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Moving Beyond First-Year Savings:

Minnesota's experience with counting behavioral energy-efficiency programs

ACEEE National Conference on Energy Efficiency as a Resource

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  - Financing
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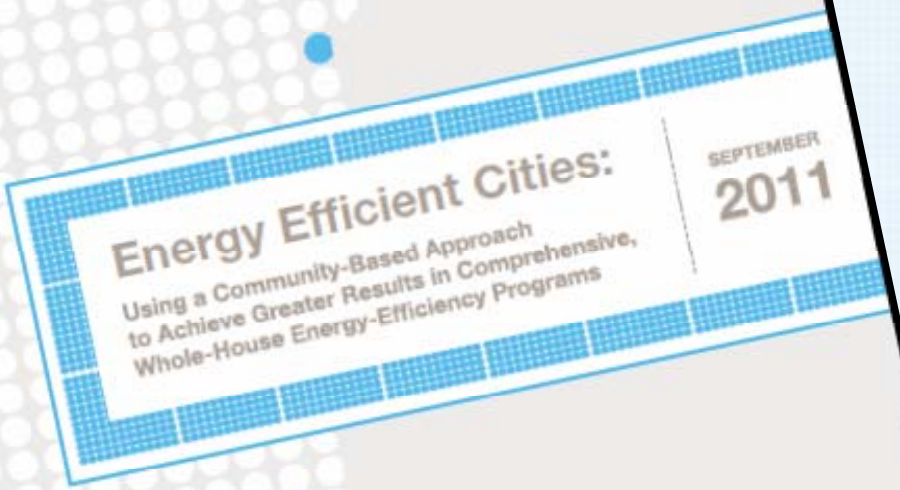
Soon to be released, newest CEE report



Outline

- Minnesota's 1.5% energy efficiency goal
- Conundrum of behavioral programs counting towards MN 1.5% goal
- Minnesota's approach
- A conceptually better approach?

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Minnesota’s 1.5% Energy Efficiency Goal

Long history of EE programs in MN

- Avoided need for new capacity
  - Xcel Energy has avoided building 9 power plants; additional avoided plants from other utilities
- Environmental benefits
  - Has been leading source for emissions reduction
- Low-cost, more secure energy
  - Help maintain low-cost energy

Key features of MN's approach

- Saving goal is 1.5% per year (electric and gas)
- Counts "first year savings" – annual average savings counted in the year the measure is installed
- Utilities implement and report on program achievements
- Division of Energy Resources reviews and approves plans (every 3 years) and reported savings (every year)
- Incentive mechanism

First-year savings claimed for 1.5% goal are:

Incremental
"new" savings that occurred in year measure was installed

&

Equal to the **Average Annual Savings** over the life of the measures

as reflected in regulatory filings…

Table 1: Total Electric CIP Savings and Spending by Year, 2006-2009[3]
(Incremental First-Year Savings)

(Incremental First-Year Savings)

	MWh Savings	Spending	Savings (tons)
2006	411,999	$82,245,240	375,537
2007	468,070	$91,239,426	426,646
2008	597,288	$102,010,572	544,428
2009	648,163	$144,554,140	590,801

Source: MN Division of Energy Resources
"Minnesota Conservation and Improvement Program
Energy Savings and Carbon Dioxide Savings Report for 2008 – 2009"

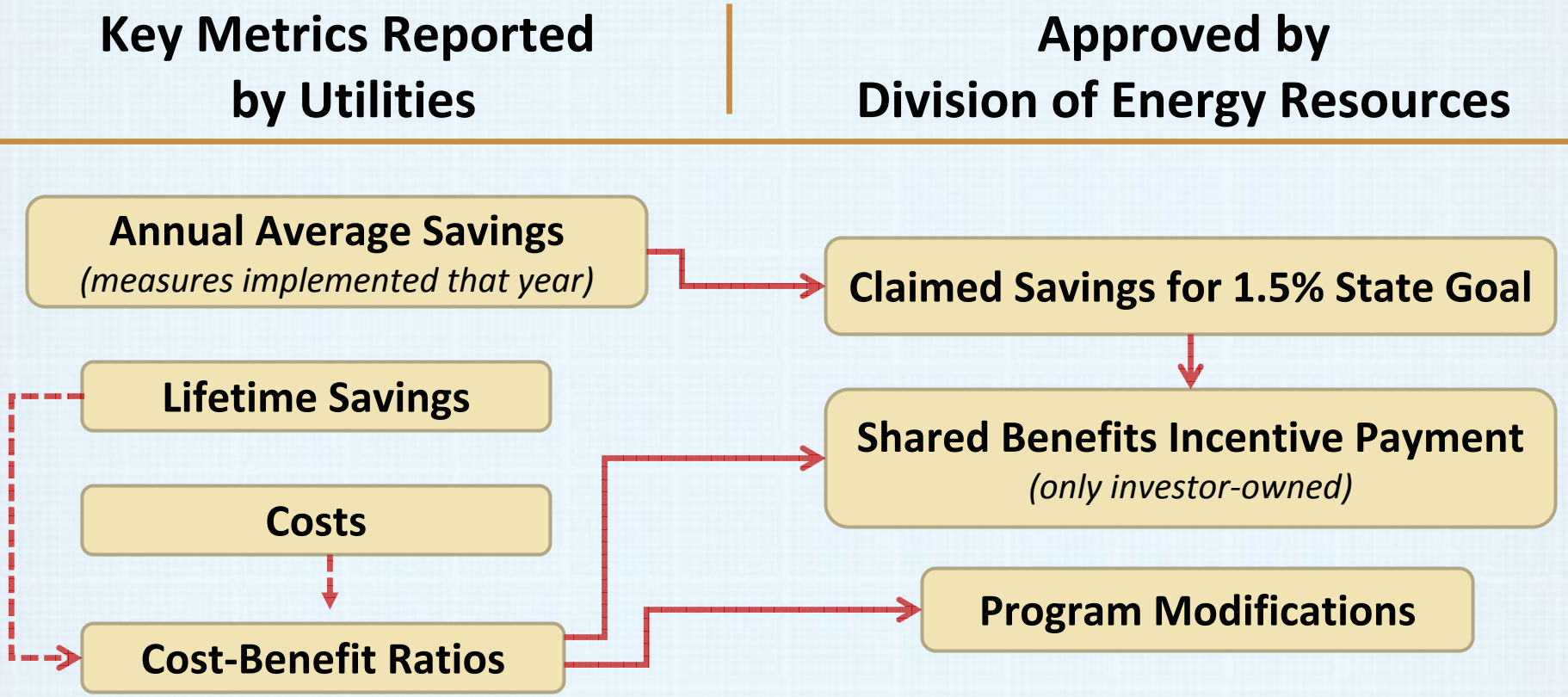
General/Other	
Energy and Demand Savings - Generator	
Average Annual kWh Savings per Participant	286

Average Annual kWh Savings per Participant

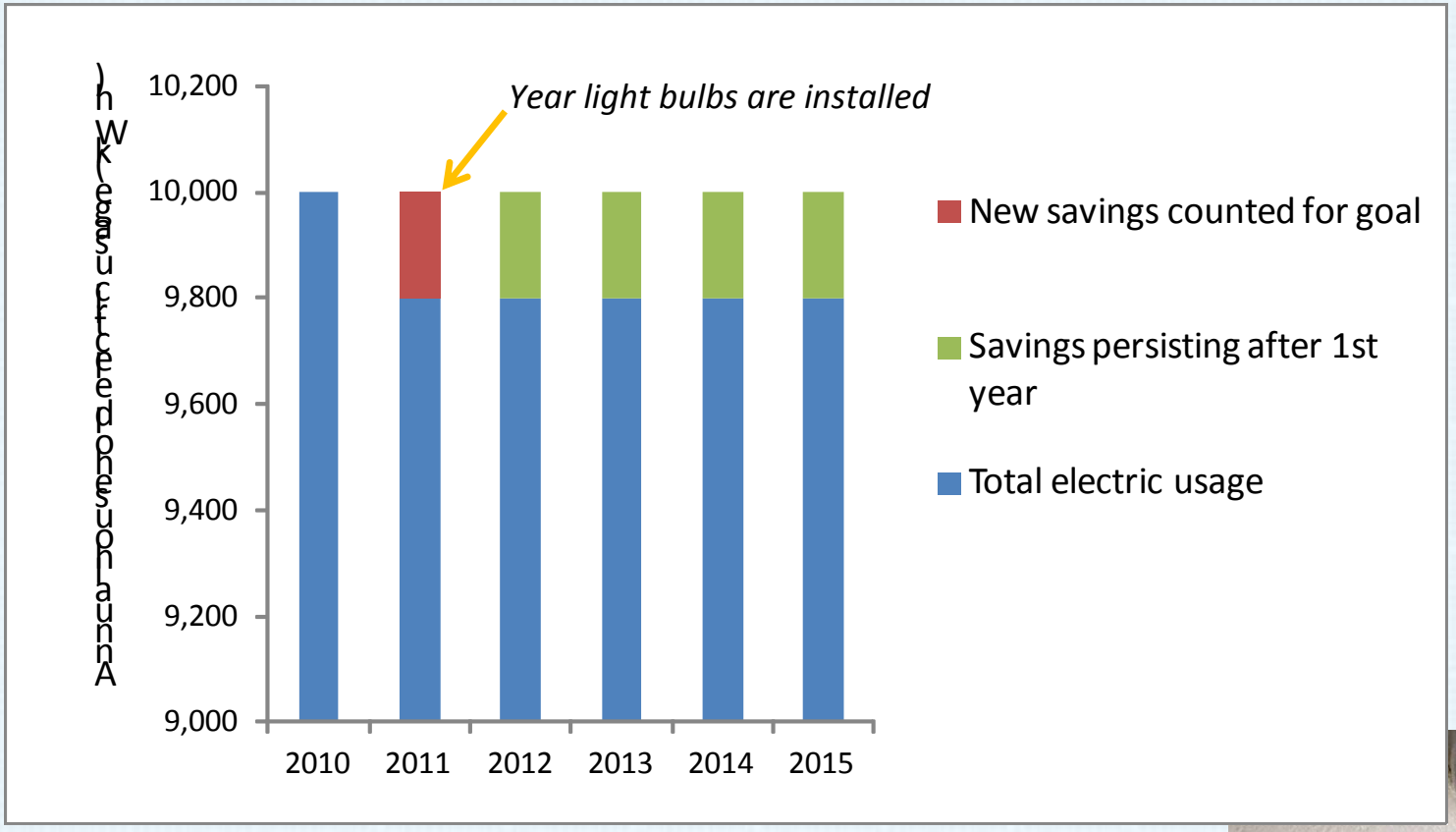
Lifetime kWh savings	4,230,399,437
Cost per kWh Lifetime	$0.0130
Average kW Savings per Participant	0.08
Annual kW Savings - Generator	90097
Cost per KW Saved	$611.07
Cost/Benefit Results	

Source: Xcel Energy
"2010/2011/2012 Triennial Plan: Minnesota Gas and Electric Conservation Improvement Program"

Annual reporting towards MN 1.5% goal



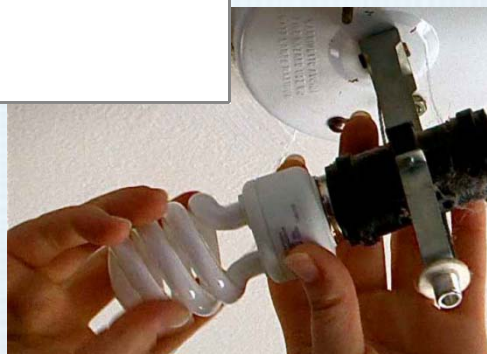
Hypothetical Example: Lighting retrofit project in an individual house



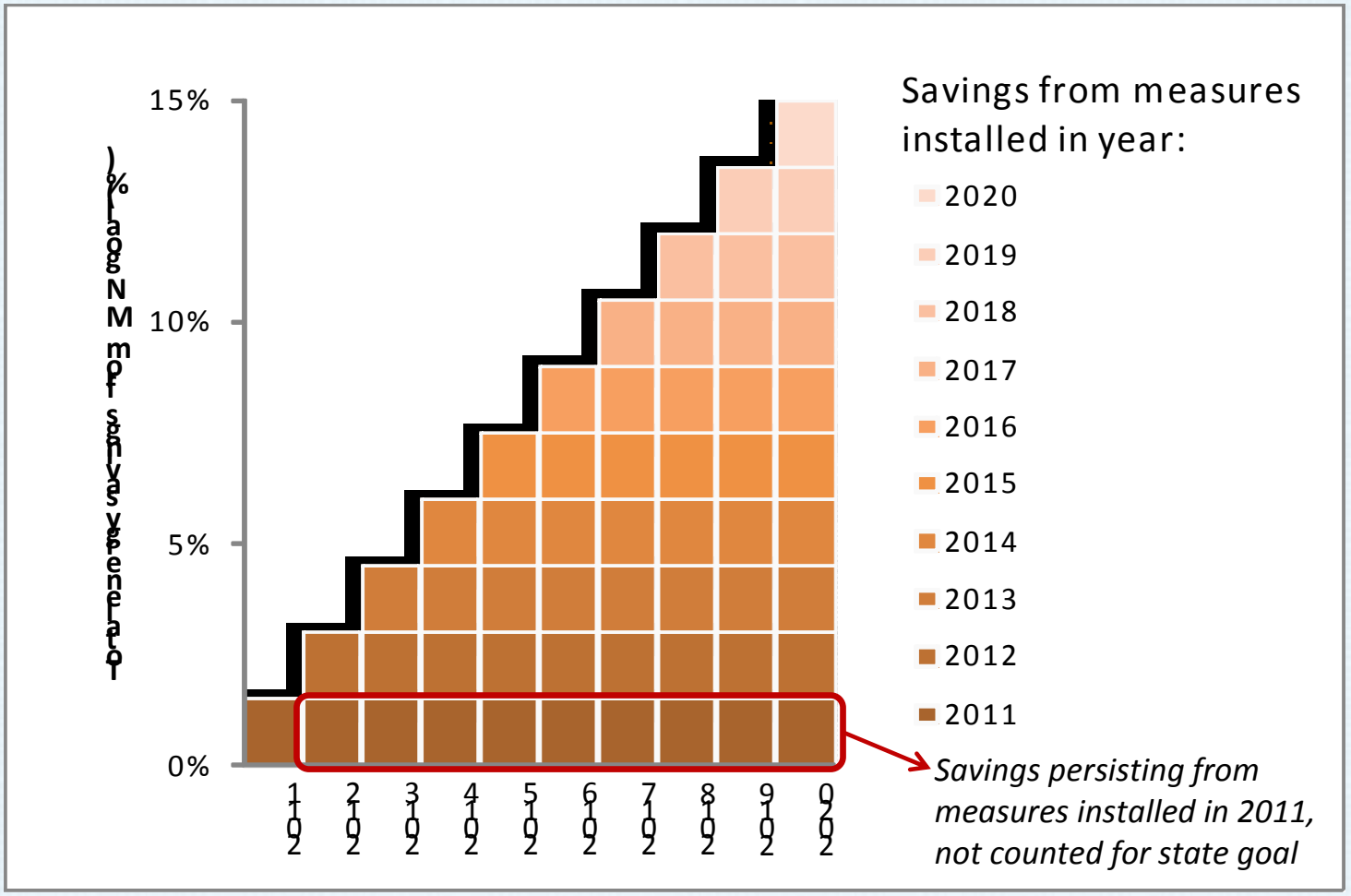
Average annual savings: 200 kWh

Lifetime savings: 10,000 kWh

Counted for goal: 200 kWh



How First Year Savings Accumulates



TECHNICAL NOTE: For reference, the average measure life (across a utility's program portfolio) is about 15 years, for the majority of MN IOUs at present.

The behavioral program conundrum

What are behavior-based programs?

- Target occupant behavior (in contrast to traditional equipment-based EE programs)
- Generally require on-going intervention in order for savings to continue
- Energy savings is highly dependant on quality of program delivery, and varies by participant

REPORTING METRICS FOR 1.5% GOAL:

Average annual savings

Lifetime savings

Costs

Cost-benefit analysis

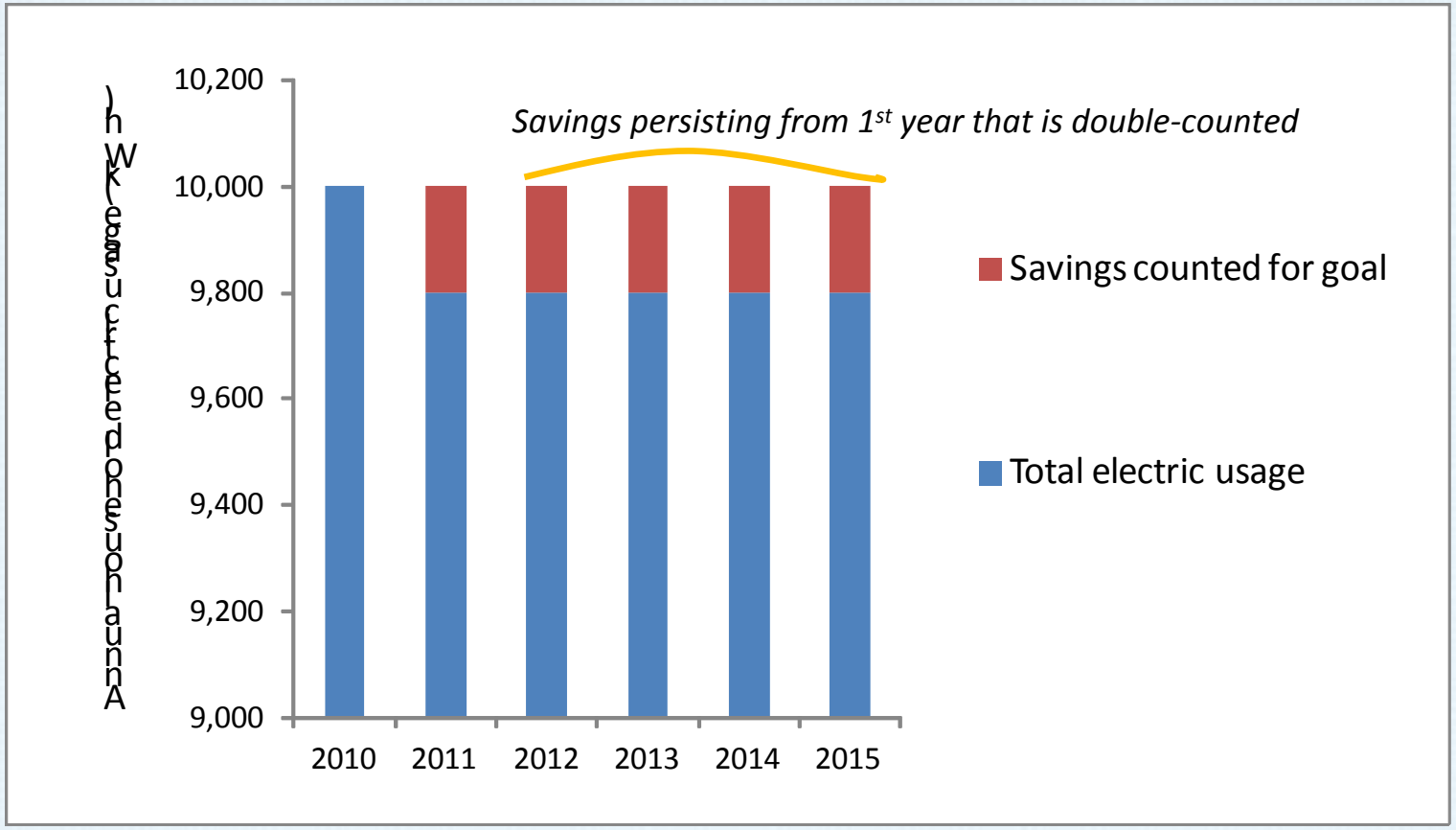
Challenges of reporting savings from behavioral programs under a first year savings regime

- Ongoing year-by-year measurement (through statistical techniques) is usually required to determine savings
- Costs occur in each year, not just 1st year
- Lifetime, and lifetime savings, may be unknown at the start of the program

Initial approach: Assume 1-year measure life

- If program lasts multiple years, then costs and benefits can be counted in each year of the program
- This approach was taken for initial “pilot programs” of Minnesota utilities, until a more permanent solution could be found

Initial approach has double-counting issue

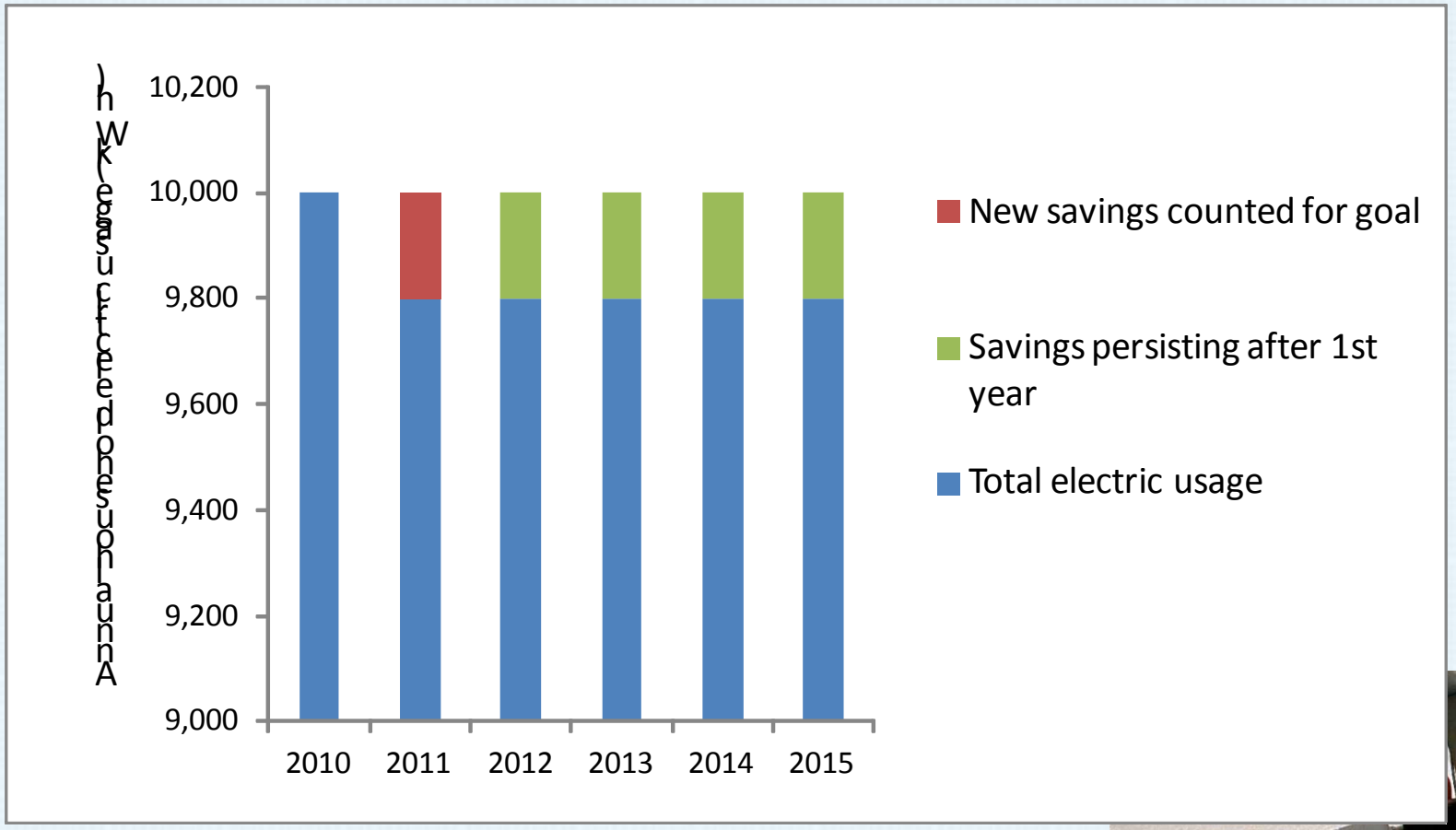


Average annual savings: 200 kWh

Lifetime savings: 10,000 kWh

Counted for goal: 10,000 kWh

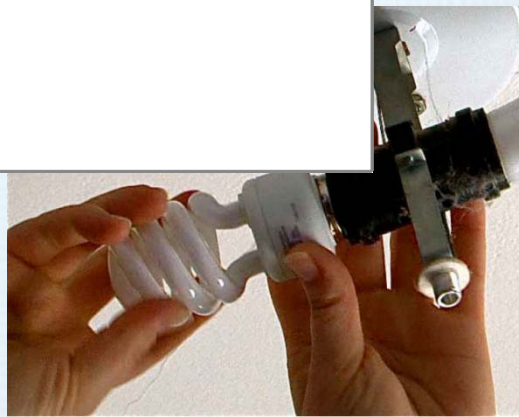
Five times the claimed savings of lighting example



Average annual savings: 200 kWh

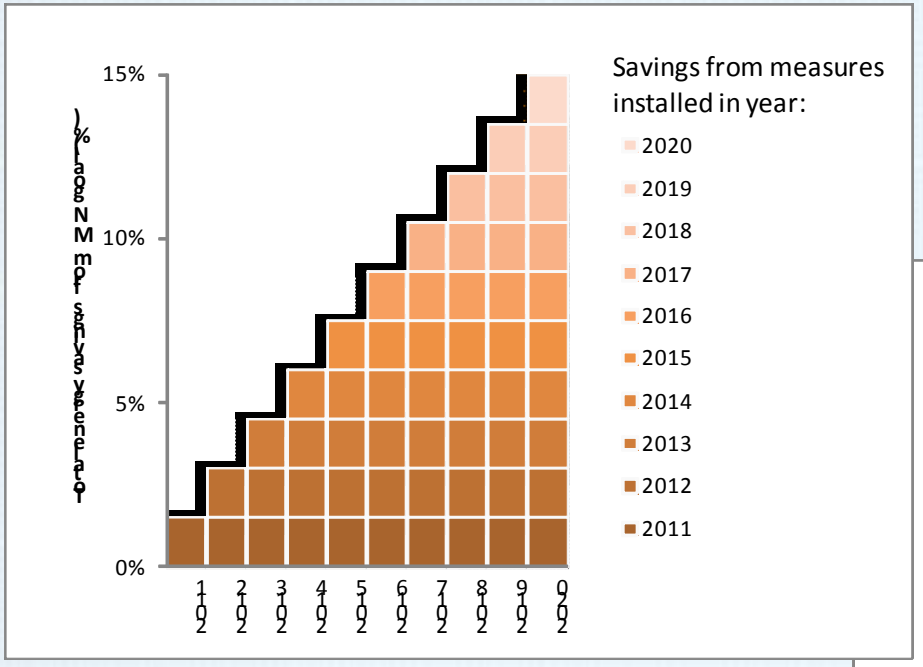
Lifetime savings: 10,000 kWh

Counted for goal: 200 kWh

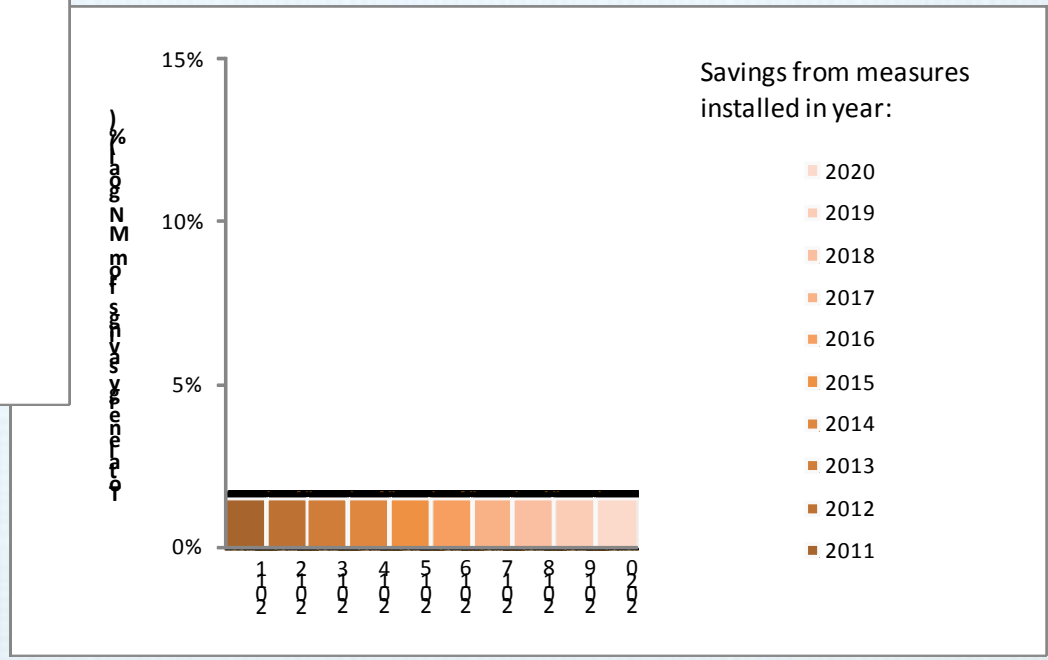


Could significantly reduce long-term impact of MN 1.5% goal

From this:



To (potentially) this:



Ratepayers would also pay extra towards utility incentives (for IOUs)

The claimed savings would still count towards utilities incentives after the first year of savings, even for savings that was not incremental

1-year life method over multiple years can also be inconsistent with resource planning

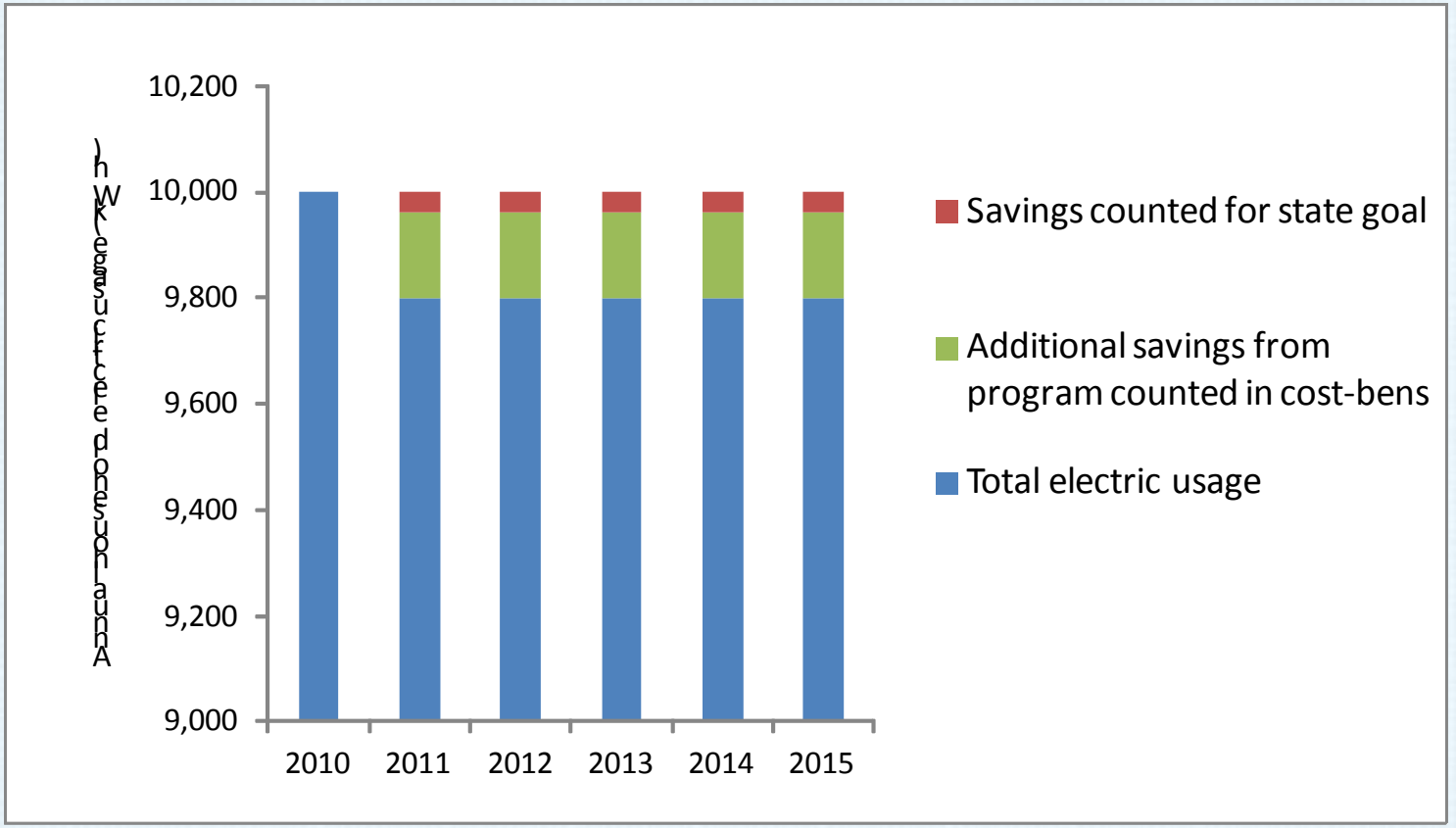
For example, saving goals for one utility in Minnesota reported for 1.5% “first year savings” are different than reported in 15-year resource plan:

1.4%	Annual savings proposed to count towards MN 1.5% goal (2011-2013)
1.2%	Annual savings goal filed in 15 year resource plan (2011-2025)
1.1%	DER analyst estimate of proposed 2011-2013 savings targets when the savings from the behavioral programs (26% of total savings) are averaged over 15-year resource plan time-frame

Minnesota's Proposed Solution

5-year annual average method:

Divide total savings in each year by 5



Average annual savings: 200 kWh

Lifetime savings: 10,000 kWh

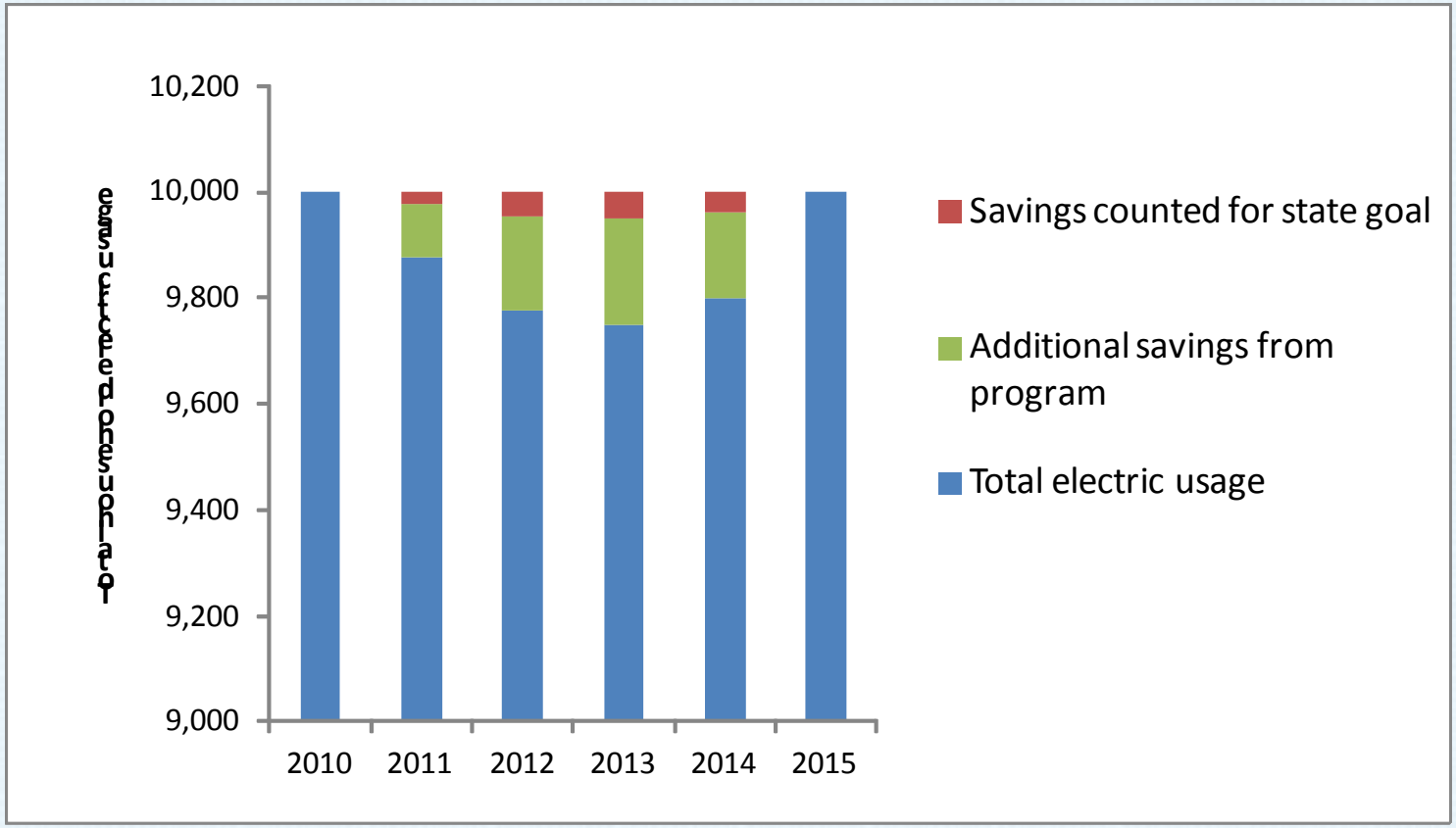
Counted for goal: 200 kWh

Setting 5-year measure life for claimed savings is policy decision, not technical question

- "How long do savings persist from behavioral programs" is an important research question, but not the important issue here

- "What benchmark should be used to average out the savings from behavioral programs, for the purposes of counting towards the state goal" is a policy question (5 years is somewhat arbitrary, but has logical basis)

Method works for shorter-life programs & programs where savings varies from yr to yr



Average annual savings:	160 kWh
Lifetime savings:	800 kWh
Counted for goal:	160 kWh

Method does not affect the cost-effectiveness of energy savings

- Cost-benefit test uses the total energy savings as an input, not the savings claimed for the state goal

- Cost-benefit results will be the same for a 1-year or 5-year behavioral program, all other things being equal (i.e., if costs are the same for each year, and savings are the same for each year, the cost-benefit ratios will be the same)

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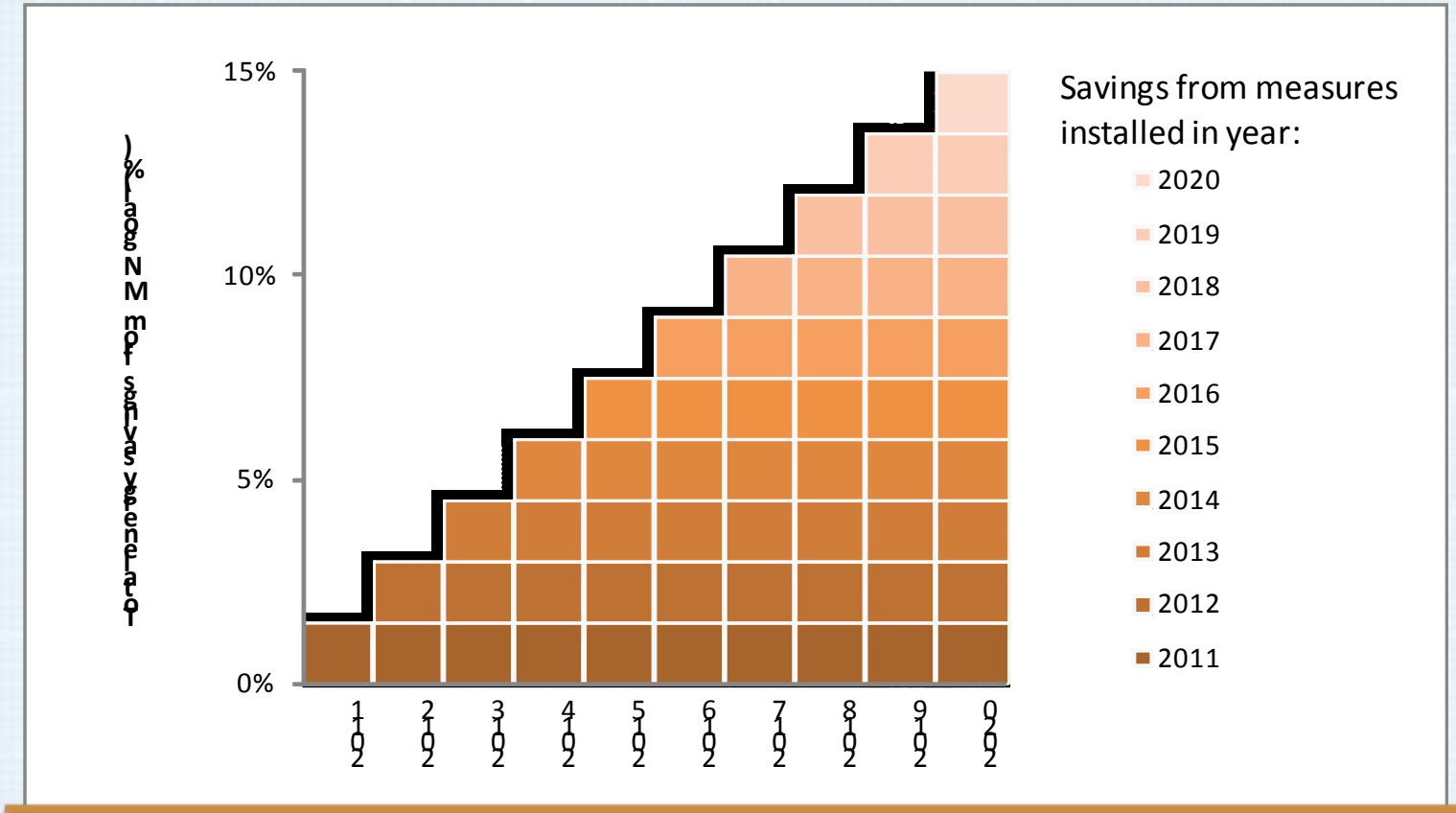
Moving Beyond First Year Savings – An Alternative Approach?

A possible alternative approach to better capture energy efficiency's value as a resource

- Set longer-term savings goals (e.g., 22.5% of retail sales over 15 years) with intermediate annual goals
- Integrate reporting for 1.5% goal with resource planning, over longer-term time horizon
- Use lifetime energy savings as the metric instead of annual average savings

Savings goals could include savings from measures installed in previous years



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Savings Goals:	1.5%	3.0%	4.5%	6.0%	7.5%	9.0%	10.5%	12.0%	13.5%	15.0%

Concluding thoughts

- Behavioral programs are important additions to portfolio – but they don't always fit in the traditional reporting metrics that have been used
- When setting rules for accounting, need to keep longer-term objectives in mind --- first year savings method (without modifications) is not ideal for counting energy efficiency as a long-term resource
- Credibility of energy efficiency as a long-term resource could be compromised unless accounting is done carefully

Questions?