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STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

SEE Action Webinar: Analyzing and Managing Bill Impacts of Energy Efficiency Programs

June 26, 2013

Moderator: Katrina Pielli, DOE

Speakers: Tim Woolf, Synapse Energy Economics
& John Sibley, Southface

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STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK



Analyzing and Managing Bill Impacts of Energy Efficiency Programs: Principles and Recommendations

Driving Ratepayer-Funded Efficiency through Regulatory Policies Working Group

July 2011

The State and Local Energy Efficiency Action Network is a state and local effort facilitated by the federal government that helps states, utilities, and other local stakeholders take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020.

Learn more at www.seeaction.energy.gov

The Guide provides provide a set of **principles and recommendations** for state regulatory commissions to consider in assessing rate impacts of utility sector energy efficiency programs:

- Principles for Managing Rate and Bill Impacts
- Efficiency Program Design Principles to Mitigate Rate Impact

www.seeaction.energy.gov/billimpacts



Driving Ratepayer-Funded Efficiency through Regulatory Policies

Working Group Members

Name	Organization
Jan Berman	Pacific Gas and Electric Company
Janet Besser	New England Clean Energy Council
Robert Clayton	Missouri Court of Appeals
Adam Cooper	IEE – Innovation, Electricity, Efficiency
Rebecca Craft	Consolidated Edison
Dena Delucca	New Hampshire Electric Coop
Keith Dennis	National Rural Electric Cooperative Association
Jennifer Easler (Co-Chair)	Iowa Office of Consumer Advocate
Ellie Friedman	Colorado Public Utilities Commission
Jeff Genzer	National Association of State Energy Officials
Don Gilligan	National Association of Energy Service Companies
Wilson Gonzalez	Ohio Consumers' Counsel
Jennifer Hinman	Illinois Commerce Commission
Kit Kennedy	Natural Resources Defense Council
Miles Keogh	National Association of Regulatory Utility Commissioners
Jared Lawrence	Duke Energy
Cynthia Marple	American Gas Association

Diane Munns	Mid American
Derek Murrow	Environment Northeast
Steve Nadel	American Council for an Energy-Efficient Economy
Bob Nelson	Montana Consumer Counsel
Anne-Marie Peracchio	New Jersey Resources
Cheryl Roberto (Co-Chair)	Public Utilities Commission of Ohio
Brian Rounds	South Dakota Public Utilities Commission
John Sibley	Southface Energy Institute
Marsha Smith	Idaho Public Utilities Commission
Sheldon Switzer	Baltimore Gas and Electric
Rick Tempchin	Edison Electric Institute
Aliza Wasserman	National Governors Association





Synapse
Energy Economics, Inc.

Energy Efficiency: Rate, Bill and Participation Impacts

State Energy Efficiency Action Webinar

June 26, 2013

Tim Woolf

- Brief overview of the concepts in the SEE Action Report.
 - Link between rate impacts, bills and program participation.
 - Customer equity.
- Preliminary analysis of a typical utility and a typical EE plan.
 - Based on an actual utility and actual EE plan.
- Estimate rate impacts, bill impacts and participation rates:
 - Low efficiency budget scenario.
 - Mid efficiency budget scenario.
 - High efficiency budget scenario.
- The importance of assessing program participation.
- Policy recommendations.

Rate Impacts of Energy Efficiency Programs

- Concerns about rate impacts play a critical role in stakeholder support for energy efficiency.
 - However, rate impacts are rarely analyzed thoroughly.
- The standard response to rate impact concerns:
 - Rates go up, but average bills go down.
 - On average customers are better off.
- This response does not sufficiently address the issue.
 - Program participants see higher rates but lower bills.
 - Non-participants see just higher rates.
- Rate & bill impacts are a matter of customer equity.

Addressing Customer Equity

- Program participation rates:
 - Typically not well understood or analyzed.
 - Are the key to drawing the right balance between rates and bills.
 - Are the key to maintaining or promoting customer equity.
 - Can/should be addressed through regulatory policies.
- Big picture recommendations:
 - Analyze rate, bill and participation impacts, in order to fully understand what the impacts are;
 - Manage rate, bill and participation impacts, in order to achieve energy goals and optimize benefits to all customers; and
 - Promote customer participation, to address equity concerns.

Typical Utility with Typical Efficiency Plan

- Analysis below is based on an actual 2013 energy efficiency plan for an actual utility located in the Northeast.
- Three-year energy efficiency plan.
- Costs recovered through a system benefits charge. Distribution rates are decoupled.
- Standard EE programs, targeted to all customer types:
 - Low-income: audit and retrofit at no cost.
 - Residential: new construction, retrofits, lighting, appliances, HVAC.
 - C&I: new construction, small C&I, large C&I.
- Programs designed to achieve both breadth and depth.

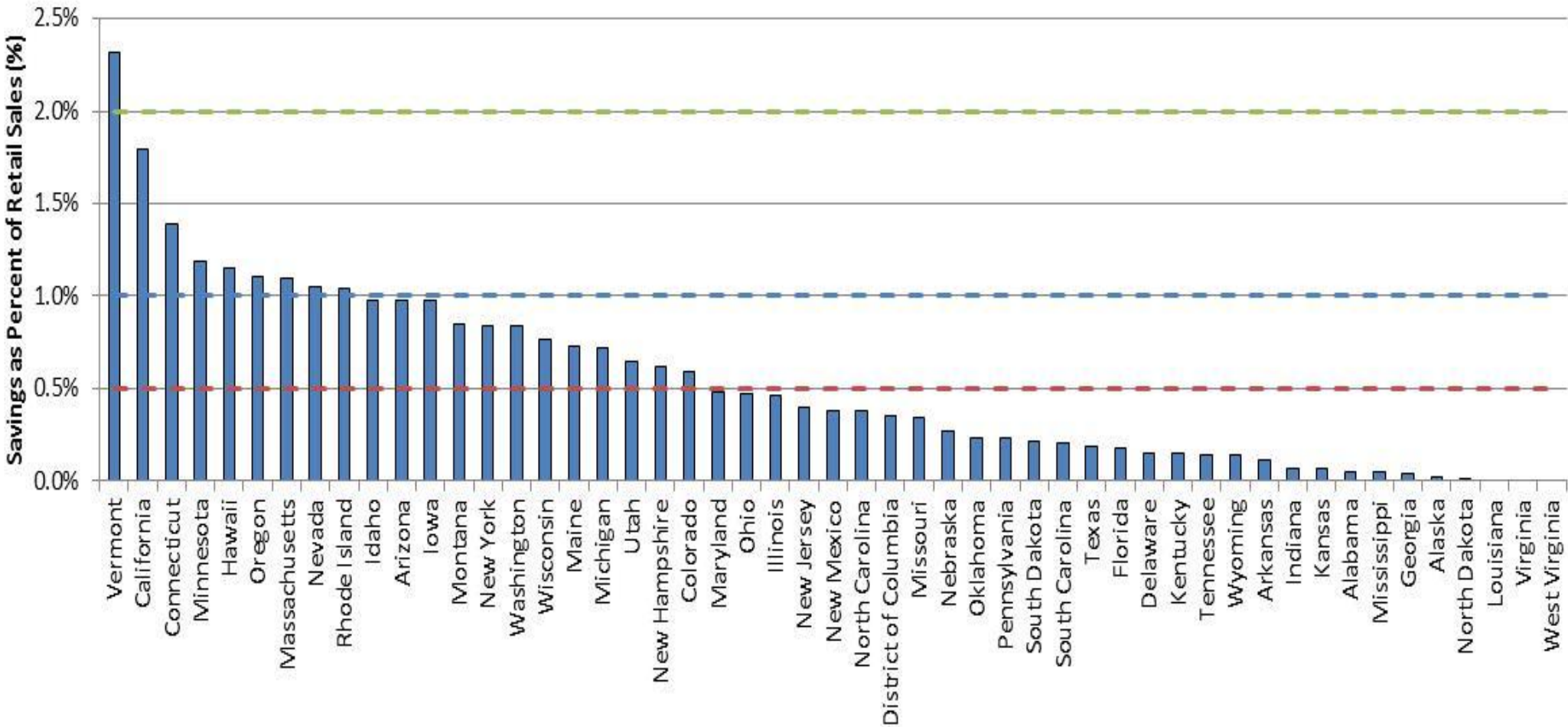
Typical Utility with Typical Efficiency Plan

- Program average benefit-cost ratios:
 - Low-income: 1.5
 - Residential: 1.6
 - C&I: 2.9
 - Total: 2.3
- Program average cost of saved energy (¢/lifetime kWh):
 - Low-income: 12.9
 - Residential: 7.7
 - C&I: 3.7
 - Total: 4.9

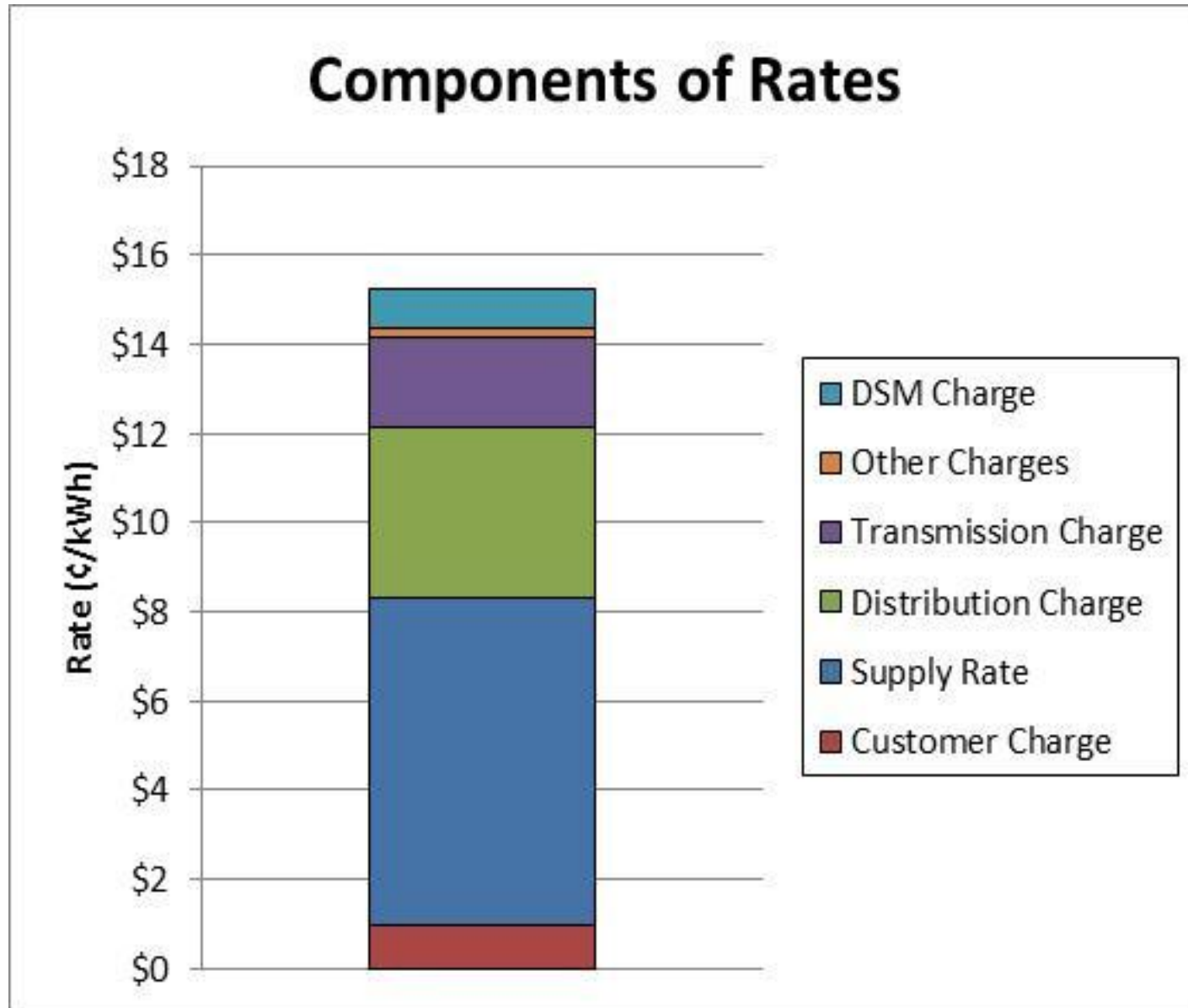
Efficiency Plan Scenarios

- **High Efficiency Case:**
 - Annual EE savings = 2.0% of annual sales.
 - This is the actual savings from the actual utility modeled.
- **Mid Efficiency Case:**
 - Annual EE savings = 1.0% of annual sales.
 - Efficiency savings and budgets are determined by reducing the High EE Case by 50 percent.
- **Low Efficiency Case:**
 - Annual EE savings = 0.5% of annual sales.
 - Efficiency savings and budgets are determined by reducing the Mid EE Case by 50 percent.

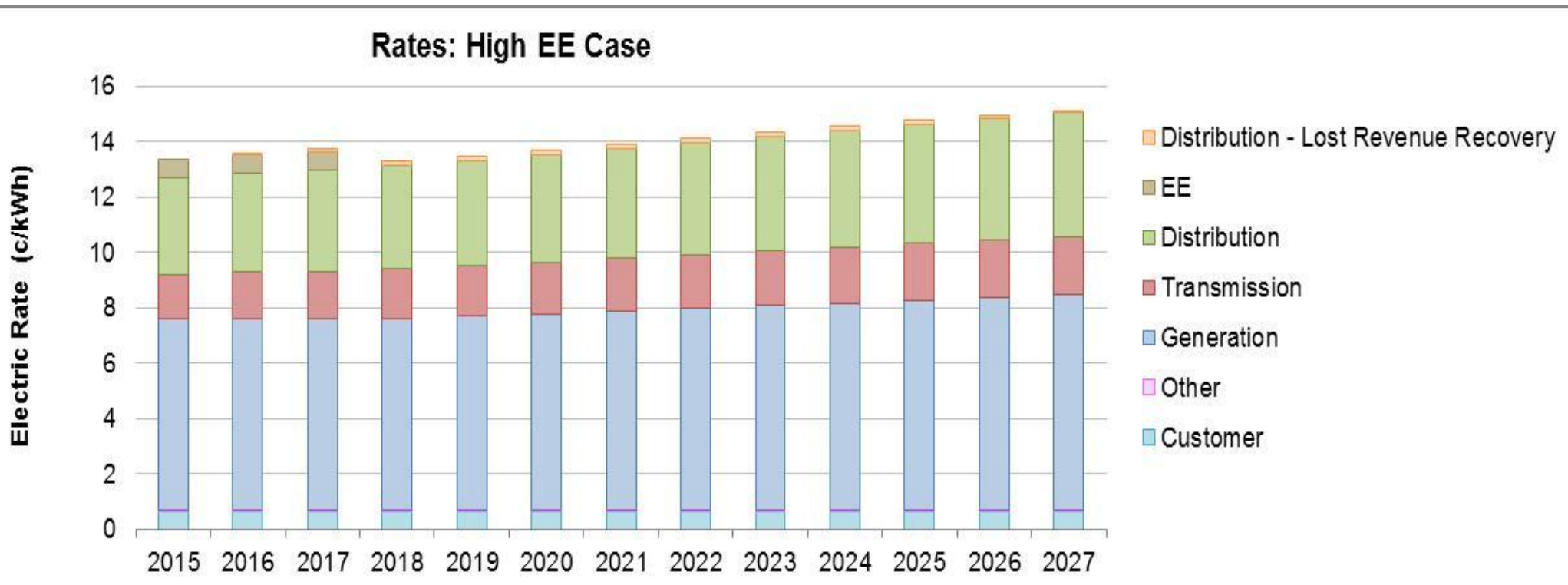
2010 Electricity Savings by State (% of Sales)



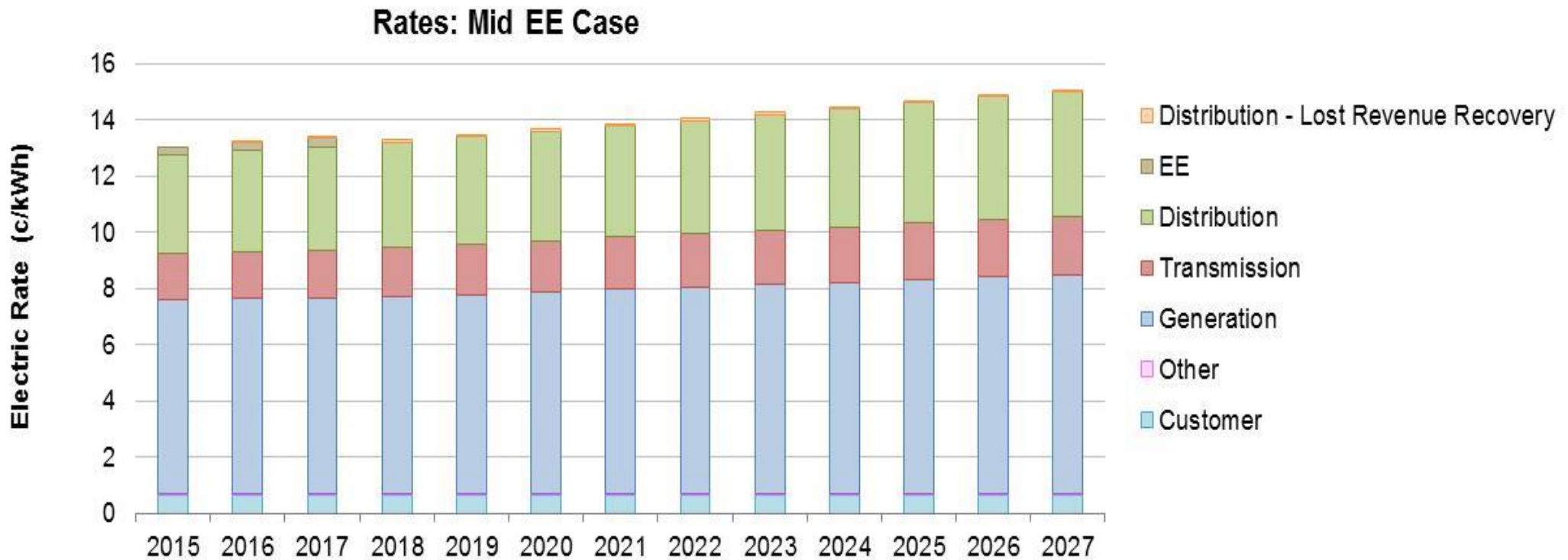
Typical Utility – Breakdown of Rates



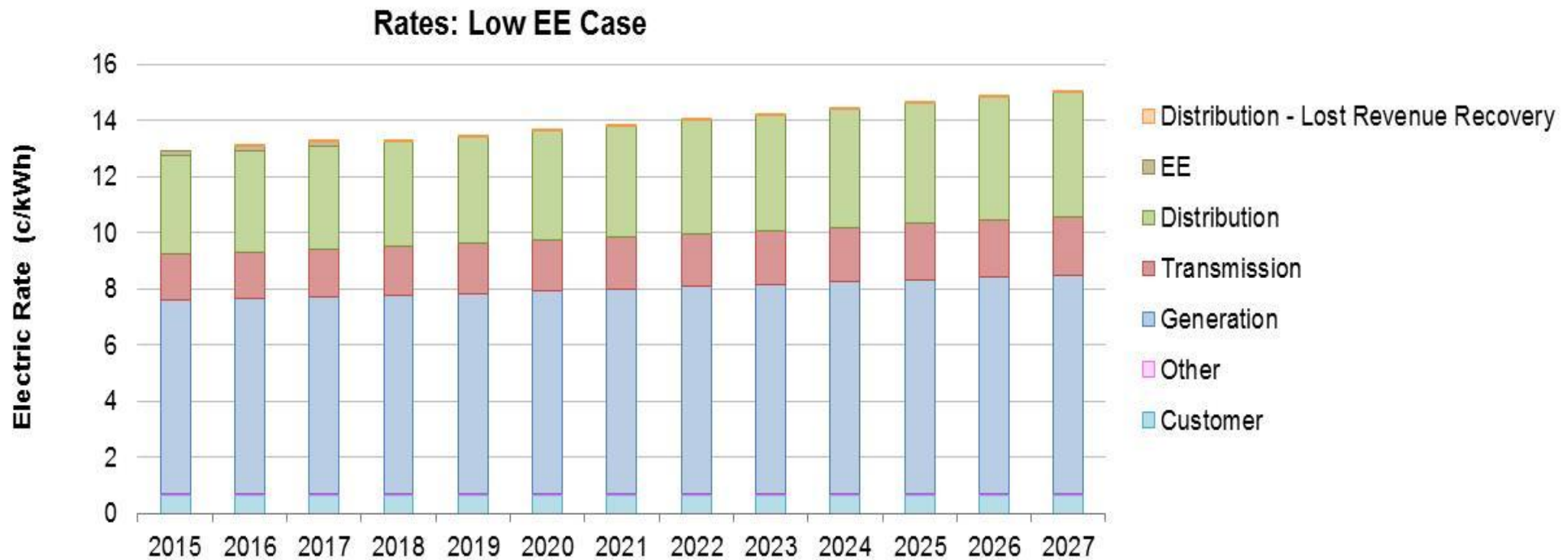
High EE Case: Annual Rate Impacts Due to Energy Efficiency



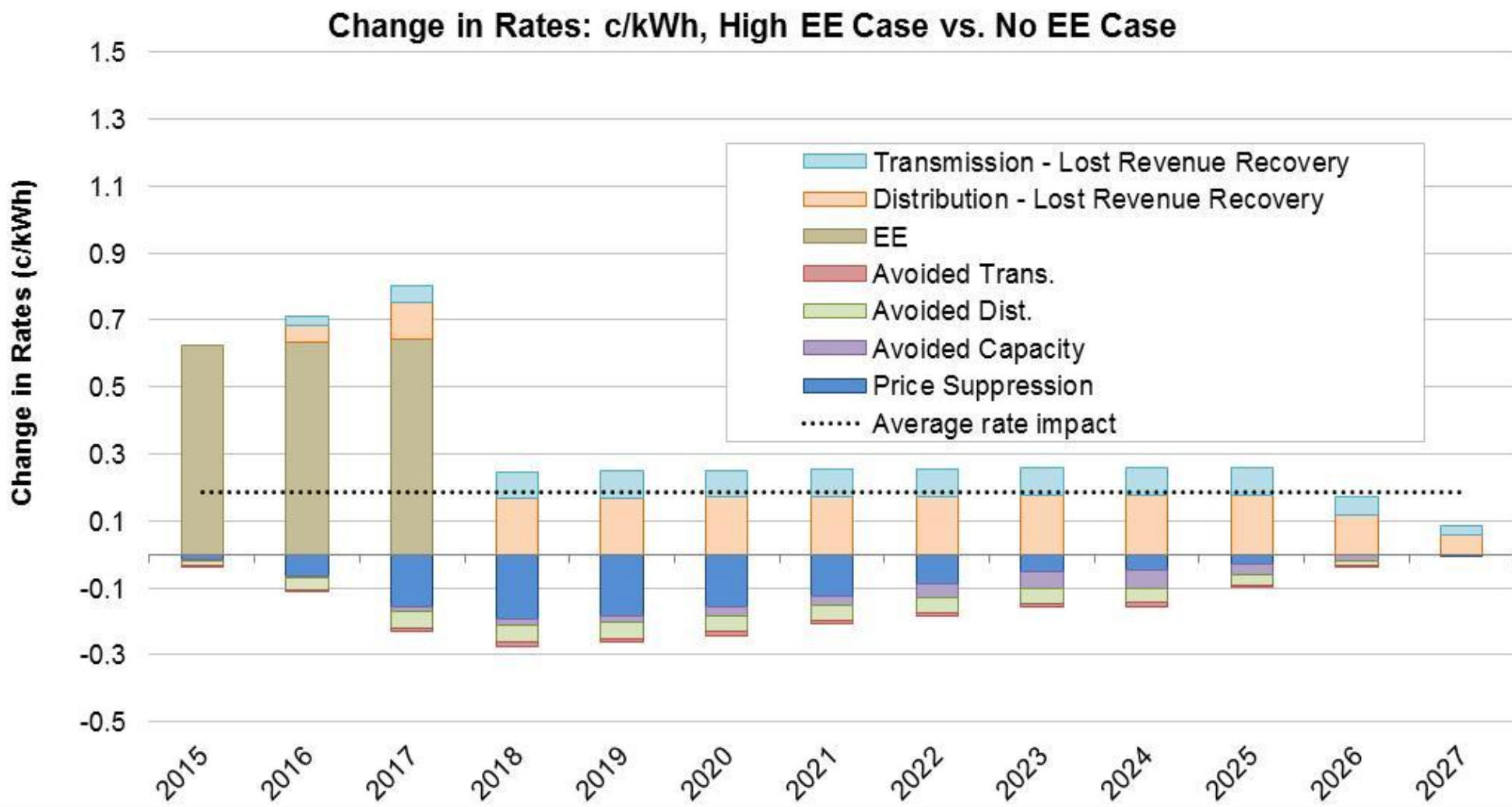
Mid EE Case: Annual Rate Impacts Due to Energy Efficiency



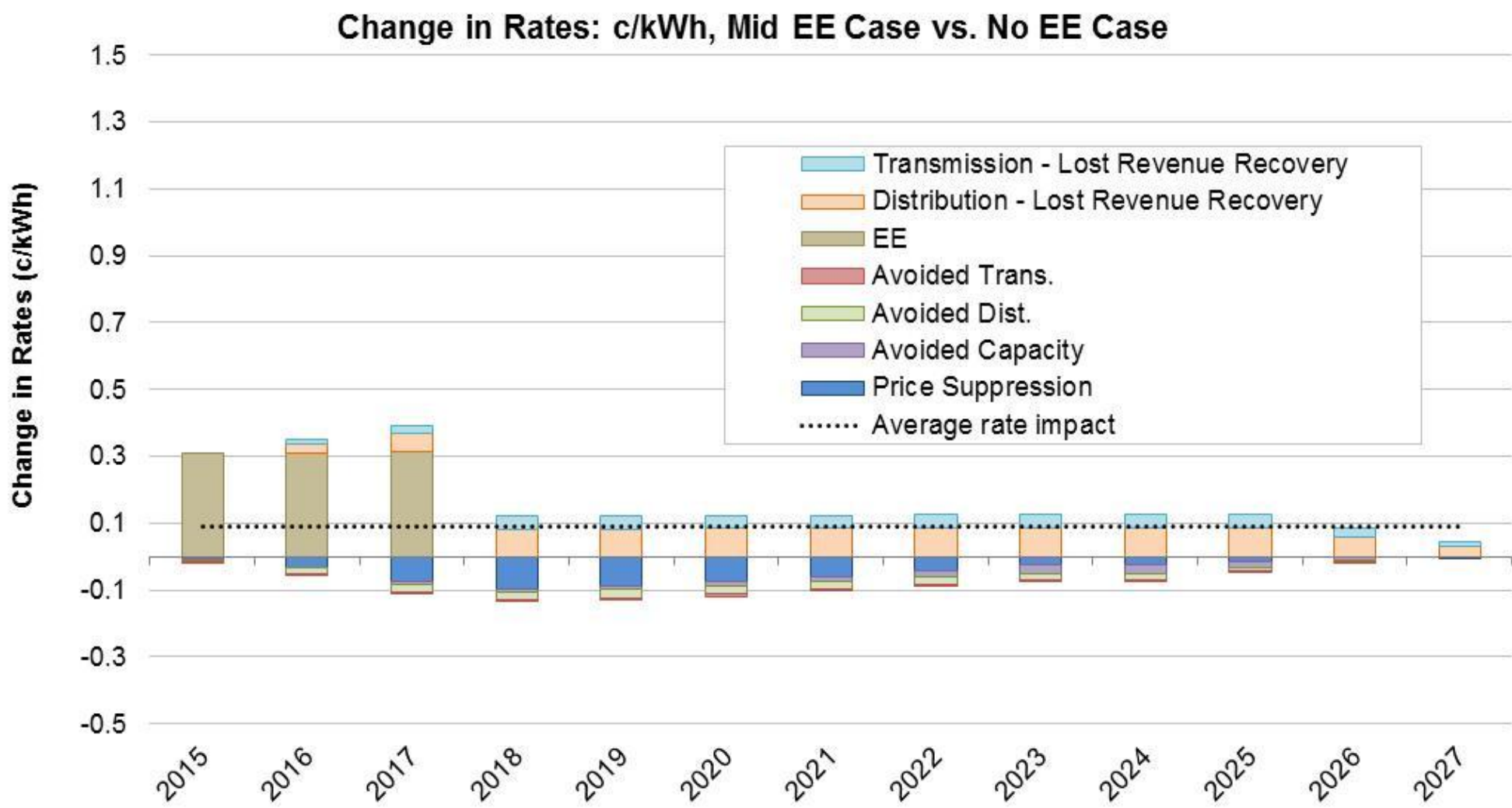
Low EE Case: Annual Rate Impacts Due to Energy Efficiency



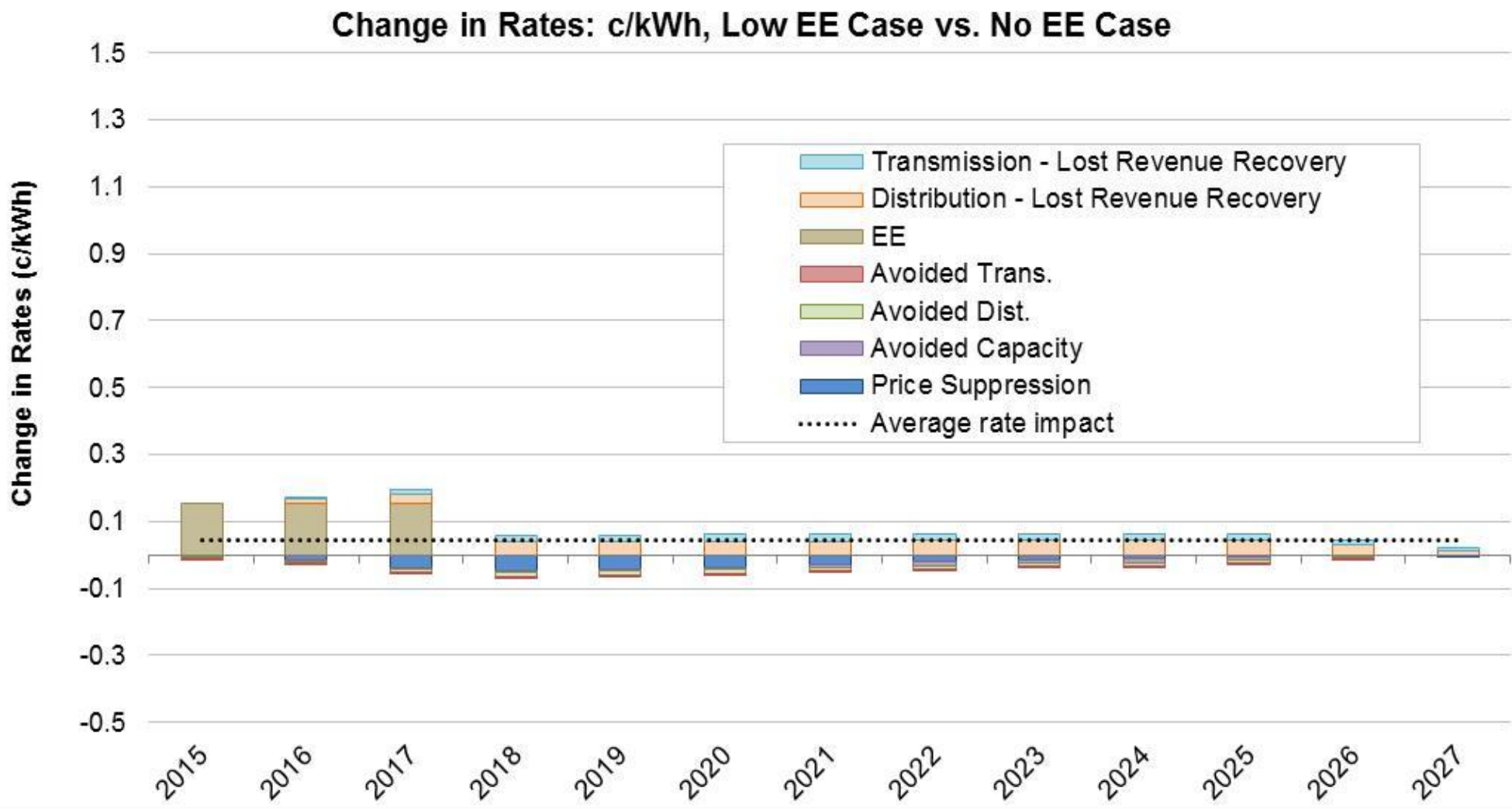
High EE Case: Long-Term Rate Impacts (c/kWh)



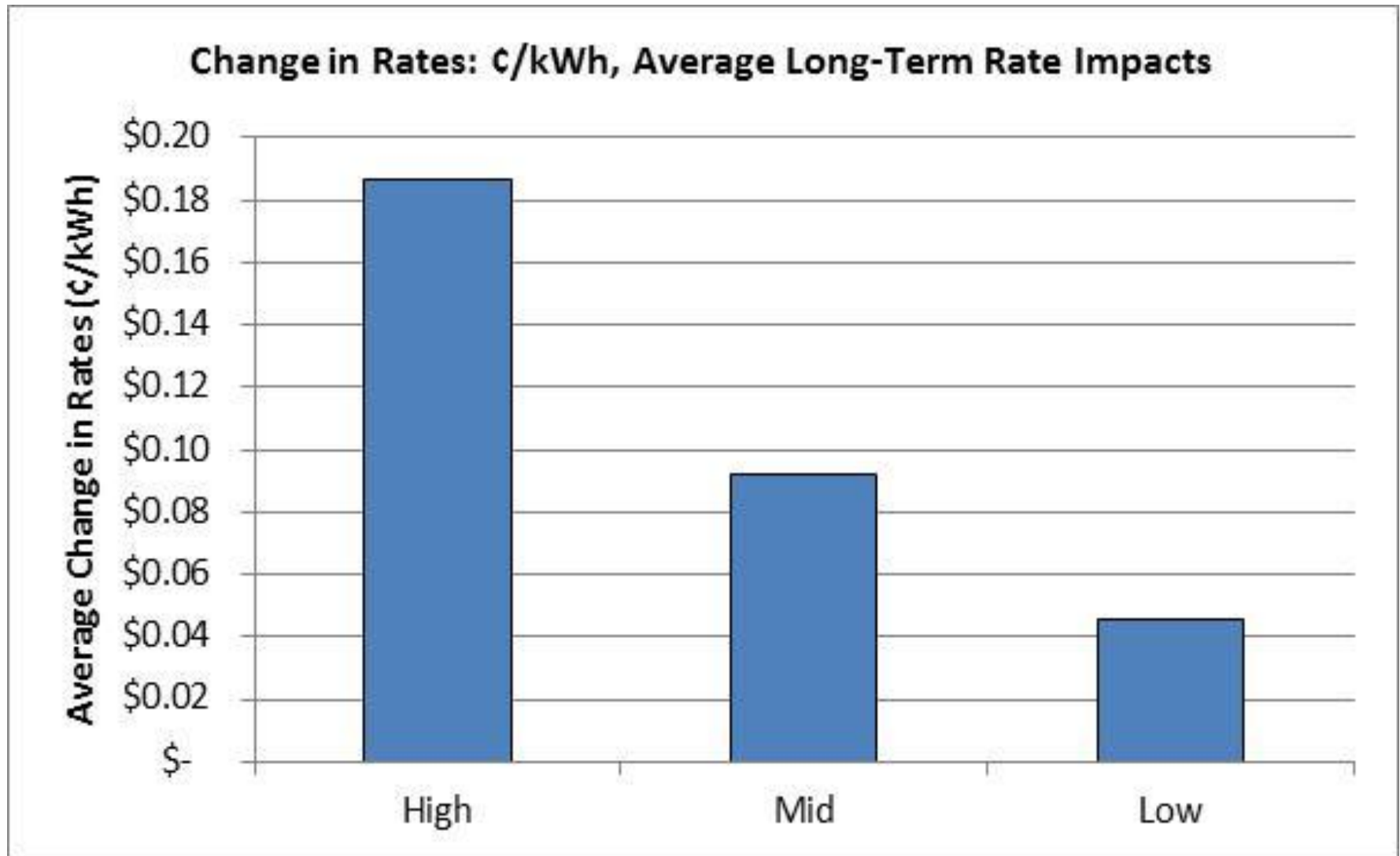
Mid EE Case: Long-Term Rate Impacts (c/kWh)



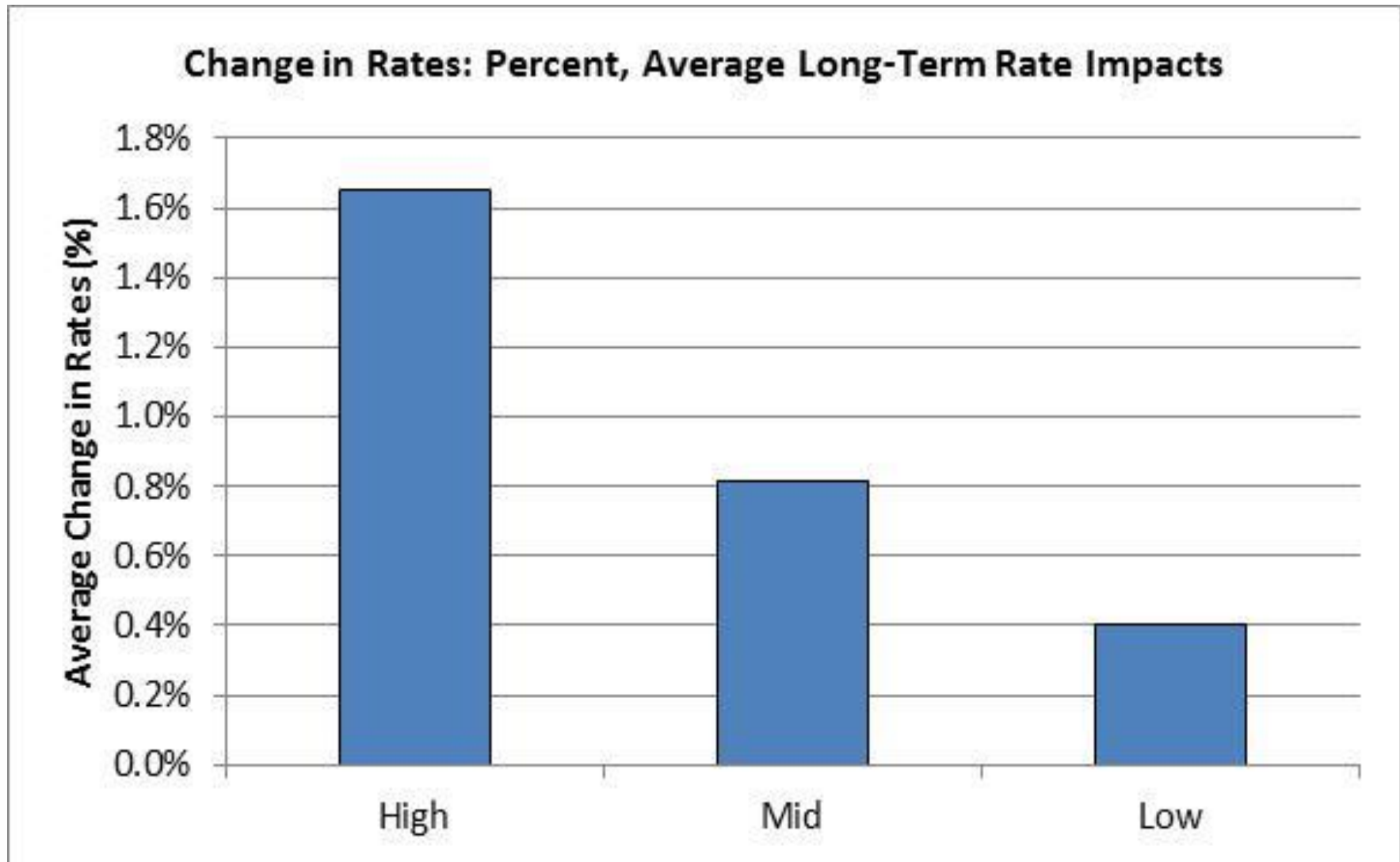
Low EE Case: Long-Term Rate Impacts (c/kWh)



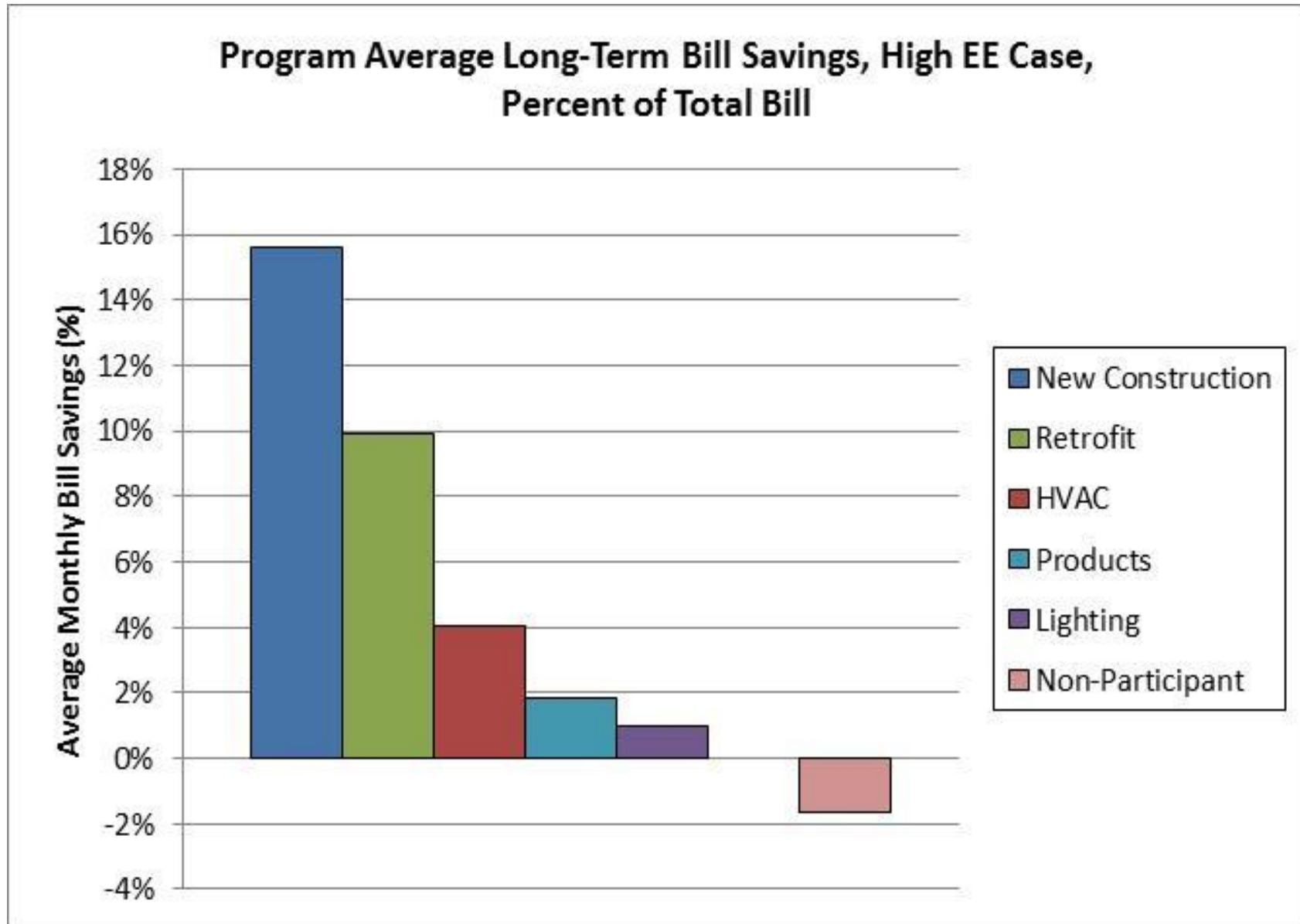
Summary of EE Cases: Average Long-Term Rate Impacts (¢/kWh)



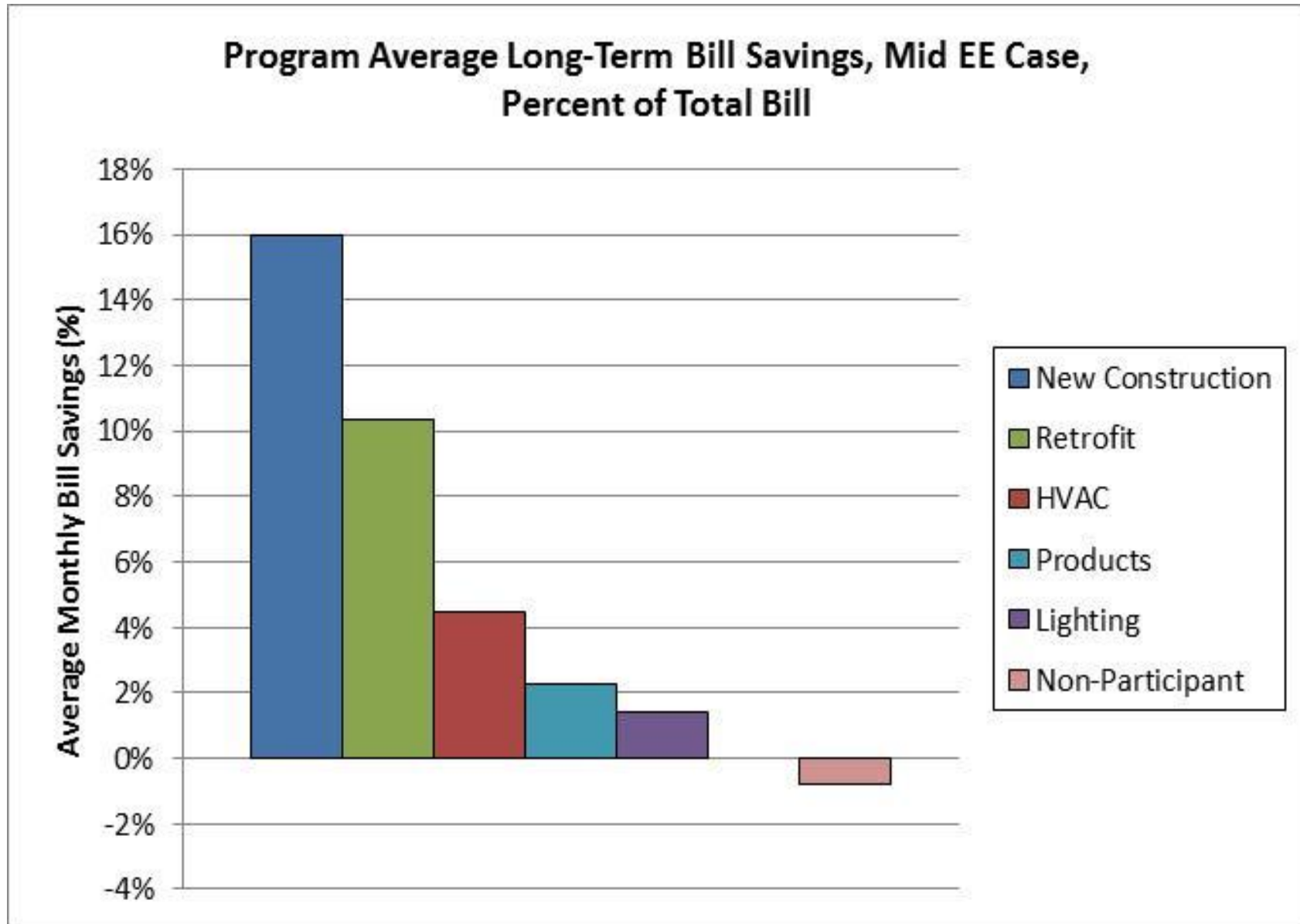
Summary of EE Cases: Average Long-Term Rate Impacts (% change)



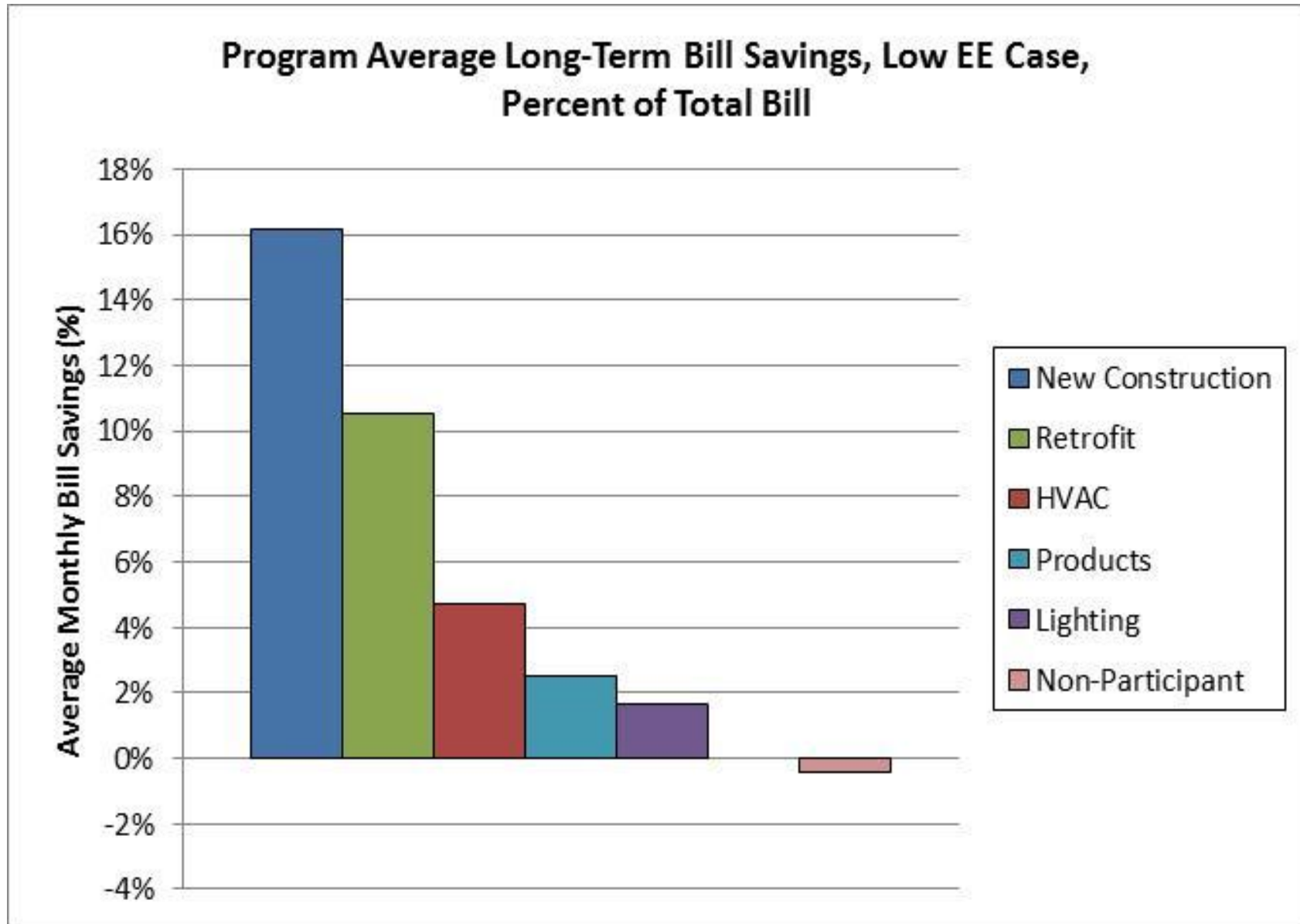
High EE Case: Average Long-Term Bill Impact by Program



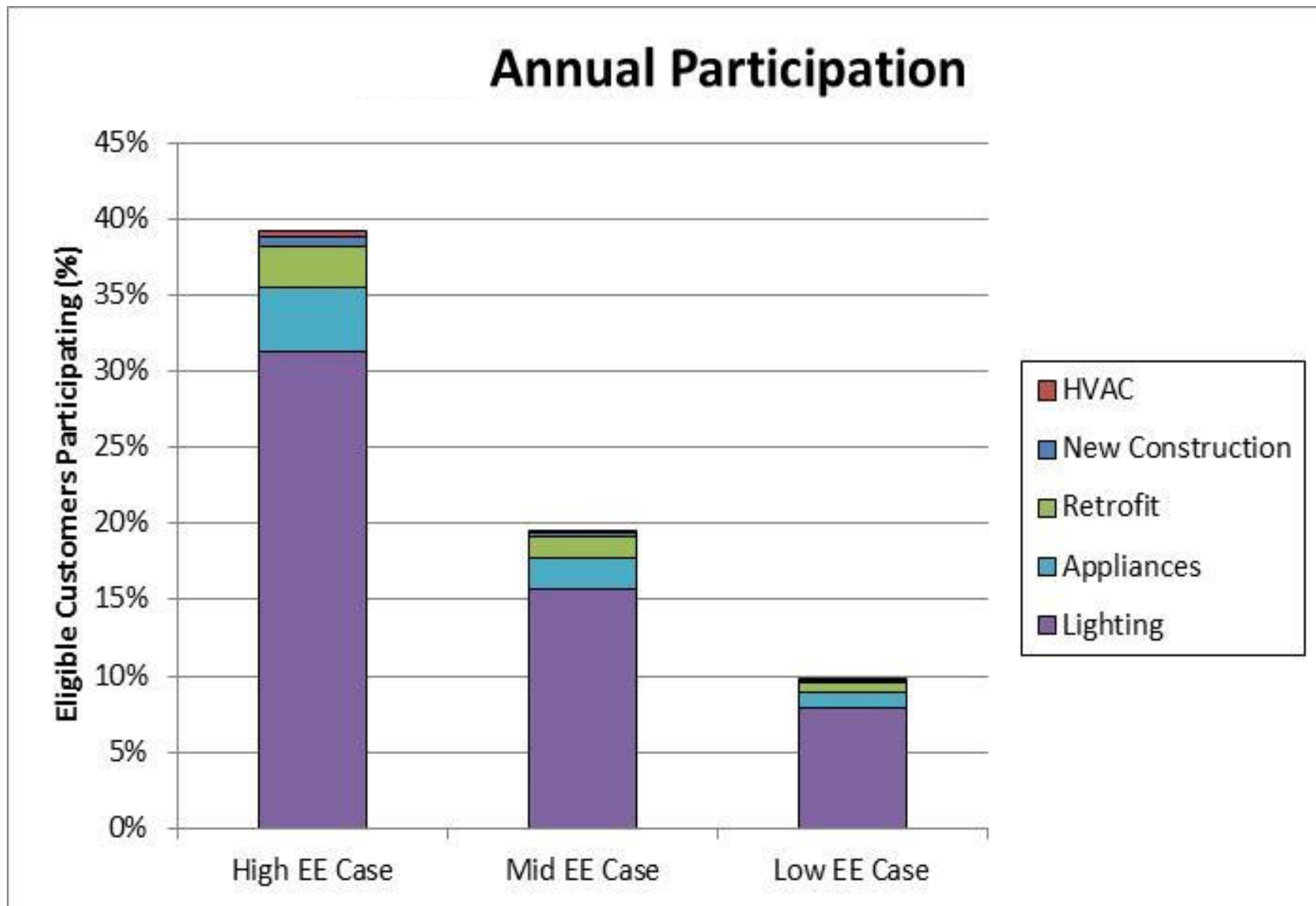
Mid EE Case: Average Long-Term Bill Impact by Program



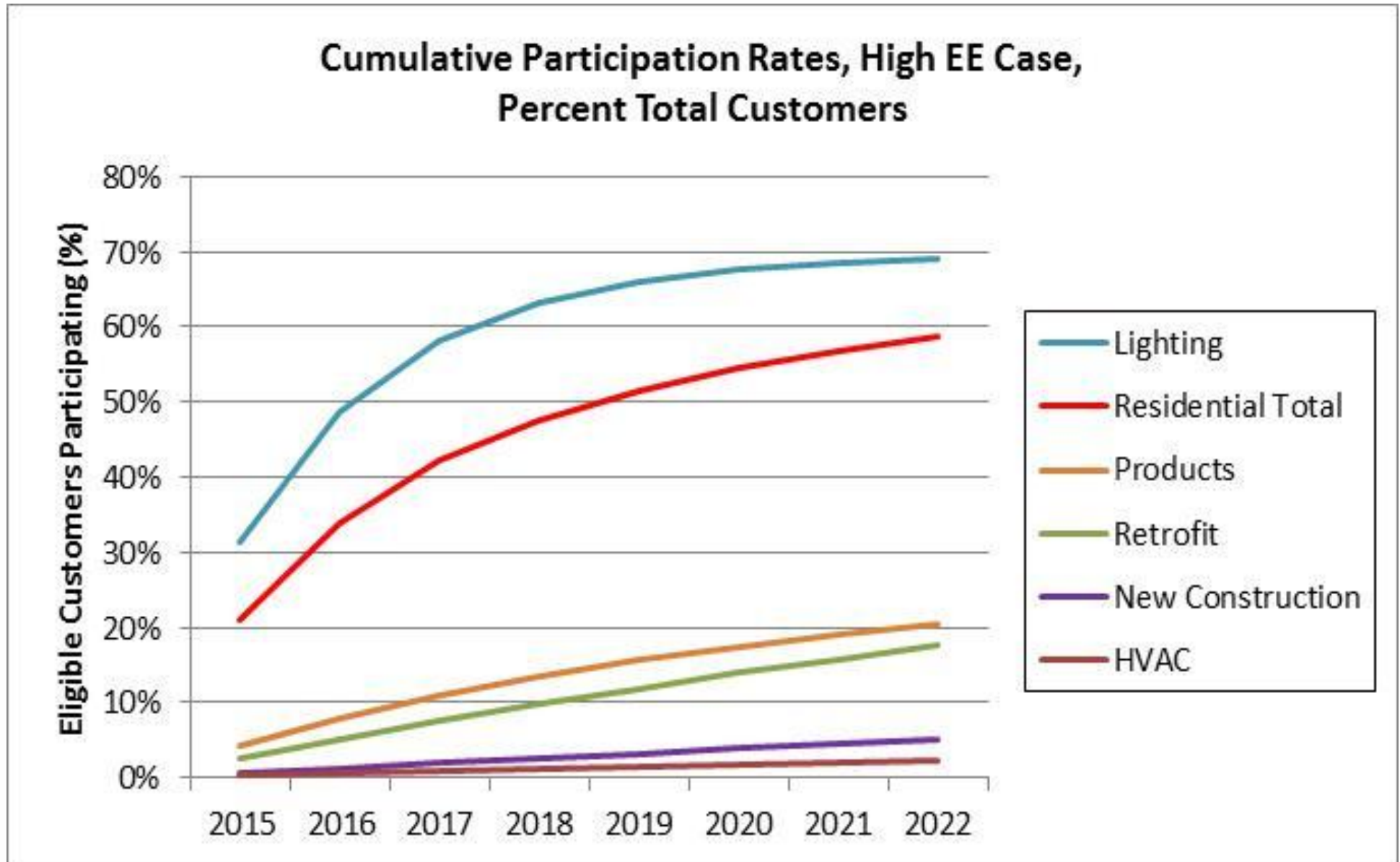
Low EE Case: Average Long-Term Bill Impact by Program



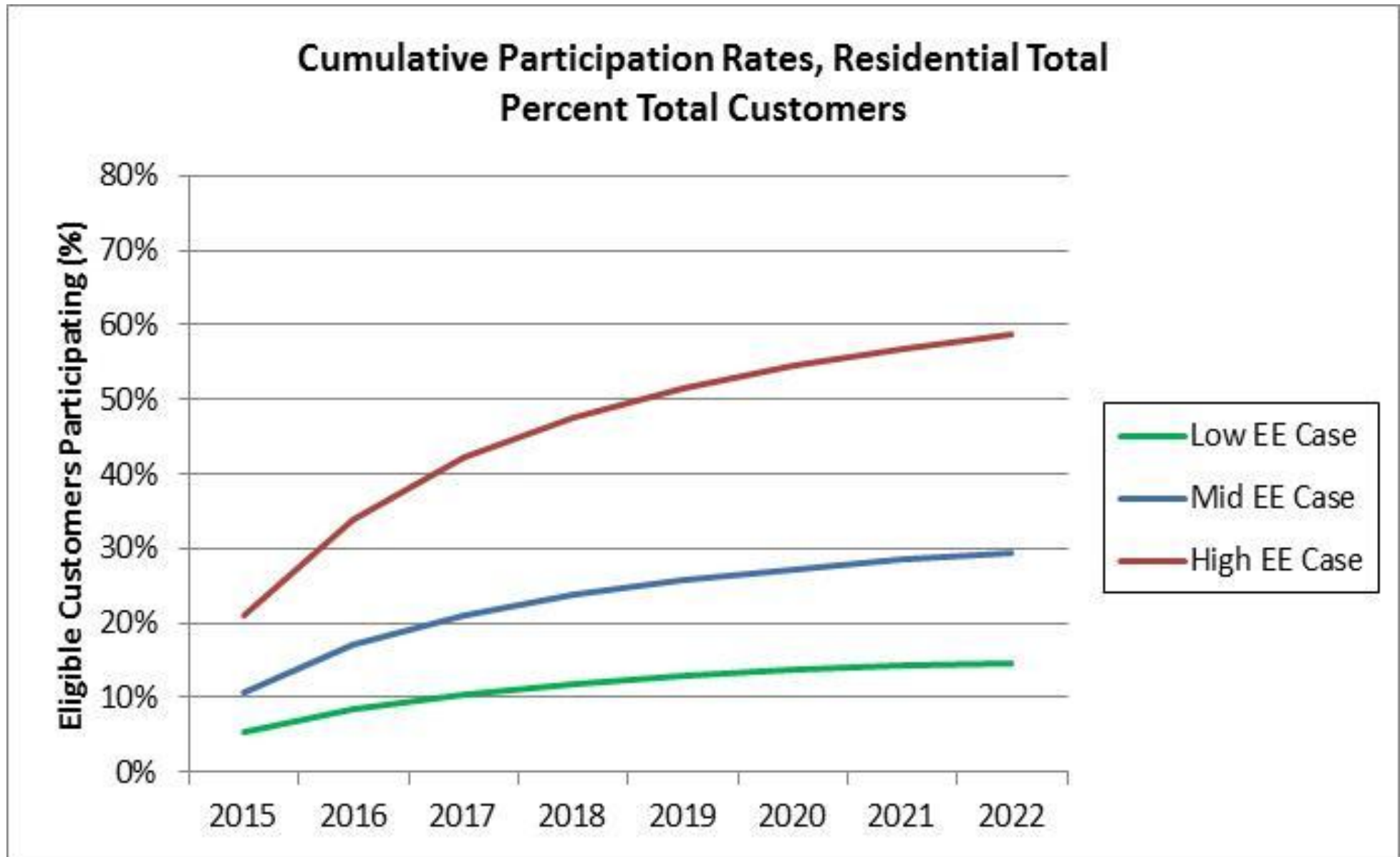
Annual Participation Rates



High EE Case: Cumulative Participation Rates



Residential Total: Cumulative Participation Rates



High EE Case: Summary of Rates, Bills, and Participants

	Rates Impacts	Bill Impacts	Participation
	(% of Total Rate)	(% of Total Bill)	(% of Customers)
New Construction	1.6%	-15.6%	1.9%
HVAC	1.6%	-4.1%	1.0%
Retrofit	1.6%	-9.9%	7.9%
Lighting	1.6%	-1.0%	94.0%
Products	1.6%	-1.8%	12.7%
Non-Participants	1.6%	1.6%	minority

Rate, bill and participation impacts are all based on three years of EE.

Mid EE Case: Summary of Rates, Bills, and Participants

	Rates Impacts	Bill Impacts	Participation
	(% of Total Rate)	(% of Total Bill)	(% of Customers)
New Construction	0.8%	-16.0%	1.0%
HVAC	0.8%	-4.5%	0.5%
Retrofit	0.8%	-10.3%	3.9%
Lighting	0.8%	-1.4%	47.0%
Products	0.8%	-2.3%	6.3%
Non-Participants	0.8%	0.8%	many

Rate, bill and participation impacts are all based on three years of EE.

Low EE Case: Summary of Rates, Bills, and Participants

	Rates Impacts	Bill Impacts	Participation
	(% of Total Rate)	(% of Total Bill)	(% of Customers)
New Construction	0.4%	-16.2%	0.5%
HVAC	0.4%	-4.7%	0.3%
Retrofit	0.4%	-10.5%	2.0%
Lighting	0.4%	-1.6%	23.5%
Products	0.4%	-2.5%	3.2%
Non-Participants	0.4%	0.4%	majority

Rate, bill and participation impacts are all based on three years of EE.

Program Designs to Increase Participation

Program administrators can take steps to increase participation in order to help mitigate the equity issue:

- EE programs should address all end-uses.
- EE programs should address all customer types.
- All customers should have an opportunity to participate.
- Program incentives should be tailored to assist all customers in overcoming barriers to energy efficiency.
- Program Administrators should actively pursue the non-participants and those who have not participated in a while.
- Program Administrators and others should consider increasing efficiency budgets:
 - Increased budgets could be used to increase participation.

Policy Options to Increase Participation

- Gather better data on participation.
- Include participation rate requirements in EE plans.
- Include participation rate requirements in EE targets.
- Incorporate participation rates in utility shareholder incentives.
- Increase participation rates through program designs.
- Increase program budgets, rather than decreasing them.
- All cost-effective energy efficiency - for all customers.
- (Note that the goal of increased participation should be balanced against the goal of minimizing cream-skimming.)

Benefits of EE that Flow to All Customers - I

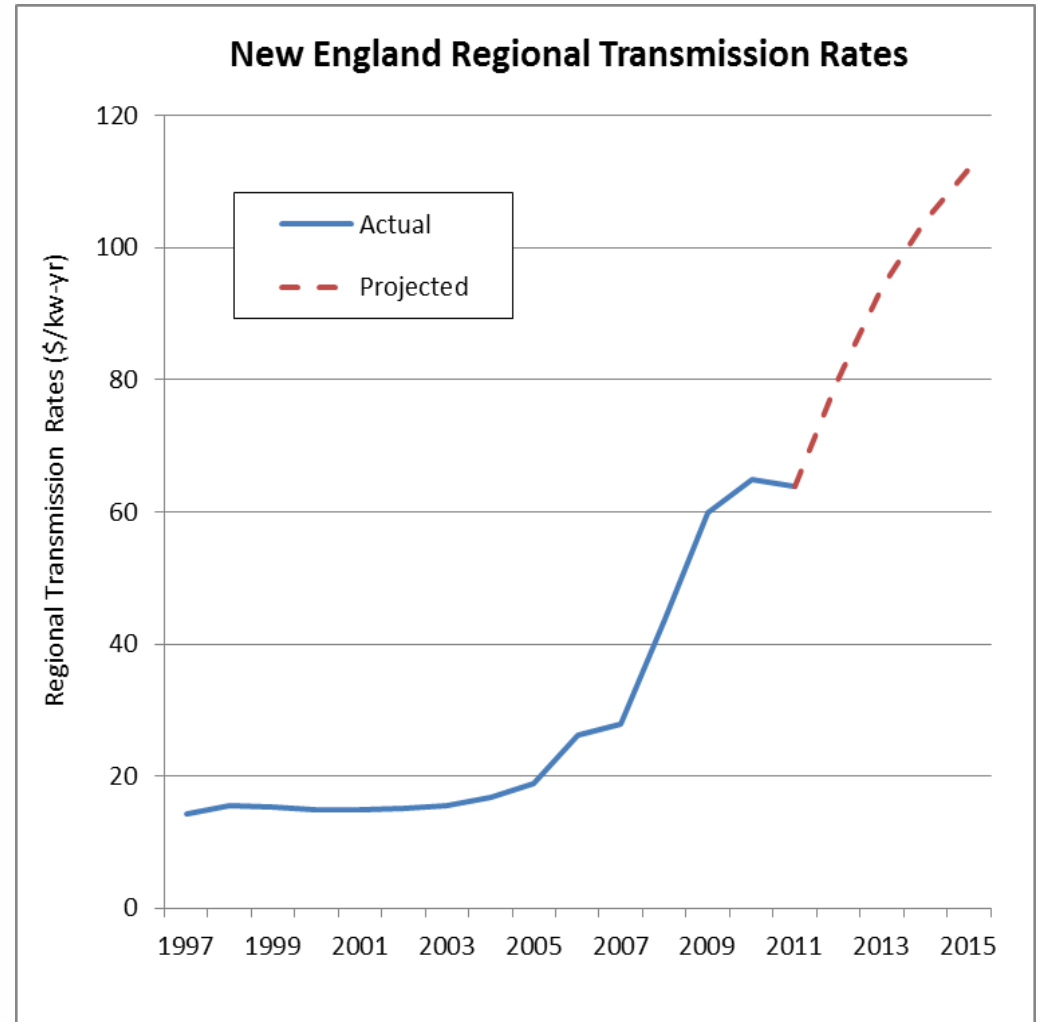
- Increased system reliability.
- Reduced risk and exposure to volatile fossil fuel prices.
- Reduced cost of compliance with environmental regulations.
- Reduced consumption of fossil fuels.
- Reduced reliance upon imported fuels.
- Reduced environmental impacts, including reduced greenhouse gases.

Benefits of EE that Flow to All Customers - II

- EE will reduce the price of the wholesale energy and capacity markets in New England.
 - Lower peak and energy demands means that marginal supply-side resources are dispatched less.
 - This results in a lower market clearing price.
- This benefit flows to **all** customers in New England, regardless of whether they participate in EE programs.
- The MA Three-Year Plans were estimated to save over \$700 million for all MA customers.
 - This is in addition to the bill savings to participants.

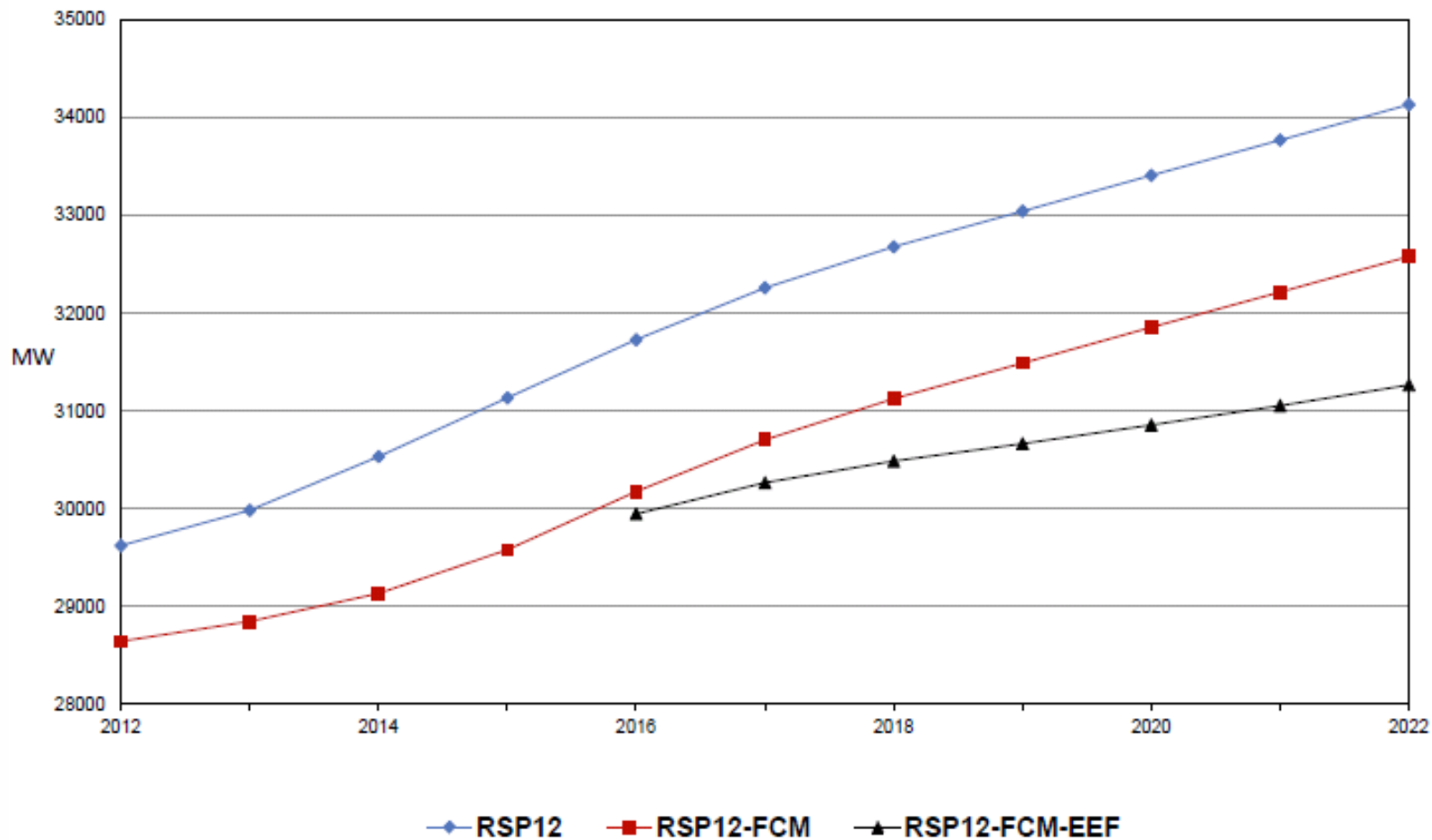
Benefits of EE that Flow to All Customers - II

- Energy efficiency will avoid costs of transmission and distribution lines.
- MA Three-Year Plans were estimated to save roughly \$423 million in avoided T&D costs.
 - This is in addition to the bill savings to participants.
- Transmission costs in New England are expected to increase dramatically.



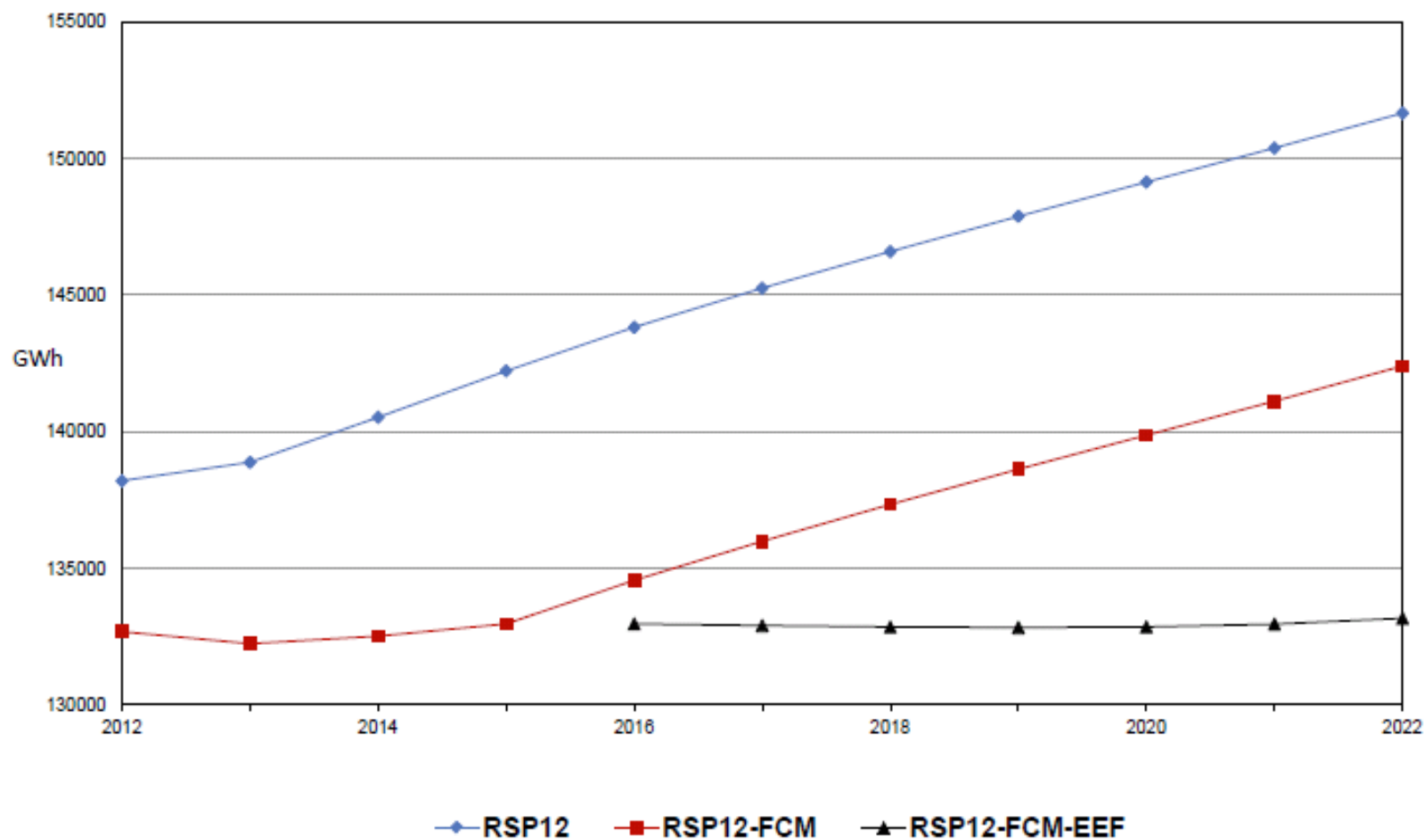
Impact of EE on New England Peak Demand

ISONE Summer Peak (90/10) Forecast



Impact of EE on New England Energy Demand

ISONE Annual Energy Forecast



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Bill and Rate Impacts Georgia Power's 2013 IRP

John Sibley
Senior Policy Fellow



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Research

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Energy Efficiency in Georgia Power's IRP

- Georgia Power submits an Integrated Resource Plan every 3 years and seeks certification of EE programs.
- IRP, which has a ten year planning period for energy efficiency, is reviewed by the Georgia Public Service Commission. 2013 IRP is now under review.
- Energy Efficiency portfolio is developed over 18-24 months in consultation with stakeholders (including Southface) in a Demand Side Management Working Group.
- Savings from the proposed portfolio are included in the supply plan as an adjustment to projected load growth.

Georgia Power's test for Energy Efficiency

- “Minimize upward pressure on rates and maximize economic benefit.”
- This balance is struck by comparing RIM results to TRC results.
- Since only RIM and TRC are compared, bill savings, though filed, are not in the balancing analysis presented to the PSC.
- Based on PSC order from 2004.

GP Ramped up EE 2011-2013 (2010 IRP)

- 7 new residential and commercial programs.
- Budget doubled: \$13.7M 2011 to \$27.8M 2013.
- Savings tripled: ~0.12% of sales to ~0.35%.
- TRC benefits 2011-2013: \$499M.
- RIM costs 2011-2013: \$70M.
- Ratio of TRC to RIM 2011-2013: ~7 to 1.
- Bill savings 2011-2013: \$569M.
- Cost of saved energy: less than 1.5 cents/kWh.

GA PSC revisited balancing test (2010 IRP)

Order on 2010 IRP states:

“While the RIM test should be considered in conjunction with other tests, such as the TRC test, the Societal test, the Program Administrator test and the Participant test, a ratio of above 1.0 under the RIM test should not be deemed mandatory.... Because the RIM test only indicates whether electric rates may increase if an energy efficiency measure or program is implemented, and not whether the impact may **reduce a participant’s overall electric bill**, this test will screen out energy efficiency measures that can save significant amounts of electricity and can **lower customer electric bills**..... **Considering the results of the three tests discussed above in conjunction**, the record reflects that the programs...will result in **significant ratepayer savings.**”

GP's proposal for 2014-2016 (2013 IRP)

- Flatter budget: \$34.1M 2014 to \$37.9M 2016.
- Savings remain less than 0.4% of sales.
- GP's rationale: "TRC test results declined and RIM test results worsened since 2010."
- TRC benefits 2014-2016: \$561M.
- RIM costs 2014-2016: \$246M.
- Ratio of TRC to RIM 2014-2016: ~2.3 to 1.
- Bill savings: \$833M.
- Cost of saved energy: less than 1.4 cents/kWh.

Proposal by EE proponents to ramp to 1% by 2016

- DSMWG met 3/11-12/12 on EE portfolio for 2013 IRP.
- EE proponents proposed continuing to ramp up savings to 1% of sales in 2016.
- In DSMWG process, GP tested a version of a 1% portfolio.
- GP found cumulative rate impacts over 10 years of about \$4B.
- Southern Alliance for Clean Energy (SACE) has provided alternative analysis in hearings.

Can the discussion of bill and rate impacts in the Southeast be more complete?

- Southface has contracted with Georgia Tech to develop a new modeling tool for stakeholders.
- Principal Investigator – Dr. Marilyn Brown, Professor, School of Policy Studies.
- Research Assistants – Alex Smith, PhD candidate, and Ben Staver, Masters candidate.
- Advisory Committee – Georgia Power, Duke Energy, GA PSC, NCUC, DOE, LBNL, ORNL, Synapse, SACE, SEEA.

Goals of the project

- Free, open source modeling tool.
- Relevant to the primary concerns of stakeholders.
- Accessible to as broad a range of stakeholders as possible.
- Accurate enough to provide information of real value.
- Flexible architecture, to address different regulatory contexts based on the depth of information available.

Proposed capacities for new tool

- Compare costs and benefits of EE.
- Calculate levelized cost of energy saved.
- Analyze impacts on rates and bills of both participants and nonparticipants.
- Analyze impacts on earnings and ROE of utilities.
- Assess different approaches to recovery of lost revenues and any performance incentives.
- Calculate societal benefits, if info available.

Stay tuned for the outcome of this project

For more information

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