Assessing the Financial Impacts of Performance Based Compensation

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June 11, 2018

The work described in this presentation was supported by the Energy Foundation

Project objective

- Better understand financial implications associated with incrementally or fundamentally changing the utility business model to performance based compensation (PBC)

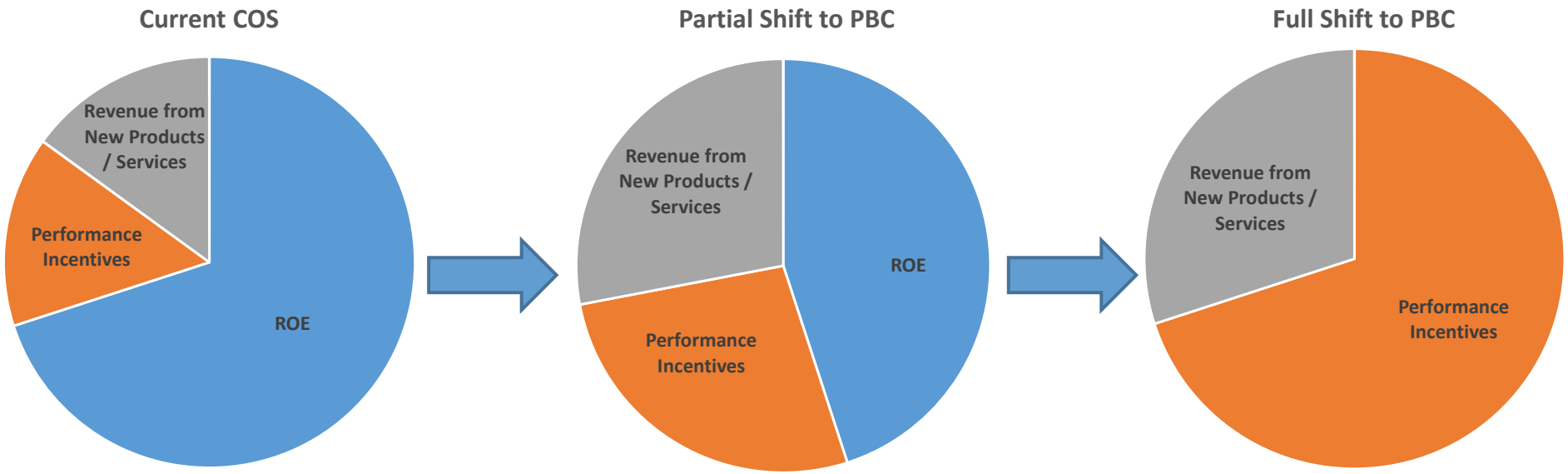


Figure source: e21 Initiative Phase II Report, 2016.

Process and e21 technical advisory group

-Fresh Energy

-MN Chamber of Commerce

-MN Center for Environmental Advocacy

-Stoel Rives

-Xcel Energy

-Allete/MN Power

-Otter Tail Power

-MN Attorney General

-MN Department of Commerce

-Citizens Utility Board of Minnesota

-Great Plains Institute

-Center for Energy and Environment

- Periodic updates on analytical approach at e21 meetings
- Convened technical advisory group (TAG) in January 2018 to present analytical tool and get feedback on input assumptions/scenario development
  - TAG representation listed at left

We incorporated some but not all TAG scenarios

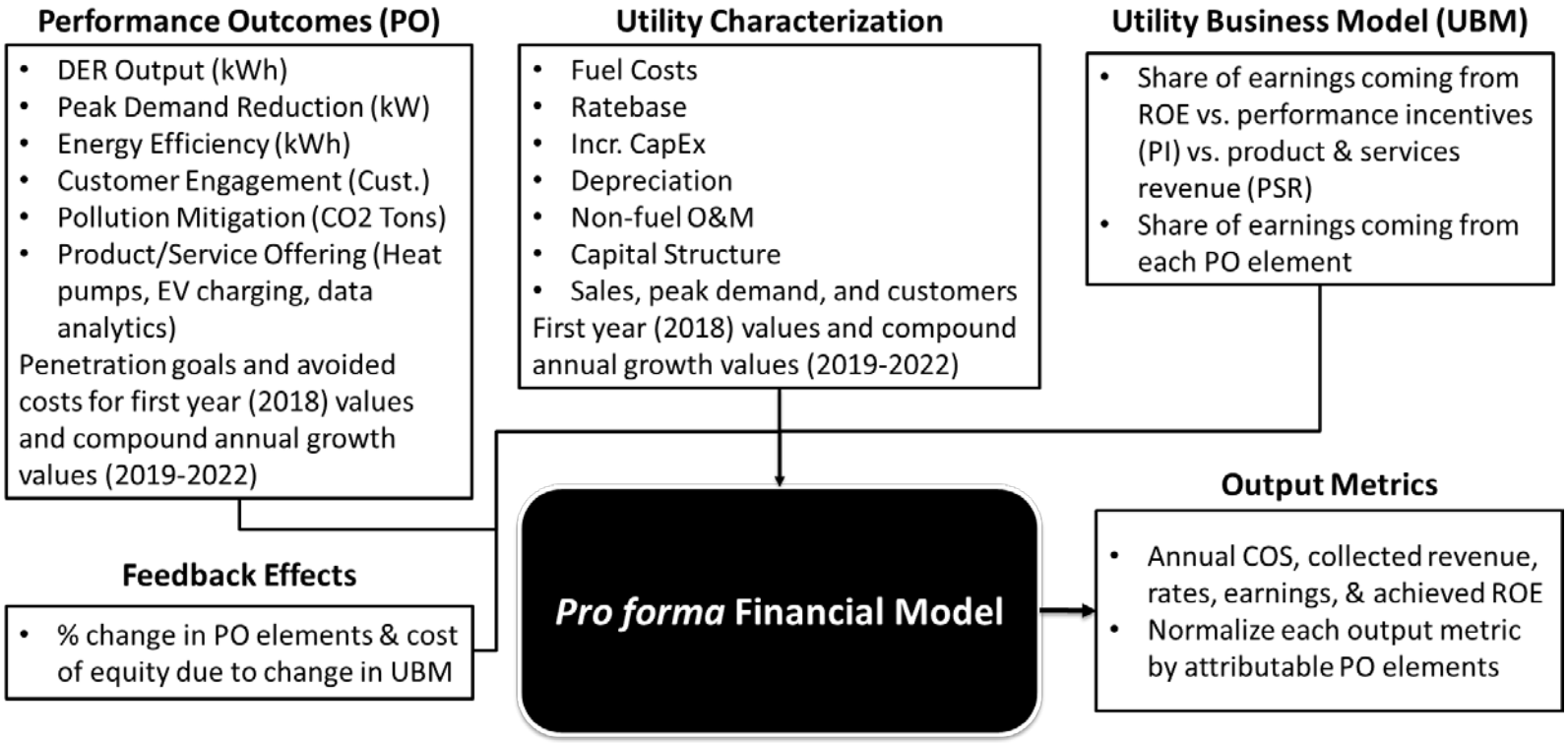
TAG scenario elements

- Deep decarbonization / carbon reduction goals (e.g., 80% reduction of power and transportation sectors)
- Performance incentives and penalties for energy efficiency (EE), demand response (DR), customer satisfaction, reliability, among others
- Some but not complete utility ownership of distributed energy resources (DERs) and electric vehicle (EV) infrastructure

Modeled scenario elements

- High EE and PV savings goals
- Utility ownership of distributed solar PV and EV infrastructure
- "Grid modernization initiative" utility investment plan
- DER performance incentives
- Changes in regulatory model: Multi-year rate plan and revenue-per-customer decoupling

Analytical approach

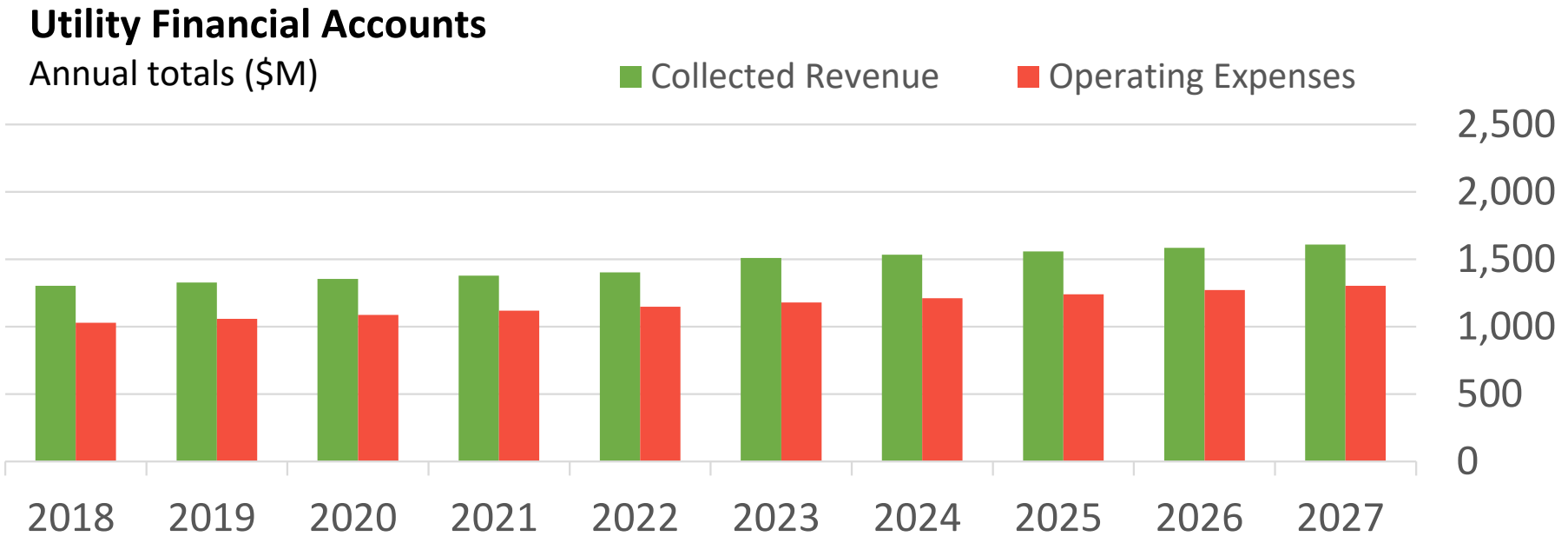


- Assess financial impacts on utility costs, collected revenues, average all-in retail rates, achieved earnings, and achieved ROE over ten-year period (2018-2027)

Hypothetical Minnesota Utility

- We characterized a "hypothetical" Minnesota electric utility serving as a "Business-as-Usual" (BAU) scenario representing electric utility without changes to its regulatory or business model
- Utility cost, load, capital, and regulatory assumptions based on Minnesota electric utility data from Jurisdictional Annual Reports, FERC Form 1, and SEC 10-k filings
- Many values are rounded to suggest **general representation** rather than precision of a particular Minnesota utility

Operating expenses growing slightly faster than revenues



- Operating expenses grow at 2.7% per year whereas collected revenues grow at 2.4% per year
- 50% of non-fuel O&M and 50% of capital expenditure related expenses recovered annually via tracker mechanism; 100% of fuel and purchased power costs recovered annually via tracker mechanism

Utility characterization | Impacts of DERs | Impacts of Earnings Opportunities | Impacts of Changes in Revenue Recovery Models | Comprehensive Portfolios

Hypothetical MN utility has financial incentive to invest capital

10 Year Present Value	
Operating Expenses ($M)	8,069
Ratepayer Bills ($M)	10,087
Average All-In Retail Rate (¢/kWh)	13.9
Achieved After-tax Earnings ($M)	1,397
Achieved After-tax ROE (%)	7.9
Minimum Equity Return (%)	7.0
Market Value ($M)	3,175
Market-to-Book Ratio	1.5

- Utility is under-earning relative to authorized levels (9.2%)
- At market-to-book ratio >1.0, investing capital adds shareholder value

Modeled DER achievement goals

Third-parties install rooftop PV systems continuing at current pace

Utility EE programs look to grow incremental first-year savings from 1.0% in 2018 to 2.0% by 2027

Electric vehicle adoption ramps up considerably but is still very small in terms of total cars sold and impact on retail sales and peak demand

DER achievement goals – PV assumptions

Third-parties install rooftop PV systems continuing at current pace

- Used GTM Research incremental and total non-utility scale solar PV nameplate capacity for MN from 2016-2022
- Converted nameplate capacity to energy output → MW (Nameplate capacity)* 0.78 (losses & conversion) * 1500 (energy production factor from DOE EERE for MN)
- Looked at other states with larger and evolving utility PV leasing programs
- Estimated starting year value and CAGR for incremental non-utility scale PV adoption and production goals

DER achievement goals – EE assumptions

Utility EE programs look to grow incremental first-year savings from 1.0% in 2018 to 2.0% by 2027

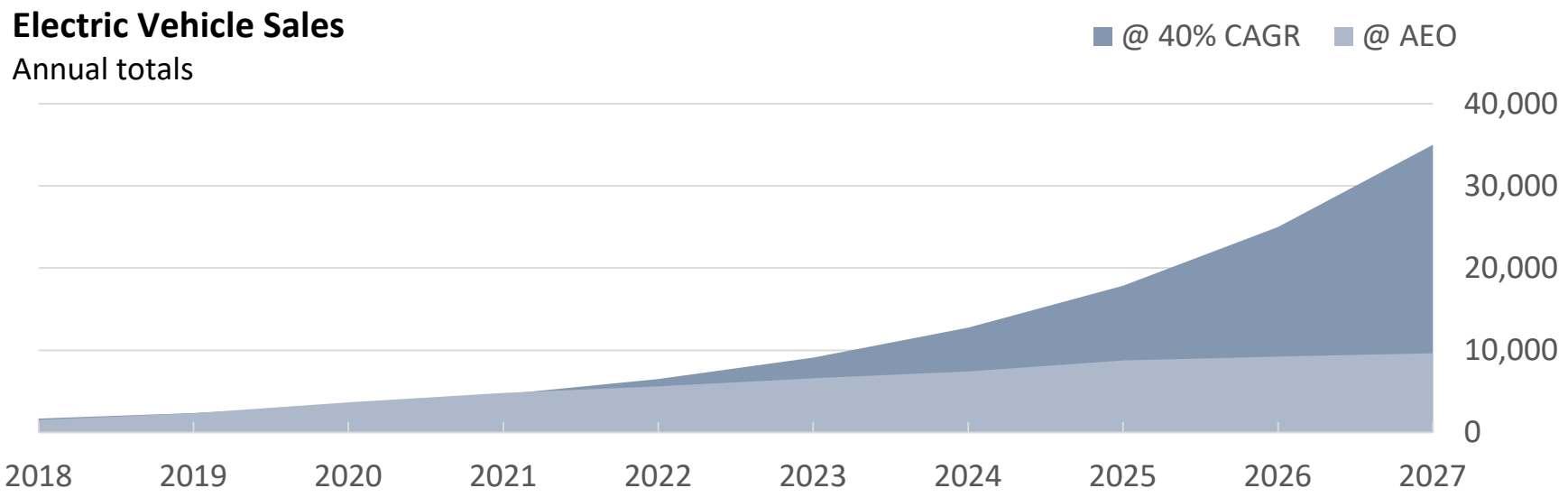
- Used ACEEE State Energy Efficiency Scorecard to assess initial statewide savings estimates
- Derived CAGR necessary to achieve 2% incremental sales reduction within 10 years (leading states ambitious goal)
- Cost of saved energy (CSE) data based on LBNL data on regional customer-funded EE programs
- CAGR adjusted based on LBNL analysis of CSE when ramping up savings

DER achievement goals – EV assumptions

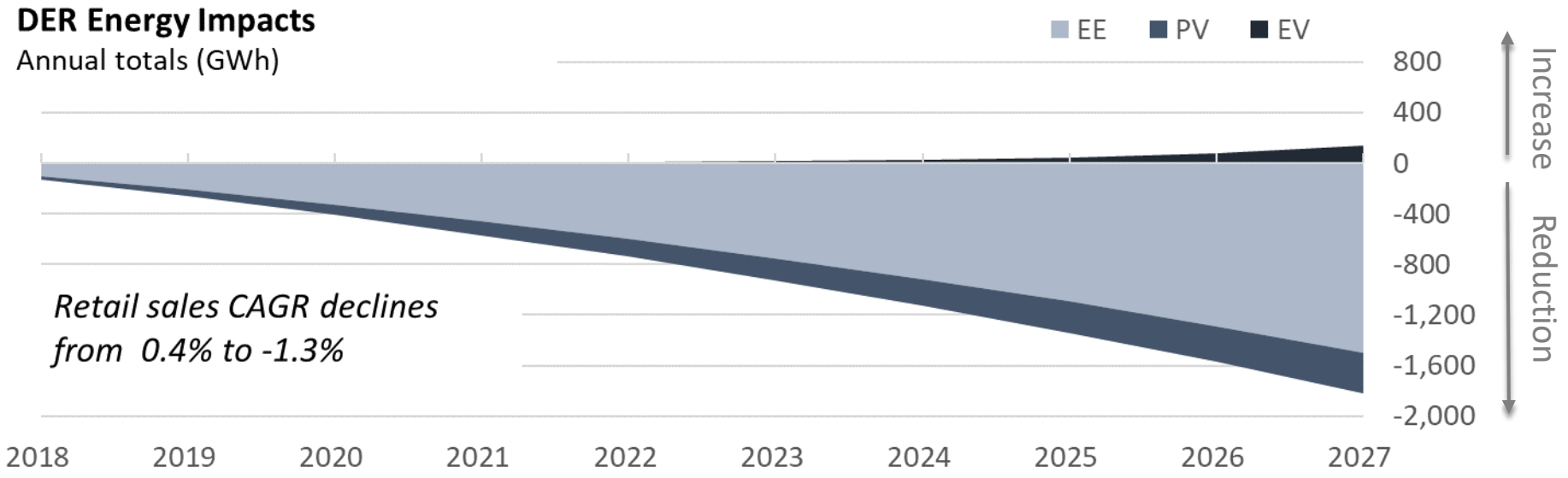
Electric vehicle adoption ramps up considerably but is still very small in terms of total cars sold and impact on retail sales and peak demand

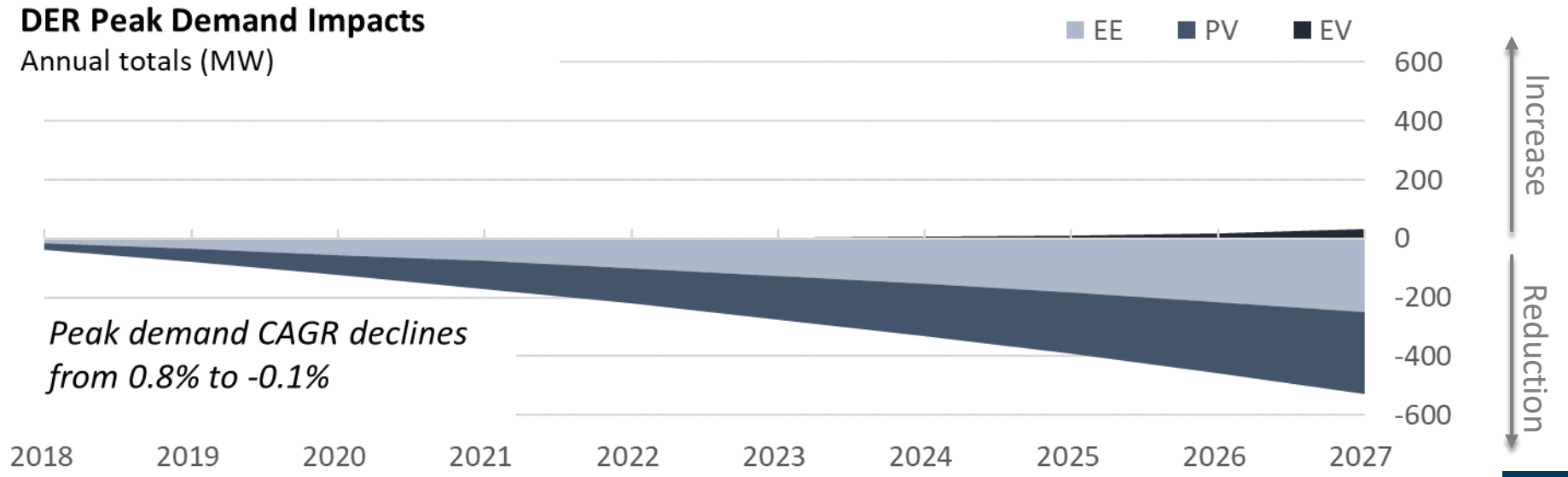
- Derived estimates of EV adoption in MN based on high national EV sales forecast (40% CAGR) and MN-specific car sales data estimates (AEO 2017)
- Estimated incremental energy and peak demand requirements, assuming unstructured charging (FleetCarma 2018, Dogan 2015)
- Derived starting year values and CAGR for energy and peak demand impacts of EV adoption

DER achievement goals – EV adoption assumptions

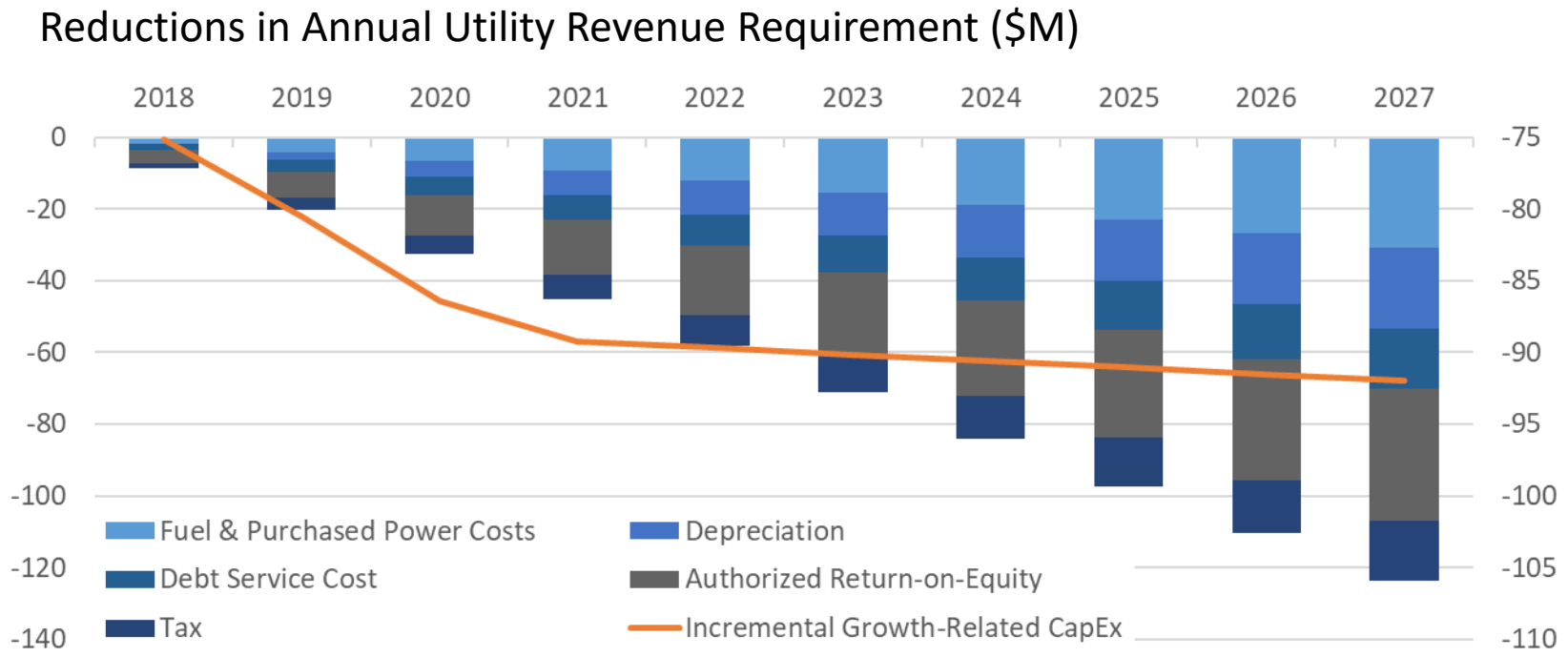


Increased demand from EVs does not offset EE and PV load impacts



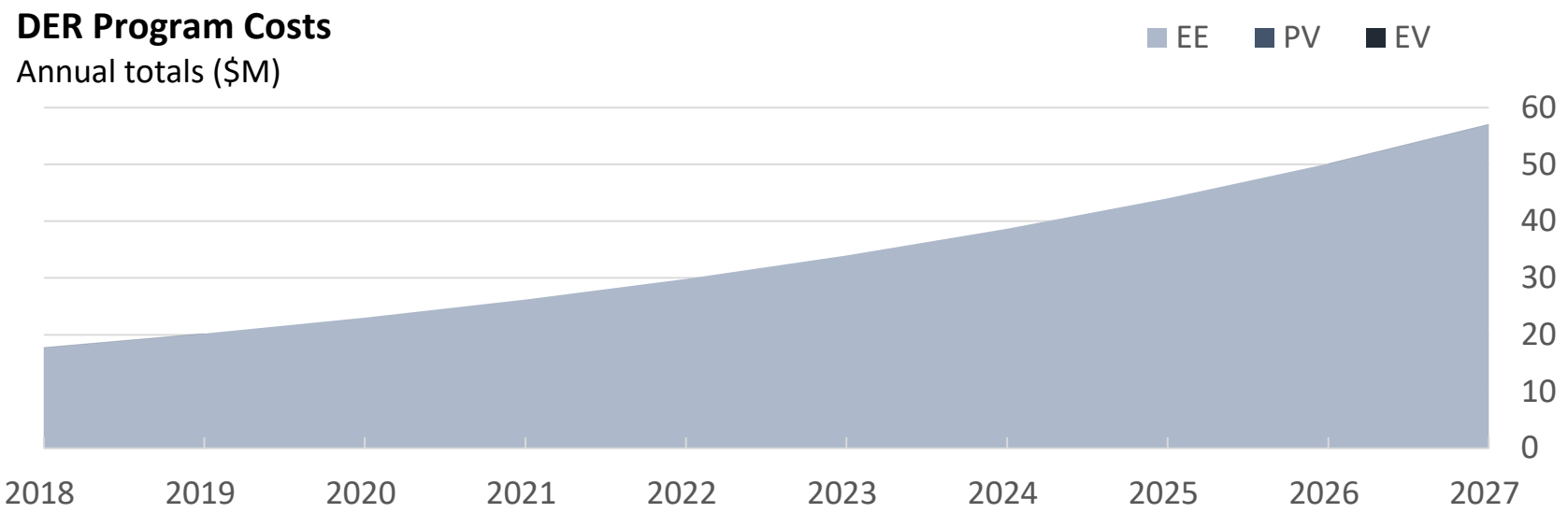


DER portfolio reduces fixed and variable costs



- Sources of cost reductions include reduced fuel and purchased power, lower return of and on avoided CapEx, and reduced taxes due to lower earnings

DER portfolio program costs grow over time as savings goals increase



- DER portfolio consists of utility-administered EE programs
  - DER program costs grow from <2% to more than 4% total operating expenses
- No ratepayer funding for distributed PV and EV charging as it is installed exclusively by third-parties

Ratepayers see negligible change in costs and slightly lower total bills

	BAU	DER (Δ)	DER (%Δ)
Operating Expenses ($M)	8,069	-218	-3%
Incremental Expenses ($M)	0	223	N/A
Net Operating Expenses ($M)	8,069	5	0%
All-In Retail Rate (¢/kWh)	13.9	0.7	5%
Total Ratepayer Bills ($M)	10,087	-285	-3%

- DER portfolio net impact on utility costs is negligible
- Average all-in retail rates increase
- But the reduction in retail sales offsets most of the rate increase such that aggregate ratepayer bills are slightly lower

Shareholders see decline in earnings, ROE, and value

	BAU	DER (Δ)	DER (%Δ)
Operating Expenses ($M)	8,069	-218	-3%
Incremental Expenses ($M)	0	223	N/A
Net Operating Expenses ($M)	8,069	5	0%
All-In Retail Rate (¢/kWh)	13.9	0.7	5%
Total Ratepayer Bills ($M)	10,087	-285	-3%
Achieved Pre-Tax Earnings ($M)	2,018	-293	-15%
Achieved After-Tax Earnings ($M)	1,397	-204	-15%
Achieved After-Tax ROE (BP)	793	-56	-7%
Market-to-Book Ratio	1.5	-0.3	-21%

- Earnings drop as revenue continues to grow more slowly than costs
- Utility risk assessment increases while achieved ROE decreases
- Shareholder value is reduced though utility still has slight incentive to invest capital

Utility characterization | **Impacts of DERs** | Impacts of Earnings Opportunities | Impacts of Changes in Revenue Recovery Models | Comprehensive Portfolios

Implications of DER portfolio

- In the 10 year analysis period, utility shareholder value is destroyed by the achievement of the DER deployment goals
- Given this backdrop, the utility would be expected to seek mitigation of some or all the financial impacts
- We model four incremental changes that could make the utility more supportive of the DER deployment goals

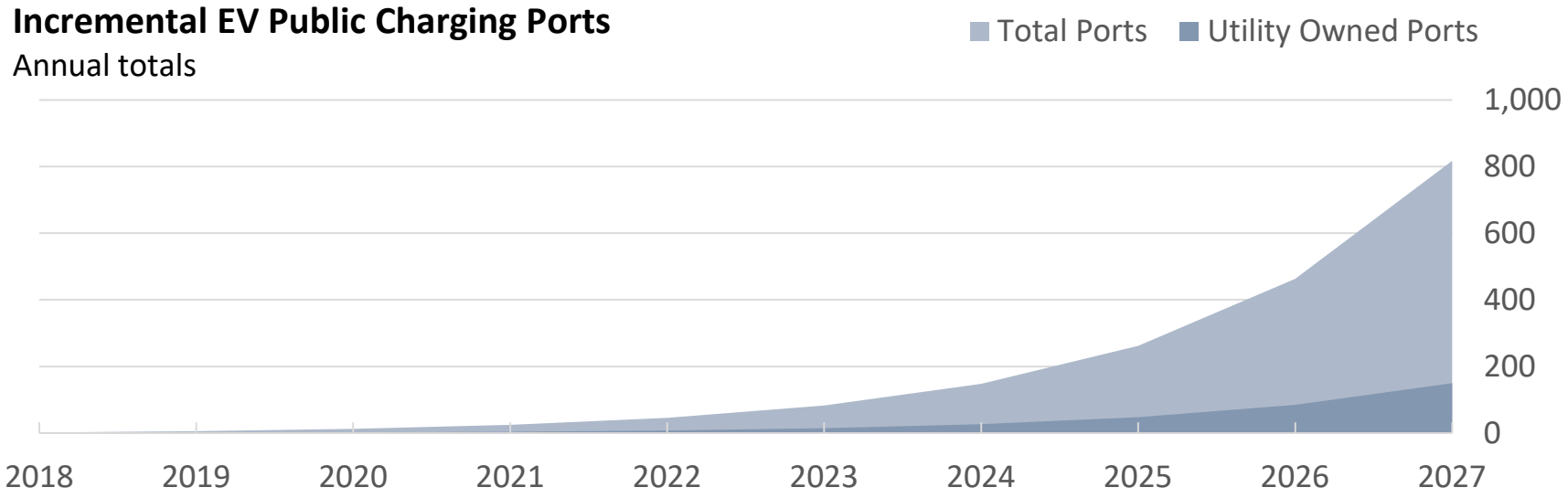
Modeled increased earnings opportunities

Opportunity	Intent	Design
Performance Incentive Mechanisms (PIM)	Financially reward utility for specific outcomes that achieve desired DER portfolio	Energy goals: 20 BP Peak demand goals: 10 BP DPV goals: 20 BP
Solar PV Ownership (Own PV)	Utility authorized to own and ratebase solar PV installations	70% of total PV production at $3.1/W, but participants cover 100% of costs
Electric Vehicle Charging Infrastructure Ownership (Own EV)	Utility authorized to own and ratebase EV charging ports	Own 20% of all charging ports in service territory resulting in investment of $900K (PV) and $130K (PV) of O&M
Grid Modernization Investments (Grid Mod)	Utility authorized to invest in AMI and distribution system improvements	~$400M (PV) capital investment with a reduction of ~$285M (PV) in expenses over 10 years

Increased Earnings Opportunities – EV Ownership

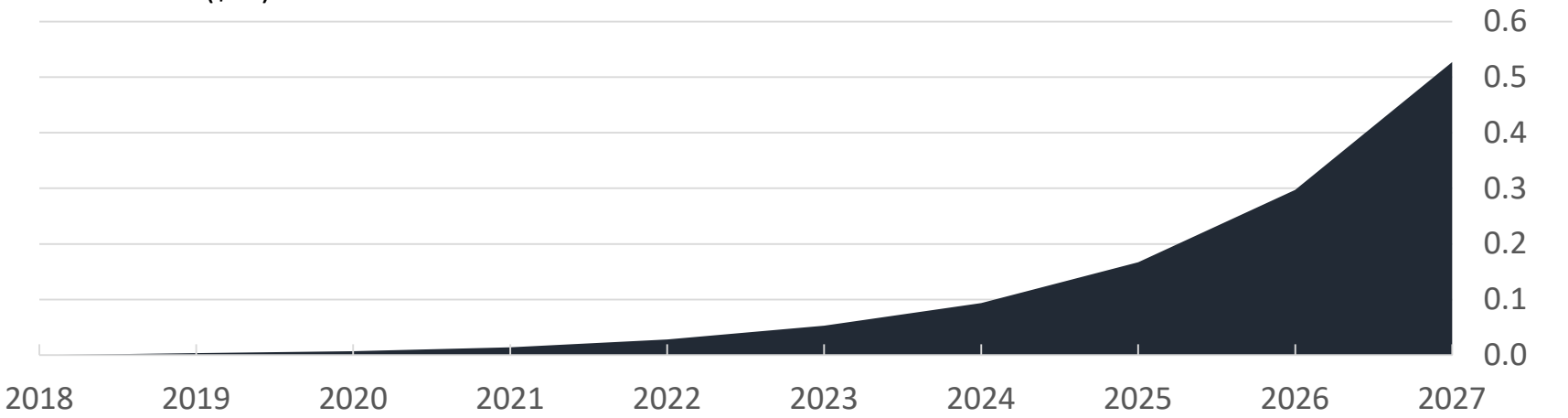
Incremental EV Public Charging Ports

Annual totals



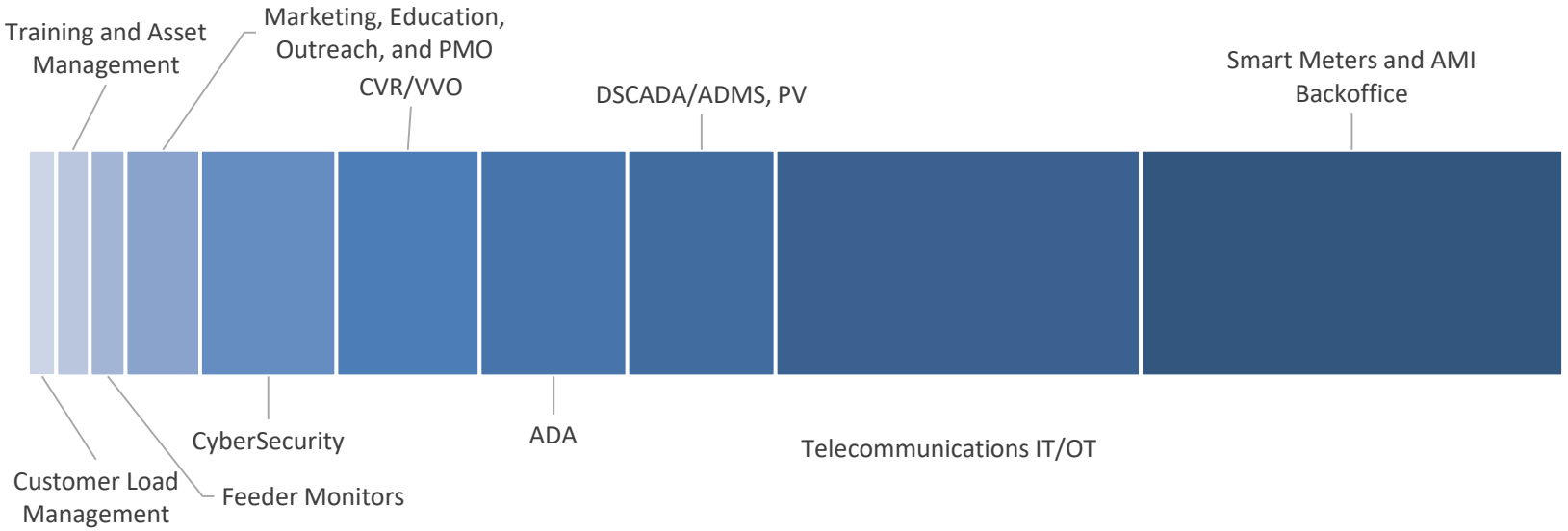
EV Infrastructure Incurred Costs

Annual totals ($M)



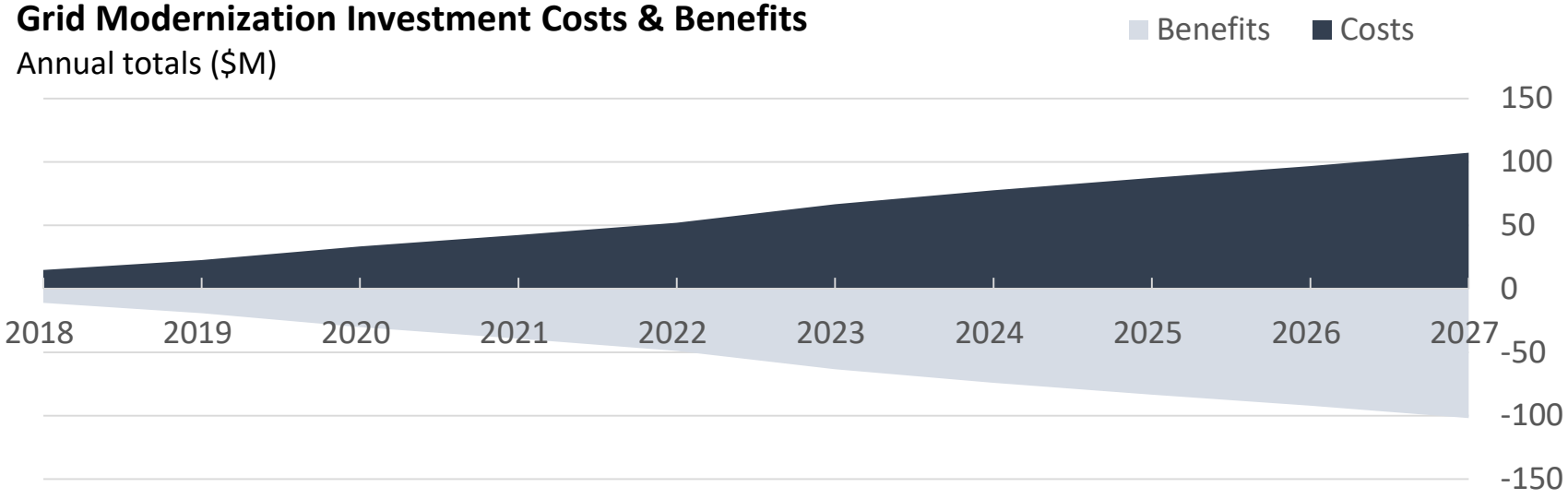
Increased Earnings Opportunities – Grid Mod

Grid Modernization Investment Cost Elements

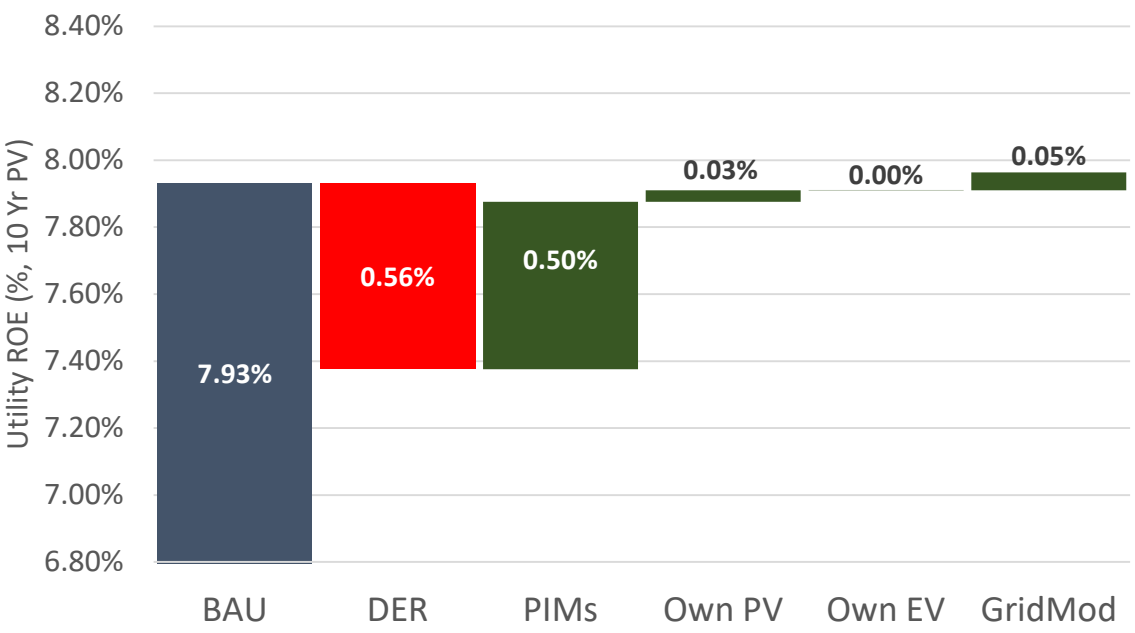


Grid Modernization Investment Costs & Benefits

Annual totals ($M)



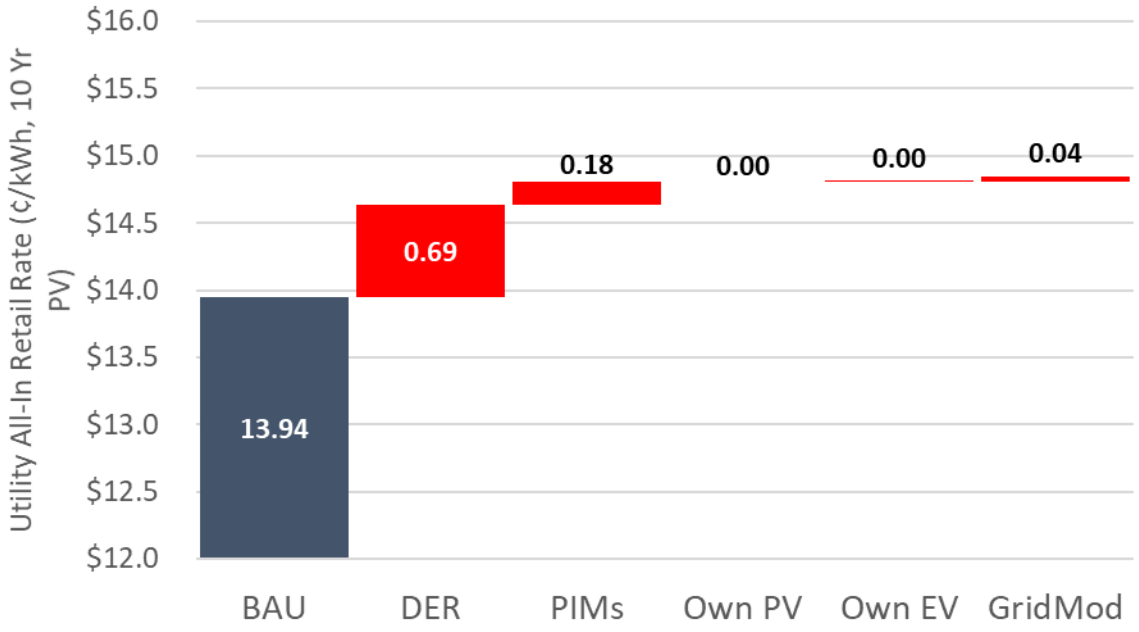
PIMs provide most significant increase to ROE



- PIMs add 50 BP on a 10 year PV basis
- Utility ownership of solar PV adds very little to ROE (3 BP)
- Utility ownership of EV is so small that it barely registers change in ROE
- Grid Mod investments add 5 BP to ROE

Utility characterization | Impacts of DERs | **Impacts of Earnings Opportunities** | Impacts of Changes in Revenue Recovery Models | Comprehensive Portfolios

Increased utility revenue presents tradeoff of higher retail rates



- PIMs add 0.2 ¢/kWh to average retail rates over 10 years
- Utility ownership of solar PV adds nothing, because participants ultimately bear 100% of the costs
- Costs of utility ownership of EV are very small (<$1M incremental CapEx)
- Grid Mod investments add modestly to rates (0.04 ¢/kWh)

Utility characterization | Impacts of DERs | **Impacts of Earnings Opportunities** | Impacts of Changes in Revenue Recovery Models | Comprehensive Portfolios

Conclusions of increased earnings opportunities

- PIMs can be designed to provide a larger or small financial incentive than modeled with commensurate impacts on rates
- Utility ownership of solar PV contributes very little to utility bottom line, but participants cover all costs
- Utility ownership of EV infrastructure is worth very little to utility profitability because so few EV charging stations are developed
- Grid Mod investments offer large capital investment opportunity, but don't have nearly the same magnitude affect on ROE as additional equity must be issued

Modeled increased revenue recovery models

Opportunity	Intent	Design
Multi-year Rate Plan (MYRP)	Create a schedule of rates that rises based on net-productivity improvements over 5-year rate cycle such that 10-year PV of achieved ROE is same as in BAU	Net-productivity (K) factor = 1.7% Utility risk assessment drops
Revenue-per-customer Decoupling Mechanism (RPC)	Break the link between sales and revenue but allow for revenue growth over 5-year rate cycle such that 10-year PV of achieved ROE is same as in BAU	Net-inflation (Z) factor = 0.8% Utility risk assessment drops even more

Mechanisms are designed to achieve ROE parity but have different impacts on shareholder value

Key Metrics (10-Yr PV)	BAU	DER	DER + MYRP	DER + RPC
Ratepayer Bills ($M)	10,087	9,802	9,933	9,932
All-In Retail Rates (¢/kWh)	13.9	14.6	14.8	14.8
Return-on-Equity (%)	7.9	7.4	**7.9**	**7.9**
Market Value ($M)	3,175	2,506	3,033	3,652
Market-to-Book Ratio	1.5	1.2	**1.4**	**1.7**

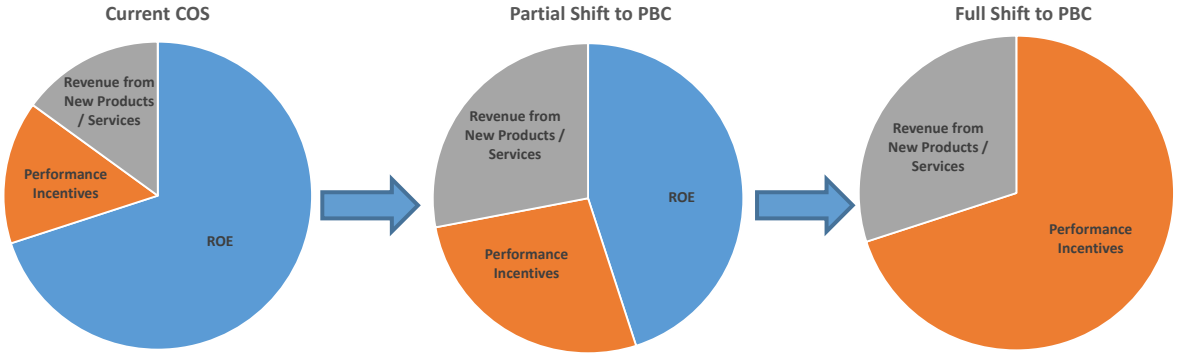
- Both revenue recovery mechanisms designed to collect the same amount of revenue over the 10 year analysis period on a PV basis; and thus have identical impacts on rates and ROE
- Greater financial incentive for shareholder-focused utility to achieve DER goals under RPC Decoupling mechanism than MYRP, due to reduction in risk

Conclusions of increased revenue recovery models

- Financial cost to ratepayers is the same, by design, for both MYRP and RPC, but they have very different impacts on shareholder value
- Reduction in assessment of risk is worth quite a lot to utility shareholders
  - MYRP can almost bring the utility back to parity with BAU while RPC Decoupling creates substantial shareholder value due to large macroeconomic risk reduction
- MYRP and RPC Decoupling mechanisms can be designed in lots of different ways
  - Impacts on shareholders are rarely integrated into design process
  - Understanding the implications for risk reduction could help develop revenue recovery mechanisms that provide more efficient incentives that benefit both shareholders and ratepayers

Possible comprehensive portfolios linked to conceptual shift in regulatory and business models

Earnings and Revenue Recovery Opportunities	Portfolio PIMs	Portfolio Services
Performance Incentive Mechanisms	●	
Utility Solar PV Ownership		●
Utility EV Charging Infrastructure Ownership		●
Grid Modernization Investments		●
Multi-Year Rate Plan	●	●



Utility characterization → Impacts of DERs → Impacts of Earnings Opportunities → Impacts of Changes in Revenue Recovery Models → Comprehensive Portfolios

Comprehensive portfolios suggest important rate and shareholder value implications

Key Metrics (10-Yr PV)	BAU	DER	Portfolio PIMs	Portfolio Services
Ratepayer Bills ($M)	10,087	9,802	9,933	9,938
All-In Retail Rates (¢/kWh)	13.9	14.6	14.8	14.8
Return-on-Equity (%)	7.9	7.4	7.9	7.9
Market Value ($M)	3,175	2,506	3,033	3,127
Market-to-Book Ratio	1.5	1.2	1.4	1.5

- MYRP still designed to achieve ROE parity, but required k-factor differs substantially: 0.2% (Portfolio PIMS) vs. 1.5% (Portfolio Services)
- Services-driven portfolio produces greater market value

Conclusions and implications

Design and intent matters	First ask, "what is the intent of the financial incentive mechanism?" Then consider design options to achieve that intent (e.g., k-factor, z-factor that can achieve earnings or ROE parity)
Risk is significant factor for shareholder value	Some mechanisms can achieve similar returns but increase/decrease risk by different amounts that has implications for shareholder value Mechanisms to reduce utility risk include: decoupling, cost trackers, and earnings (sharing) mechanisms aimed at specific and measurable goals
More capital investment is not always significant financial incentive	Larger scale investments, like Grid Mod, require additional equity and may not provide commensurate returns New utility investments should be considered within a scale, risk, and return framework that considers how all three interact together
Important financial tradeoffs between shareholders and ratepayers	PIMs, in particular, can be designed to provide financial incentives for successful achievement of goals but can impose additional ratepayer costs Design should be predicated, in part, on the value provided by the achievement of the goals/objectives

Discussion and questions?

Feedback questions

As we consider enhancing and expanding this work, we would like to know:

- Is the level of detail consistent with your expectations?
- What earnings opportunities or regulatory mechanisms are missing?
- What information is missing that you believe is necessary to take action?

Contact information

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