What Does It Cost to Save a Therm?

Presented by Greg Leventis

NARUC 2020 Winter Summit

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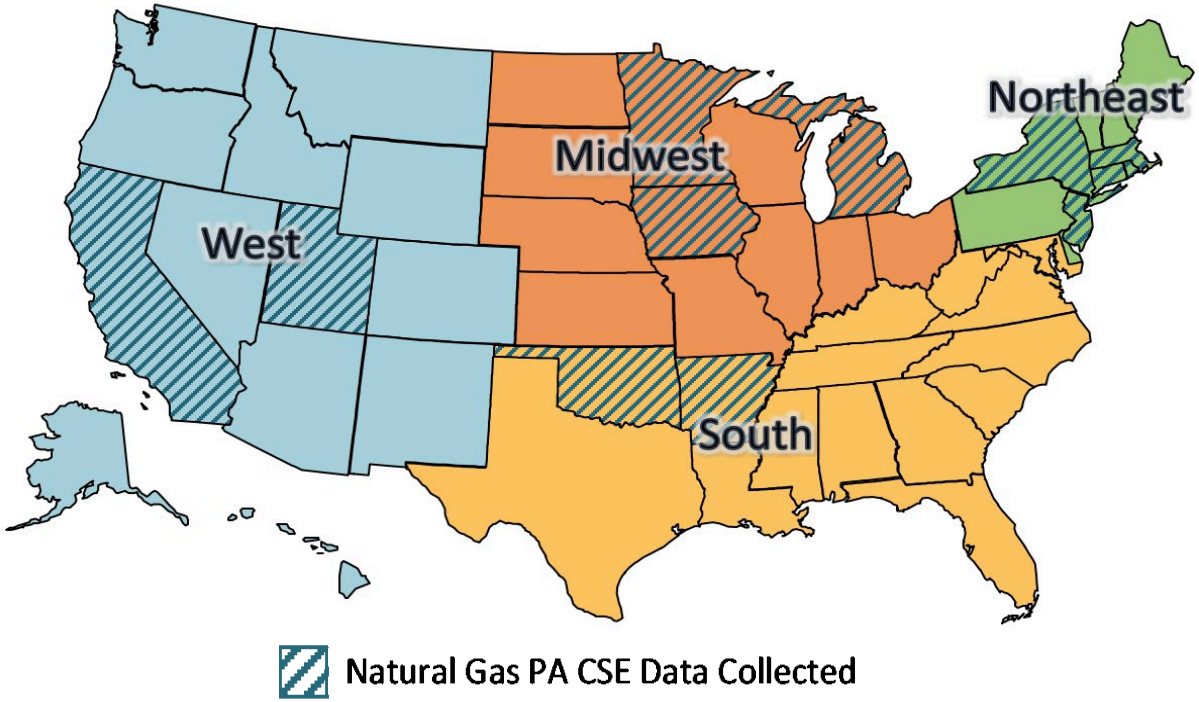
Berkeley Lab Studies on Cost of Saving Energy

- Program typology (2013)
- First study on program administrator (PA) cost of saving energy (2014)
  - Natural gas and electric investor-owned utilities (IOUs)
  - Program administrator (PA) cost – cost to utility or third-party administrator
  - Analysis at program level
- Updated analysis for electricity in 2015, including total cost
  - Total cost = PA cost + participant contributions
- Most recent electricity analyses for IOUs
  - 116 PAs in 41 states, 2009-2015 (2018)
  - Cost of saving peak demand, 9 states, 2014-2017 (2019)
- New analysis for publicly owned electric utilities (2019)
  - 111 PAs, representing 219 utilities in 14 states, 2012-17
  - Analysis at market-sector level
- New study on cost of saving gas — *report forthcoming*
  - By Steve Schiller, Ian Hoffman, Sean Murphy, Greg Leventis and Lisa Schwartz

https://emp.lbl.gov/projects/what-it-costs-save-energy

New Study on Cost of Saving Gas

- 37 PAs from 12 states: AR, CA, CT, IA, MA, MI, MN, NJ, NY, OK, RI and UT
  - Account for about 50% to 70% of annual national spending on natural gas efficiency programs
- Representation in all four census regions
- Portfolio and market sector-level spending and savings
- 2012-2017 study period



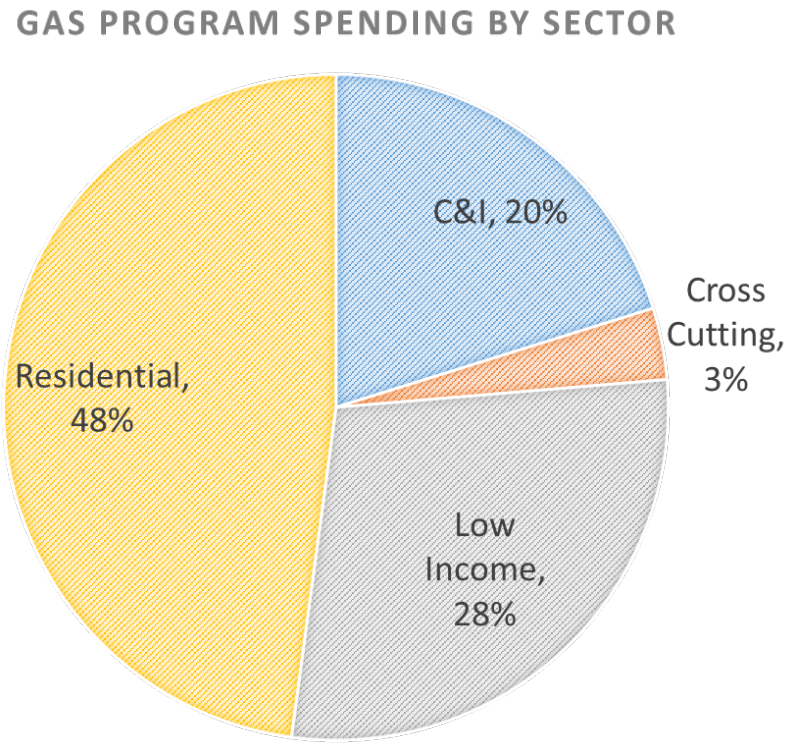
Scale of Efficiency Investments

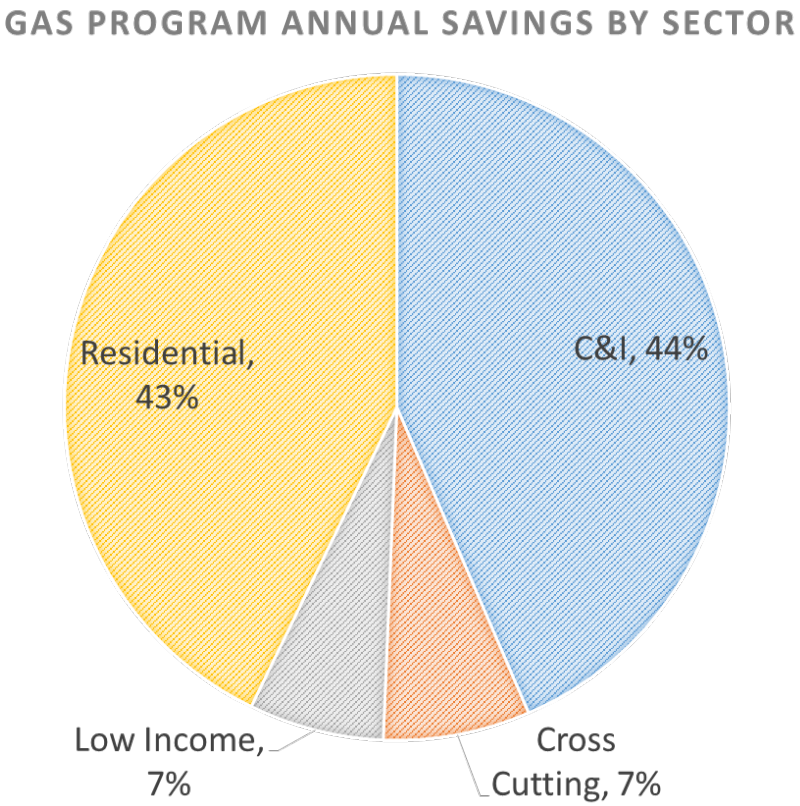
- About $5B invested, saving nearly 1.4B therms for our sample

Sector	Annual Gross Savings (millions of therms)	Spending ($2017 million)	Average PA CSE ($2017)	Median PA CSE ($2017)
Residential	587.3	$2,283.7	$0.43	$0.40
C&I	598.1	$989.6	$0.18	$0.24
Low Income	91.1	$1,350.1	$1.47	$1.16
Portfolio (All Sectors)	**1,375.0**	**$4,971.1**	**$0.40**	**$0.34**

Spending by Sector

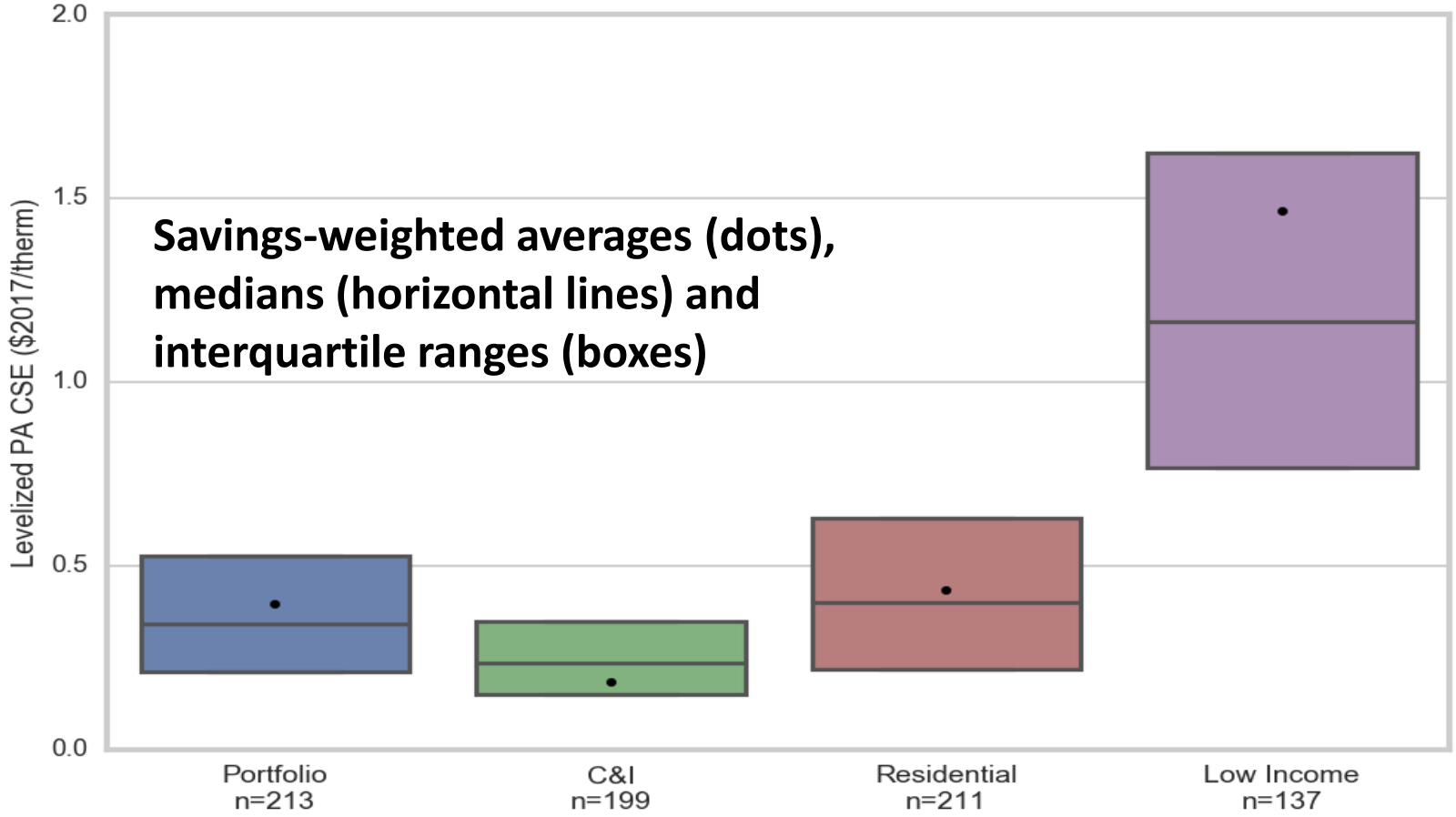
- Residential and low-income sectors account for 48% and 28% of spending in our sample, respectively
- Annual *savings* for residential and C&I are roughly equivalent





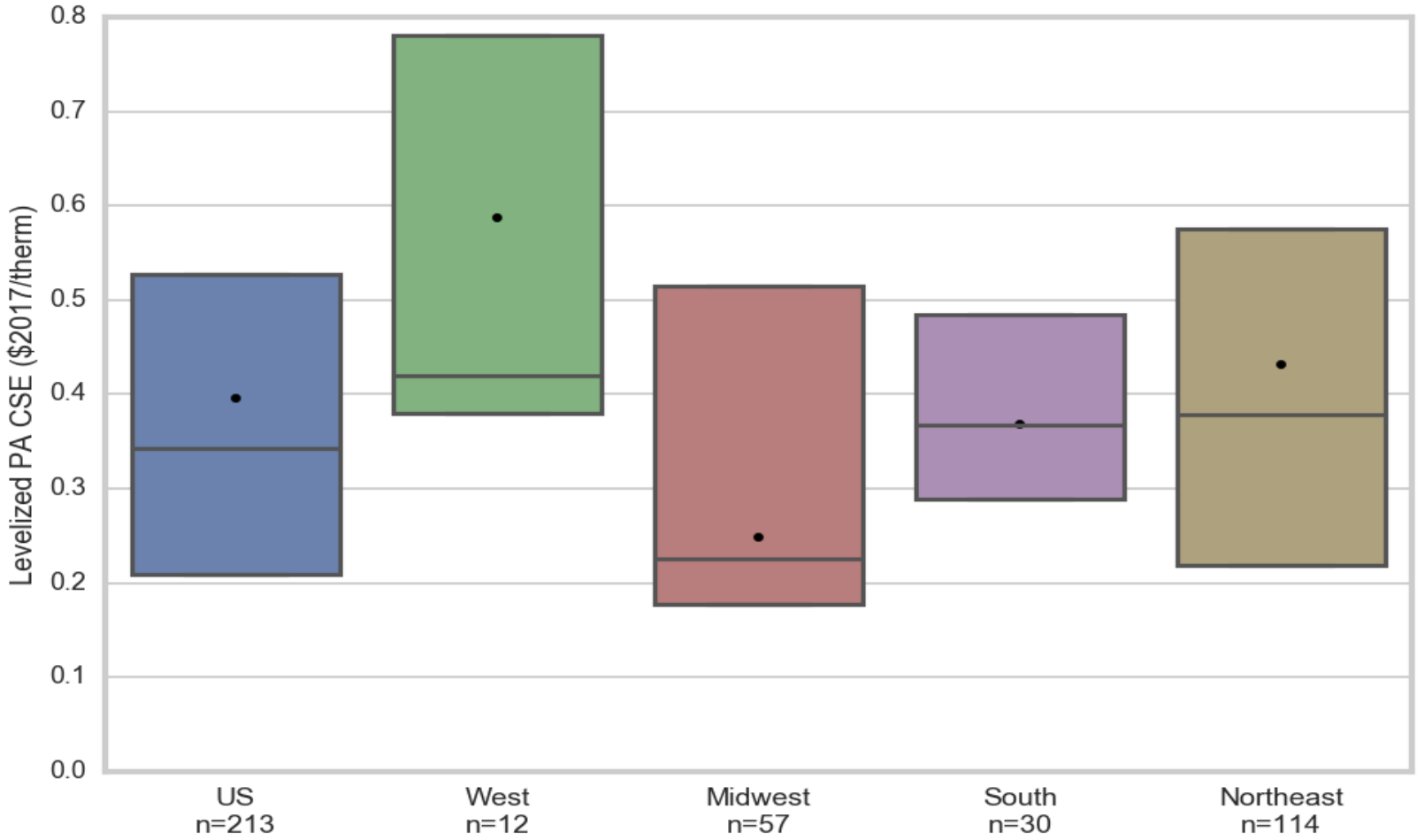
Cost by Market Sector

- Savings-weighted average PA cost of saving gas is $0.40/therm for our 12-state sample over the study period
- The cost of saving NG in a given jurisdiction can be compared to the avoided costs for that jurisdiction

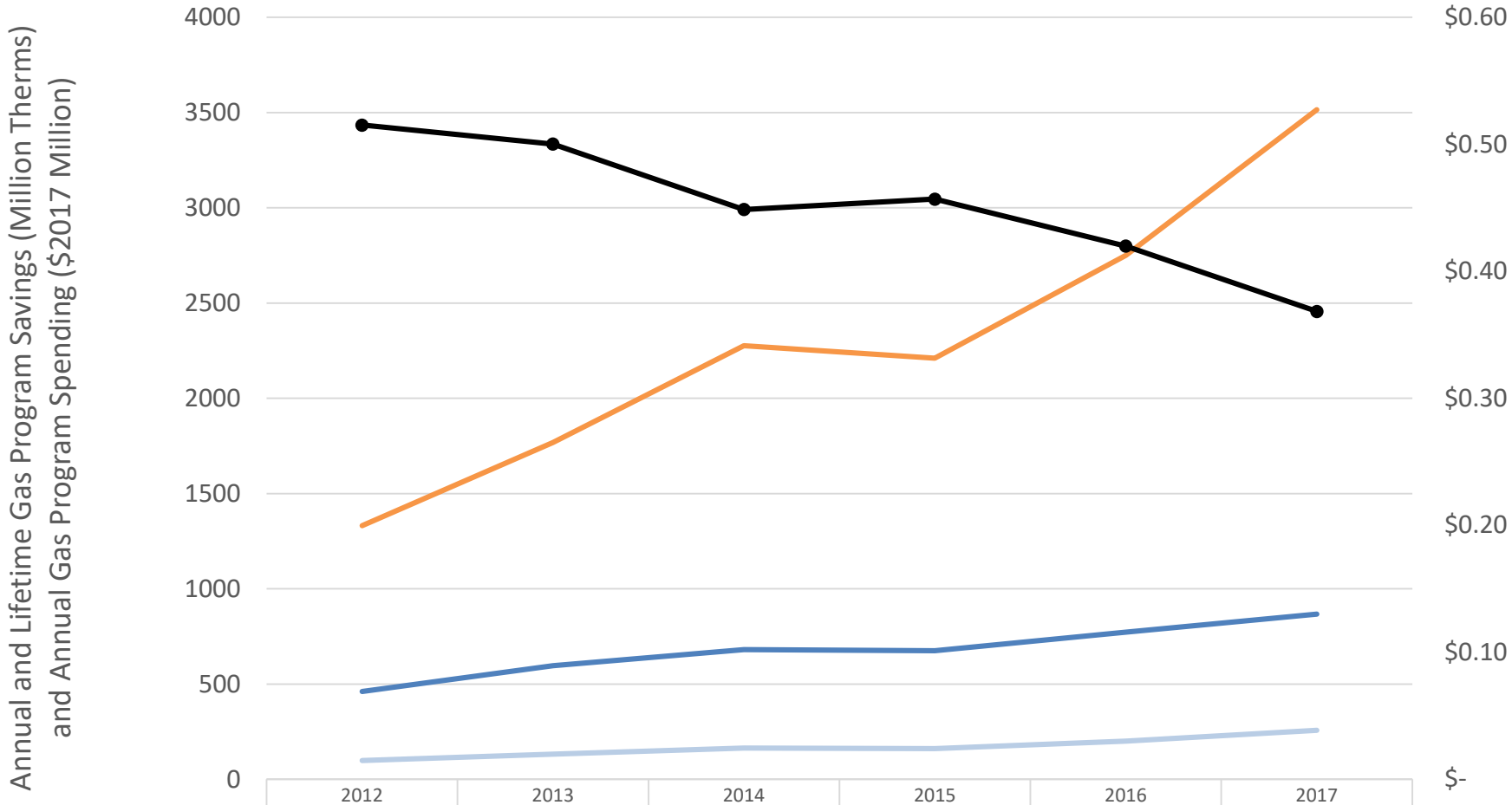


Costs by Region

- Cost/therm varies by region—Midwest $0.25 vs. West $0.59



Cost and Savings Trends



	2012	2013	2014	2015	2016	2017
Annual Savings (Million Therms)	98.6	132.7	164.4	161.4	200.7	257.4
Spending ($2017 Million)	$460.89	$597.08	$680.81	$675.58	$772.26	$867.11
Lifetime Savings (Million Therms)	1330.8	1767.5	2276.5	2209.8	2750.0	3514.6
Levelized PA CSE ($2017/therm)	$0.52	$0.50	$0.45	$0.46	$0.42	$0.37

Data and Reporting Challenges

- Data quality and screening challenges—for example, program administrator definition, estimation and reporting of:
  - Savings metrics
  - Program costs
  - Market sectors
  - Program types
  - Measure lives
- Reporting of gas program data has improved in many states. But significant and meaningful opportunities remain for great greater transparency, rigor and comprehensiveness in data reporting.
- Work could be expanded in various ways—for example, expand data collection, provide technical guidance on improved reporting, analyze drivers of cost trends, and estimate cost by program type.

For More Information

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Additional slides

Definition: PA Cost of Saving Gas

Levelized Program Administrator Cost of Saving Gas (PA CSE)	The cost to the *program administrator* for achieving gas savings over the economic lifetime of the actions taken, discounted back to when the costs were paid and the actions occurred

Assumptions and inputs:

- 6% discount rate (real)
- Estimated program average measure lifetimes
- Total program cost (not including participant contributions), including incentives (2017$)
- Gross annual therms saved

Program Administrator Cost of Saving Gas =

$$\frac{\textit{Capital Recovery Factor} * (\textit{Program Administrator Costs})}{\textit{Annual Gas Savings (in therms)}}$$

$$CRF = \frac{r(1+r)^N}{(1+r)^N - 1}.$$

r = the discount rate

N = estimated program lifetime in years and calculated as the savings-weighted lifetime of measures or actions installed by participating customers in a program