BUSINESS MODELS FOR UTILITIES OF THE FUTURE: EMERGING TRENDS IN THE SOUTHEAST

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In Cooperation with

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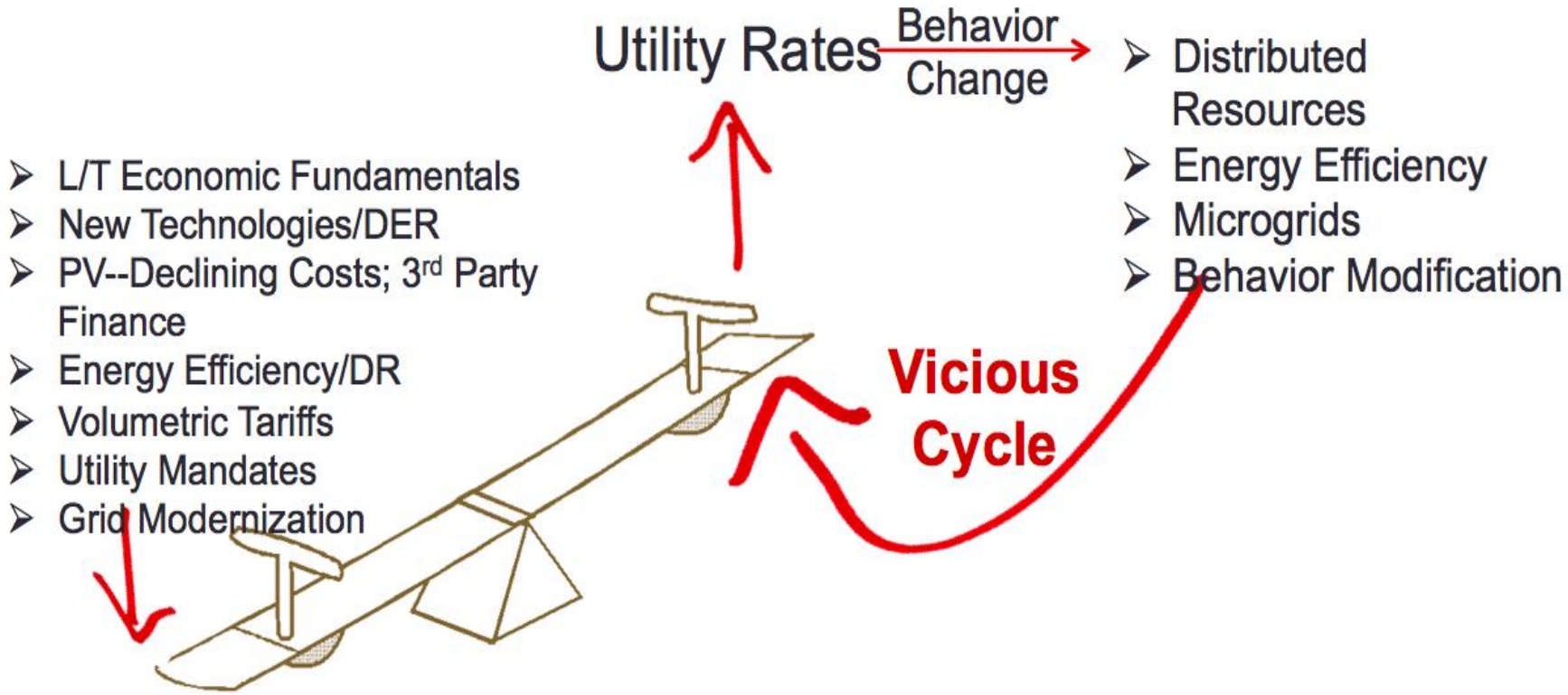
Southface promotes sustainable homes, workplaces and communities through education, research, advocacy and technical assistance.

THE NATIONAL CONTEXT

Disruptive threats to utility business models:

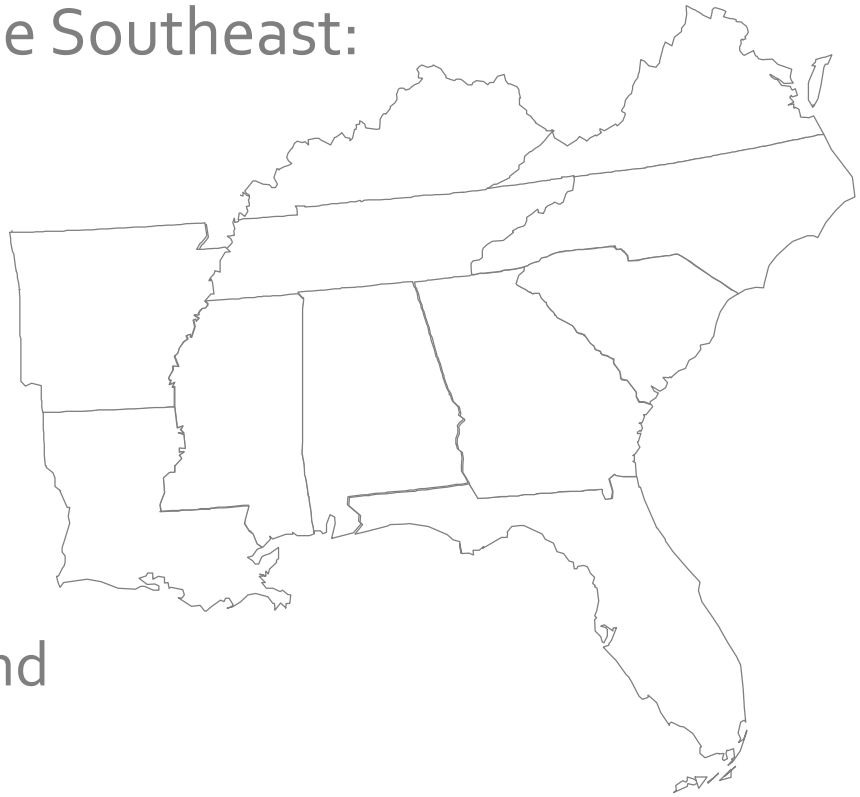


Source: Peter Kind (2013). *Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business*. Edison Electric Institute.

GEORGIA TECH/SOUTHFACE RESEARCH ON SE

Purpose: provide a tool and illuminate impacts of emerging EE business models in the Southeast:

- Built new modeling tool for the analysis
- Surveyed IOU business models in 11 states
- Identified an emerging prototype
- Characterized a realistic Southeastern IOU
- Analyzed impacts on the utility and customers with the modeling tool



We appreciate the support of the Energy Foundation.

GEORGIA TECH'S MODELING TOOL: GT-DSM

- Runs in Microsoft Excel
- Freely available under open source license
- Relies entirely on publicly available inputs
- Integrates existing methods from Tech and others
- Adds features requested by review committee
  - Capital investment deferrals
  - Potential impacts of high-consumption participants
  - Fuel cost impacts ("DRIPE" effect)

The modeling tool and user's manual are at http://cepl.gatech.edu/projects/mecp/modeling.

SURVEY: NAPEE'S THREE-LEGGED STOOL EMERGES IN THE SOUTHEAST

Recovery of Program Costs

Expensed contemporaneously – general practice

Amortized over several years – not found

Recovery of Lost Revenues

Lost revenue adjustment mechanism – 7 states

Per customer decoupling – not found

Straight fixed variable rate – not found

Provision of Performance Incentive

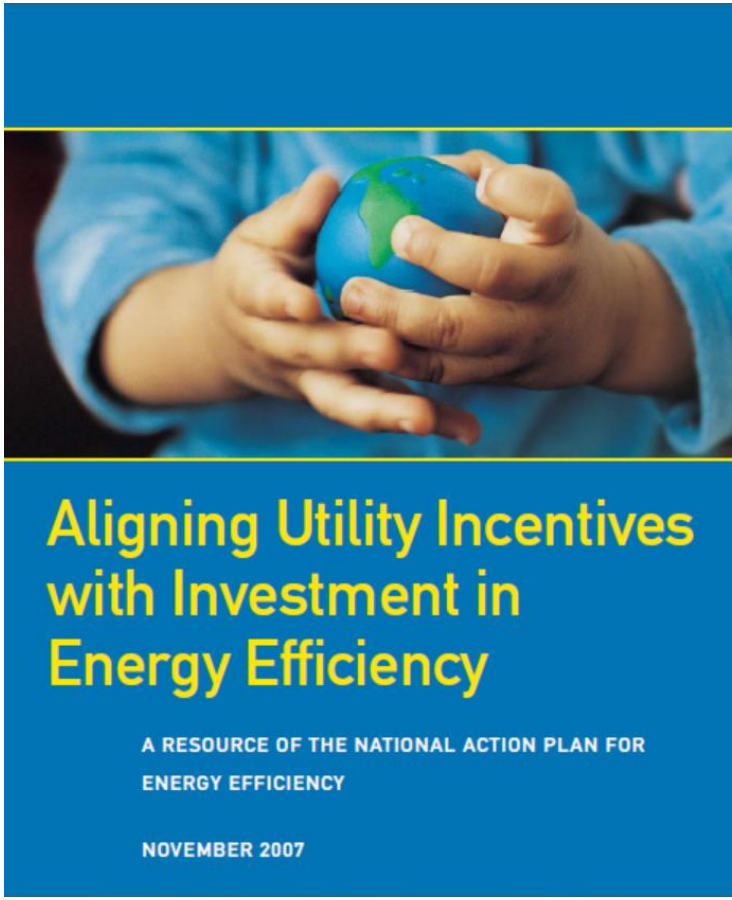
Shared savings based on TRC – 3 states

Shared savings based on PAC – 2 states

Return on program costs – 1 state

See "Aligning Utility Incentives with Investments in Energy Efficiency," National Action Plan for Energy Efficiency, 2007, http://www.epa.gov/cleanenergy/documents/suca/incentives.pdF

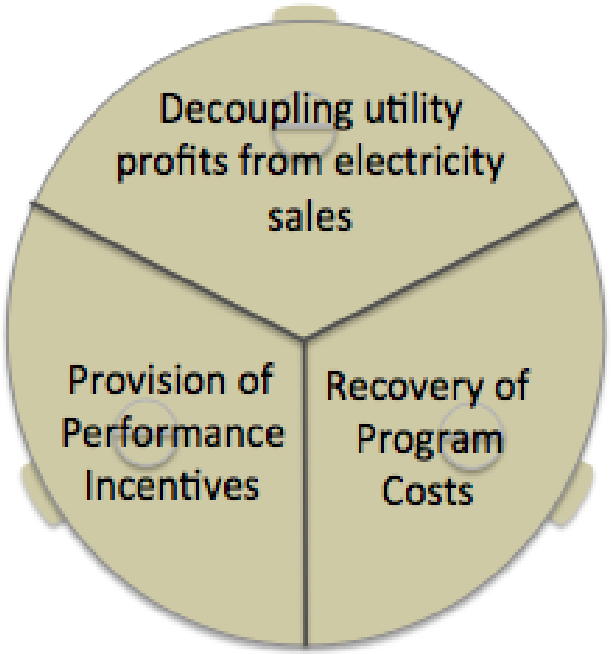
Molina and Kushler, "Policies Matter: Creating a Foundation for an Energy Efficient Utility of the Future, 2015, http://aceee.org/sites/default/files/policies-matter.pdf.



THE PROTOTYPICAL APPROACH USED IN THE SE

The prototypical approach is highlighted for each "leg" of the three-legged stool:

- Straight Fixed Variable Rate
- ***Lost Revenue Adjustment Mechanism***
- Per Customer Decoupling



- ***Shared Savings based on PAC test***
- Shared Savings based on TRC test
- Return on Program Costs

- Amortized over 3 years w/ carrying cost
- ***Expensed and Recovered Contemporaneously***

OBSERVATION: DEBATE ON BEST PRACTICE FOR LOST REVENUES IS NOT OVER IN THE SE

Examples:

- AR led the way in refining LRAM, has invited utilities to propose decoupling mechanisms, and is considering annual adjustments through a formula rate plan
- VA has questioned the proof of lost revenues and denied recovery in several proceedings
- In NC, recovery is limited to 3 years
- Georgia Power continues to prefer to recover lost revenues in rate cases every 3 years
- LA and MS are early in the implementation of the three-legged stool

CHARACTERIZATION OF A REALISTIC IOU

Using public data on Georgia Power, a hypothetical but realistic IOU was characterized in GT-DSM. GPC was not replicated.

- 2.4 million customers, with annual sales of 81.1 TWh and a peak demand of 15.4 GW
- Customers grow 1.0% per year; sales and demand grow 1.24%
- Earnings are $1.2 billion based on an 11.25% return on equity
- Average rates are 12 ¢/kWh for residential and 8 ¢/kWh for C/I
- Residential rates are volumetric; C/I rates have demand charge
- Capital is 54% equity and 46% debt; WACC is 8%
- Major capital investments are programmed over several years
- Rate case filed every 3 years

THE IOU'S ENERGY EFFICIENCY PORTFOLIO

- Utility invests 0.5% of revenues in residential and commercial programs and saves 0.4% of retail sales
- Residential (lighting, appliances, whole house, new home, and refrigerator recycling) cost $19.1M, save 57.8 GWh per year.
- Commercial (custom, prescriptive, and small business) cost $19.2M, save 241 GWh per year; no industrial program
- 8% of residential and 10% of commercial savings occur during peak period, much more than the 3.7% of the year that is peak
- Programs will deploy measures for 10 years, and the commercial measure life is 15 years, so our analysis of the impacts of these programs extends for 25 years

RESULTS: IMPACTS ON THE UTILITY AND CUSTOMERS

Marilyn A. Brown, Benjamin Staver, Alexander M. Smith, and John Sibley. 2014. "Business Models for Utilities of the Future: Emerging Trends in the Southeast," School of Public Policy, Georgia Institute of Technology, Working Paper #84, http://cepl.gatech.edu/sites/default/files/attachments/BusinessCase_10-28-2014%20_WP84.pdf#

Brown, et al., "Alternative Business Models for Energy Efficiency: Emerging Trends in the Southeast," Electricity Journal (2015), http://www.sciencedirect.com/science/article/pii/S1040619015000664

THE IMPACT OF COMMERCIAL EE PROGRAMS

	Utility Economics		Customer Economics			
	Cumulative Earnings in $Billions[a]	Return on Equity (%) (25-Year Average)	Average Commercial Energy Bill ($/year)	Participant Energy Bill ($/year)	Non-participant Energy Bill ($/year)	Average Commercial Energy Rate (¢/kWh)
Utility Without EE Programs	47.02	11.46	28,107	NA	NA	12.37
+ Commercial EE Programs	45.22	11.04	26,747	22,293	28,070	12.35
+ Prototypical Business Model	46.79	11.41	27,015	22,516	28,351	12.50

- Utility economics are hurt by EE programs, but both participants and non-participants enjoy reduced bills because of the "DRIPE" effect.
- The prototypical business model restores 99.7% of utility earnings and provides earnings above the target of 11.25%, but rates rise by 1.0%.

THE IMPACT OF RESIDENTIAL EE PROGRAMS

	Utility Economics		Customer Economics			
	Cumulative Earnings in $Billions[a]	Return on Equity (%) (25-Year Average)	Average Residential Energy Bill ($/year)	Participant Energy Bill ($/year)	Non-participant Energy Bill ($/year)	Average Residential Energy Rate (¢/kWh)
Utility Without EE Programs	47.02	11.46	2,533	NA	NA	19.23
+ Residential EE Programs	45.84	11.18	2,484	2,343	2,533	19.22
+ Prototypical Business Model	46.88	11.43	2,511	2,367	2,560	19.42

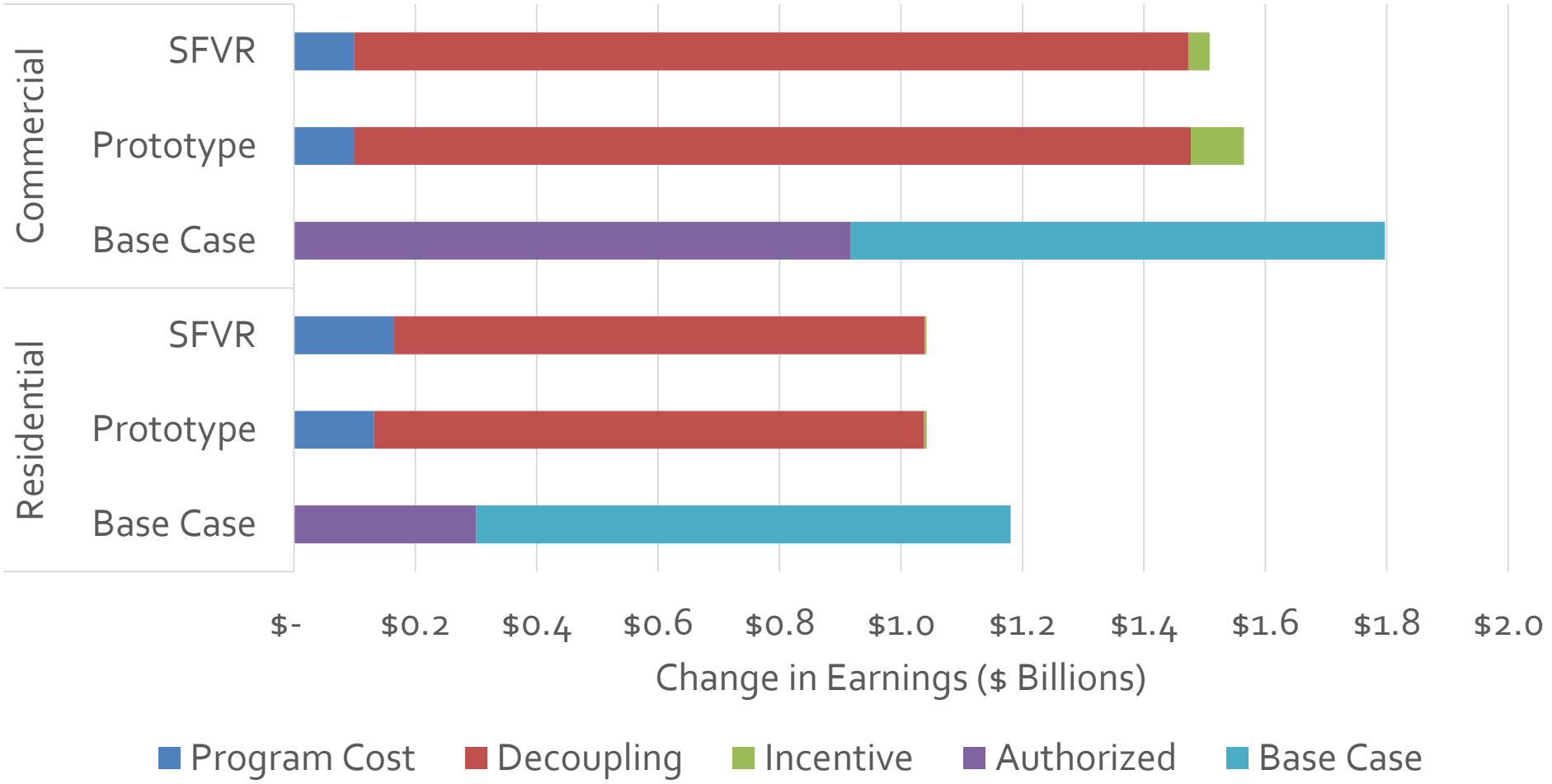
- Utility economics are hurt by EE programs, and participants benefit without adding cost for non-participants ("DRIPE" effect).
- The prototypical business model restores 99.7% of utility earnings and provides earnings above the target of 11.25%, but rates rise by 1.0%.

THE "DRIPE" EFFECT – DEMAND REDUCTION INDUCED PRICE EFFECT

- EE programs reduce rates by eliminating a greater proportion of more expensive on-peak than off-peak fuel expenditures.
- Even if the utility recovers program costs and is paid incentives, there is still downward pressure on rates because of the "DRIPE" effect.
- But with this combination, the utility is still left short of the earnings and ROE it would receive without the EE programs.

Note: Deferring "new builds," environmental retrofits, and T&D upgrades would be additional benefits, but these were not specified for the modeled utility.

IMPACT ON UTILITY EARNINGS

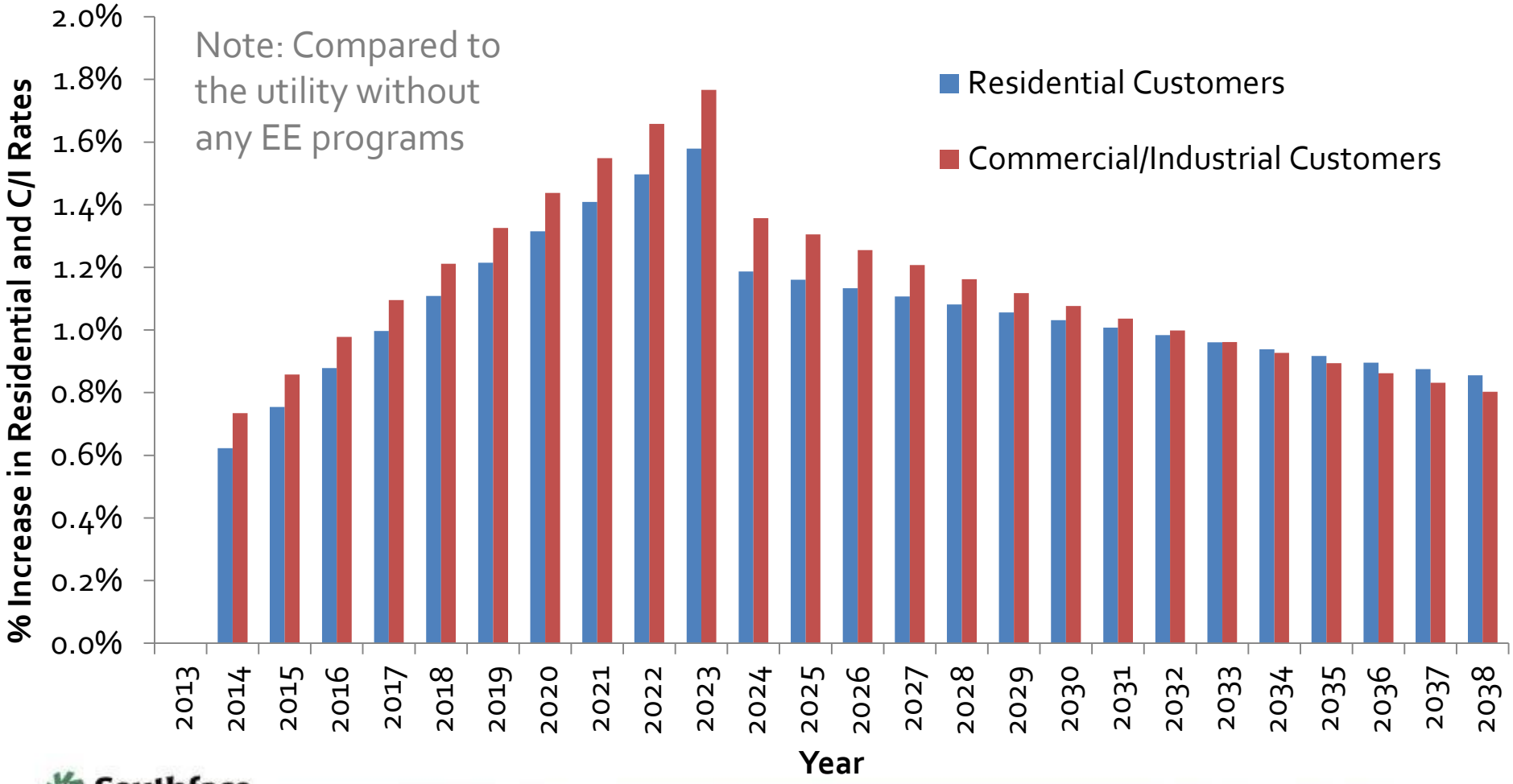


Note: Compared to operating an EE program without any business model features

SFVR = straight fixed variable rate

THE PROTOTYPICAL BUSINESS MODEL'S IMPACT ON RATES

Rates decline with EE Programs, but increase when lost utility revenues are recovered.



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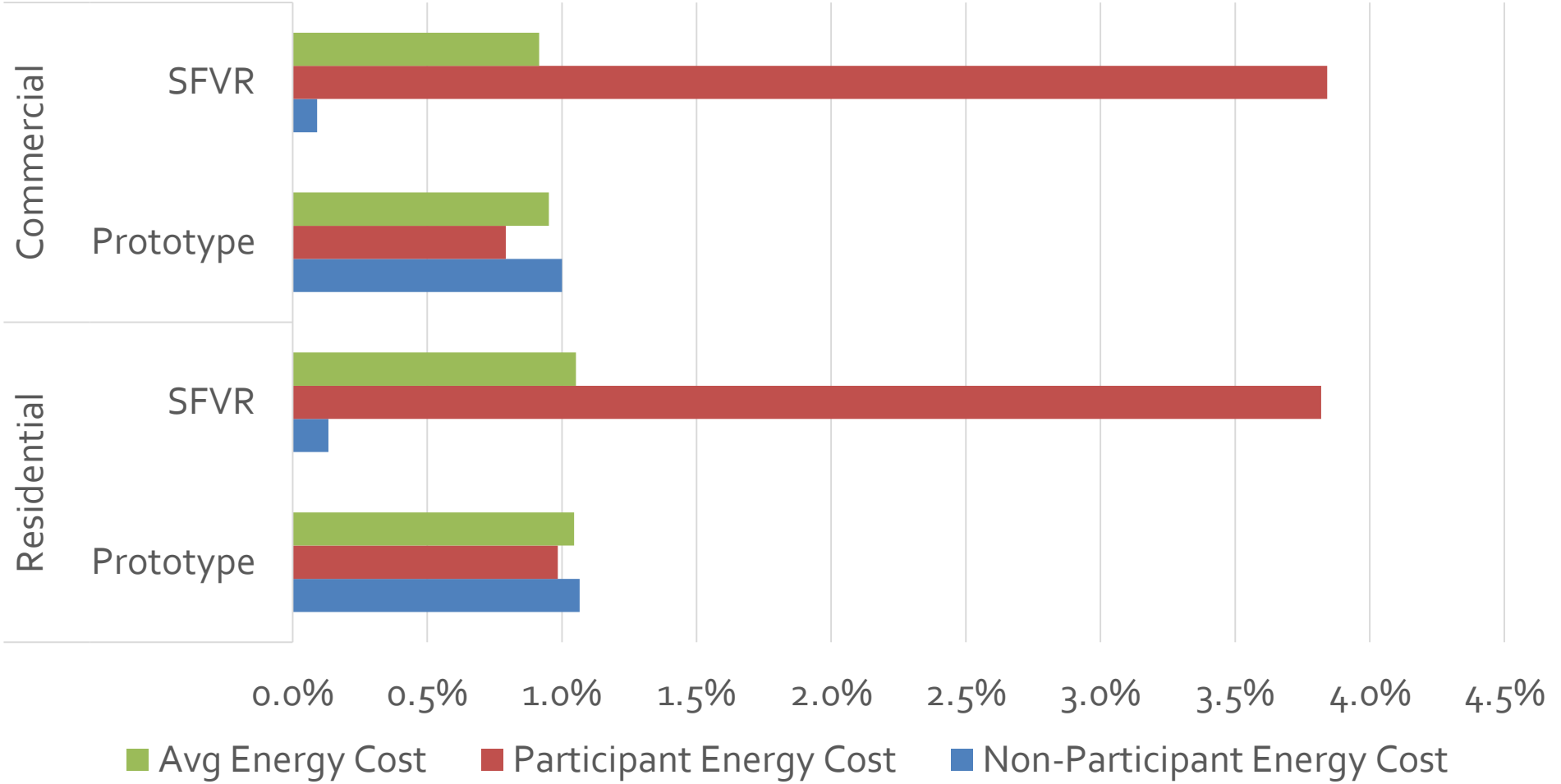
AVERAGE CHANGE IN ENERGY BILLS



Note: Compared to operating an EE program without any business model features

SFVR = straight fixed variable rate

CONCLUSIONS

- Utility earnings are reduced by EE programs, but they can be restored by alternative business models.
- With these alternative models, EE programs:
  - cause modest increases in electricity rates,
  - significantly reduce the electricity bills of participants.
- Depending on the choice of business model, non-participant utility bills may also decline.
- Selecting the right business model is important to the future of EE programs.

FOR MORE INFORMATION

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