Financial Implications of using Energy Efficiency to contribute towards meeting a Federal RES: Case Study of Kansas

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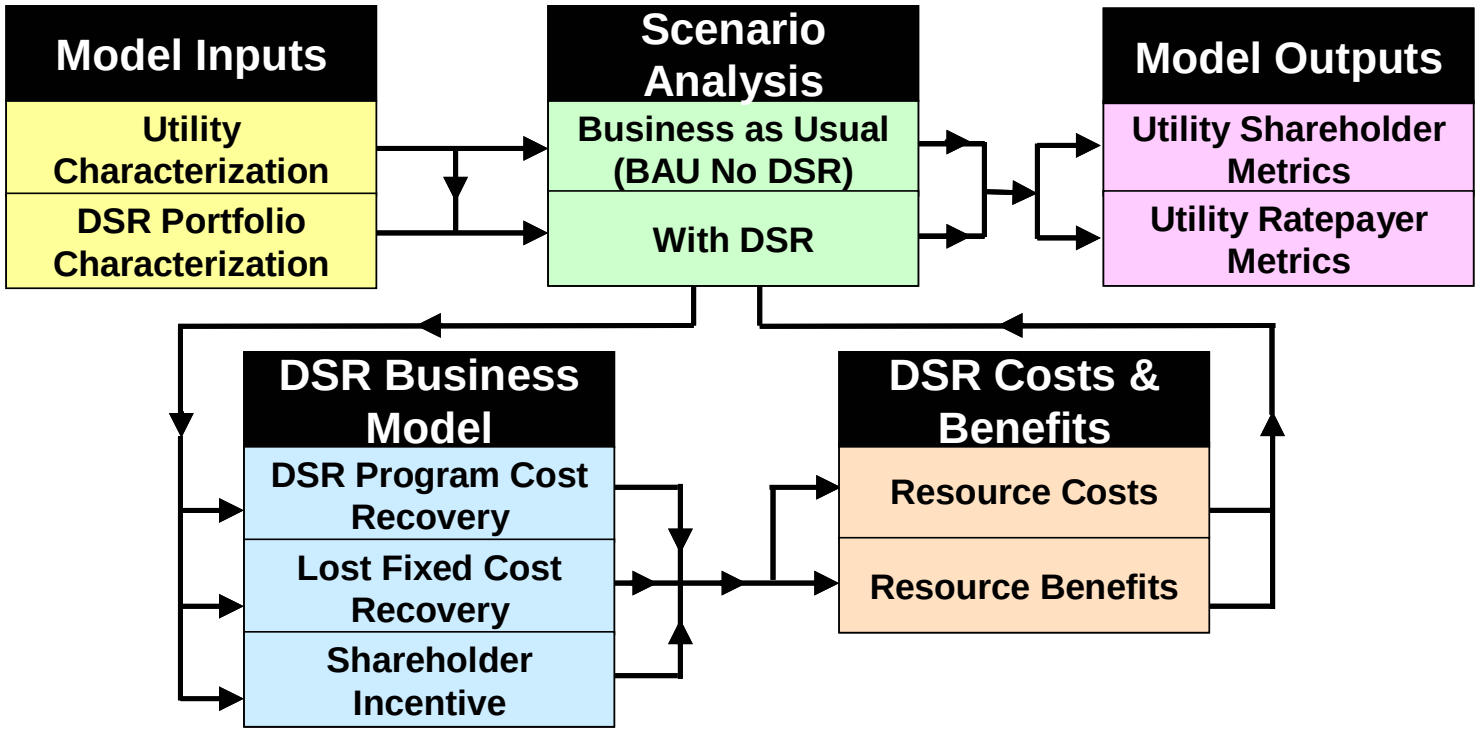
Presentation Outline

Objective: This analysis seeks to quantify the financial implications when different sized EE portfolios under alternative business models are allowed to serve as a resource in meeting a federal RES requirement using a case study approach (Kansas)

- **Analysis methodology**
- **Federal RES Requirements**
- **Utility and EE Portfolio characterization**
- **Financial implications of EE as a resource**
- **Conclusions**

Basic Analysis Framework – Overview



- **Utilized a pro-forma financial spreadsheet model originally developed as part of the National Action Plan for Energy Efficiency (NAPEE) but expanded by LBNL**
  - **Model has ability to illustrate impacts on stakeholders under variety of different DSR portfolios and/or business models**

American Clean Energy and Security Act (Passed House in June 2009)

- **Includes Renewable Electricity Standard (RES)**
  - **Specifies fraction of annual actual retail sales that must be met with "renewable" resources**
  - **Compliance percentage ramps up from 6% in 2012 to 20% in 2020 and beyond**
- **Treatment of Energy Efficiency in RES**
  - **EE able to serve as a resource to meet up to 25% of RES obligation**
  - **EE reduces annual actual sales which forms the basis for the RES obligation**

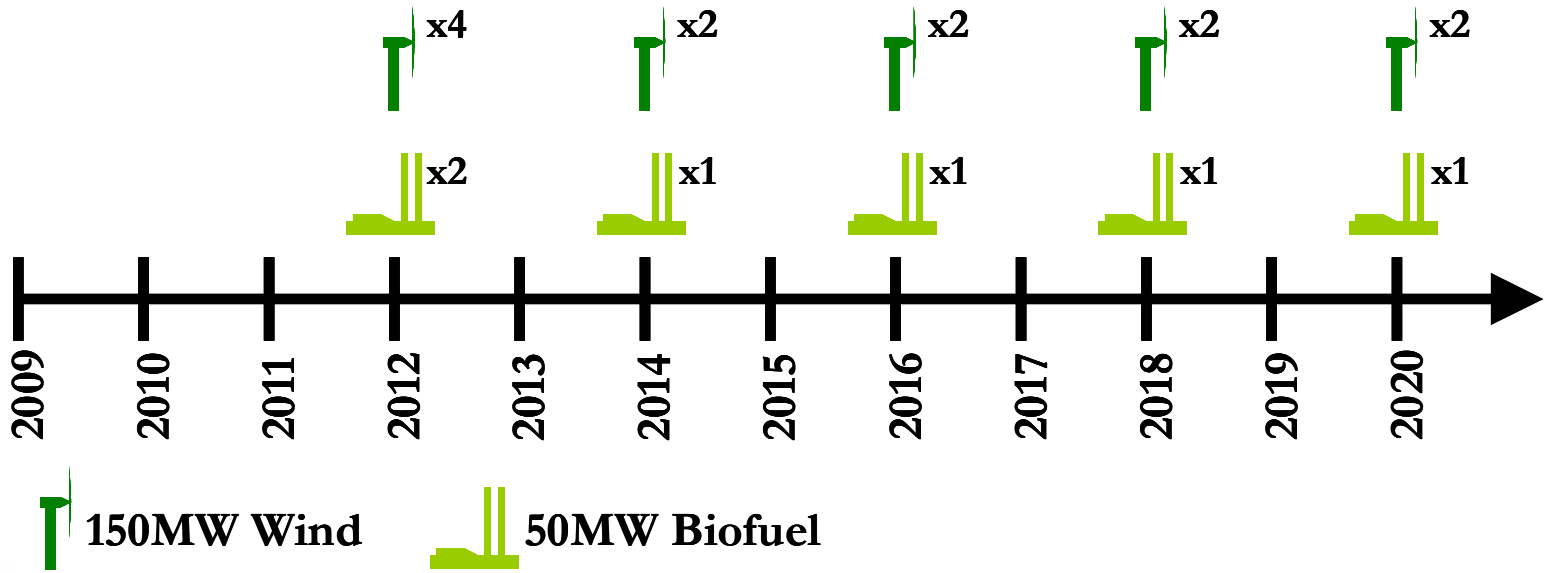
Utility Characterization: Building the Kansas "Super-Utility"

- Collected FERC Form 1 data for three largest IOUs
  - Kansas Gas and Electric
  - Westar Energy
  - Kansas City Power and Light
- Utilized ~15 years worth of historical sales and cost data to inform likely relationship between future sales growth and cost growth
- Combined cost categories (e.g., Non-fuel O&M, T&D CapEx) and growth rates from each of the three utilities to construct a single "super-utility"

Federal RES Compliance: Build vs. Buy

	Expansion Priority	Facility Size (MW)	Capacity Factor	Levelized Build Cost ($/MWh)	Levelized PPA Cost ($/MWh)
Wind Resources	Primary	150 MW	38%	48	43
Biofuel Resources	Secondary	50 MW	85%	96	92

BAU No EE Resource Expansion Plan to meet ACES RES Requirement



BAU No EE Financial Metrics (2009 – 2020)

	Build RES Scenario	Buy RES Scenario	Difference
Avg. Retail Rates (¢/kWh)	8.92	7.80	1.12
Collected Revenue ($B, PV)	$24.16	$23.27	$0.89
Achieved After-Tax Earnings ($B, PV)	$2.93	$2.45	$0.48
Achieved After-Tax ROE (Avg.)	10.39%	10.34%	0.05%

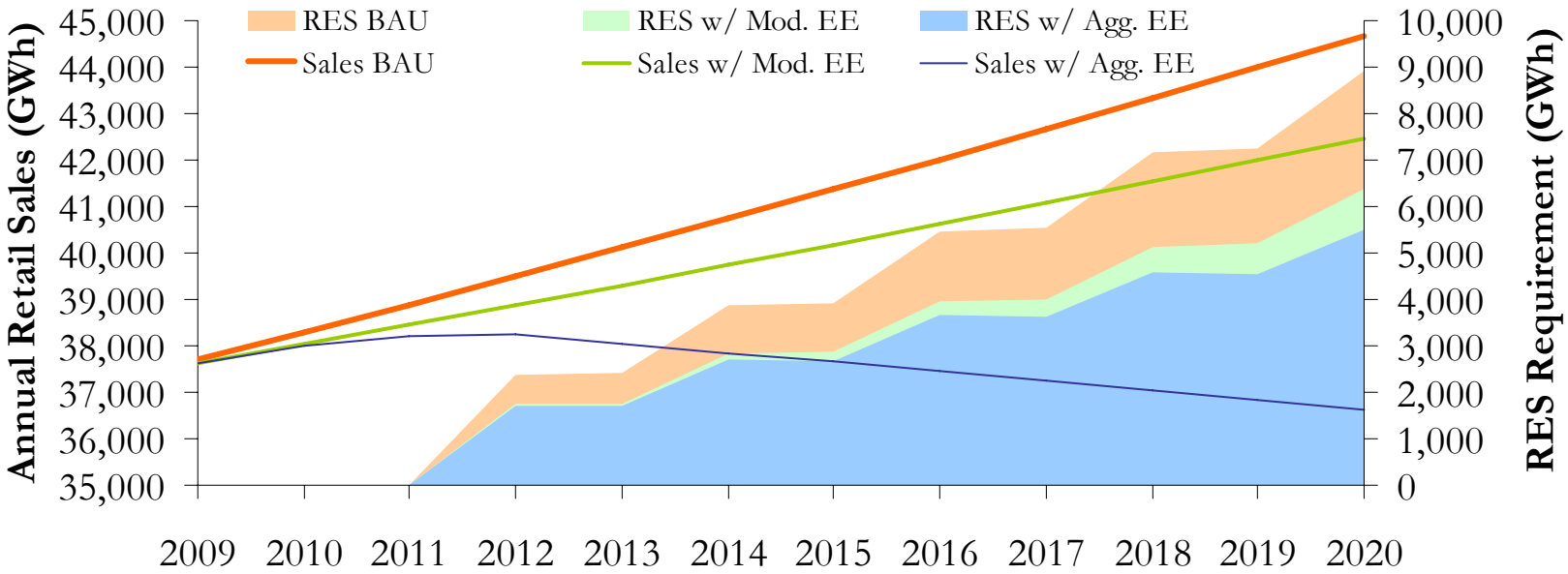
- **If utility chooses to sign PPAs rather than build its own "green" power plants:**
  - **Ratepayers are much better off, saving $~890M while retail rates drop on average by over 1 ¢/kWh**
  - **Utility shareholders are worse off, losing ~$480M in earnings and seeing avg. ROE drop by 5 basis points**

Energy Efficiency Portfolio: Costs and Savings (2009 – 2020)

	Lifetime Energy Savings (GWh)	Lifetime Pk. Demand Savings (MW)	Total Resource Benefits ($M, PV)	Utility Program Costs ($M, PV)	Total Resource Costs ($M, PV)	Net Resource Benefits ($M, PV)	Benefit Cost Ratio
	(1)	(2)	(3)	(4)	(5)	(6) = (3) - (5)	(7) = (3)/(5)
Mod. EE	27,184	535	$744	$345	$554	$191	1.34
Agg. EE	105,409	2,019	$2,701	$1,481	$2,169	$532	1.25

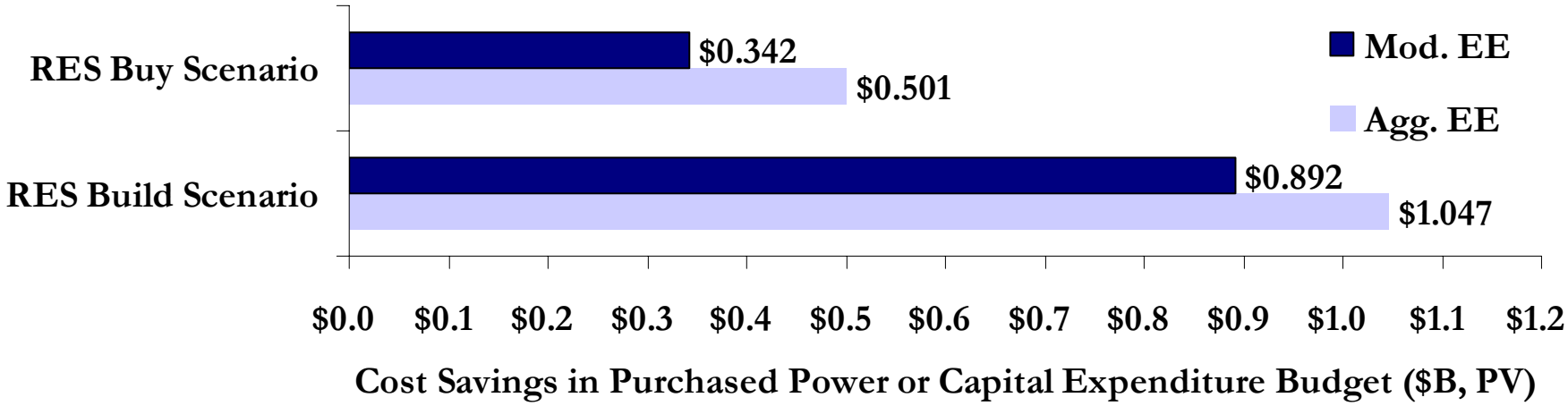
- Modeled two alternative EE portfolios for Kansas "super-utility" to help meet 2012 federal RES requirement
- Moderate EE portfolio: Meets maximum contribution of EE towards RES at levelized TRC of ~3.3 ¢/lifetime kWh
- Aggressive EE portfolio: Completely offsets incremental load growth starting in 2012 at levelized TRC of ~3.6 ¢/lifetime kWh

RES Requirement w/ EE as a Resource



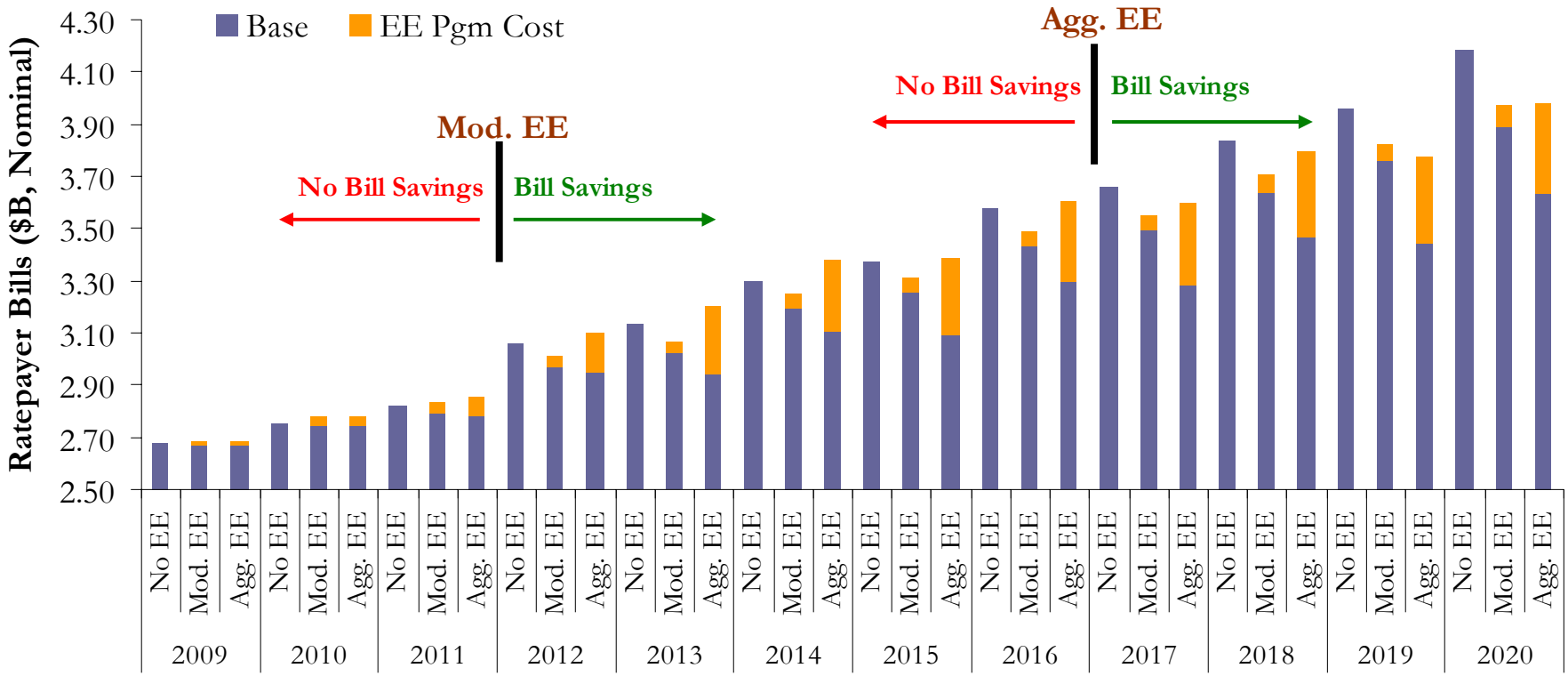
- **RES requirement represents energy that must be served by non-EE renewable resources (see right axis)**
- **Impact of EE on RES requirement is substantial, but incremental reduction in RES requirement of going from Mod. to Agg. savings level is more limited**

Impact of EE as a Resource in Cost to Comply with Federal RES (2009 – 2020)



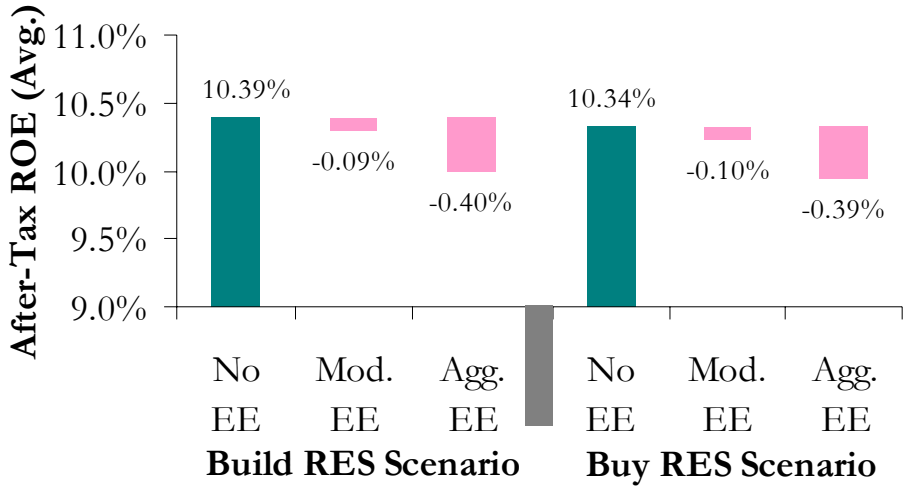
- If utility pursues a "Buy" strategy, EE can save between $340-$500M in PPA costs
- Alternatively, if utility chooses to build its own "Green" power plants under cost-of-service regulation, EE reduces capital expenditures by $892M - $1.05B

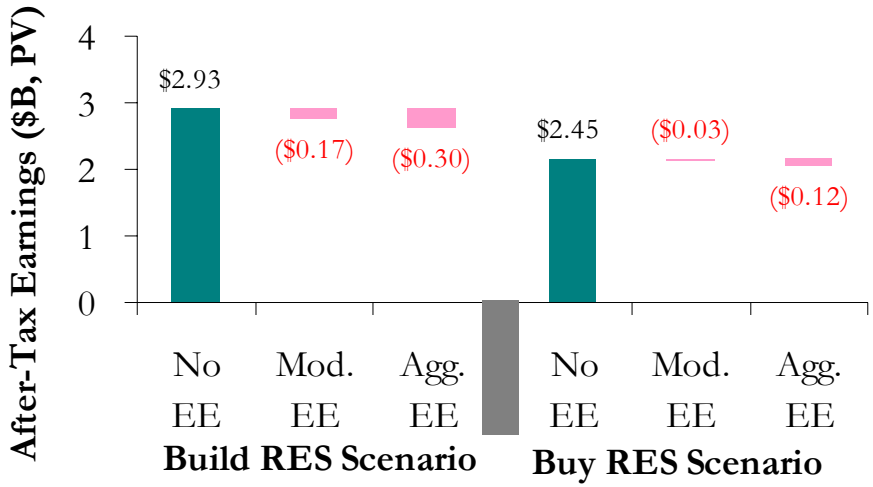
Ratepayer Bill Savings from EE: Timing Issues (Build RES Scenario)



- It takes time for the accumulated benefits of EE (e.g. bill savings) to take effect and exceed the annual EE program expenditures
- Consumers start seeing aggregate bill savings in 2012 for Mod. EE and in 2017 for Agg. EE

Impact of EE on Shareholders' Financial Interests (2009 – 2020)





- **The bigger the savings from EE the bigger the reduction in utility ROE and earnings**
- **RES compliance method has basically no impact on the change in ROE associated with identical sized EE portfolios, not so with respect to utility earnings**

EE Business Model Considerations

- **Incentives for Kansas super-utility to strategically pursue these levels of EE are not well aligned with ratepayer interests**
- **To achieve these levels of savings, the utility may need a comprehensive business model (BM) that differs by savings level**

	EE w/o BM		EE w/ BM	
	Mod. EE	Agg. EE	Mod. EE	Agg. EE
EE Program Cost Recovery Method	Expensing		Expensing	
Lost Base Revenue (LBR) or Decoupling (Dec.)	N/A		LBR	Dec.
Shared Net Benefits (Basis Point Contribution)	N/A		10	15

Impact of EE Business Model on Financial Metrics: Ratepayer Perspective

Change in Financial Metric from BAU No EE Case	Build RES Scenario				Buy RES Scenario			
	Mod. EE		Agg. EE		Mod. EE		Agg. EE	
	w/o BM	w/ BM	w/o BM	w/ BM	w/o BM	w/ BM	w/o BM	w/ BM
Δ Avg. Retail Rates (¢/kWh)	0.06	0.08	0.78	0.89	0.14	0.16	0.85	0.94
Δ Collected Revenue ($M, PV)	($401)	($347)	$13	$278	($165)	($116)	$282	$521

BM = Business Model

- **EE business model adds ~$50M in costs under Mod. EE and ~$150M under Agg. EE in total from 2009 - 2020**
- **Business model increases all-in average retail rates minimally; 0.2 mills/kWh for Mod. EE and ~1 mill/kWh for Agg. EE**

Impact of EE Business Model on Financial Metrics: Shareholder Perspective

Change in Financial Metric from BAU No EE Case	Build RES Scenario				Buy RES Scenario			
	Mod. EE		Agg. EE		Mod. EE		Agg. EE	
	w/o BM	w/ BM	w/o BM	w/ BM	w/o BM	w/ BM	w/o BM	w/ BM
Δ Achieved Earnings ($M, PV)	($167)	($135)	($297)	($138)	($33)	($4)	($123)	$21
Δ Achieved ROE (Avg.)	(9)	3	(40)	21	(40)	3	(39)	23

BM = Business Model

- **ROE exceeds BAU No EE scenario in all cases when EE implemented with a business model, but reduced if no business model is provided**
- **Even with EE business model, utility is unable to fully reach its BAU No EE earnings except under Buy scenario**

Conclusions

- **EE can serve as a cost-effective resource in reducing federal RES compliance costs regardless of compliance method (build vs. buy)**
- **If size of EE portfolio exceeds allowable levels as a RES resource, annual RES compliance level is reduced at best by 2 MWh for every 10 MWh of EE savings**
- **It takes time for ratepayers, as a whole, to start seeing bill reductions from EE: in 2012 for Mod. EE and in 2017 under Agg. EE portfolio under RES Build Scenario**
- **Implementing "business model" as part of EE, can make utility indifferent if not prefer EE from an ROE standpoint but not always from an earnings standpoint**