

Behavior Programs and Persistence in Illinois

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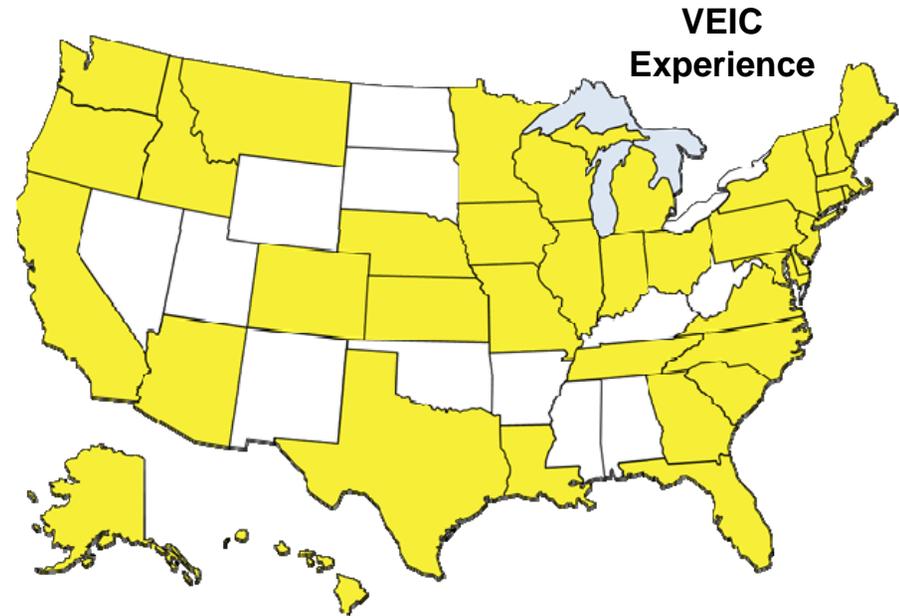
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About VEIC

veic.org

- Mission-driven nonprofit
- 30 years reducing economic & environmental costs of energy (specific focus on low income)
- Over 300 staff; offices in Vermont, Ohio, & Washington DC
- Services - scope is electric & thermal; buildings & transportation:
 - Implementation of energy efficiency, renewable energy, and transportation efficiency programs
 - Program design, review, evaluation
 - Policy, planning, regulatory support



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To Be Presented at IEPEC

Accounting for Persistence in Behavior Programs –
A Protocol and a Call for Discussion

My co-authors:

- Ted Weaver, First Tracks Consulting Service/ Nicor Gas
- Carly Olig, Navigant
- Olivia Patterson, Opinion Dynamics
- David Brightwell, Illinois Commerce Commission
- Illinois TRM Technical Advisory Committee

Agenda for Today

- Introduce savings persistence in behavior programs
- Identify the importance of accounting for persistence
- Present the approach developed for the Illinois TRM
- Discuss its implementation
- Review the assumptions used
- Ask for your input
- Answer questions

Persistence in Savings from Behavior Programs

- Evaluations of HERs-type programs show that savings continue after “treatment” stops
- Studies so far show that some level of savings persists for at least 1 and up to 3 years – but at declining levels over time
- On average: 15-30% decay/year (electric programs)
- Lots still left to learn...

See:

Khawaja, M.S., and J. Stewart. 2014. Long-run Savings and Cost-effectiveness of Home Energy Reports Programs. Cadmus.

Skumatz, L. 2016. Persistence of Behavioral Programs: New Information and Implications for Program Optimization. The Electricity Journal 29: 27-32.

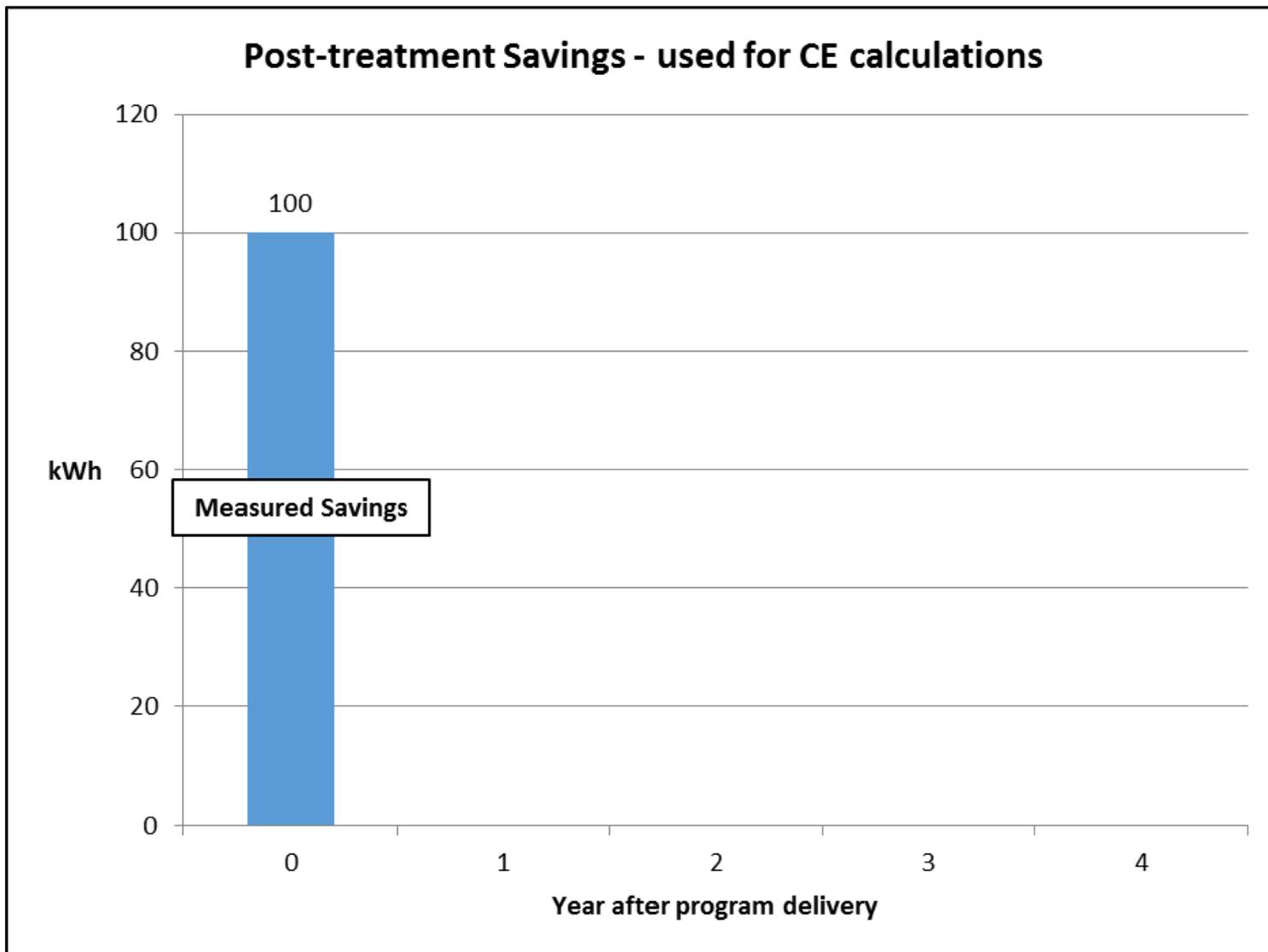
POLL

Are you assessing persistence in your
behavior programs??

Implications of Savings Persistence

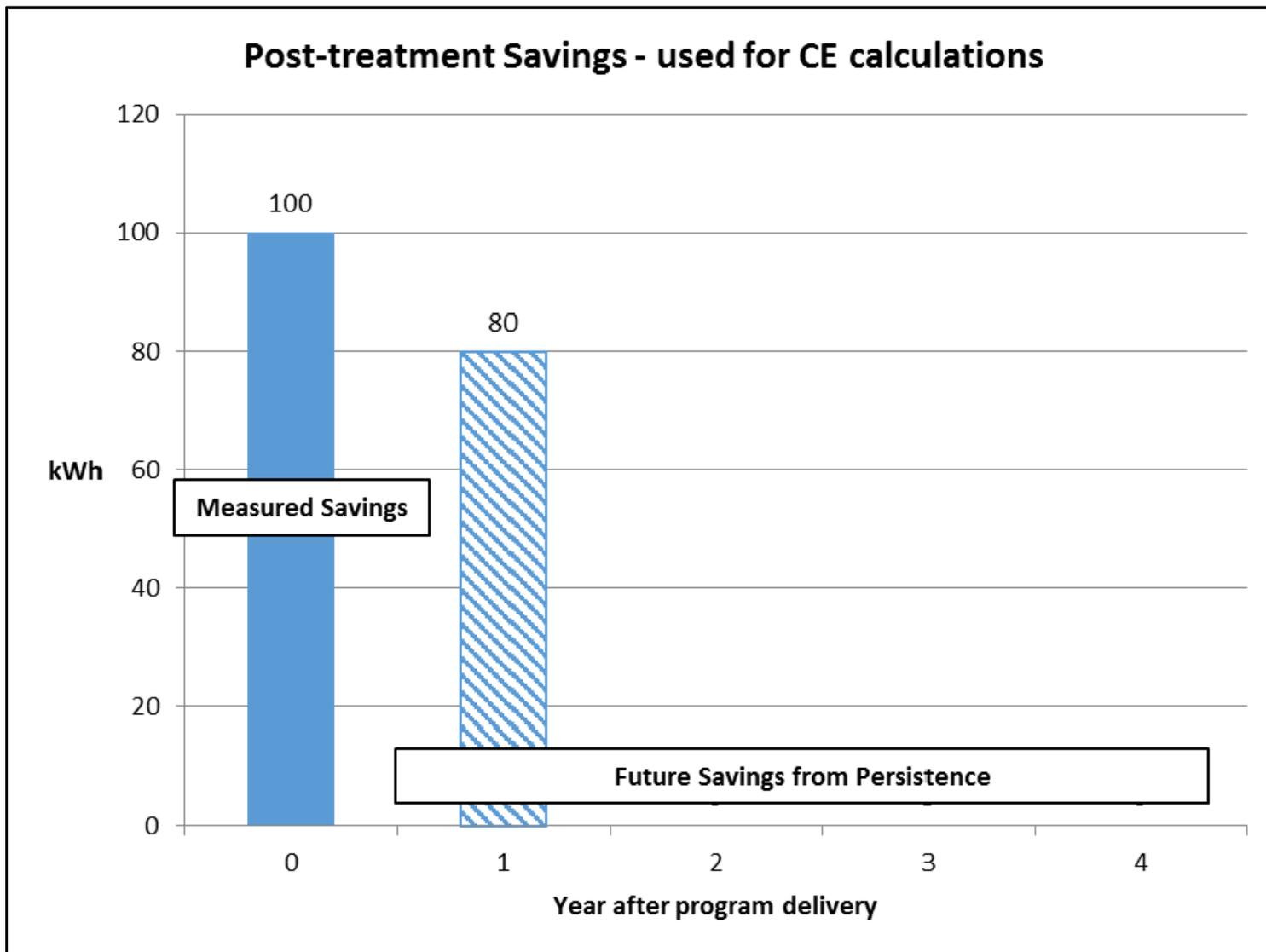
- This means that savings in future years are attributable to the current year's intervention
- Why should we care?
 - **Your programs should get credit for all the savings driven by costs incurred in the intervention year – for cost-effectiveness or life-time savings calculations**

Implications for Cost Effectiveness



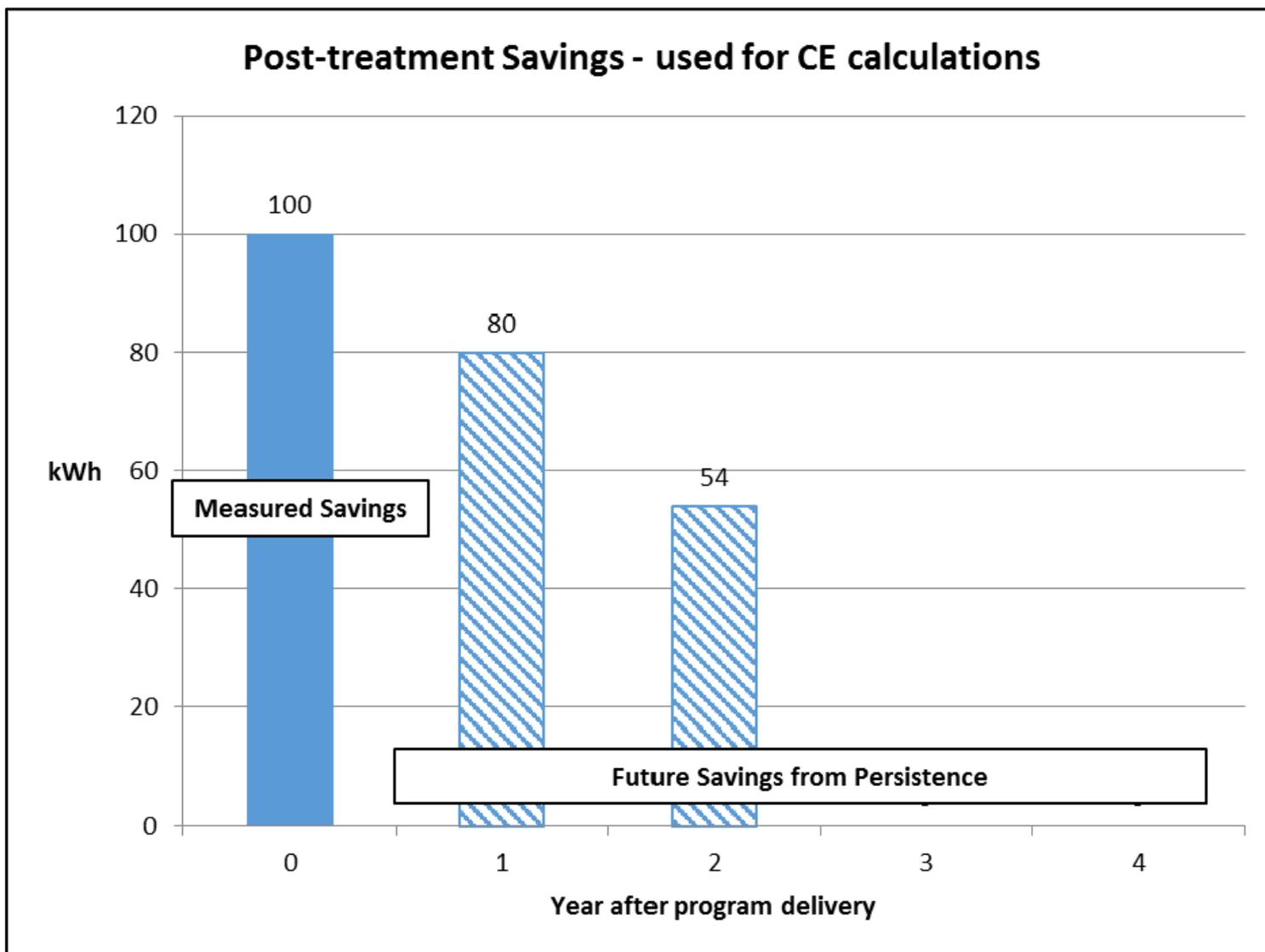
Based on Khawaja and Stewart, 2014 and IL TRM persistence rates

Implications for Cost Effectiveness



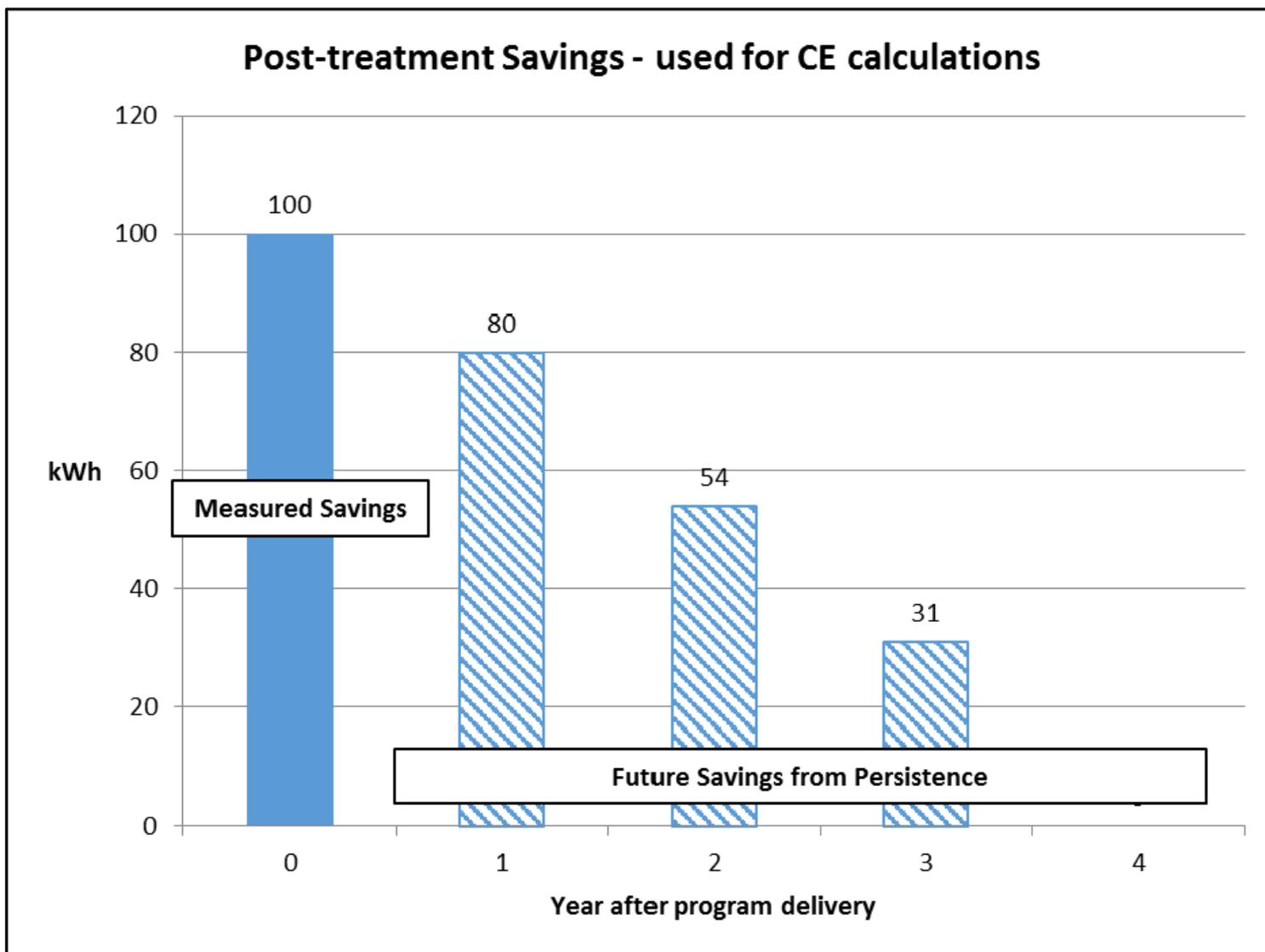
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Implications for Cost Effectiveness



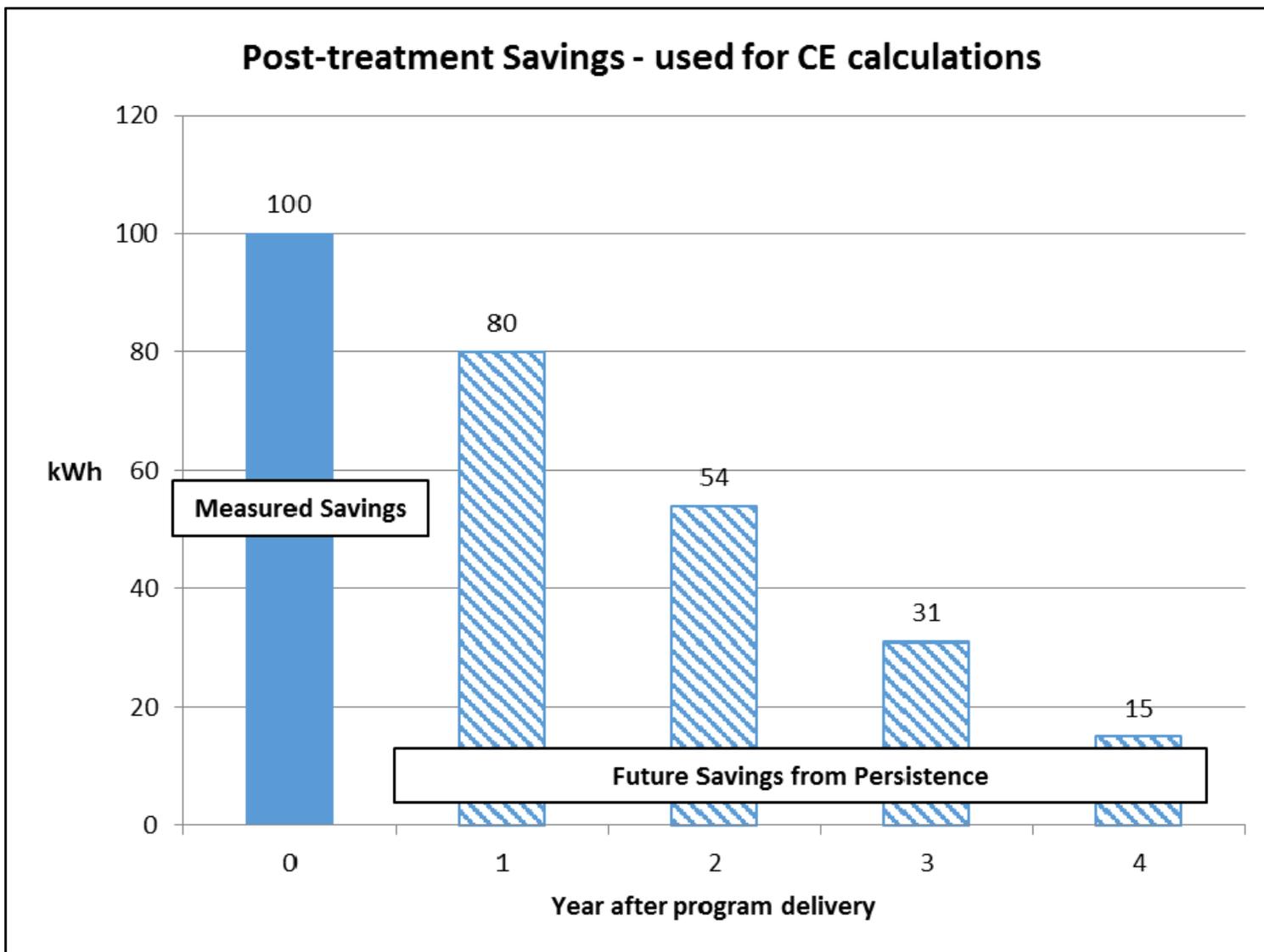
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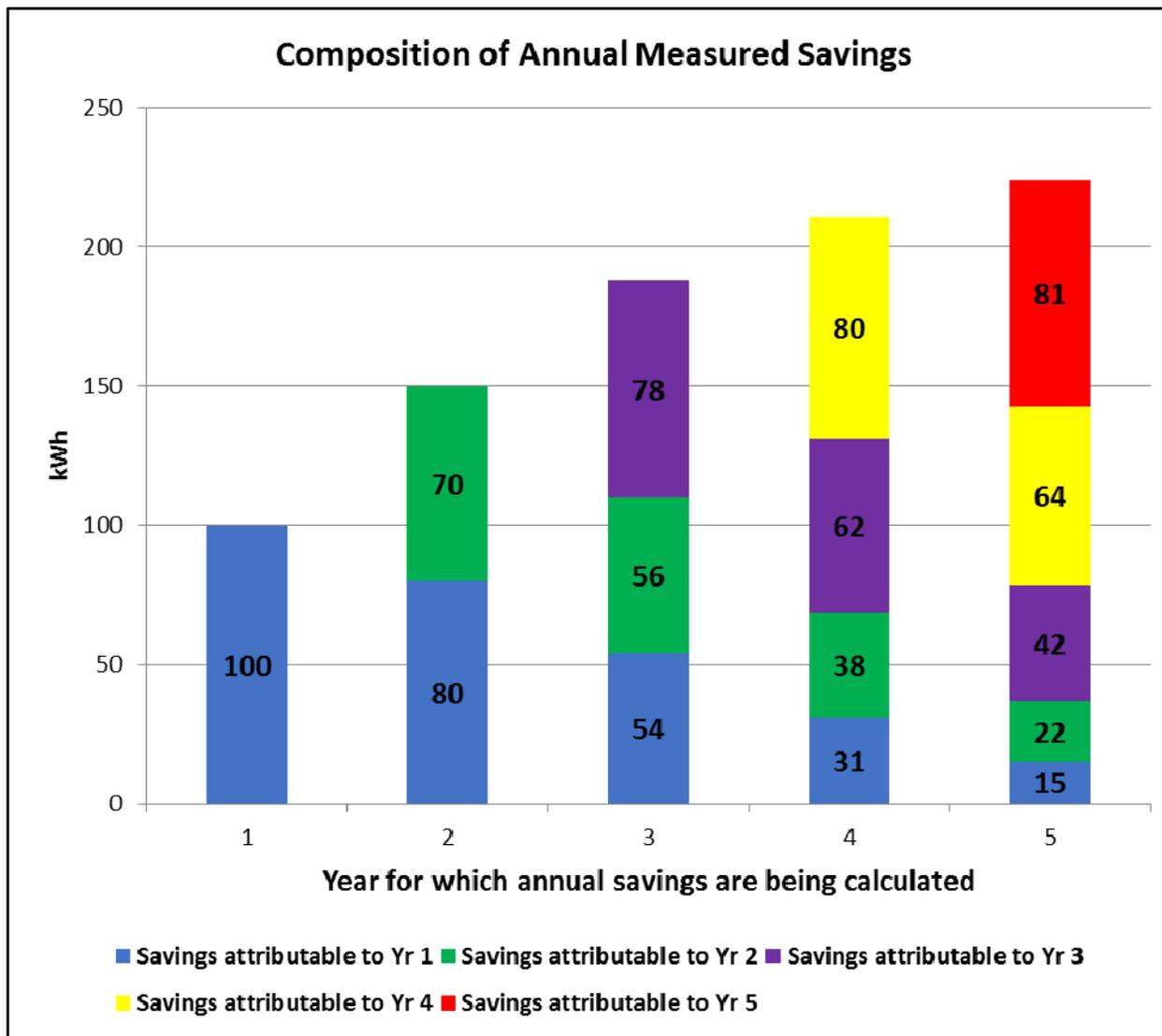
- This means that savings in future years are attributable to the current year's intervention
- Why should we care?
 - You should get credit for all the savings driven by costs incurred in the intervention year – for cost-effectiveness or life-time savings calculations
 - **You should be careful about when you take credit for savings if you provide additional intervention in future years – calculation of subsequent first-year savings may be affected by persistence**

Implications for Ongoing Annual Savings



Annual program savings (per home) as measured by program evaluation

Implications for Ongoing Annual Savings



Annual program savings (per home), showing portion of measured savings attributable to previous years' activities

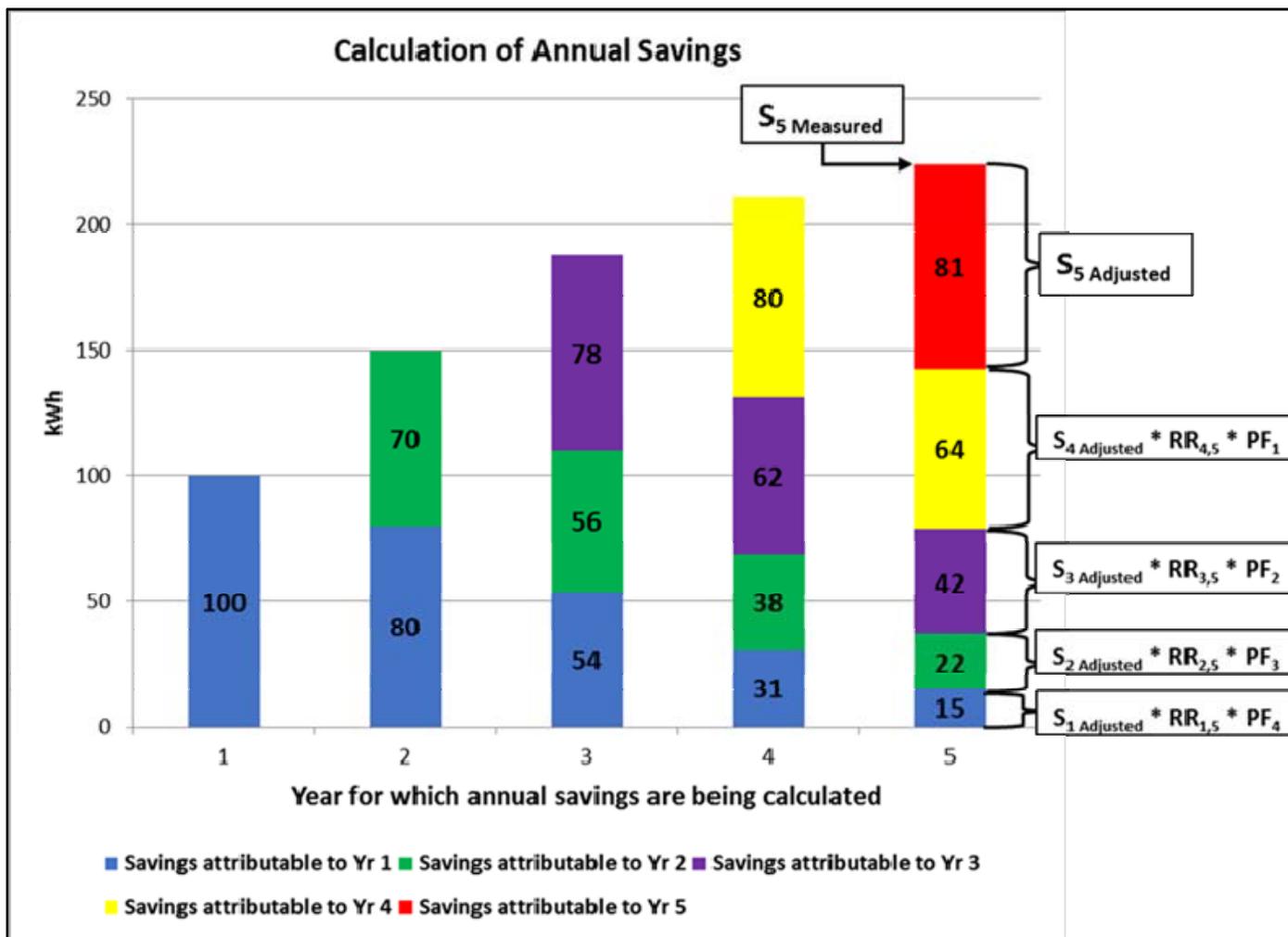
The Illinois Request

- Several utilities in Illinois are delivering HERs-type programs, and have had some persistence studies done
- Stakeholders wanted to incorporate the effects of persistence into their savings calculations
 - For cost-effectiveness
 - To be secure that ex-post evaluation would not reduce measured savings because of persistence
- The IL TRM Technical Advisory Committee requested that a protocol for accounting for this persistence be included in the TRM

What Are Others Doing?

- Not much publically available
 - A few programs are using a simple average persistent savings across 2-3 years
 - Others are beginning to consider including in current planning efforts
- No clear guidance

The Illinois Protocol



$$S_{T \text{ Adjusted}} = S_{T \text{ Measured}} - \sum_{i=1}^n (S_{T-i \text{ Adjusted}} * RR_{T-i,T} * PF_i)$$

Potential Impact

- Without accounting for persistence, you are:
 - Short-changing your cost-effectiveness (lifetime savings) results
 - Over-stating first-year savings in subsequent years for on-going programs

Potential Impact - Example

Year	Measured MWh savings	Annual Reported MWh	Lifetime MWh	Avoided cost (NPV)	Cost Effectiveness
Without Accounting for Persistence					
2018	18,000	18,000	18,000	\$900,000	1.5
2019	21,000	21,000	21,000	\$1,050,000	1.8
2020	22,000	22,000	22,000	\$1,100,000	1.8
2021	23,000	23,000	23,000	\$1,150,000	1.9
2022	23,000	23,000	23,000	\$1,150,000	1.9
Total	107,000		107,000	\$5,350,000	

Assumes:

Annual deployment cost = \$600,000; Avoided cost (\$/kWh) = 0.05; Discount rate = 7%; Participant retention rate = 95%

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2022	23,000	23,000	23,000	\$1,150,000	1.9
Total	107,000		107,000	\$5,350,000	
Accounting for Persistence					
2018	18,000	18,000	47,436	\$1,922,882	3.2
2019	21,000	7,320	19,290	\$781,972	1.3
2020	22,000	7,665	20,198	\$818,774	1.4
2021	23,000	8,823	23,252	\$942,578	1.6
2022	23,000	8,414	22,174	\$898,860	1.5
Total	107,000		132,351	\$5,365,064	

Assumes:

Annual deployment cost = \$600,000; Avoided cost (\$/kWh) = 0.05; Discount rate = 7%; Participant retention rate = 95%

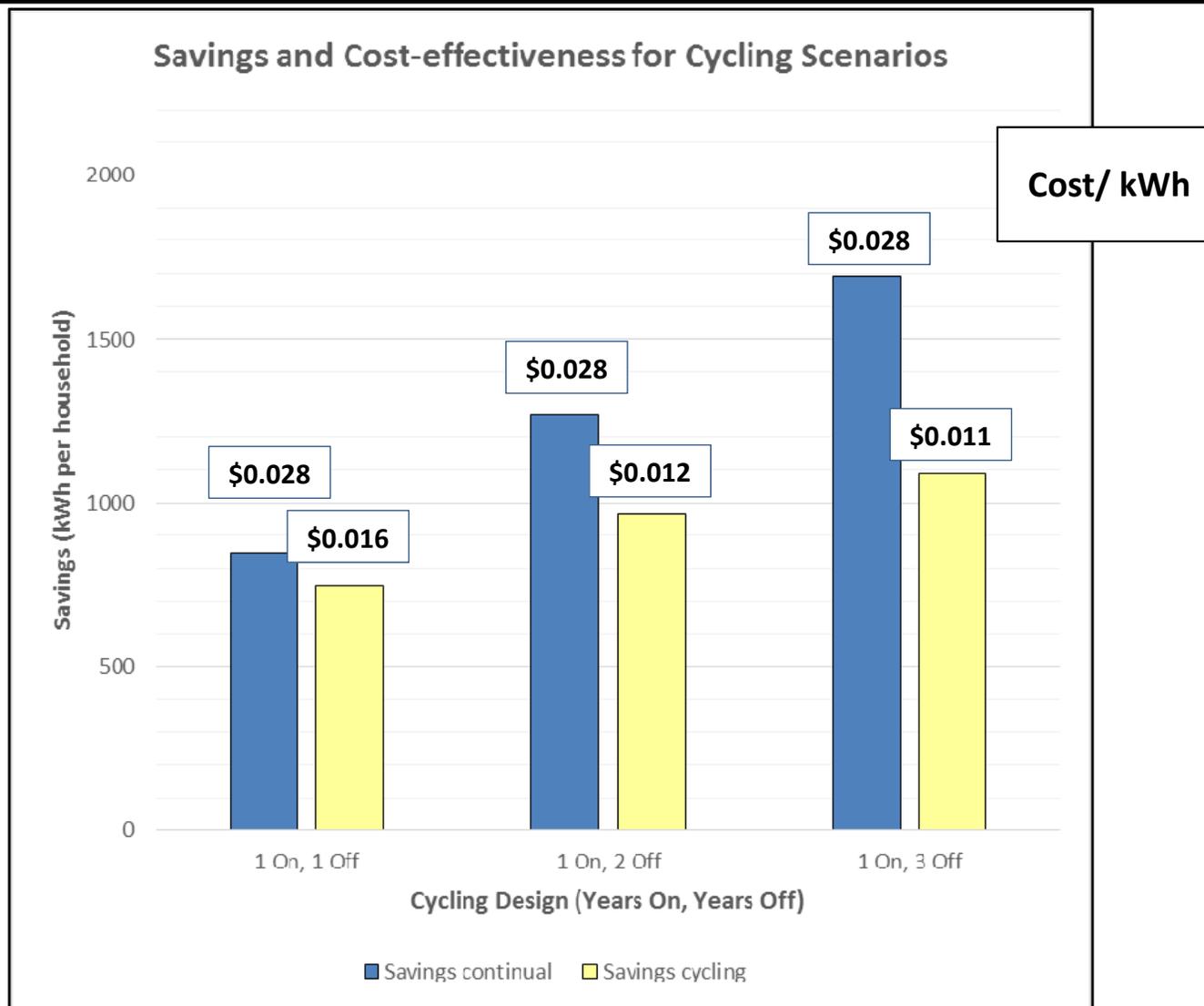
Potential Impact

- Without accounting for persistence, you are:
 - Short-changing your cost-effectiveness (lifetime savings) results
 - Over-stating first-year savings in subsequent years for on-going programs
 - **Missing important information that might be useful for program design improvements**

Implications for Program Design

- Perhaps program delivery schedules can be designed to leverage persistence
- “Crop rotation” among customers may allow savings to be achieved at a lower cost per kWh than continual treatment. For example:
 - 1 year on, 1 year off
 - 1 year on, 2 years off
 - Etc.
- Adjusting program/messaging to offset decay with the goal of:
 - Motivating a larger response in second, third years
 - Messaging for longer-lived responses
- Best approaches may depend on goal metrics: maximize savings, maximize cost-effective savings, etc.

Implications for Program Design



Hypothetical example taken from analysis by Skumatz, L. 2016. Persistence of Behavioral Programs: New Information and Implications for Program Optimization. The Electricity Journal 29: 27-32.

Illinois – Implementation

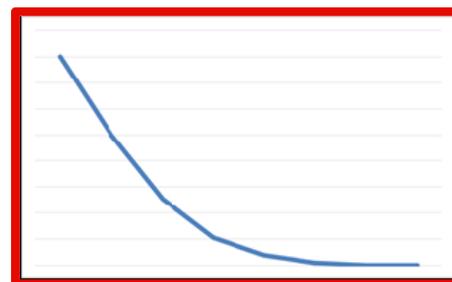
- The Commission staff have been active participants in the TRM process and discussions of the development of the protocol
- Program administrators are using the protocol for current program planning
- There is some discussion of considering adjusting program design and delivery schedules to adjust cost-effectiveness

POLL

What are others doing??

Illinois Assumptions and Compromises

- Persistence rates are expected to be sensitive to program design elements, length of program, etc. – need to make some assumptions -
 - Persistence rate – Using a national average vs. individual program studies
 - Shape of decay curve – declining rate based on ComEd study



- Length of duration of persistence – 5 years (reasonable?)
- Further studies are needed to answer these questions

Illinois Assumptions and Compromises

- Adjustments to measured inputs – as standard for HERs programs (program lift, move-outs, etc.)
- Adjust for cross-year effects from weather
- Program retention rates – from program data
- Peak savings persistence – ??
- Implementation:
 - Separate application for different program “waves” (new customers)
 - Initial transition date defined for using this approach if programs already in place

Assumptions and Compromises

- We would like to hear from you:
 - Your data
 - Your experiences
 - Your decisions about treatment of persistence

Questions?

Contact

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