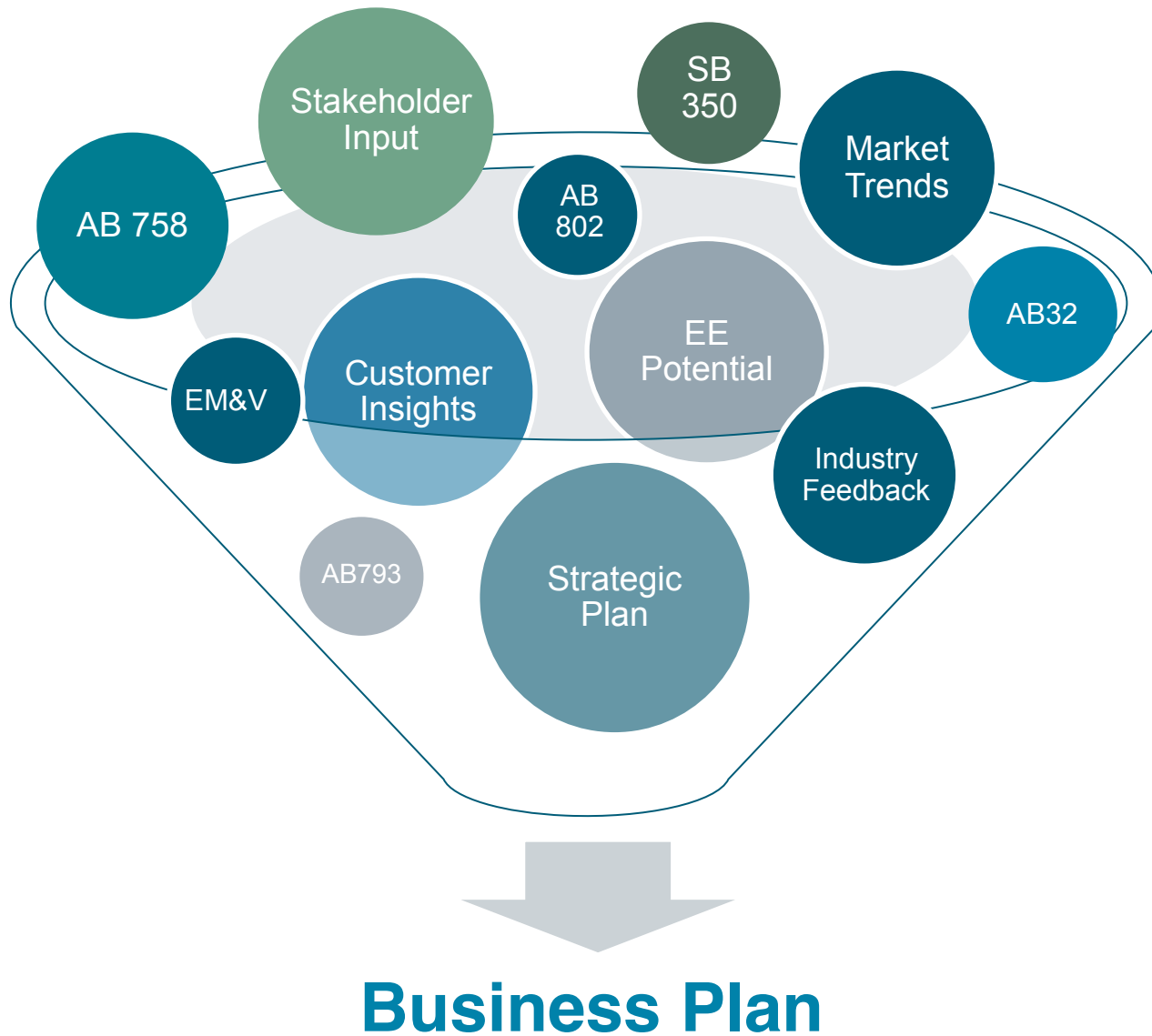
Residential Market Trends

Intervention Approaches and Future Opportunities

Q&A



Plan Inputs



Residential Sector Data

PG&E Territory

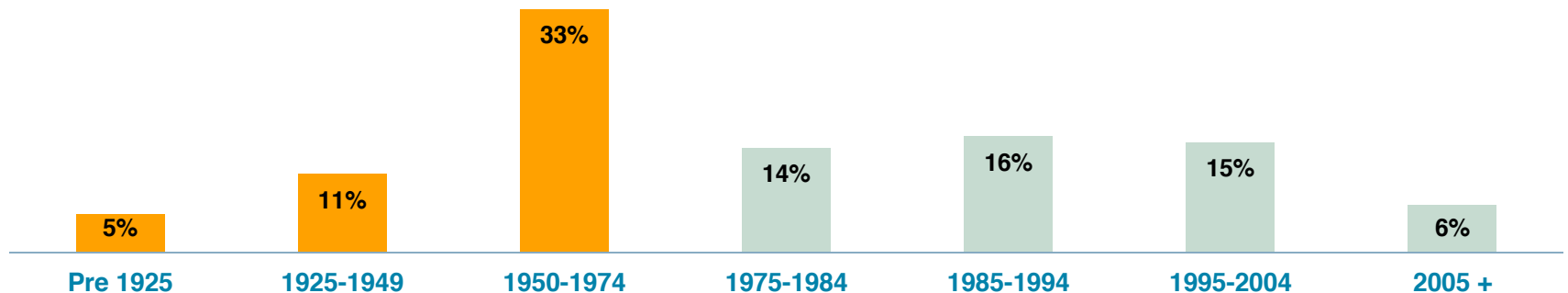




Pacific Gas & Electric Overview



- 70,000 square-mile service area
- Provides energy services to 16 million Northern & Central Californians across 9 climate zones
 - 5.4 million electric customer accounts
 - 4.3 million natural gas customer accounts
- 49% of homes built before modern code
- 43% renters, 18% live in multi-family buildings
- 3.4 million in temperate climates

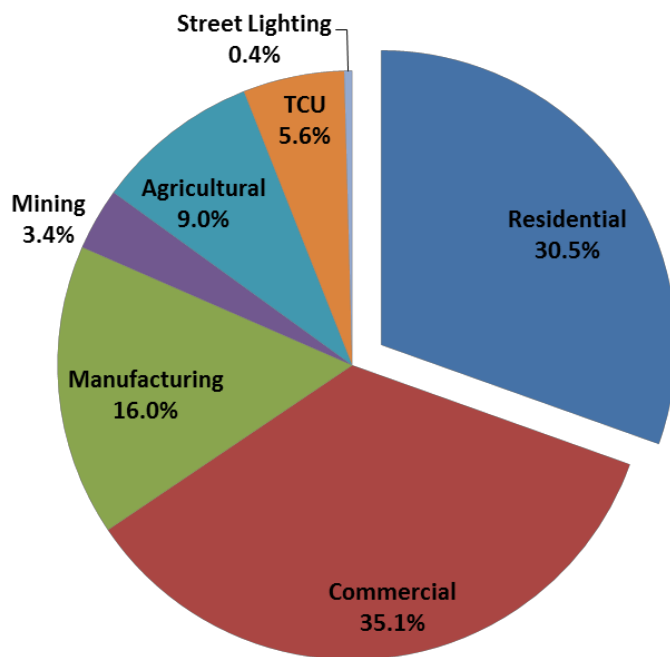


Percentage of Residential Homes by Year Built

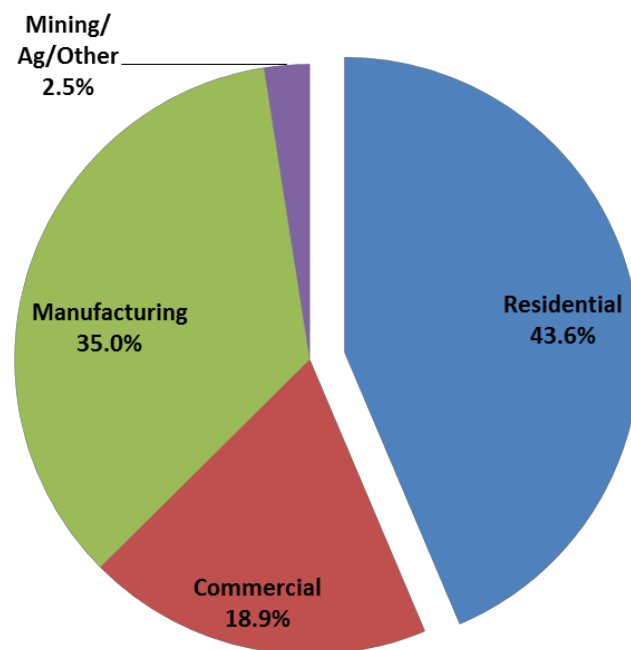


PG&E Energy Usage by Segment

2015 Energy Consumption
(Total = 87,801 GWh)



2015 Gas Consumption (PG&E)
(Total = 4,679 MM Therms)



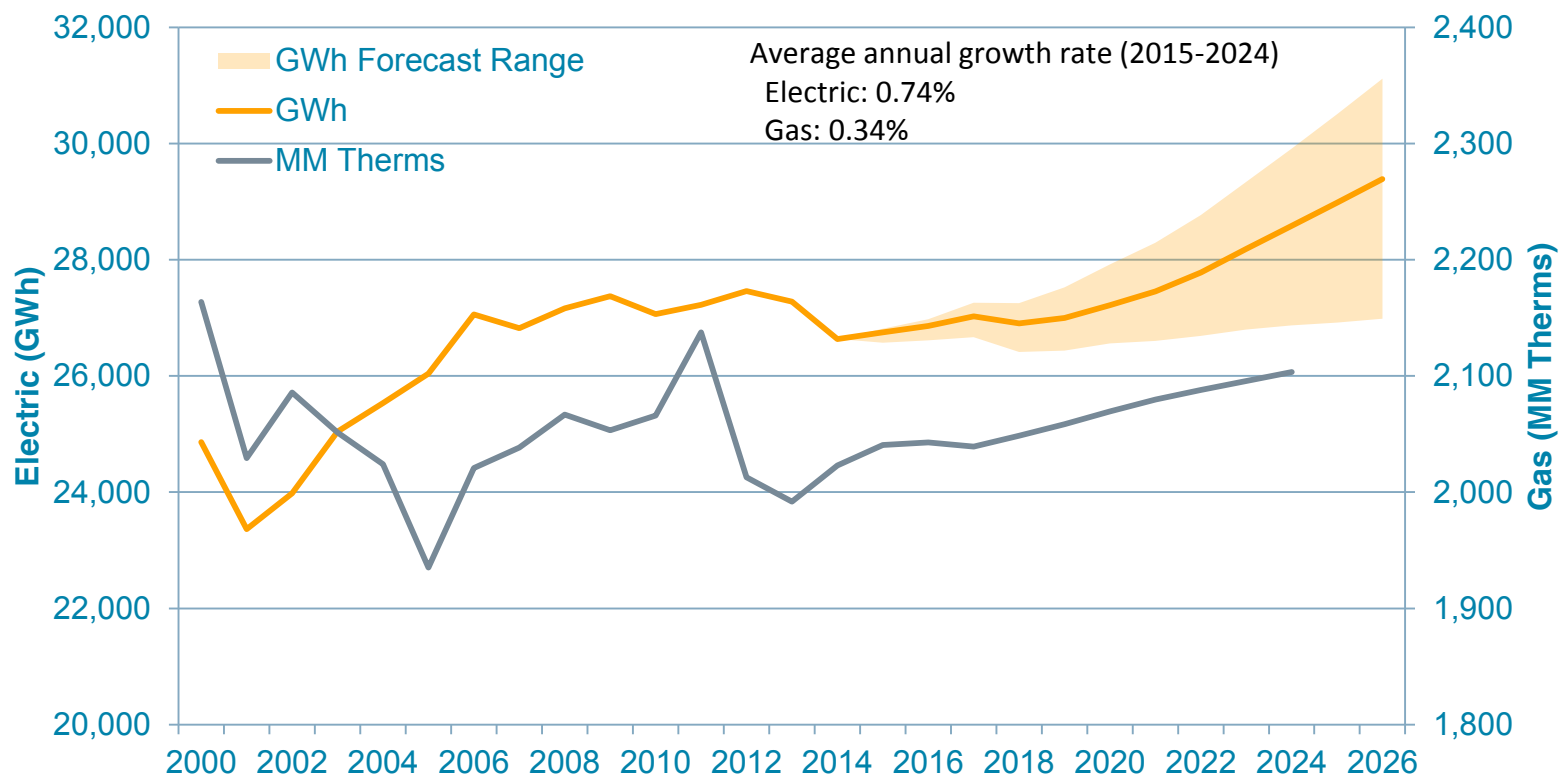
Key Points

- Residential sector gas share has grown ~5% since 2012
- Electric share has remained relatively steady



PG&E Residential Energy Forecast

Residential Consumption Forecast



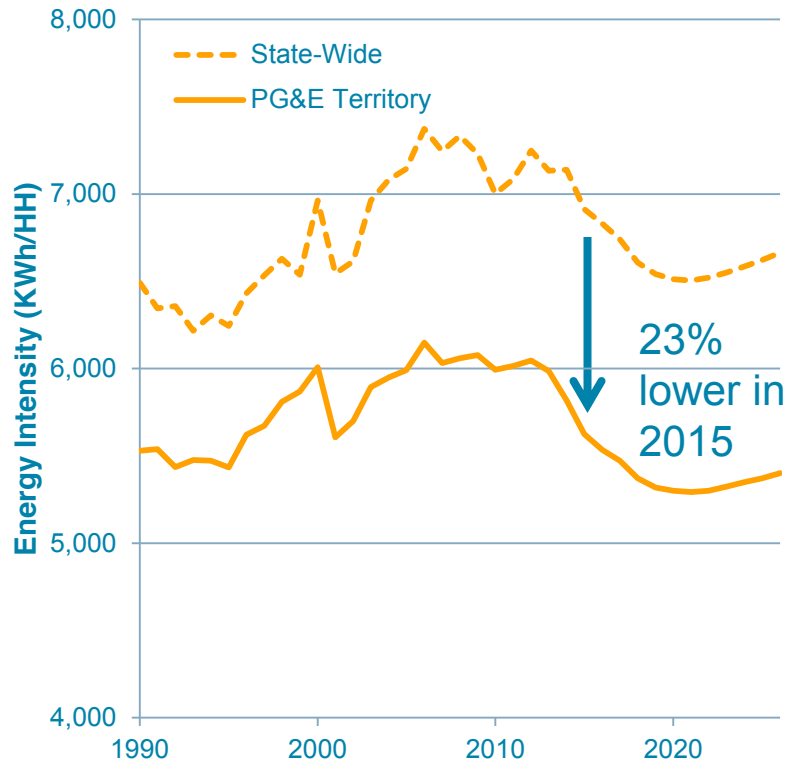
Key Points

- Steady rise in consumption over next 10 years
- Electric vehicles forecast to rise in PG&E territory from <1% of use to 5% by 2025
- Plug loads growing rapidly

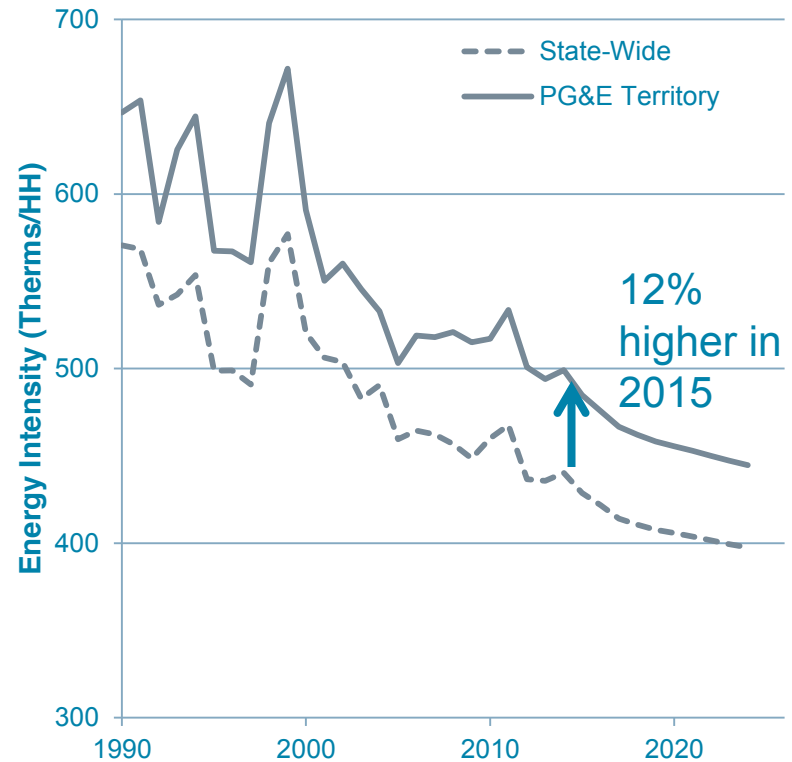


Residential Use Per-household

Average Household Electricity



Average Household Gas



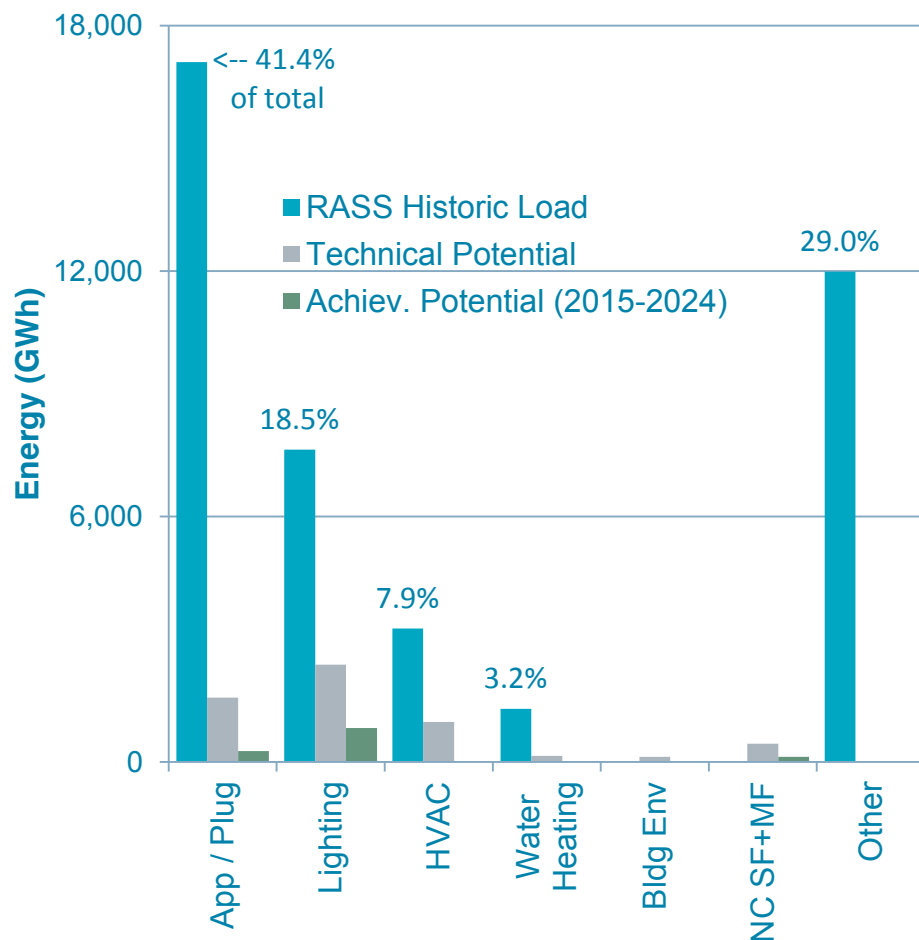
Key Points: PG&E territory energy use lower for electric and higher for gas

- Average home AC use lowered by 3.4M customer homes in temperate climates
- More opportunities in gas, but low price disincentives customer action and impacts cost-effectiveness
- Higher codes and new MF units growing 4x new SF homes lowering average home use
- Plug-loads and EV forecast to ramp up and drive electric use growth



Electric Load and Potential Residential - PG&E Territory

Electric Demand and Ten-year Potential



Key Points

Cost-Effectiveness

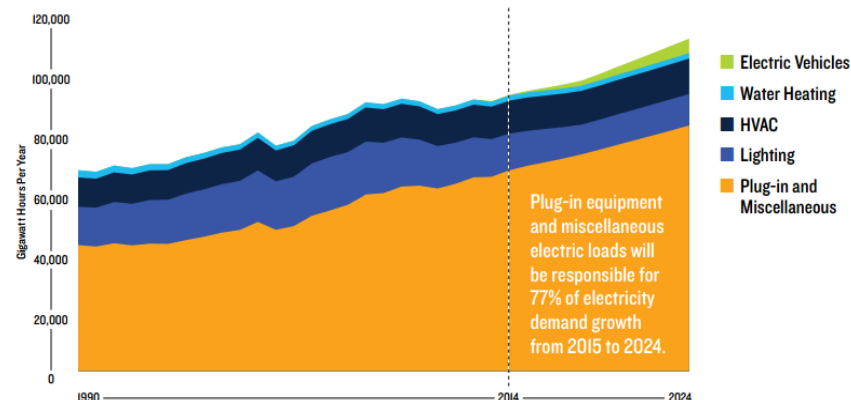
- Limited cost-effective sector potential
- Opportunity to review IMC policies
- Updates for existing conditions (AB802) may change picture

Data Availability

- 2009 RASS needs refresh and does not match Potential categories - “Other” breakout may help ID new opportunities

Plug-loads a large and growing challenge

Figure 2: California Residential Electricity Growth Forecast⁷



Ref: RASS: 2009 California Residential Appliance Saturation Study,
Prepared for CEC by KEMA, Inc, CEC- 200- 2010-004-ES, Oct 2010;

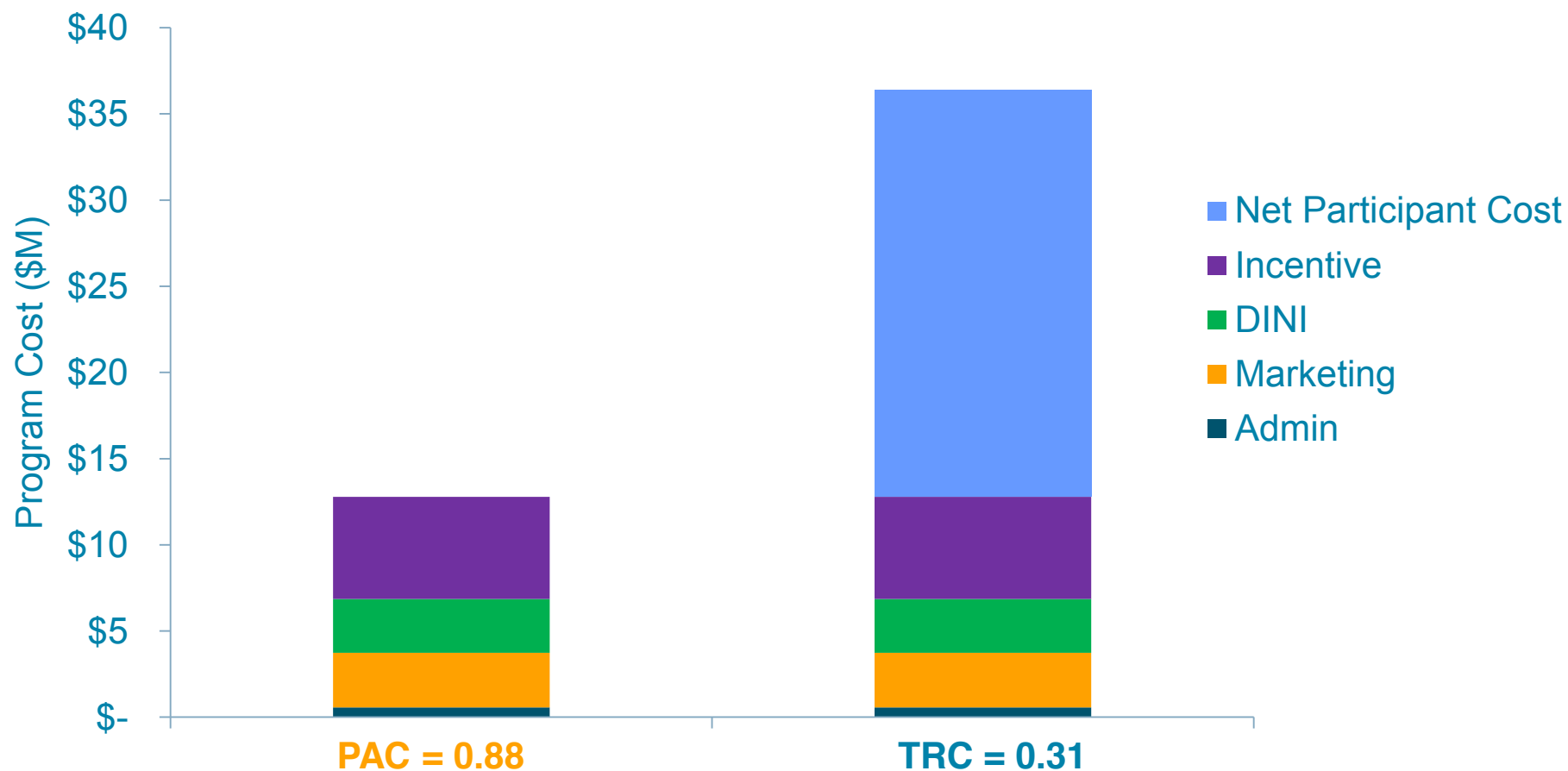
Potential: 2015, Energy Efficiency Potential and Goals Study for 2015 and Beyond. Prepared for CPUC by Navigant Consulting, Ref. No. 174655

Plug-In Equipment Efficiency: A Key Strategy to Help Achieve California's Carbon Reduction and Clean Energy Goals; NRDC Issue Brief



Impacts of IMC Policies

Energy Upgrade CA® Home Upgrade – 2014





Electric Potential and Sector Savings

Residential - PG&E Territory

Key Points

Lighting potential and opportunity

- ~75% of current potential is CFLs
- LED offerings limited by IMC, dynamic pace of changing market conditions and increased competition

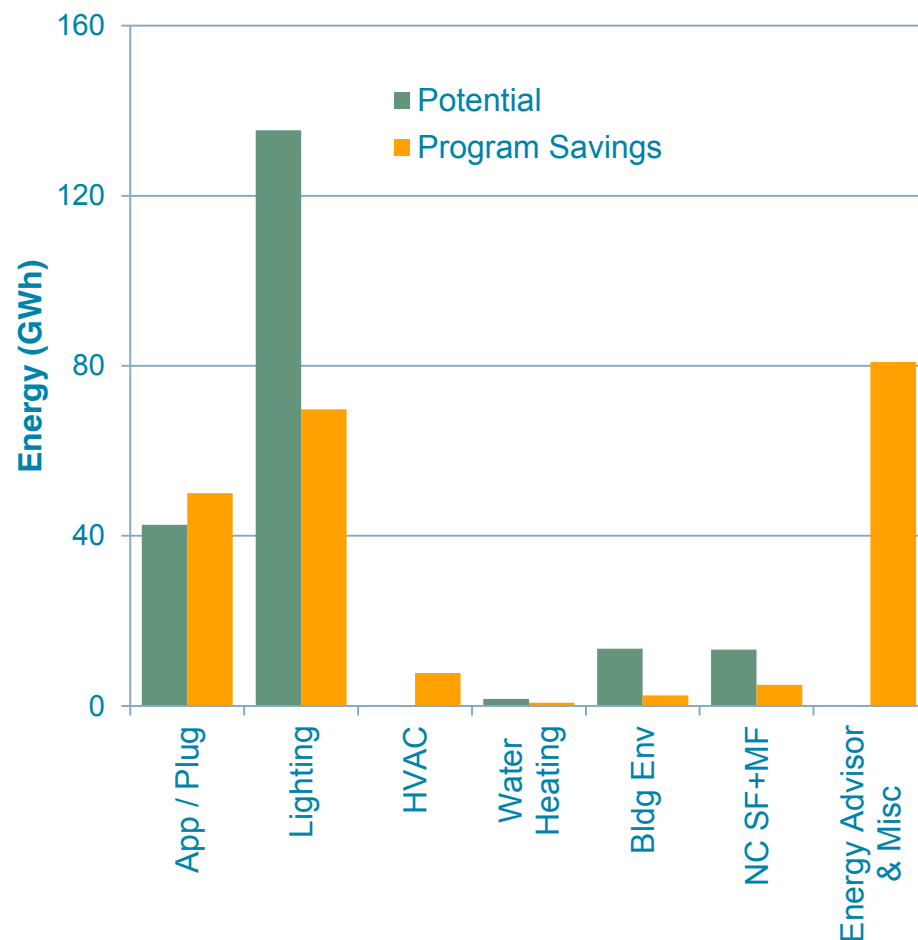
HVAC savings beyond potential

- Achieved a relatively large amount of non-cost effective savings compared to potential

Behavioral savings opportunities

- Provide significant savings
- Need to better understand future behavioral Potential

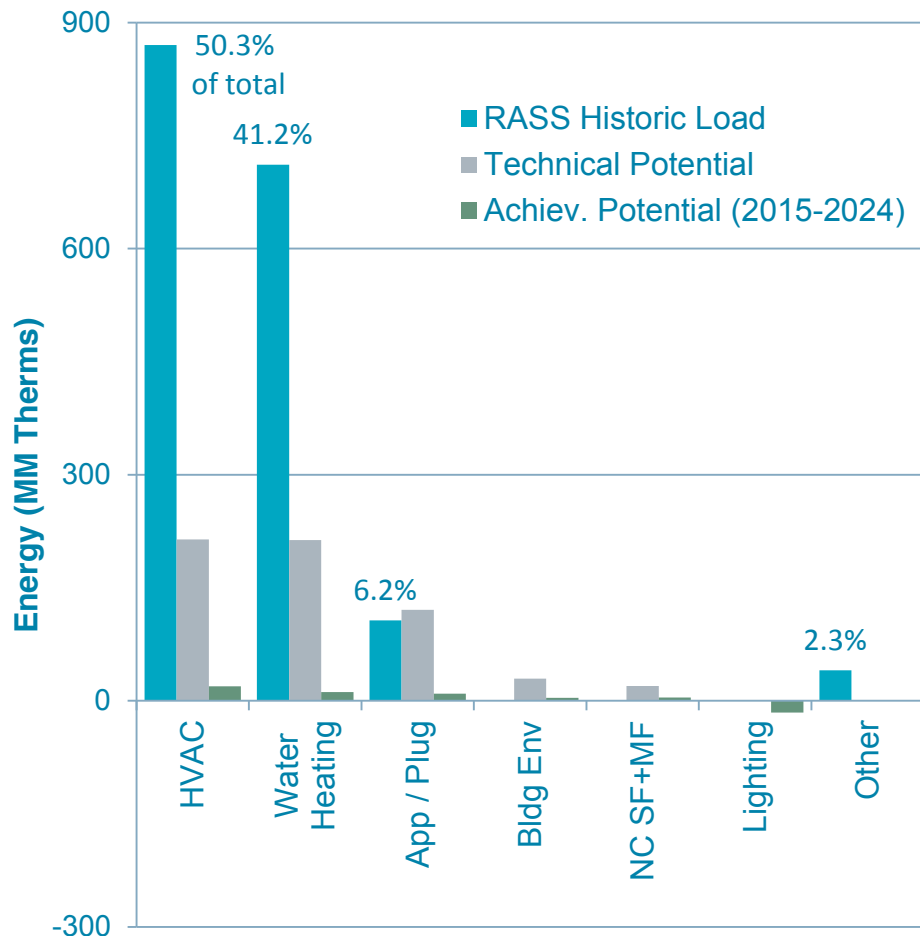
Average Annual Savings (2013-2014)





Gas Load and Potential Residential - PG&E Territory

Gas Demand and Ten-year Potential



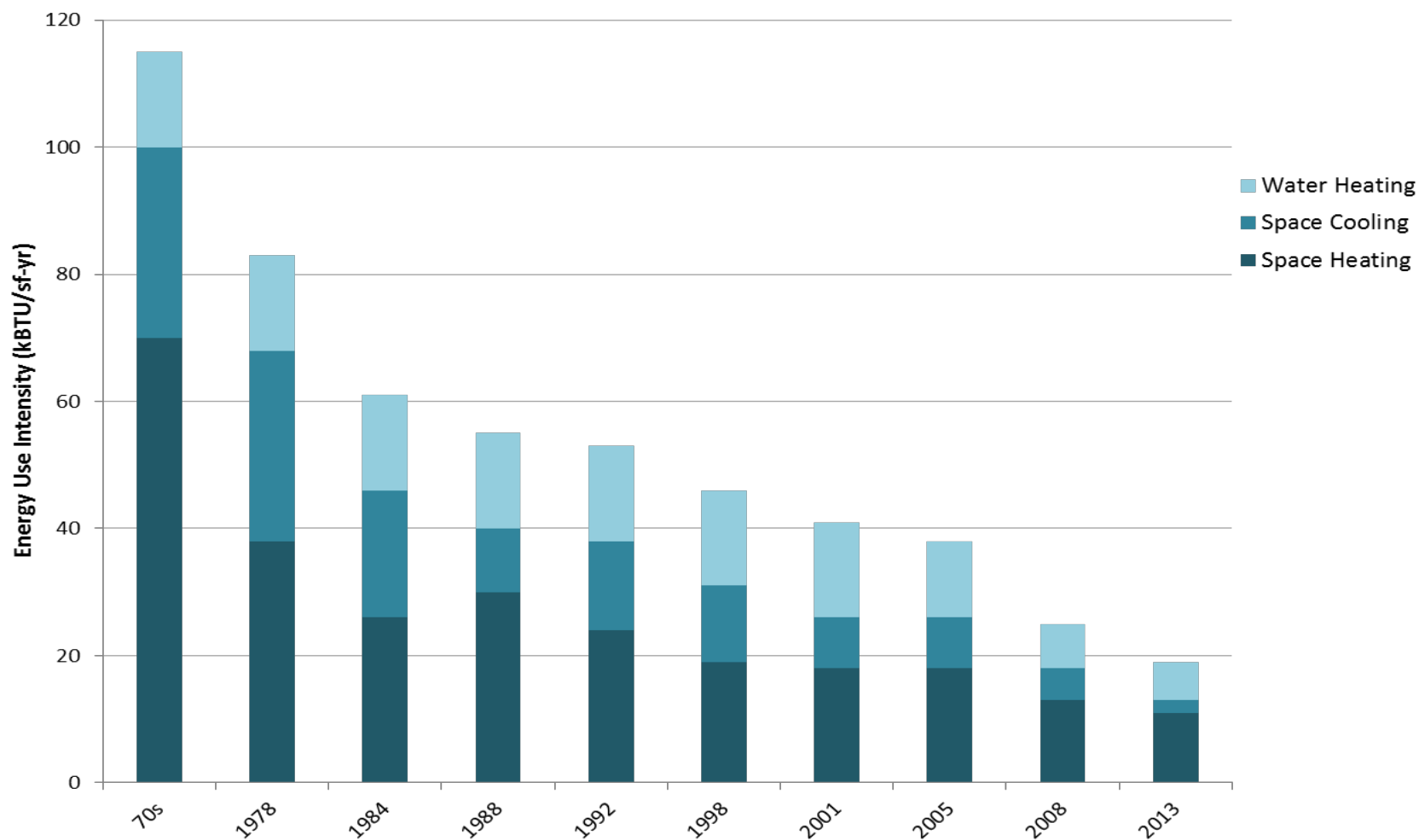
Space and water heating key gas drivers

- Relatively large amounts of technical potential, cost-effective potential is less
- Low price of gas impacts customer decisions and cost-effectiveness
- Relatively long useful life; need to look at driving new behavioral savings along with replacement approaches
- Going upstream: seeing recent progress with water heater distributor program
- Higher codes have dramatically changed energy intensity



Gas Load and Potential

Residential - PG&E Territory



Market Trends

PG&E Territory





Residential Market Trends

Trends

Increasing expectations for ease of services

Growing number of energy management choices for customers

Implications / Ideas

- New program delivery solutions and online tools to meet expectations
- Further support project phasing and target new intervention points
- Continue to partner with industry to support customer needs & facilitate innovation
- Enhanced data targeting to identify and clarify opportunities for customers





Residential Market Trends

Trends

State Policy Objectives

Advancing Codes

High-volume, low unit-savings products require new interventions

Implications / Ideas

- Help target stranded savings
- Provide EE “grid value”
- Focus on meter-based savings measurements

- Constrains cost-effective resource program opportunities
- Increase coordination w/ Codes & Standards
- Focus on scale and cost-efficiency

- Expand behavioral policy, offerings
- Look closer at mid-/up-stream (RPP)
- Test new incentive models (expand POS, other non-rebate options)

“Plug loads account for virtually all of the 2013-2026 residential energy consumption growth, caused by an increasing growth forecast for ‘miscellaneous.’” Tom Gorin, CEC, June 2015

Intervention Strategies & Opportunities Overview

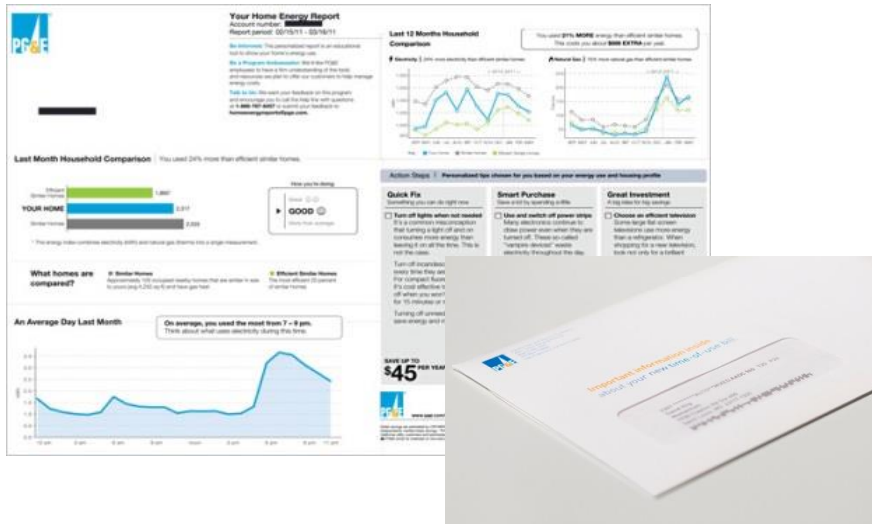
PG&E Territory





Multi-Angle Market Intervention

At Home



Online



In Stores



Trade Pros





2015 Residential Program Performance

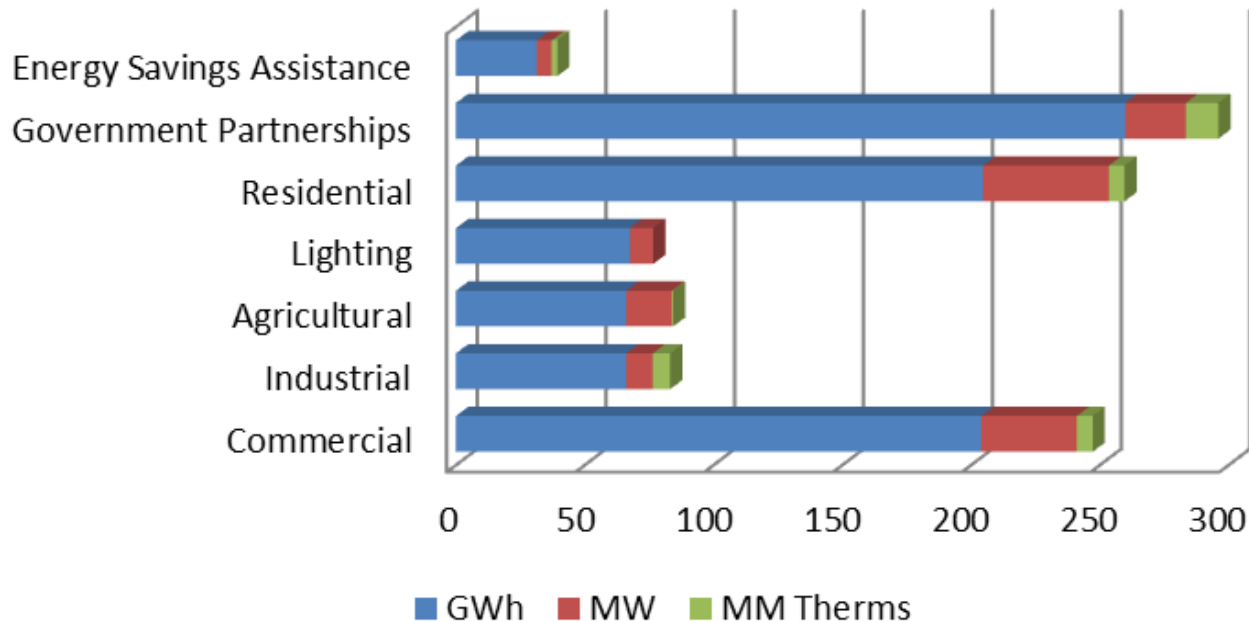
22.8%
Gwh

32.0%
MW

18.5%
Therms

27.5%
Incentives

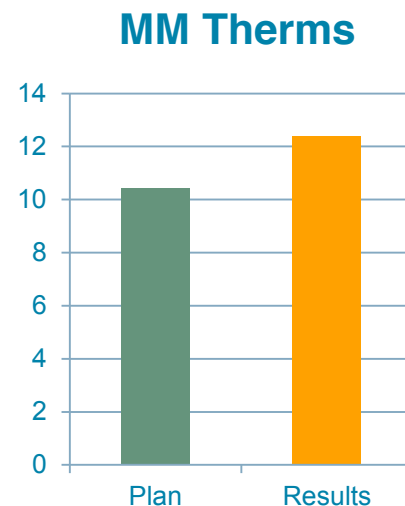
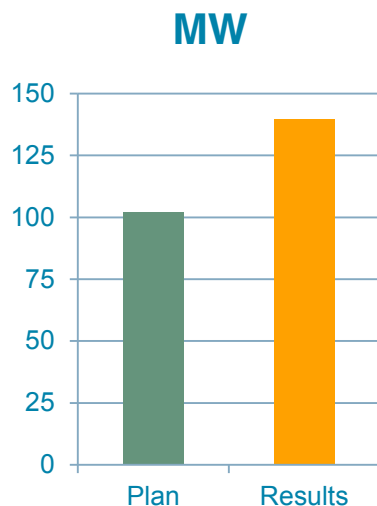
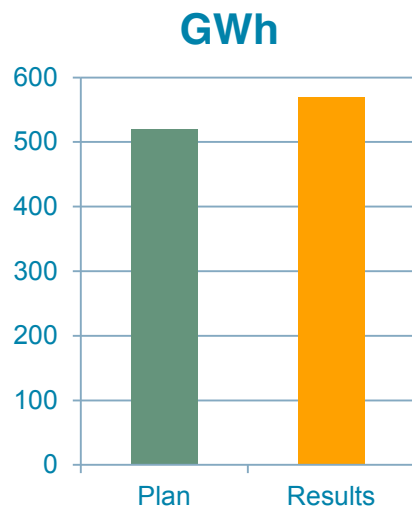
2015 Savings by Segment





Residential Programs Impacts

Residential Sector Results vs Plan 2013-2015



- Programs have delivered more savings than planned in EE portfolio
- \$72.3M total in rebates and incentives
- Cost-effectiveness relatively low: 0.53 TRC/0.99 PAC**

**2015 data portion is preliminary. Comparison includes Residential Programs and Primary Lighting, but does not include small amount of Res savings in Government Partnerships. Plan is from PG&E Compliance Filings.*

*** 2013-2014 Portfolio*



Opportunities Overview

Customers

- Drive innovation to meet customer needs
- Make it easy
- Provide new solutions for renters (43% and growing)
- New intervention strategies to address high-volume, low unit-savings products

Policy

- Opportunity to discuss and expand behavioral intervention approaches
- Review cost-effectiveness policies
- Allow EE to support “grid needs”

Data

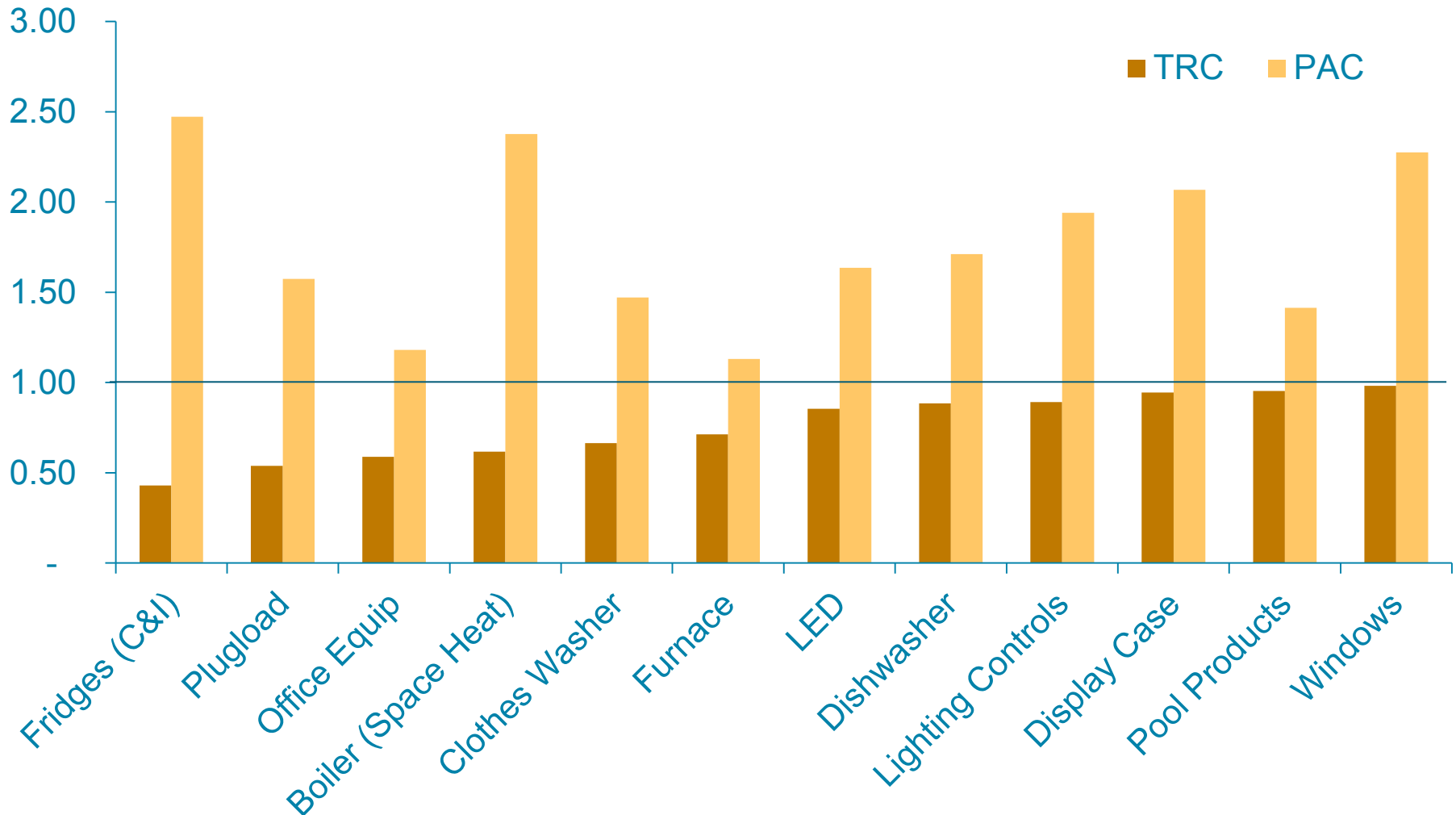
- More clarity expected with updates to Potential Study and 2009 RASS usage study
- Utilize data to make informed program design and policy decisions as we build-out Business Plans.

Appendix





Products with TRC <1





Standard v. Innovative Technology

CFL v. LED



Key Measure Values

Incremental Measure Cost

\$4.55

\$25.57

Incentive

\$1.50

\$8.00

Savings

25.6 kWh

13 kWh

Effective Useful Life

9.2

16

Net to Gross

0.54

0.85

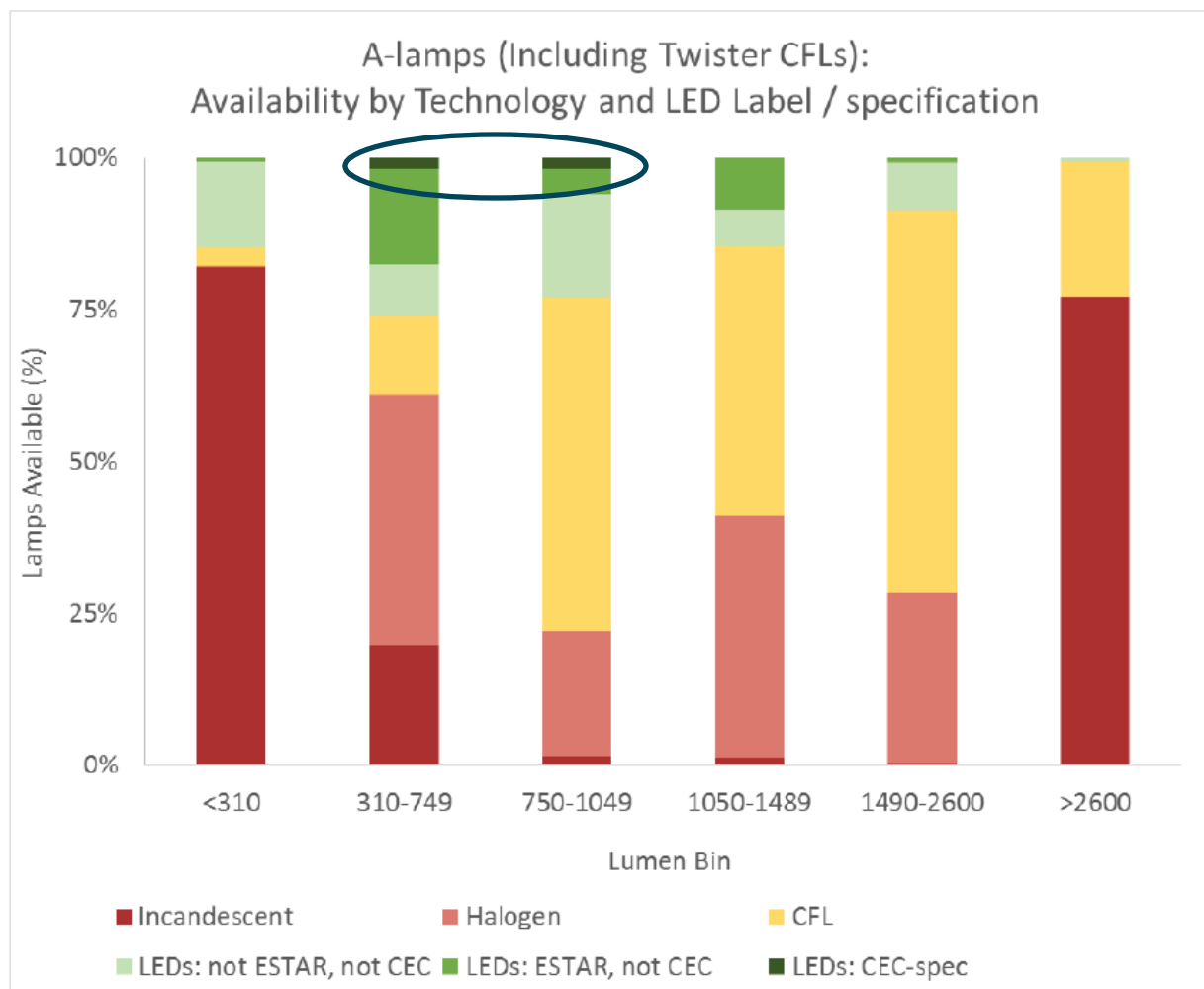
Lighting Trends and Opportunities





Lighting Challenges

Current policy focused on CEC-spec, but small part of market

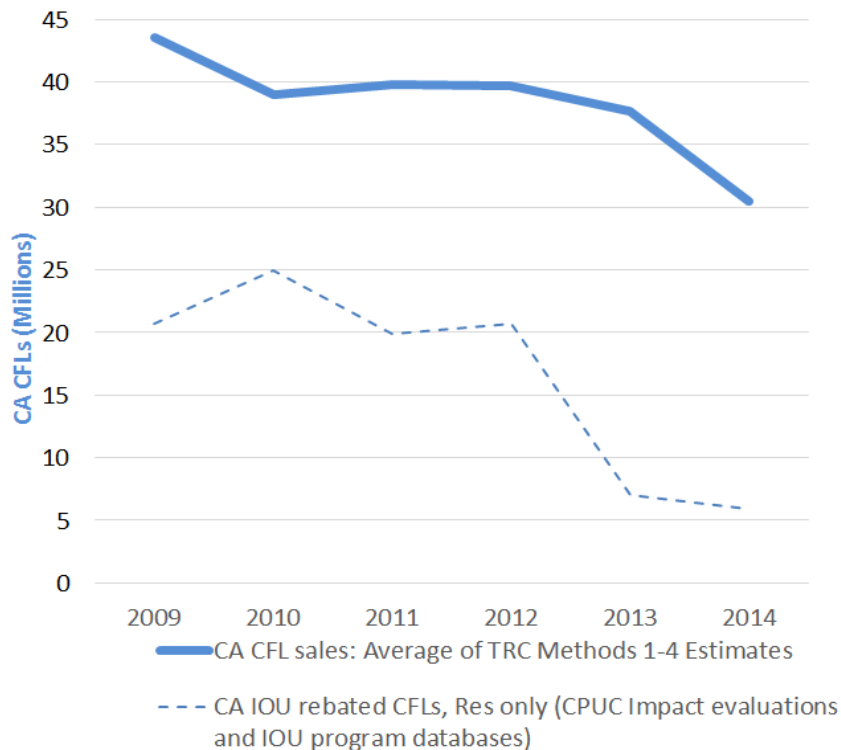




Lighting Challenges

- CFL sales are decreasing, Halogen sales are growing fast
- Customers left with no high-efficiency, low-cost option.

Dramatically reduced CFL rebates



Halogens likely to replace incandescent after the onset of EISA.

