4,000+ (Program) Years of Efficiency:

Preliminary Results of a Program-Level Analysis of the Administrator Cost of Saved Energy

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Presentation Outline

- What is this project and why it is being done?
- How it was done
  - Program typology and definitions
  - Data collection and quality control
- The database – portfolio/program numbers
- Threats to validity
- Preliminary results on cost of saved energy
- Next steps

LBNL Energy Efficiency Administrator Cost of Saved Energy (CoSE) Project

What, Why, How

Defining CoSE

- Simply put: $/kWh or $/therm for reductions in energy use (lifetime/levelized)
- What we are covering:
  - Utility customer-funded end-use efficiency programs
  - Focus on program administrator costs (not total resource costs)
  - Present and analyze:
    - at state and regional levels
    - by market sector (e.g., commercial, industrial and residential)
    - by program type (e.g., residential whole house programs, commercial retro-commissioning, and industrial custom programs)
    - across other metrics such as climate zones and status of state-level efficiency policies

LBNL CoSE Project: Motivation & Objectives

The cost of saved energy at program level has not been comprehensively documented or analyzed:

- Limited number of studies done on regional or national costs for saved energy
- And, only at the portfolio/sector levels using relatively limited amounts of data

Objective: more, and more cost-effective, efficiency through understanding the drivers of CoSE:

- Collect, maintain, update program level cost and impact data
- Benefit resource and transmission planners by providing continually improving projections of future spending, costs, savings and program performance
- Conduct analyses to determine whether patterns/trends and statistically valid relationships between the cost of saved energy (at the program, sector and portfolio level) and certain independent variables can be defined and documented, such as administrator experience, changes in codes and standards, and scale of efficiency investments

What's In the Program Database?

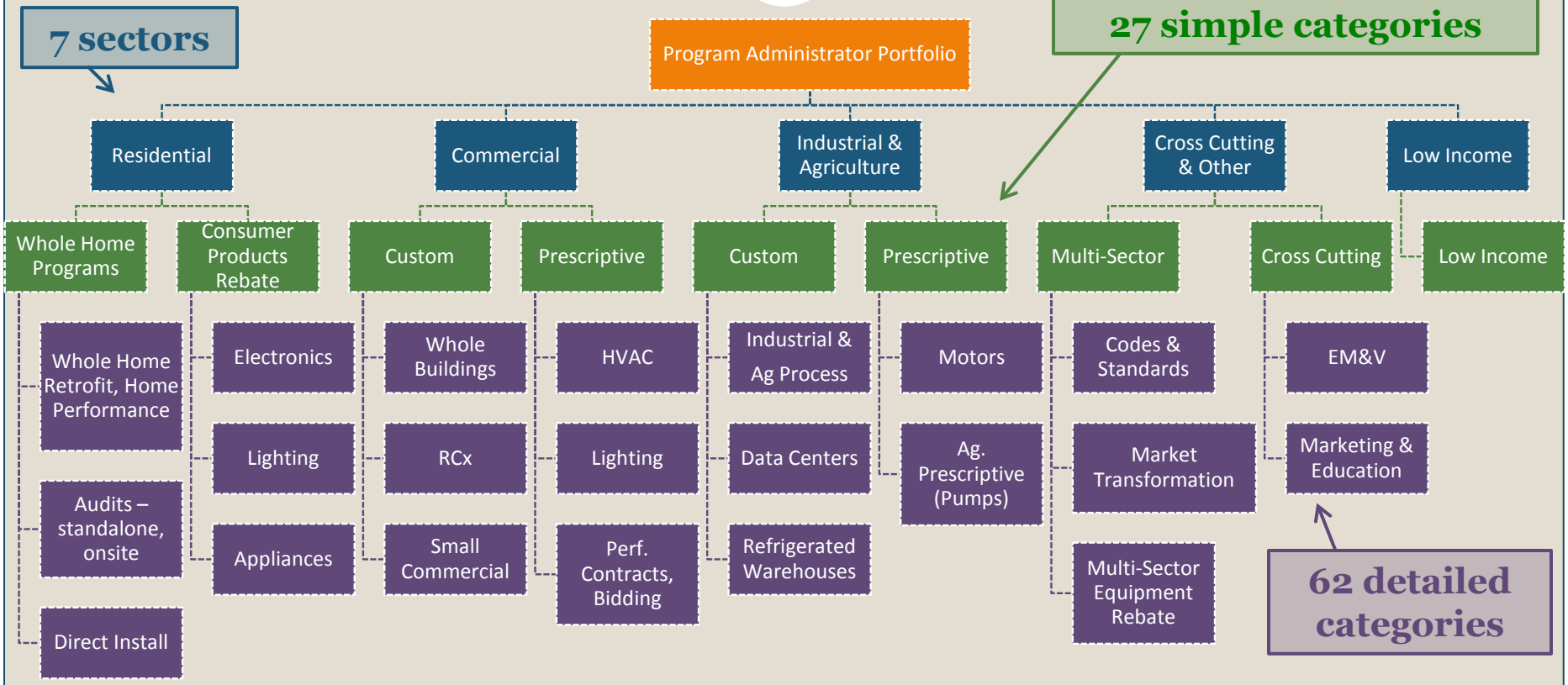
Data Coverage

- Covers over 1,700 programs for 3 years (2009-2011) in 31 states
- More than 4,000 program years (multiple years for same programs) in the dataset
- Electric, natural gas, and electric/gas programs

Data Covered

- Net & gross annual incremental & lifetime savings
- Budget & expenditures
  - Incentive costs
  - Education, marketing & outreach
  - Evaluation
- Participant costs
- Measure lifetimes for programs
- Program participation

LBNL program typology



See LBNL Policy Brief: Energy Efficiency Program Typology and Data Metrics: Enabling Multi-State Analyses Through the Use of Common Terminology – at http://emp.lbl.gov

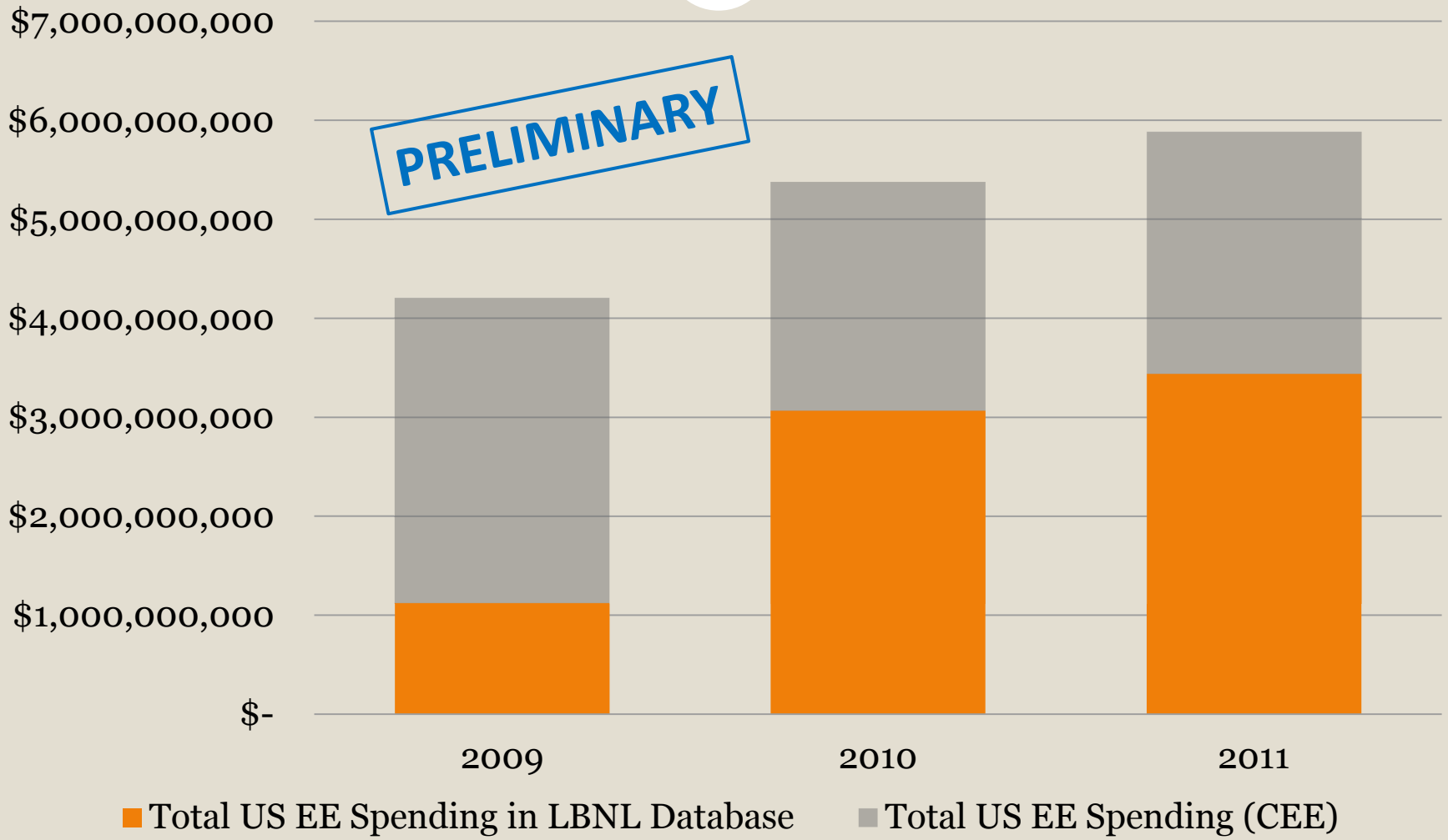
Program Type Categorization Level

Portfolio	Sector
Simplified	Detailed

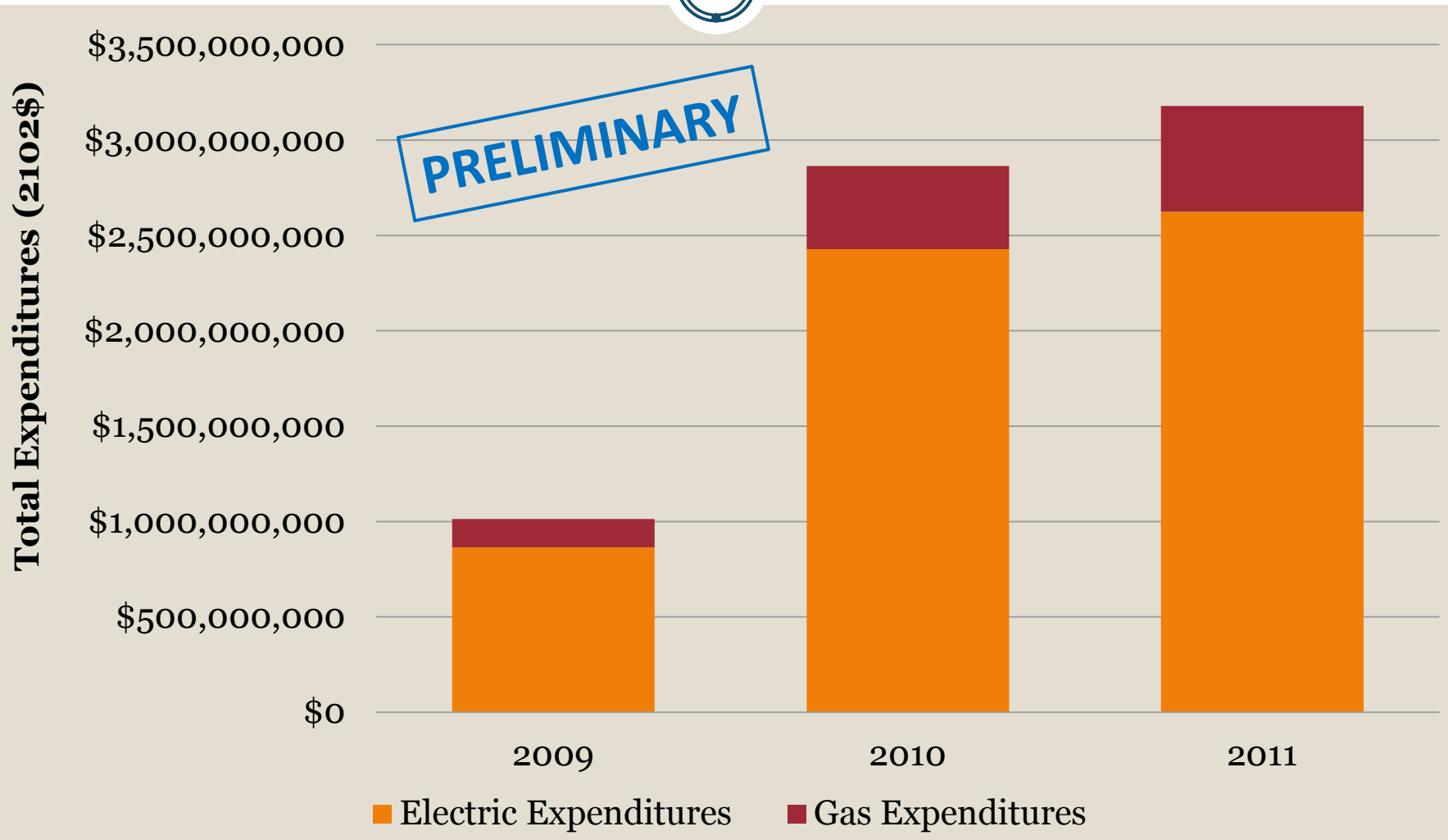
LBNL Energy Efficiency Administrator Cost of Saved Energy (CoSE) Project

Program Database

LBNL Gas and Electric Program Dataset Compared to National Spending (CEE)



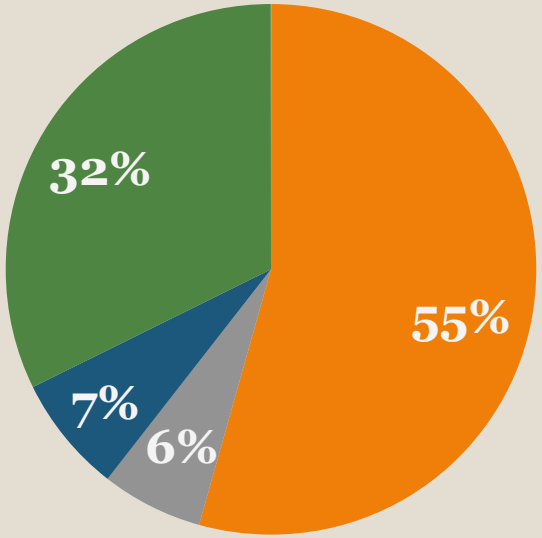
Total Program Administrator Expenditures by Year in LBNL Dataset



2009-2011 Electric Programs: Administrator Expenditures and Savings

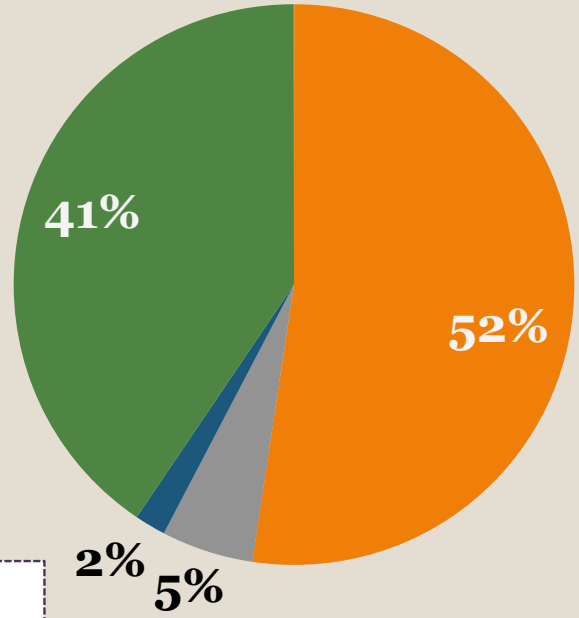
Expenditures (in 2012$)

Total = $5.8B



Program 1st Year Claimed Gross Savings

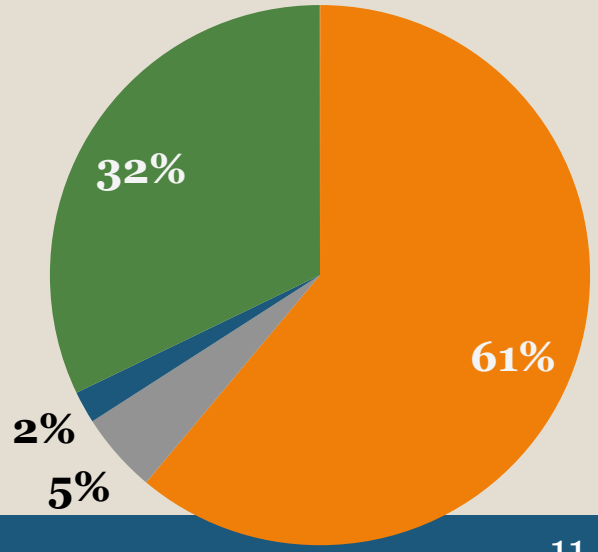
Total = 32,447 GWh



PRELIMINARY

Lifetime Gross Savings

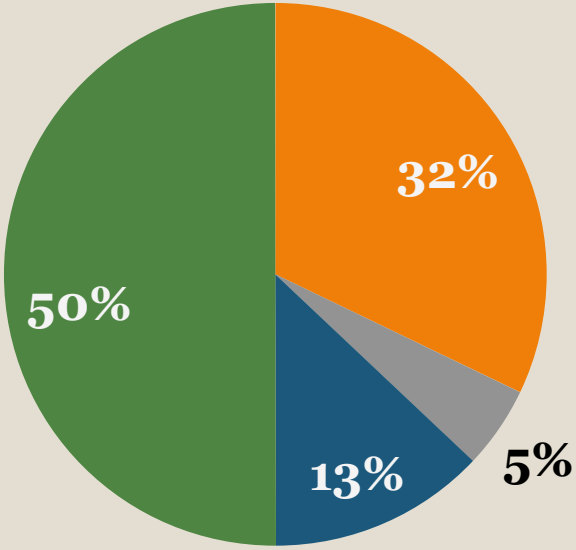
Total = 351,279 GWh



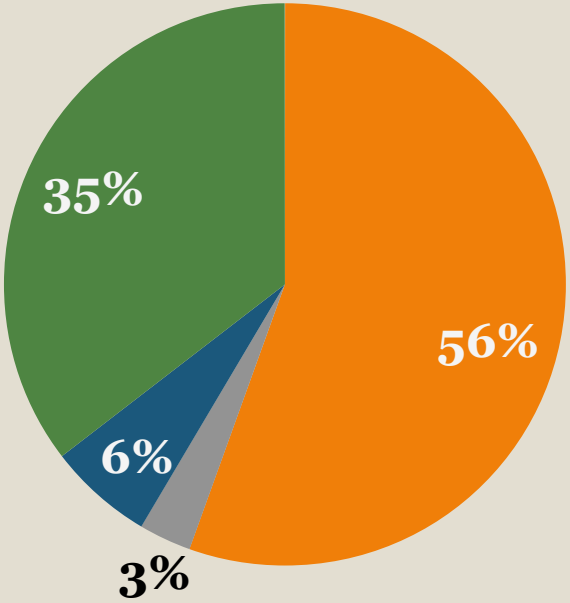
C&I
Residential
Low Income
Cross Sector/Other

2009-2011 Natural Gas Programs: Administrator Expenditures and Savings

Expenditures
Total = $1,139M

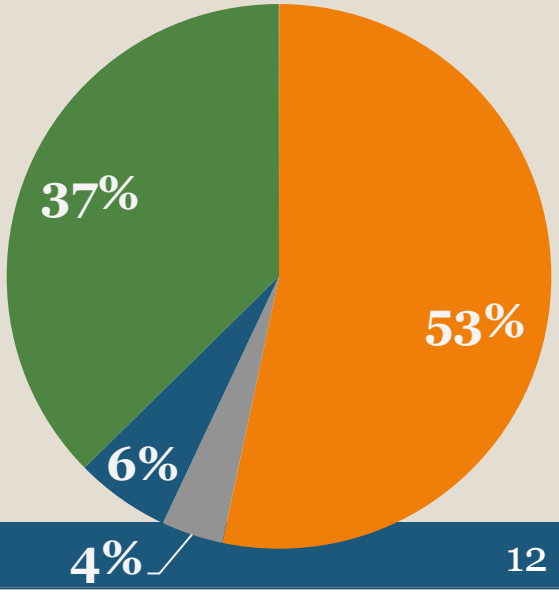


1st Year Claimed Gross Savings
Total = 33 MMDth



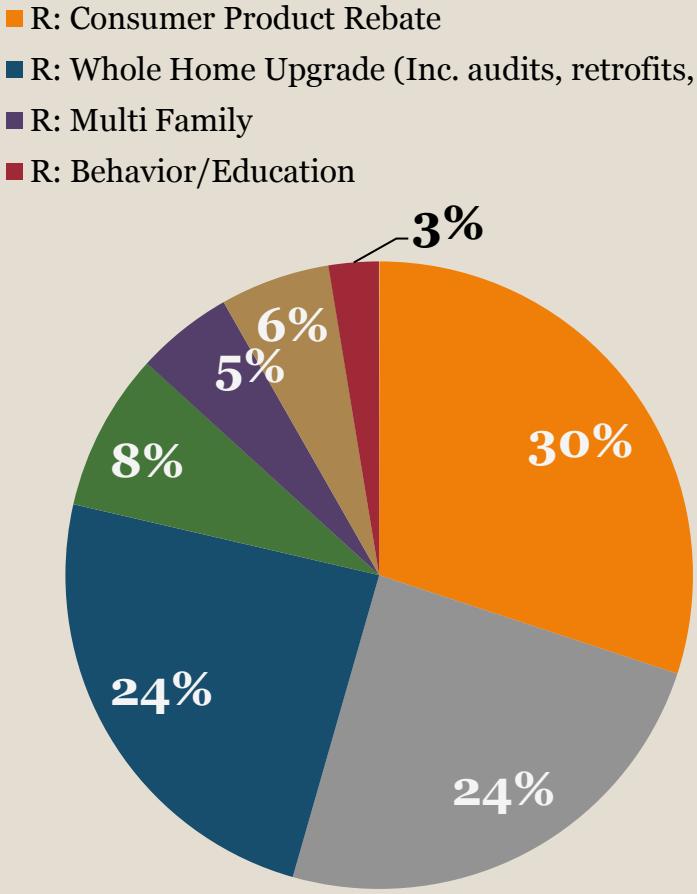
PRELIMINARY

Lifetime Gross Savings
Total = 639 MMDth



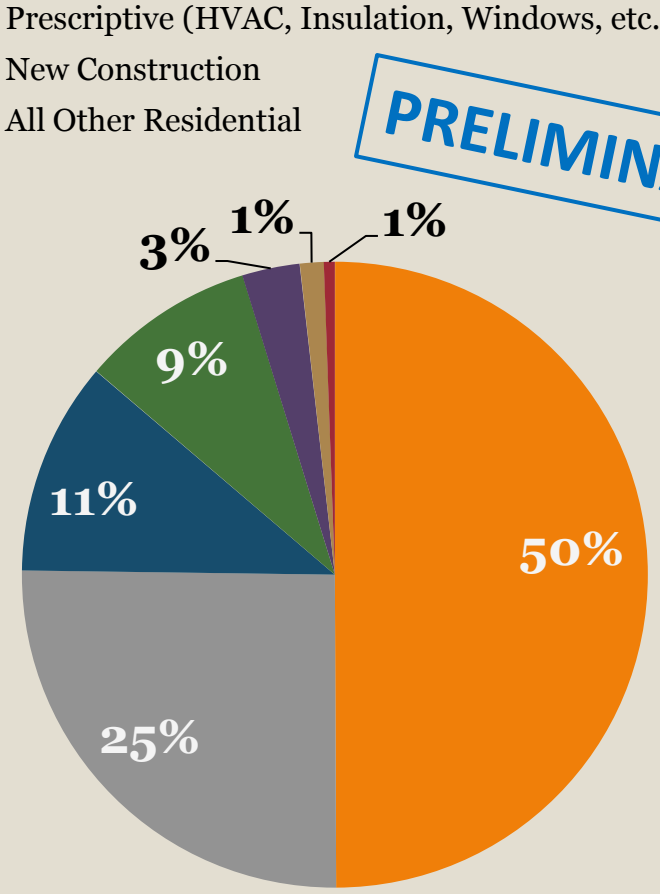
C&I
Low Income
Residential
Cross Sector/Other

2009-2011 Residential Electric Programs: Administrator Expenditures and Savings



Expenditures

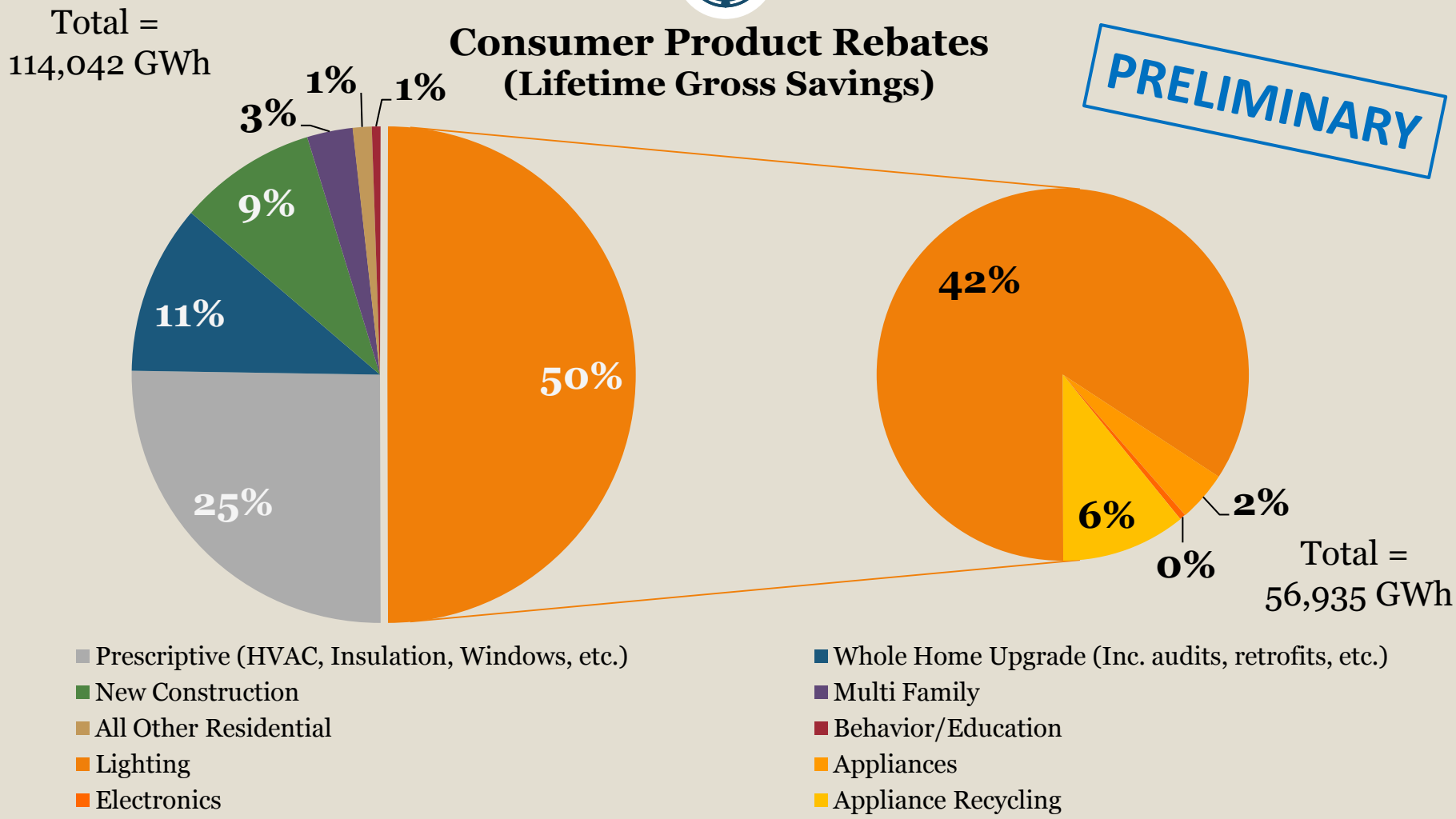
Total = $ 1.9 B (2012$)



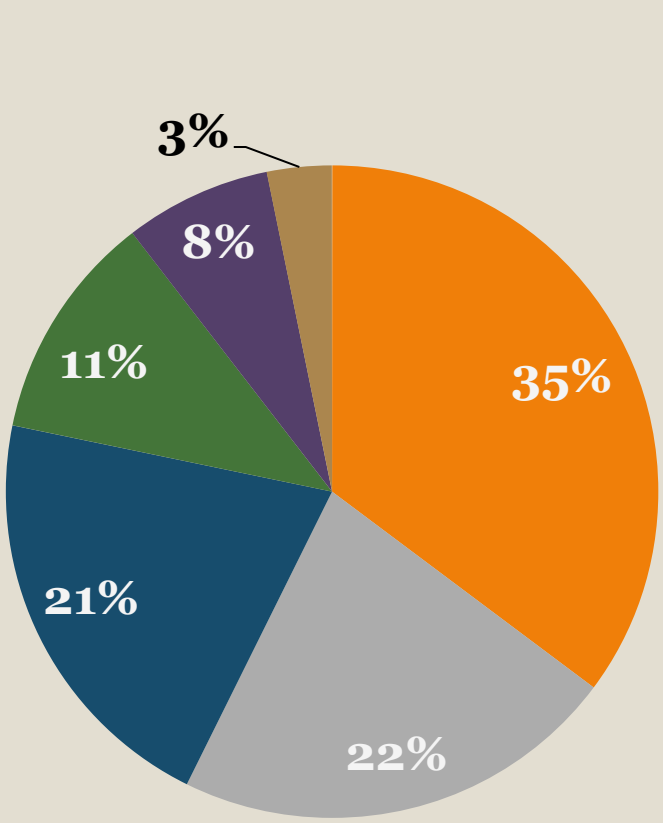
Lifetime Gross Savings

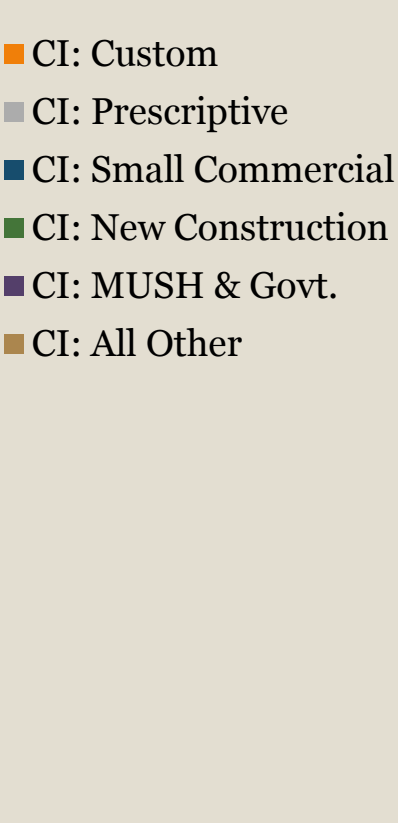
Total = 114,042 GWh

2009-2011 Residential Electric Programs: Detailed Program Level Example

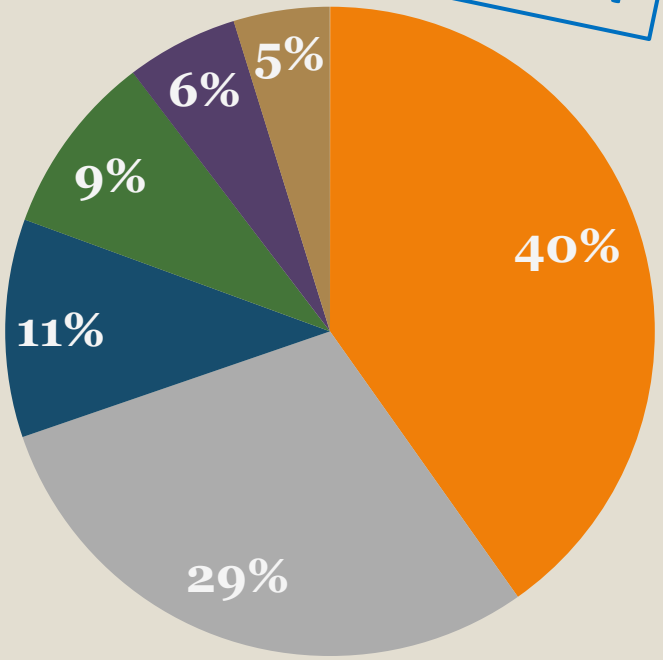


2009-2011 C&I Electric Programs: Administrator Expenditures and Savings





PRELIMINARY



Expenditures

Total = $ 3.129 B (2012$)

Lifetime Gross Savings

Total = 259,783 GWh

LBNL Energy Efficiency Administrator Cost of Saved Energy (CoSE) Project

Data Challenges

Data Challenges

Assuming that the primary data reported by program administrators and their evaluators are 100% accurate, we still have issues.

So…

- *Why is collecting regional and national efficiency program cost and performance data like eating in a bad restaurant?*
  - *The data is not that good, and there is not enough of it.*

Data Challenges

Energy savings/costs not defined consistently

Examples:

- Lifetime energy savings
- Net and gross savings
- Allocating portfolio costs between programs; in particular program costs between combined gas and electric programs

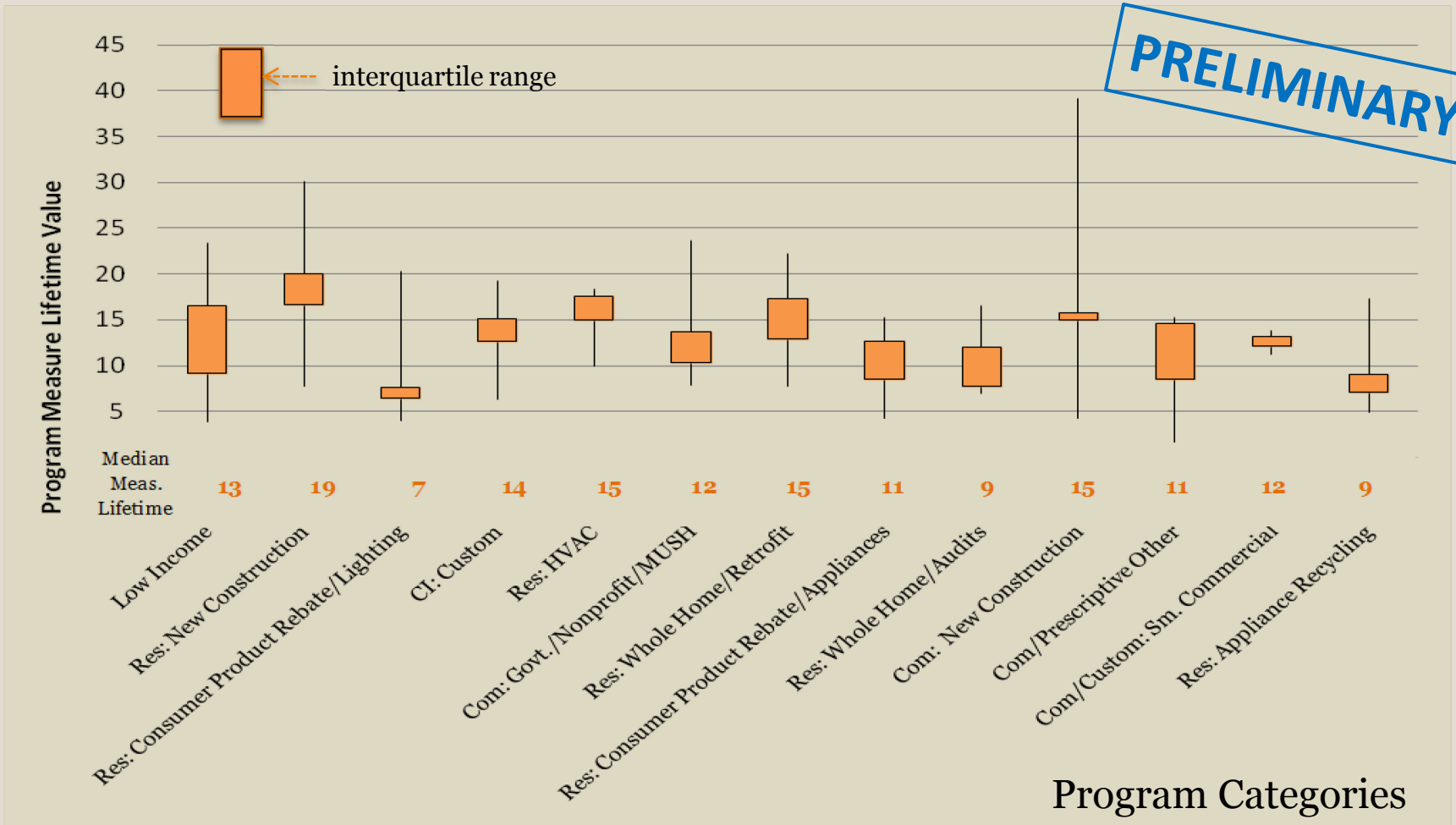
Reported cost and savings data not consistent

Example:

- Less than 40% of reported program results included information on program measure lifetimes or lifetime savings

Programs and sectors are not characterized in a universal or standardized fashion

Range of Measure Lifetimes



Data Challenges Summary

- The terminology and semantics of energy efficiency are products of state by state regulatory practices
- When data are compiled from multiple states or program administrators, the "language differences" can distort regional or national observations
- Thus:
  - Costs are ***administrator***, not total resource costs
  - Caution should be used when applying indicated results
  - Need more robust and consistent data to improve regional and national analyses

Can showing the benefits of such analyses encourage state and regional entities to establish common reporting definitions and formats?

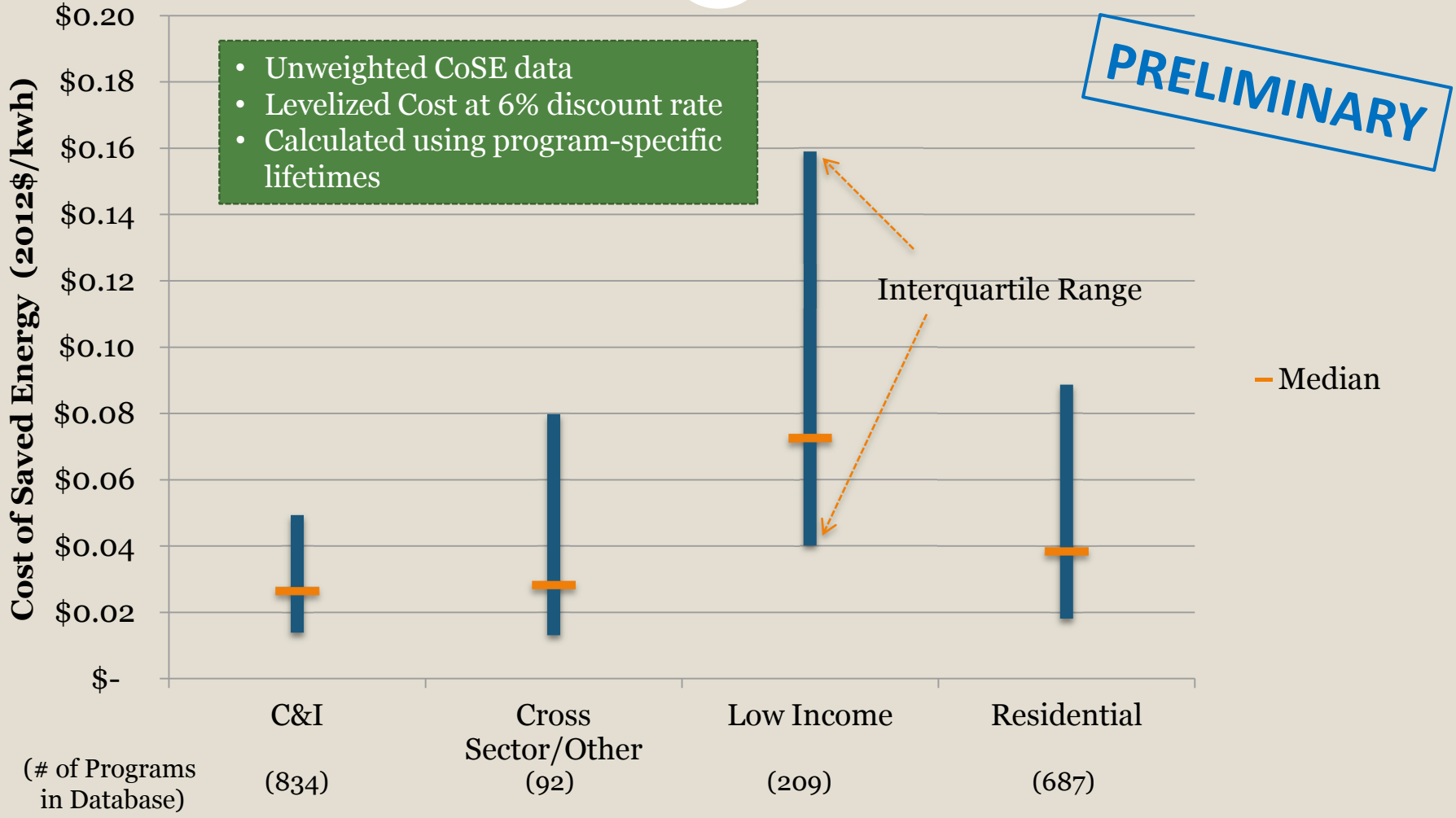
LBNL Energy Efficiency Administrator Cost of Saved Energy (CoSE) Project

Preliminary Results

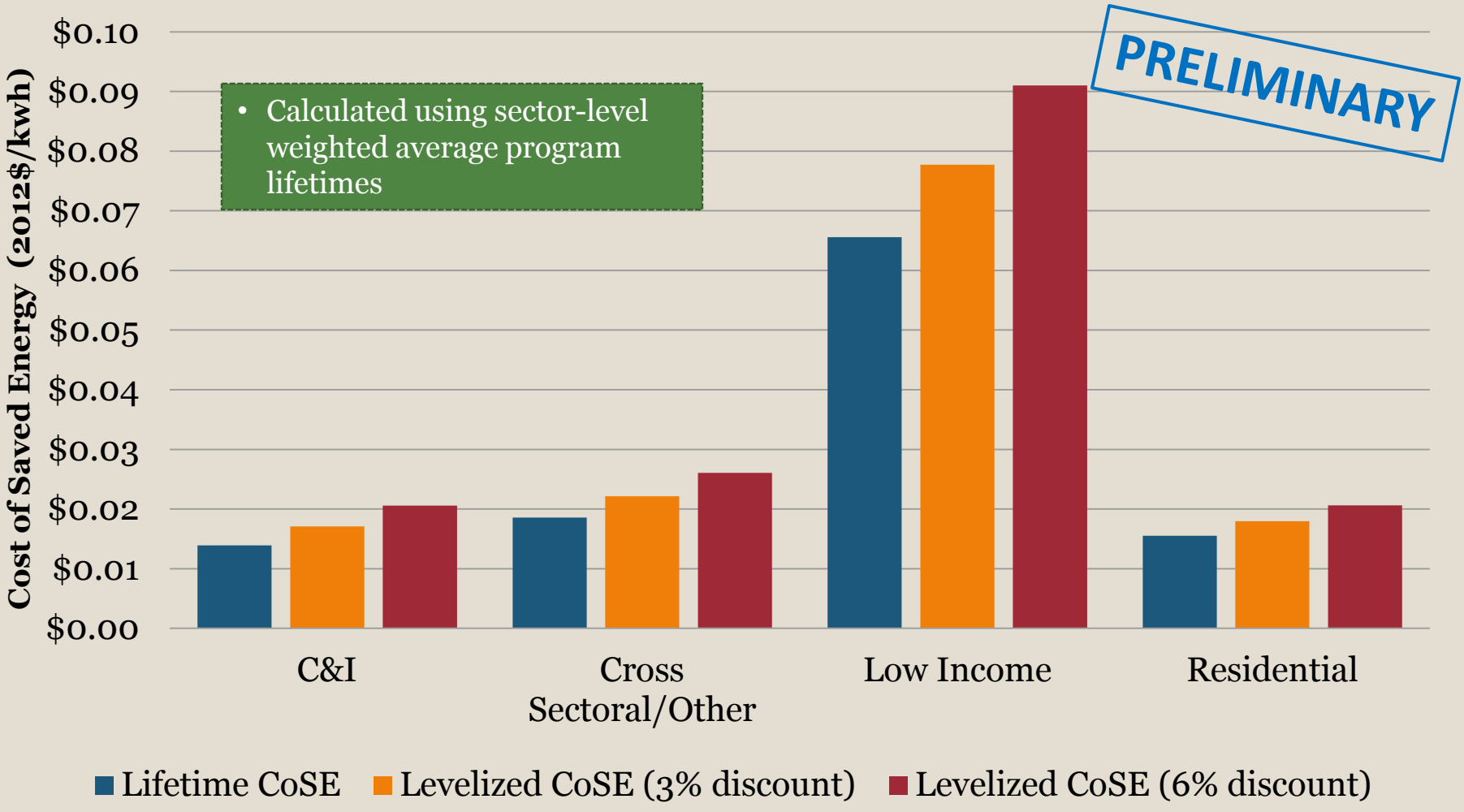
Obligatory Disclaimer

- These are *preliminary* results
  - Not intended to be cited, utilized in models or for wider dissemination
  - Final results will be available in a LBNL report scheduled for Fall 2013
- There is no such thing as a single CoSE, depends on data and intended use of the CoSE values
  - We report ranges to reflect data uncertainty, different assumptions
- In the full report, these values will include:
  - Administrator costs divided by just first year savings
  - Administrator costs divided by simple lifetime savings
  - Levelized Administrator CoSE – 3% and 6% discount rates

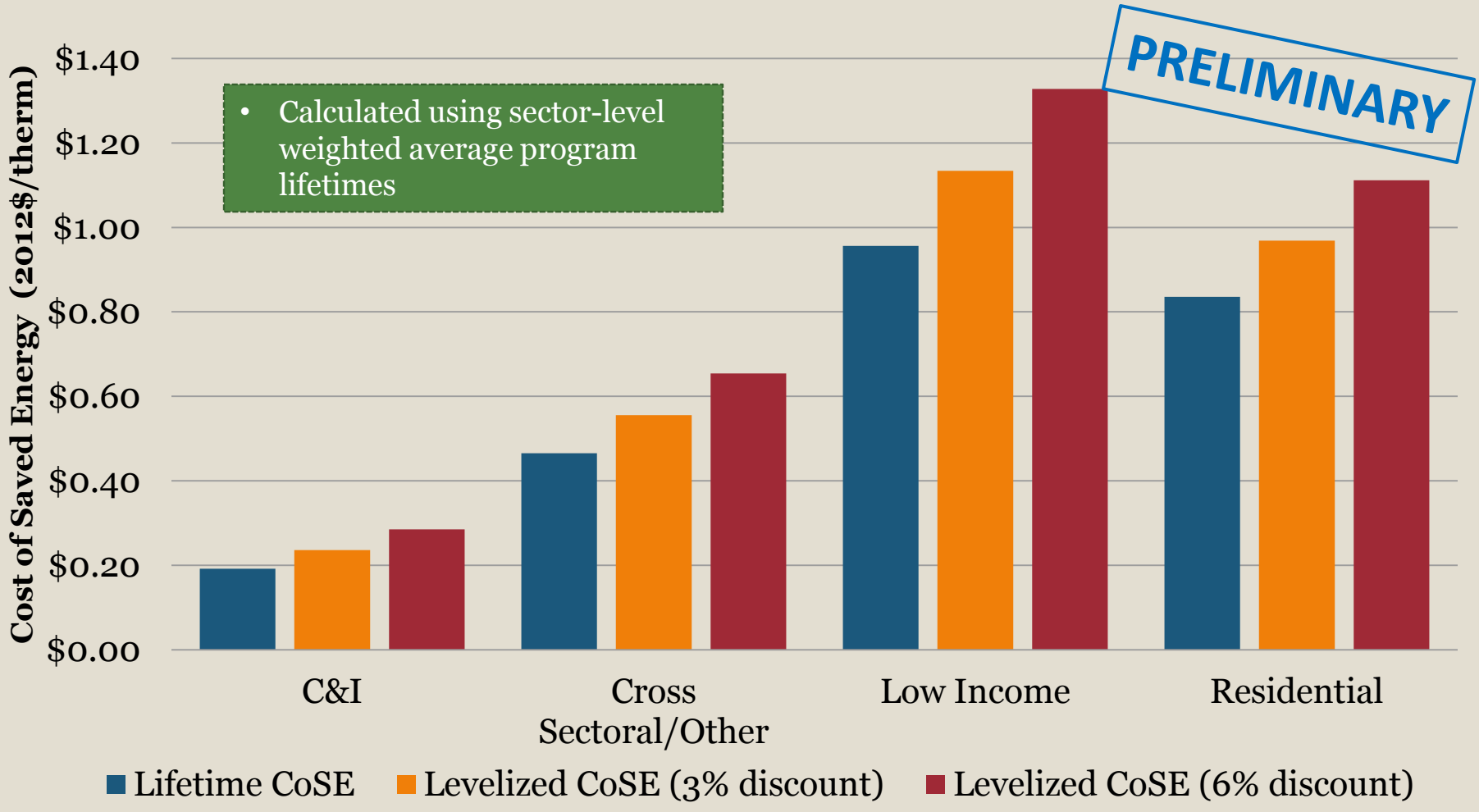
Electric Programs: Levelized Administrator CoSE–National by Sector



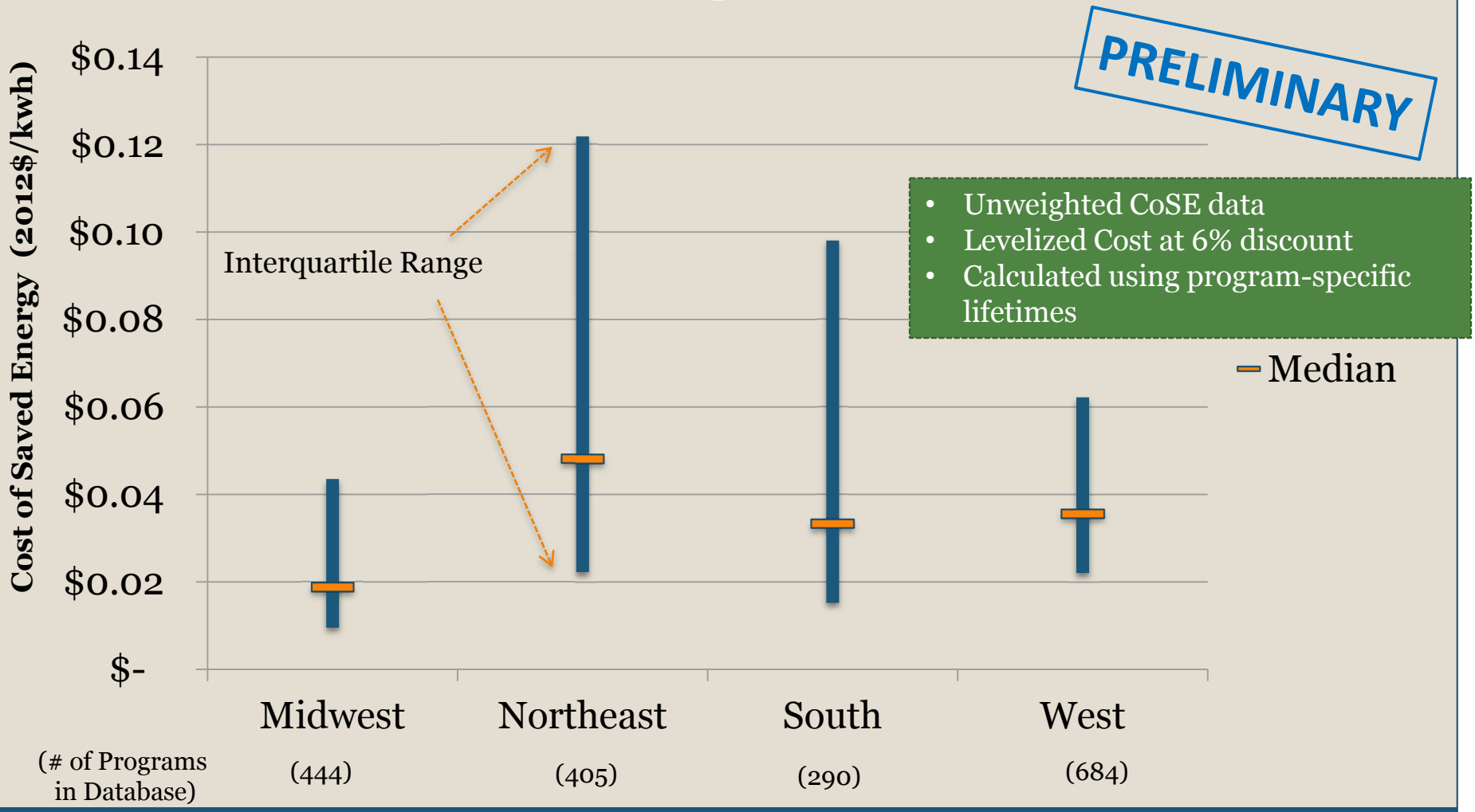
Administrator CoSE—Electric Programs
National Weighted Average Values—Sector



Administrator CoSE—Gas Programs
National Weighted Average Values—Sector



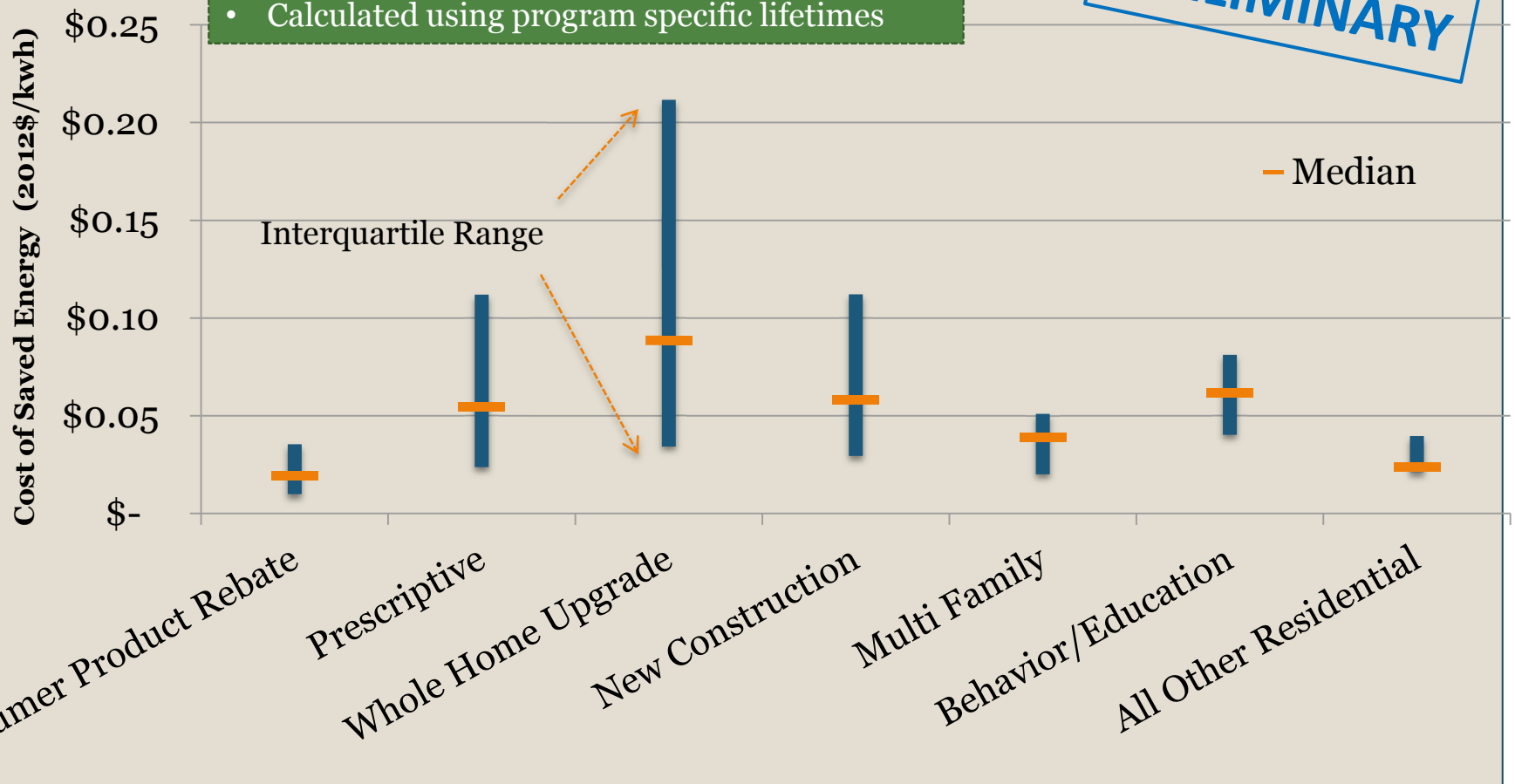
Electric Programs: Levelized Administrator CoSE by Region



Electric Programs: Residential Programs Levelized Administrator CoSE

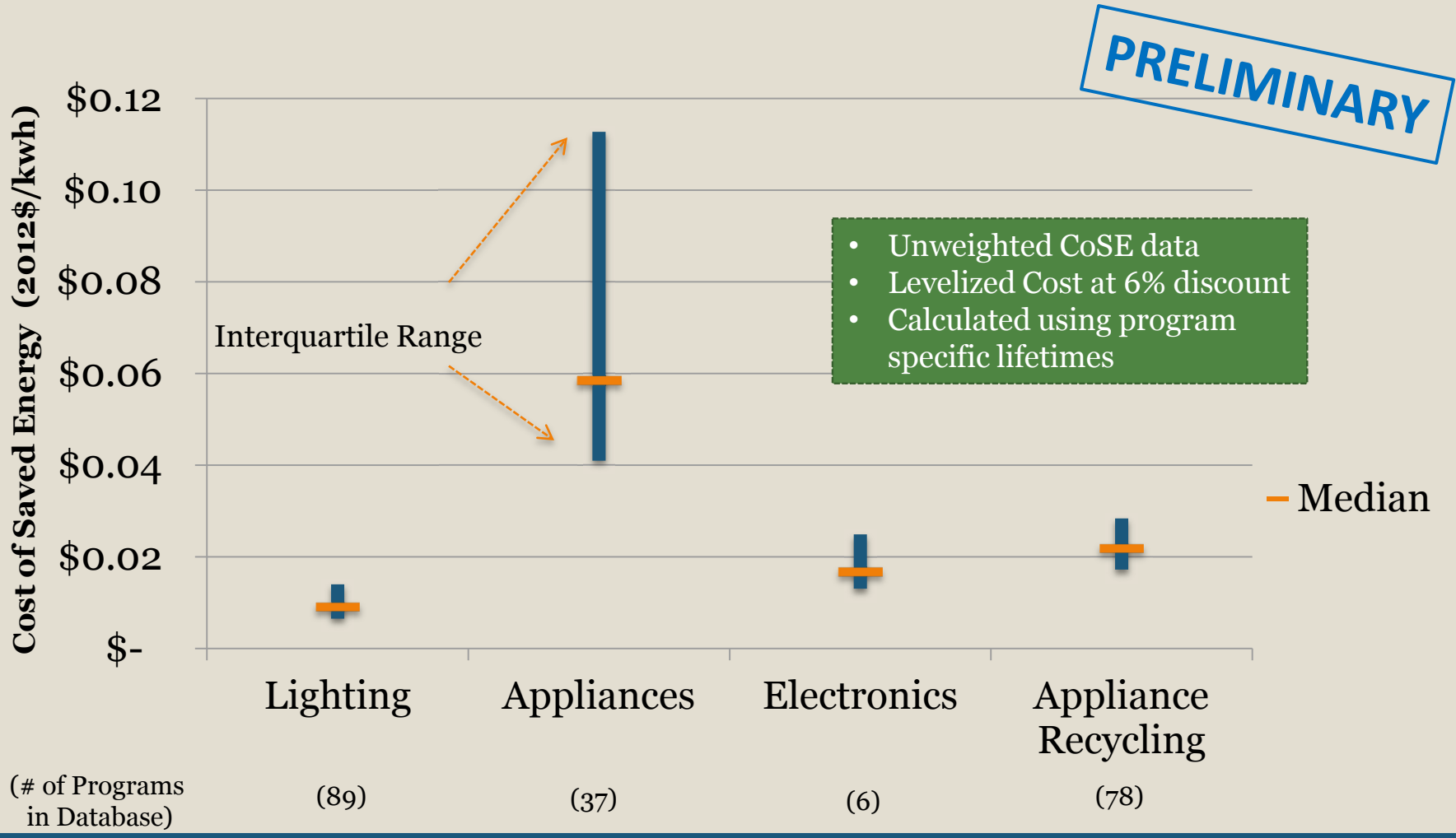
- Unweighted CoSE data
- Levelized Cost at 6% discount
- Calculated using program specific lifetimes

PRELIMINARY



(# of Programs in Database)	(223)	(157)	(154)	(103)	(47)	(27)	(11)

Electric Programs: Detailed Residential Product Rebates Levelized Administrator CoSE



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Next Steps

Questions Questions Questions…

- What is the cost of efficiency to administrators (and participants)?
  - What does it cost to achieve efficiency savings for different program types and in different 'situations'?
  - What is the range of costs for incentives, administration, marketing, etc?
  - Is the cost per kWh or therm saved going up or down?
  - What should system planners assume for the future costs of efficiency? Can EE be counted on for future resource planning purposes?
- What influences the cost of saved energy ?
  - State Policy Environment?
  - Program Administrator Experience?
  - Achieved Program Savings?
  - Retail Rate Environment?
  - Scale of Program?
  - Labor Costs in State?
  - Load Characterization (level of residential versus C/I load)?
  - Level of Cost Effectiveness Testing?

Next steps

Initial Presentation and Analysis of CoSE

- Portfolio, sector, program
- National, regional, state, climate zone, building energy code status
- Some econometric regression on theorized influences

Outreach

- Policy brief on metrics and program types: August 2013
- First technical paper: Fall 2013
- Continued coordination with partners on data collection and analyses and annual/biennial updates to program categories and definitions

Future Efforts

- Continue collecting data and recruiting partners
- Outreach to encourage consistent reporting
- More analyses and public publications/
- presentations

Thank You

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